[redacted]

7th October 2024

Scottish Government
Agriculture & Rural Economy
161 Brooms Road
Dumfries
DG1 3 ES

Dear Sirs

[redacted]

Following the submission of an EIA application please find enclosed further information on the farming enterprise and practices at [redacted]

The unit consists of [redacted] acres of land which supports a dairy enterprise of [redacted] dairy cows and [redacted] dairy youngstock. All of the unit is down to grass with the emphasis on growing a high quality grass sward for grazing and conserving.

A structured reseeding and liming policy is in place to ensure the efficient production of high quality forage. The climate in South West Scotland being well suited to growing grass. Increased milk production and quality, or improved liveweight gain from forage production reduces the requirement for bought in feeds. Thus, improving business efficiency and therefore profitability in a sector where cost of production is imperative to business survival. Grass growth and its utilization also has a large impact on the emissions generated and the resulting carbon footprint. Less stock producing the same output or increased liveweight gain resulting in target liveweight being achieved earlier all have a positive effect on the emissions produced.

[redacted] forms part of the unit and is the area of ground subject to the EIA application.

Over recent years [redacted] has received investment to improve grass production and quality in line with other land areas on the unit. A map is enclosed with details of the management use and works carried out as follows:

98	NX/77651/48373	Field is used for silage production and grazing Receives applications of slurry and inorganic fertilizer Ploughed and reseeded in 2020
99	NX/77744/49467	Field is used for grazing
100	NX/77777/48183	Field is used for silage production and grazing Receives applications of slurry and inorganic fertilizer Ploughed and reseeded in 2021

Address: [redacted]
Office Tel/Fax: [redacted] Mobile: [redacted]
Email: [redacted]

101	NX/77782/48800	Field is used for silage production and grazing Receives applications of slurry and inorganic fertilizer Ploughed and reseeded in 2023
102	NX/77826/49706	Field is used for silage production and grazing Receives applications of slurry and inorganic fertilizer
103	NX/77885/49275	Field is used for silage production and grazing Receives applications of slurry and inorganic fertilizer
104	NX/77896/49151	Field is used for silage production and grazing Receives applications of slurry and inorganic fertilizer
105	NX/77975/48844	Field is used for silage production and grazing Receives applications of slurry and inorganic fertilizer Ploughed and reseeded in 2021
106	NX/77986/49441	Field is used for silage production and grazing Receives applications of slurry and inorganic fertilizer
107	NX/77993/48497	Field is used for silage production and grazing Receives applications of slurry and inorganic fertilizer Ploughed and reseeded in 2021 Earth banked slurry lagoon constructed in 2020
108	NX/78045/48188	Field is used for silage production and grazing Receives applications of slurry and inorganic fertilizer Ploughed and reseeded in 2023
109	NX/78108/49350	Field is used for silage production and grazing Receives applications of slurry and inorganic fertilizer
110	NX/78158/49716	Field is used for silage production and grazing Receives applications of slurry and inorganic fertilizer Ploughed and reseeded in 2023
112	NX/78182/48976	Field is used for silage production and grazing Receives applications of slurry and inorganic fertilizer Ploughed and reseeded in 2021
115	NX/78423/50025	Field is used for silage production and grazing Receives applications of slurry and inorganic fertilizer Ploughed and reseeded in 2018 Over seeded in 2023

116	NX/78435/49121	Field is used for grazing
117	NX/78499/49769	Field is used for silage production and grazing Receives applications of slurry and inorganic fertilizer Ploughed and reseeded in 2018 Over seeded in 2023
118	NX/78587/49391	Field is used for grazing Receives applications of slurry and inorganic fertilizer Area piped in 2023. Overspill from saturated wood (114), follows the contour of the land in 118, throughout the winter months and periods of high rainfall
120	NX/78833/49621	Field is used for silage production and grazing Receives applications of slurry and inorganic fertilizer Ploughed and reseeded in 2020 Part of field drained in 2019

The fields within the EIA are 116, 118 and 120. These fields are the less productive parts of the unit as evident from the grass quantity and quality. Stock which graze these fields require further supplementation with bought in concentrates/feeds. There has also been occasions when stock have died or become very ill by suspected poisoning from weeds or plants.

Given the ongoing pressures many dairy farmers face it is important that a business can effectively utilize all the resources available to it, land and grass, and the ability to grow this being a major one. Producing a high quality product in a sustainable way is a requirement and not a request from today's consumers.

Based on the ecological survey produced, and its findings, it is proposed to maintain the wetland areas in fields NX/78345/49121 (116) and NX/78833/49621 (120), each with a five meter habitat corridor. The cluster of trees adjacent to the wetland in 116 would also be maintained.

Should you have any questions or queries please do not hesitate to contact me.

Yours sincerely

[redacted]

Application for an Environmental Impact Assessment (EIA) Screening Decision

The Scottish Government
Riaghaltas na h-Alba

For official use only

Sequential number:

Date application received:

Scottish Government
RPID Dumfries
LB - 9 MAY 2024
RECEIVED

Section 1 – Business details

Business name	[redacted]
Business address	[redacted]
Postcode	[redacted]
Contact name	[redacted]
Telephone number	[redacted]
Mobile number	[redacted]
Email	[redacted]
Main Location Code (MLC)	[redacted]
Business Reference Number (BRN)	[redacted]

Do I need to complete this form?

A: For projects that involve the use of uncultivated land* or semi-natural areas* for more intensive agricultural purposes:

You should complete **sections 1, 2, 3a, 4, 5, and 7** of this form.

B: For projects that involve restructuring of rural land holdings on agricultural land:

You should complete **sections 1, 2, 3b, 4, 5 and 7** of this form if you are planning any of the following work on agricultural land in Scotland;

Activity	**Outside a sensitive area**	**Within a sensitive area ****
Add or remove **any** field boundary (e.g. fences etc)	6 km or more	**Always**
Removing hedge or drystane dyke	0.5 km	**Always**
Move earth, rock or any other material	5,000 m^3	**Always**
Restructuring an area greater than	200 ha	**Always**

Please note that the thresholds apply to the total area of land where the work is to take place even if it is undertaken bit-by-bit over one or several seasons, or if it involves different types of work. A project may involve more than one type of restructuring referred to in the table above. If any of the elements of the restructuring is above the threshold, the entire project is subject to the screening procedures, and all elements should be included in this application.

C: For projects that involve new Irrigation and/or new Drainage:

For Irrigation

- **If you are extracting water to irrigate crops with mobile equipment** you should contact SEPA to obtain an extraction licence and don't need to complete this form.
- **If you are proposing to build fixed infrastructure** for example a water storage lagoon with fixed permanent pumps and pipes, you should first find out if you need planning permission from the Local Authority. If you do, then you do not need to complete this form - apply to the Local Authority for Planning permission and SEPA for an abstraction licence. If your proposals don't require planning permission from the local authority and include fixed equipment/water storage site, then you do need to complete **section 1, 2, 3c, 4, 5 and 7** of this form in addition to contacting SEPA for an abstraction licence.

For Drainage

- Maintenance of existing drainage on improved/ intensively managed land does not require this form to be submitted. If the land is reverting to an unimproved/seminatural* state fill in **section 1, 2, 3c, 4, 5 and 7** of this form. If you propose to carry out new drainage in a sensitive** area you need to fill in **section 1, 2, 3c, 4, 5 and 7** of this form.
- If you propose to carry out new drainage outside a sensitive** area above 1 ha, you need to fill in **section 1, 2, 3c, 4, 5** of this form.

SGRPID consider land that has not been improved (e.g. spraying, liming, ploughing, draining, and reseeding such areas) or intensively farmed for around 15 years to fall into this category, contact us for more guidance if you're unsure.

***Sensitive areas are: - Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC), Special Protection Area (SPA), National Scenic Area (NSA) or land with a Nature Conservation order.*

Section 2 – Project description and potential impacts

Please provide a description of your whole project, and a map. To ensure these include all the necessary information a check list has been provided below, please ensure that each section has been included in your report on page 4, otherwise your application risks being rejected.

Project Description;

- An overview of the project ☑
- A description of the environmental sensitivity of the geographic area of the project ☑
- Is the proposed work on common land? ☑
- A detailed map of the project and surrounding area ☑
- Is there any other information relevant to this application (e.g. access rights, core paths etc) ☑

Likely environmental effect of the proposed changes covering;

- Soil ☑
- Land ☑
- Water ☑
- Biodiversity/habitats ☑
- Historical, cultural and/or archaeological considerations ☑
- Include any significant features listed above on your project map (e.g. badger sett, scheduled ancient monuments etc) ☑

If applicable, the report can include measures which are being put in place to avoid or prevent any likely significant adverse effects from the project.

Project description and potential impacts

SEE ATTACHED

Continue on a separate sheet if necessary

Section 3a – Semi-natural areas - site details and proposed operations:

Site description. *(Please describe the main features of the land, including watercourses and drainage systems, vegetation, wildlife and habitats)*	If different from Main Location **Name of Farm:** [redacted] **Location code:** [redacted]
The semi-natural areas of this project were previously improved grassland but as a result of a failing drainage system due to mains water pipe it has reverted in parts to weed grasses and rushes. The field perimeters are a combination of drystone dykes and wire fences, a few small trees have started to grow in one of the fields	**For example:** *The field was previously improved grassland but has reverted to native grasses and rushes. Enclosed by dykes and wire fence. It has a failing drainage system. Gorse / scrub is found at corners.*

Please complete the table below.

Land Parcel Identifier	Letter of proposed works on map	Area of proposed work (ha)	Description of the proposed work (mark exact area of project on map referred to in section 3a).
AB/12345/12345	*a*	*15*	*Example: Spraying off current vegetation, plough, lime, reseed with modern grass mix*
NX/78345/49121		5.88	Once drainage and restructuring completed Spray off, plough or cultivate, lime and reseed with modern grass mix remove dyke + unplanted trees
NX/7883/49621		21	Spray off, plough/cultivate, lime and reseed with modern grass mix in keeping with the rest of the field
NX/78587/49391		12.6	Once drainage and restructuring complete, spray off, reseed with modern grass mix

*** Please note that 1 hectare = 2.471 acres; and 1 acre = 0.405 ha**

If necessary, please tick this box and continue on a separate sheet ☐

Section 3b – Restructuring - site details and proposed operations:

Site description. *(Please describe the main features of the land, including watercourses and drainage systems, vegetation, wildlife and habitats)*	If different from Main Location **Name of Farm:** [redacted] **Location code:** [redacted]
The site covers 3 fields of improved grassland, it has tiled drains, some of the fields have areas that have been cut for silage	**For example:** *The site covers 12 fields of improved grassland pasture, with some drystane dykes but mostly wire fence. It has maintained tile drains. Gorse / scrub is found at corners.*

Please complete the table below.

Land Parcel Identifier	Letter of proposed works on map	Length, width, and depth (as applicable) of proposed work (m)	Volume of material to be distributed (m^3) (if applicable)	Description of the proposed work (mark exact area of project on map referred to in section 3a).
AB/12345/12345	*A* *B*	*50 m x 5 m x 1 m* *750 m*	*250 m^3* *n/a*	*Example: a – strip back topsoil, break and spread rock, replace soil and grade level, and reseed.* *Example b – Demolish 750 m of dilapidated dyke, and reuse stone to repair dykes elsewhere on holding.*
NX/78587/49391 12·6		SEE ATTACHED		
NX/78345/49121 ~~NX/78332~~ 5·88				

If necessary, please tick this box and continue on a separate sheet ☑

tion 3c – Drainage and irrigation - Site details and proposed operations:

escription. *(Please describe the main features of the land, including watercourses and drainage systems, tion, wildlife and habitats)*	If different from Main Location **Name of Farm:** [redacted] **Location code:** [redacted]
ene sites have a failing drainage system that needs repaired nd updated, Grass grown for grazing and silage	**For example:** *The site is part of an existing arable field, cropped annually.*

omplete the table below.

arcel er	**Letter of proposed works on map**	**Area to be drained / irrigated (ha)**	**Description of the proposed work (mark exact area of project on map referred to in section 3a).**
45/12345	*a*	*4*	*Example – Insert new piped drainage system (125 mm leader, 80 mm spurs 10 m average spacing) running to nearby burn to lower the water table to allow greater range of cropping. Map of layout included separately.*
27/49391 2.6			SEE ATTACHED
45/49121			
23/49621			

note that 1 hectare = 2.471 acres; and 1 acre = 0.405 ha

If necessary, please tick this box and continue on a separate sheet ☑

on 4 – Changes to Management

te this section if you are proposing to change how you manage this land. Please provide information about how all the land in question has been managed in the past. You cover the last 15 years if possible and provide information for **ALL** fields affected by your proposed project.

	Past management	Proposed management
45/12345	*Example: Sheep grazing field, average stocking 40 head. Not cut for forage. Last limed and reseeded in 2001. Currently receives 125 kg/ha compound fertiliser annually.*	*Example: Silage field, cut 3 times per year. Intensive slurry and compound fertiliser. Field will be limed and reseeded every 5 years.*
87/49391 12.6	grazed by cattle and sheep, not cut for silage currently spread with slurry and 150kg/ha fertilizer	Silage field, cut 3 times per year, spread slurry + fertiliser, lime + reseed every 5 years
833/49621 21	Majority of field cut for silage annually, grazing of cattle and sheep. [redacted] Reseeded in 2020, lime spread 175kg/ha spread annually of fertilizer	Continue with same practice including new drained area, silage x3, spread with slurry and fertilizer
8345/49121 5.88	grazed by cattle and sheep, not cut for forage	Silage field, cut 3 times per year, spread slurry + fertiliser, lime and reseed every 5 years

Section 5 – How we use your information

How we use your information: We will use the information provided on the application form, including your contact details, for the purpose of delivering and/or improving our administration of the Schemes and services we offer. This may include sending you voluntary customer satisfaction surveys from time to time to see how we are doing. We take our responsibilities for the way we store, secure and use your personal information seriously, and always seek to respect your privacy and to meet our legal obligations. These obligations include the General Data Protection Regulation, the UK Data Protection Act, and other regulations and legislation relating to privacy and communications. To see details on how we use your information and who we share your information with, please see our privacy policy located at: https:// www.ruralpayments.org/privacy-policy/ or available in paper form from your area office. Our Privacy Policy explains the purposes for which we use personal data and the legal basis for that use. It explains our responsibilities for collecting data and what happens if you fail to provide data we need or provide incorrect data. We set out the categories of data we collect and how we acquire it, especially in those cases where it may come from another party. The Privacy Policy also sets out our approach to sharing data and gives information about the organisations with whom we share data and why we do so. Finally, we advise you of your various rights and how to exercise them. If you are providing information to us on behalf of someone else (for example, as an agent representing a beneficiary), you are advised to draw this section of the Guidance and the Privacy Policy to the attention of any individual whose data is being processed. This is in order to help you fulfil your obligations under data protection legislation towards your clients or those whom you represent.

Section 6 – Declaration

Applicants should note that it is an offence to provide false information (knowingly or recklessly) to obtain a screening decision.

- I understand that I will be legally obliged to comply with any decision granted in respect of this application and conditions attached to it.
- I have read the guidance on The Agriculture, Land Drainage and Irrigation Projects (Environmental Impact Assessment) (Scotland) Regulations 2017 available on Rural Payments and Services.
- I declare that the information given in my application is correct to the best of my knowledge and belief, and I apply for a screening decision in accordance with these particulars.

APPLICANT

Signature [redacted]

Name (Block Capitals) [redacted]

Status of person signing [redacted]

(For example, Director, company secretary, or other duly authorised officer)

Agent ID number (if applicable)

Date 27 / 04 / 2024

IMPORTANT – CHECK LIST

☑ Answered all the questions.

☑ If necessary, attached any separate sheet(s) required.

If we consider that you have not supplied sufficient information to make a screening decision, we will request the additional information in writing. If you do not supply the required information then the application will be rejected.

Project description and potential impacts

The project is at [redacted]

The project covers 3 fields:

1.	NX/78587/49391	12.6 Hectares
2.	NX/78833/49621	21 Hectares
3.	NX/78345/49121	5.88 Hectares perimeter

The main objective of this project is to repair old tiled drains which have been failing since a mains water pipe was run through the fields and insert new drains where required.

We would like to remove a stretch of dyke between fields NX/78345/49121 and NX/78587/49391 which is in a state of disrepair and use the stones to repair two other dykes that require attention within the project.

There are a couple of spots in two of the fields where a bit of rock is visible or a small knowe that needs softened every so slightly to allow tractors and machinery to pass over safely.

In field NX/78345/49121 there are some small unplanted trees that have grown that we would like to remove.

Once the project is complete it will be our intention to make silage on these fields for most of the summer season and graze our youngstock later in the year with some ewes or lambs grazing through the winter months.

The extra silage ground is needed to help feed our anaerobic digester which will help us reach our carbon reduction pledge set out by our milk buyer and are in line with government targets.

The environmental sensitivity of the area will include some stresses produced by the above works, these include:

1. Disturbance of soil surfaces
2. Removal of Plant Cover
3. Possible changes of surface hydrology
4. Potential disruption to natural habitats
5. Atmospheric emissions from on site plant

The work proposed is on common land

There are no core paths on the fields in the plan

Environmental effect

The soil covering of the land will be replaced as it was or enhanced in areas of particularly shallow soils.

The land will be well drained with the ability to be more productive

Water will remain unchanged with a small stream running at the fence line of one field

There should be very little impact on the habitats of the area

I am not aware of any historical or archaeological considerations on the site or any ancient monuments.

Map of site

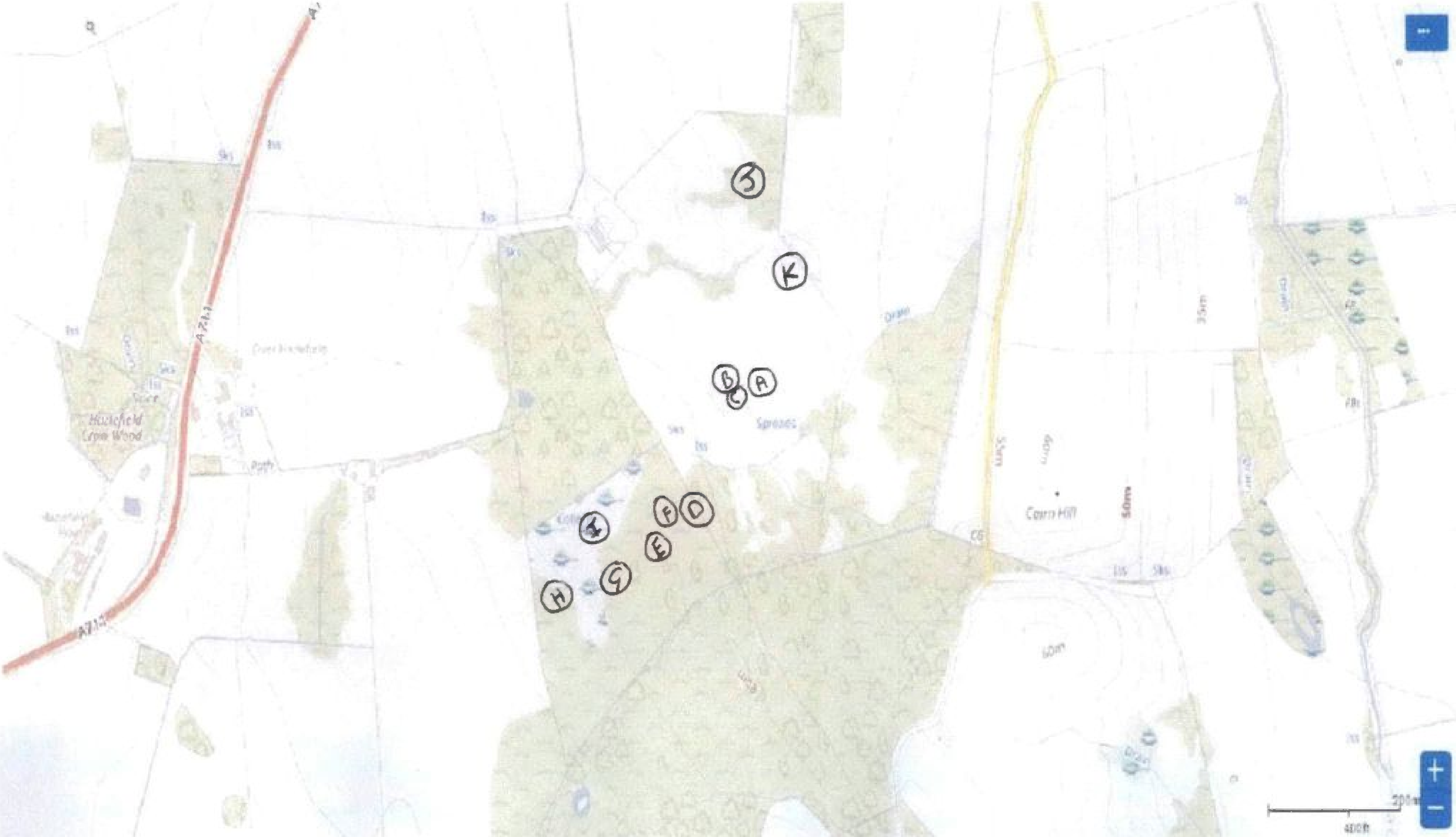


Table of proposed operations

Restructuring

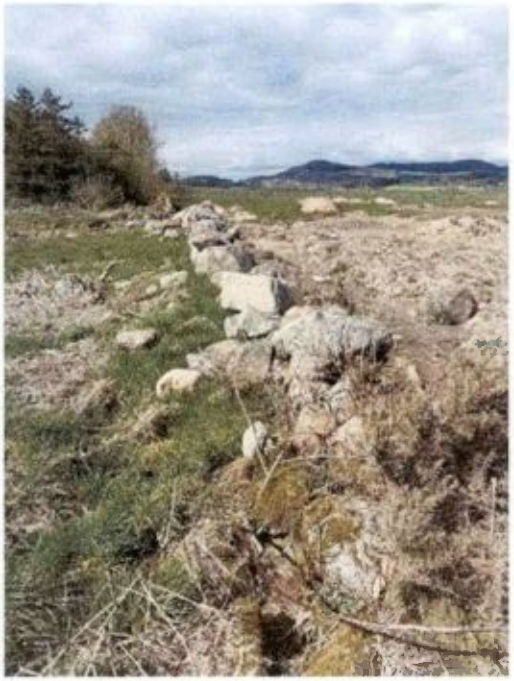
Field	Map ID	Description	Dimensions (M)	Area	Description
NX/78587/49391	A	Knowe	7 x 3 x 1	21m3	Strip back top soil, grade, replace soil and reseed
NX/78587/49391	B	Knowe	25 x 7 x 2	350m3	Strip back top soil, break and spread rock, grade level, replace soil and reseed
NX/78587/49391	C	Knowe	7 x 3 x 0.5	10.5m3	Strip back top soil, break and spread rock, grade level, replace soil and reseed
NX/78587/49391 – NX/78345/49121	D	Dyke	101	----	Demolish 101m of dilapidated dyke, reuse stones to repair dykes elsewhere on holding

Field	Map ID	Description	Dimensions (M)	Area	Description
NX/78345/49121	E	Knowe	16 x 6 x 2	192m3	Strip back top soil, break and spread rock, grade level, replace soil and reseed
NX/78345/49121	F	Area of Rock	3 x 2 x 0.5	3m3	Strip back top soil, break and spread rock, grade level, replace soil and reseed
NX/78345/49121	G	Area of Rock	2 x 2 x 0.5	2m2	Strip back top soil, break and spread rock, grade level, replace soil and reseed
NX/78345/49121	H	Trees	Individuals		We would like to remove
NX/78345/49121	I	Trees	Cluster		We would like to remove

A

B

D



E

H

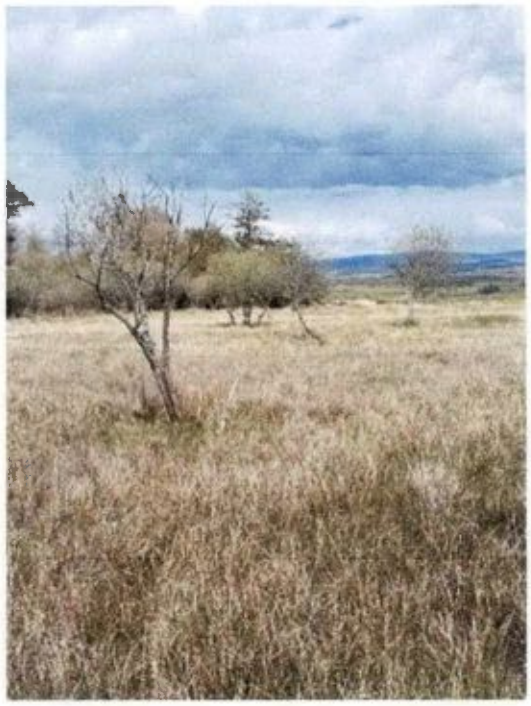


Table of Proposed operations

Drainage

	Map ID	Area (Ha)	Description
NX/78587/49391	J	1.5	Insert new drainage system 125mm leader, 80mm spurs 8m spacing, joining into existing drainage network
NX/78587/49391	K	0.25	Insert new drainage system 125mm leader, 80mm spurs 8m spacing, joining into existing drainage network
NX/78587/49391	L	0.25	Insert new drainage system 125mm leader, 80mm spurs 8m spacing, joining into existing drainage network

	Map ID	Area	Description
NX/78345/49121	Whole Field	5.88 Ha	Insert new drainage system 125mm leader, 80mm spurs 8m spacing, joining into existing drainage network

J

K

L

[redacted]

[redacted]

Habitats, vegetation & GWDTE

Status:	Final 2.0
Date:	29/09/2024
Prepared by:	[redacted]
Email:	
Web:	

Contents

Tables

Maps

Appendices

Cover picture: View from the southwestern corner, northward, across the U4a-M23a acid grassland - marshy grassland transition, towards the W1 willow scrub on the edge of the site & beyond.

[redacted]

Summary

This report describes the results of a habitat-focused survey & assessment of an area within [redacted], a farm in Dumfries & Galloways, that is located approximately midway between Auchencairn & Dundrennan.

The **aim** of the report is to describe the habitat baseline & assessment process to identify habitat constraints & opportunities.

The **main site** within [redacted] is divided between an area of unimproved pasture that includes grassland, mire & willow scrub habitat; and an area of grassland managed for silage production. The main site is located at 50 m to 90 m altitude. Flanking the site to the northwest & south is mire & willow scrub, and perennial rye-grass leys surround the remainder of the boundary. Neighbouring areas of wetland habitat to the west are also included within the survey & assessment. Development of the site into silage production is proposed and this is considered in the Mitigation & Silage production sections.

There are no **statutory designations** associated with the site.

The **Carbon & Peatland Map** predicts there is no nationally-important peatland, or peat soils.

Ancient Woodland is not present within the site nor within 1.1 km.

Habitats: Acid grassland is the most extensive habitat type within the site. It accounts for 6 ha (52 % of the total cover) and there is an additional 3 ha (30 %) in a mosaic with marshy grassland. Marshy grassland alone accounts for 1 ha (9 %). Collectively, the acid & marshy grasslands therefore account for 10 ha or 91 % of the site. The remaining habitats individually account for less than 0.4 ha (4 %) and they include: scrub; neutral grassland, tall ruderal herbs; spoil; and a mosaic between the ruderal & neutral grassland habitats.

No **notable species** were recorded but a locally distinctive wetland assemblage is identified.

Peatland Condition Assessment was not undertaken because there is no bog habitat.

No **deep peat** is present on the site.

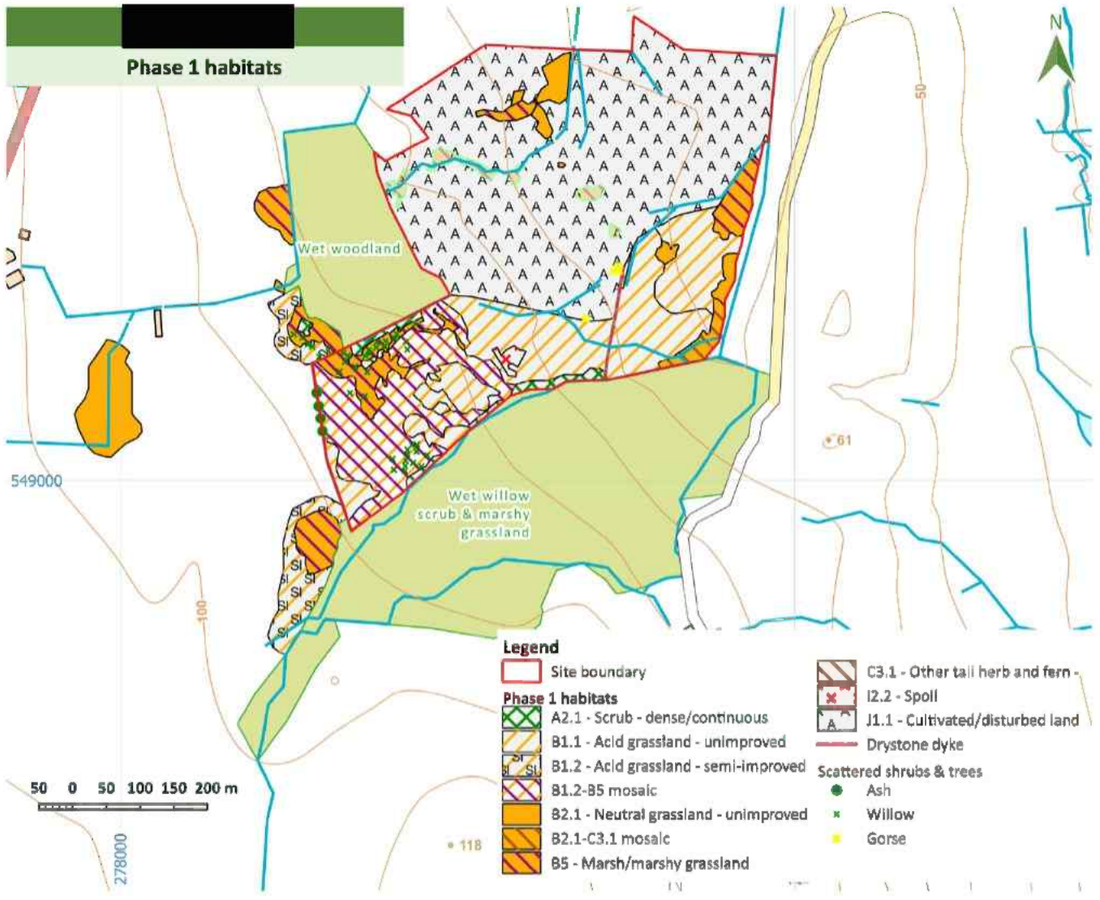
Ecological importance of the habitats ranges from Site to Local.

GWDTE of a Moderate groundwater-dependency are present within the site.

Habitat constraints are not identified.

Mitigation focuses on the retention of key wetland areas (as indicated in Map 5).

There is potential for 10.69 ha of **silage production** while retaining key areas of wetland habitat.



[redacted]

1 Introduction

Remit

1.1 This report describes the results of a habitat-focused survey & assessment of an area within [redacted], a farm in Dumfries & Galloways, that is located approximately midway between Auchencairn & Dundrennan. Intentions to convert some of the area to silage production have progressed but have ceased due to the presence of the wetland habitats that are the focus of this report.

Aim & objectives

1.2 The aim of the report is to describe the habitat baseline & assessment process to identify habitat constraints & opportunities for silage production by meeting the following objectives:

- Phase 1 habitat & National Vegetation Classification survey.
- Assessment of habitat importance & sensitivity, including designations, peat/peatland & Groundwater Dependent Terrestrial Ecosystems (GWDTE).

The site

1.3 The main site within [redacted] is an 11.5 ha area of unimproved pasture that includes grassland, mire & willow scrub habitat. Neighbouring areas of wetland habitat to the west & north are also included within the survey & assessment. These wetland areas are located in perennial rye-grass leys that are currently managed for silage. Areas of former wetland along a watercourse are also included in the report and these have been mapped from aerial photography.

1.4 Altitude across the site ranges from around 50 m to 90 m. Flanking the site to the northwest & south is mire, wet woodland & willow scrub; and perennial rye-grass leys surround the remainder of the boundary. Development of the site for arable production is considered in the Mitigation section.

[1] SiteLink data, including mapping & site documentation available at https://sitelink.nature.scot/home. Accessed 01/08/2024.

[2] Carbon & Peatland Map details are available at https://soils.environment.gov.scot/maps/thematic-maps/carbon-and-peatland-2016-map/. Accessed 01/08/2024.

[3] *A guide to understanding the Scottish Ancient Woodland Inventory* is available at https://www.nature.scot/doc/guide-understanding-scottish-ancient-woodland-inventory-awi. Accessed 01/08/2024.

2 Approach

2.1 In preparation of the baseline, a desk-based study of environmental information is undertaken, to identify relevant data (on designations, etc), and then a field-based survey. The resulting, desk study & survey data is then assessed to identify sensitivities in relation to guidance & legislation. Details on the methods & sources are provided in the following sections.

Survey boundary & buffers

2.2 The survey area is defined in Map 1 *et seq*. It includes an area of silage production that has already been modified and the location & identity of adjacent or 'satellite', wetland habitat.

Desk study

2.3 A desk study is undertaken to identify habitat designations, including:

- Sitelink[1] to identify nature conservation designations.
- Carbon & Peatland Map[2] to identify 'Class 1' or 'Class 2' peatland, or Class 5 peat soils.
- Ancient Woodland Inventory[3] to identify native woodlands.

Survey

2.4 There are two elements to the survey: a 'Phase 1' habitat survey and a more detailed 'National Vegetation Classification' (NVC) of vegetation within the habitats. The data from these is mapped & described; and supplemented by field assessment of habitat/vegetation condition & groundwater dependency. The methods are described in the following sections.

Phase 1 habitat survey

2.5 Phase 1 habitat survey is undertaken within the site boundary according to the standard method[4] & guidance[5]. As a 'broad-brush' approach, Phase 1 habitat survey is now somewhat outdated by current legislation & initiatives but it still provides a well-established & useful overview. Furthermore, it includes unvegetated habitats not covered by the more detailed National Vegetation Classification described below. In the Habitats & vegetation baseline (below), the vegetation communities are grouped & described under the heading of the corresponding Phase 1 habitat.

[4] JNCC 2010. *Handbook for phase 1 habitat survey - a technique for environmental audit* and other relevant information available at http://jncc.defra.gov.uk/page-2468. Accessed 01/08/2024.

[5] Chartered Institute of Ecology and Environmental Management 2018. *Guidelines for Ecological Impact Assessment in the UK & Ireland*. Available at https://www.cieem.net/guidance-on-preliminary-ecological-appraisal-gpea-. Accessed 01/08/2024.

National Vegetation Classification

2.6 The National Vegetation Classification (NVC) is more precise than the Phase 1 habitat method; and is necessary for identifying habitats/plant communities of relevance to modern legislation (such as Annex I of the Habitats Directive, or GWDTE of the Water Framework Directive). It is therefore the primary system to which vegetation (& habitat) is related within this report, for the purposes of identification, mapping & description.

2.7 Vegetation is identified, mapped & described according to *British Plant Communities*[6] in accordance with the *NVC Users Handbook*[7]. This involves walking the site on a route determined by topography/viewpoints and the need to sample distinctive areas. Boundaries are mapped onto rectified aerial photographs overlain with contours & other physical features. A single vegetation community, or a mosaic or transition of two or communities, is identified within a boundary, depending upon the scale & patterning of the habitat/vegetation. Where mosaics or transitions are mapped, the percentage cover of each NVC community is stated.

Target notes

2.8 Characteristics of the vegetation in particular locations, and point-features too small to otherwise map, are recorded as 'Target Notes' (in Appendix 1). These notes include a description of the feature/habitat, the coordinates and an illustratory photograph.

Habitat & vegetation description

2.9 In this section, the approach to describing vegetation biodiversity & patterning is described.

Biodiversity: species richness, evenness & distinctiveness

2.10 Biodiversity is defined as the variation in genes, species & interactions in an area. In order to describe the biodiversity of habitats & vegetation, the following measures are used on a three-point scale (high, medium/moderate & low):

- Species richness (or α diversity) is a measure of the number of species
- Evenness (or β diversity) is a measure of how equally the species are distributed.
- Distinctiveness (or γ diversity) is a measure of how much the habitat contributes to biodiversity.

2.11 Species richness relates the number of species and by inference: the number of genes & interactions. Evenness relates how many of the interactions are dominated by small number of species, or a single species, and is often indicative of habitat condition, for example: invasive species (e.g. bracken) create 'uneven' vegetation because of their exclusive dominance. Some habitats are naturally species poor but these are usually distinctive, such as reedbeds, that are dominated by a single grass but are rare in the landscape, and they host notable species. As such, distinctiveness is broadly a measure of naturalness &/or rarity.

2.12 Use of species richness, evenness & distinctiveness as measures of habitat/vegetation biodiversity therefore aids appraisal of habitat/vegetation composition, condition & ecological importance.

Mosaics, transitions & admixtures

2.13 Distinction is made between mosaics & transitions in the mapping & assessment. Mosaics are mapped where two or more habitats or NVC communities are juxtaposed as discrete areas at a scale below the resolution of the mapping (≈1:10,000). For example: acid grassland over water-shedding mounds, among marshy grassland in waterlogged depressions.

2.14 Transitions represent dynamic situations where established habitat(s) &/or NVC communities are being displaced by others. For example: bracken or purple moor-grass invading into grassland or blanket bog. In these transitions, the habitats/communities are blended together, with the invasive species/community diffusely scattered throughout in a distribution that cannot be mapped at an operable scale.

2.15 Very minor areas of one habitat within another, such as small flushes within blanket bog, are considered as admixtures to the dominant type. To maintain the clarity of the mapping, etc., these admixtures are included within the dominant habitat (and not defined as mosaics) because the admixture is usually less than 2 % of the total area. However, their presence & cover is indicated in the labelling of Map 4.

Scale

2.16 Survey is undertaken at a scale of around 1:5,000 to 1:8,000 and the habitat mapping is rendered at a scale of around 1:5,000 on small sites (<100 ha) or around 1:10:000 to 1:1:12,500 on larger sites (as specified on the maps). Small features (less than 2 m to 5 m) are not mapped, or are recorded as points or lines; and/or as Target notes, if they are ecologically significant (e.g. springs, dykes or animal burrows).

Quantification of species abundance

2.17 Plant species abundance within habitats/vegetation is semi-quantified using the DAFOR scale. This scale broadly relates abundance/cover as follows:

- **Dominant:** >51 % cover
- **Abundant:** 30 % to 50 % cover
- **Frequent:** 15 % to 30 % cover
- **Occasional:** 5 % to 15 % cover
- **Rare:** <5 % cover.

[6] Rodwell, J.S. 1991-2000. *British plant communities*. 5 Volumes. Cambridge University Press.

[7] Rodwell, J.S. 2006. *NVC Users' Handbook*. Available at http://jncc.defra.gov.uk/page-3724. Accessed 01/08/2024.

Notable species

2.18 Notable species are included in nature conservation designations & listings. The 2016 JNCC spreadsheet of taxa designations[8] defines these species and is the main point of reference in addition to the *Dumfries & Galloway Biodiversity Action Plan*[9]. Species are referred to as 'notable' to avoid confusion with the use of 'rare' in the DAFOR scale (see Quantification of species abundance).

Nomenclature

2.19 Standardised vernacular names are used for the vascular plants (ferns, herbs & trees). Scientific names (italicised within the text) are used for the moss, liverwort & lichen species because although vernacular names are now in existence, they are not in general usage. This approach assists discrimination of the plant groups and avoids long, tedious lists of vernacular & scientific names. The standard checklists for the names are employed[10].

Peat depth

2.20 Peat depth is assessed during survey on an *ad hoc* basis, to provide preliminary data on its distribution. The depth is assessed in exposures (such as in drains or eroded faces) or by use of a 1.5 m probe.

Survey accuracy

2.21 Survey accuracy is influenced by a number of factors including the following:

- GPS error.
- Georectification errors in the aerial photography used for base-mapping.
- Gradual transitions between habitats & vegetation that are poorly-defined with a simple line.
- Transitional habitats & vegetation similar to two or more habitats or NVC communities.

2.22 Furthermore, the fit of vegetation to the published NVC communities is often imperfect and the closest approximation is therefore adopted (with explanation in the habitat/vegetation descriptions in the Habitats & vegetation baseline). Surveying in Scotland also has the added limitation that NVC sampling was weighted towards England, so the published descriptions, and even community titles, are not always directly applicable (for example: eponymous species may not be present in Scotland).

Assessment

2.23 Assessment of the baseline is undertaken against local, national & international, legislation & initiatives, to identify priorities for nature conservation & sensitive habitats. The methods described in the following sections have been applied in assessment of the baseline.

Peatland Condition Assessment

2.24 Peatland Condition Assessment[11] is employed in the field to determine the condition of the peatland habitat. This assessment classifies the peatland into four classes:

- Near-Natural
- Modified
- Drained
- Actively Eroding.

2.25 Field-based assessment of a series of key indicators identifies the appropriate class for each area of peatland. These indicators include features such as the *Sphagnum* cover & vegetation condition; evidence of fire frequency & intensity; bare peat; and scrub/tree invasion[12]. Condition indicators relevant to the site are listed in the Peatland Condition Assessment section.

Deep peat

2.26 The peat depth data is used to broadly discriminate shallow peat (<0.5 m deep), shallow deep peat (0.5 m to 1.5 m deep) &/or very deep peat (>1.5 m deep); and its distribution in relation to habitat features.

Ecological importance

2.27 The habitat & species baseline established by the desk study & survey is assessed against the following to identify priorities for protection:

- Peatland & Carbon Map[2]
- Ancient Woodland Inventory[3]
- Dumfries & Galloway Biodiversity Action Plan[9]
- Annex I of the EU Habitats Directive[12]
- Scottish Biodiversity List[13].

[8] JNCC spreadsheet of taxa designations & further information available at: http://jncc.defra.gov.uk/page-3408. Accessed 01/08/2024.

[9] Dumfries & Galloway Biodiversity Action Plan 2009. Download at https://swseic.org.uk/resource/dgbap-part1/. Accessed 01/08/2024.

[10] BSBI *List of British & Irish Vascular Plants & Stoneworts*, for higher plants, available at https://bsbi.org/taxon-lists. For mosses and liverworts, the *Census Catalogue of British and Irish Bryophytes 2021* available at https://www.britishbryologicalsociety.org.uk/publications/census-catalogue/. Accessed 01/08/2024.

[11] NatureScot 2017. *Peatland Condition Assessment*. Available for download from https://www.nature.scot/sites/default/files/2017-10/Guidance-Peatland-Action-Peatland-Condition-Assessment-Guide-A1916874.pdf. Accessed 01/08/2024.

[12] List & descriptions of Habitats Directive Annex I habitats available at http://jncc.defra.gov.uk/Publications/JNCC312/UK_habitat_list.asp. Accessed 01/08/2024.

[13] Further details and download of the Scottish Biodiversity List available at https://www.nature.scot/doc/scottish-biodiversity-list. Accessed 01/08/2024.

2.28 The assessment is undertaken according to the Ecological Impact Assessment guidance[14], which recommends that a level of ecological importance is assigned to features using a geographical context as defined in Table 1.

Table 1: Ecological importance categories.

Importance	Context	Characteristics
International	Europe	• An area of habitat designated as a Ramsar site; Special Area of Conservation &/or Special Protection Area.
National	UK\Scotland	• An area of habitat designated as a Site of Special Scientific Interest. • Habitat area >1% of the national resource.
Regional	South Scotland	• A vague definition including habitats of more importance than county level but not sufficient for SSSI designation.
County	Dumfries & Galloway	• County-designated (e.g. Biodiversity Action Plan) habitats. • Habitat area >1% of the county resource. • Semi-natural, ancient woodland >0.25ha in extent.
Local	Site & 2 km buffer	• Habitats that are unique, or of some other significance, in the local area. • Areas of habitat that contribute to the local ecological resource.
Site	Site only	• Common, often anthropogenic habitats, or dominated by invasives.

Notable species

2.29 Mapping of notable species is constrained by the habitat survey method that requires different search patterns & seasons to those required for effective species survey. A key focus is therefore on the identification of species assemblages that can be efficiently identified & protected to highlight & conserve most, if not all, of the species present on a site. It also allows for the protection of less valued species alongside those that are notable.

2.30 Assemblages are usually located on unproductive areas (e.g. crags or waterlogged basins) where they have been able to escape a legacy of management or development. Furthermore, their location is usually predictable in these areas, and amenable to detection during a habitat survey

Groundwater dependent terrestrial ecosystems

2.31 Potential Groundwater Dependent Terrestrial Ecosystems (GWDTE) were identified during the NVC survey according to Confor[15] & SEPA[16] guidance. Location-specific groundwater dependency is assessed because GWDTE are not always groundwater dependent, so their inappropriate consideration can cause unnecessary constraint. Assessment is based on the physical environment (geology, hydrology & topography) of the potential GWDTE as well as their floristics.

Constraints & mitigation

2.32 Habitat-related constraints are identified from the assessment of Ecological importance and appropriate mitigation is broadly defined to reduce the intensity of potential impacts.

Biodiversity enhancement

2.33 Opportunities for biodiversity enhancement are primarily identified in relation to the Peatland Condition Assessment; assessment of ecological importance; and current, legislative priorities.

Additional background

2.34 Additional background on the approaches employed are available on the Botanæco blog at the following links:

General survey

- Using a mobile device on ecological surveys
- Setting up a speedy, mobile GIS using QField
- Habitat survey kit
- Approaches to survey
- Semi-automating vegetation data entry

Habitats & vegetation

- Conserving relict species assemblages
- A way to describe vegetation
- Fitting Phase 1 habitats & NVC communities to their designations.

Peat & peatlands

- Peat depth survey - a modern approach
- Confusion over peat depth & other mire sediment types
- Peatland Condition Assessment.

GWDTE

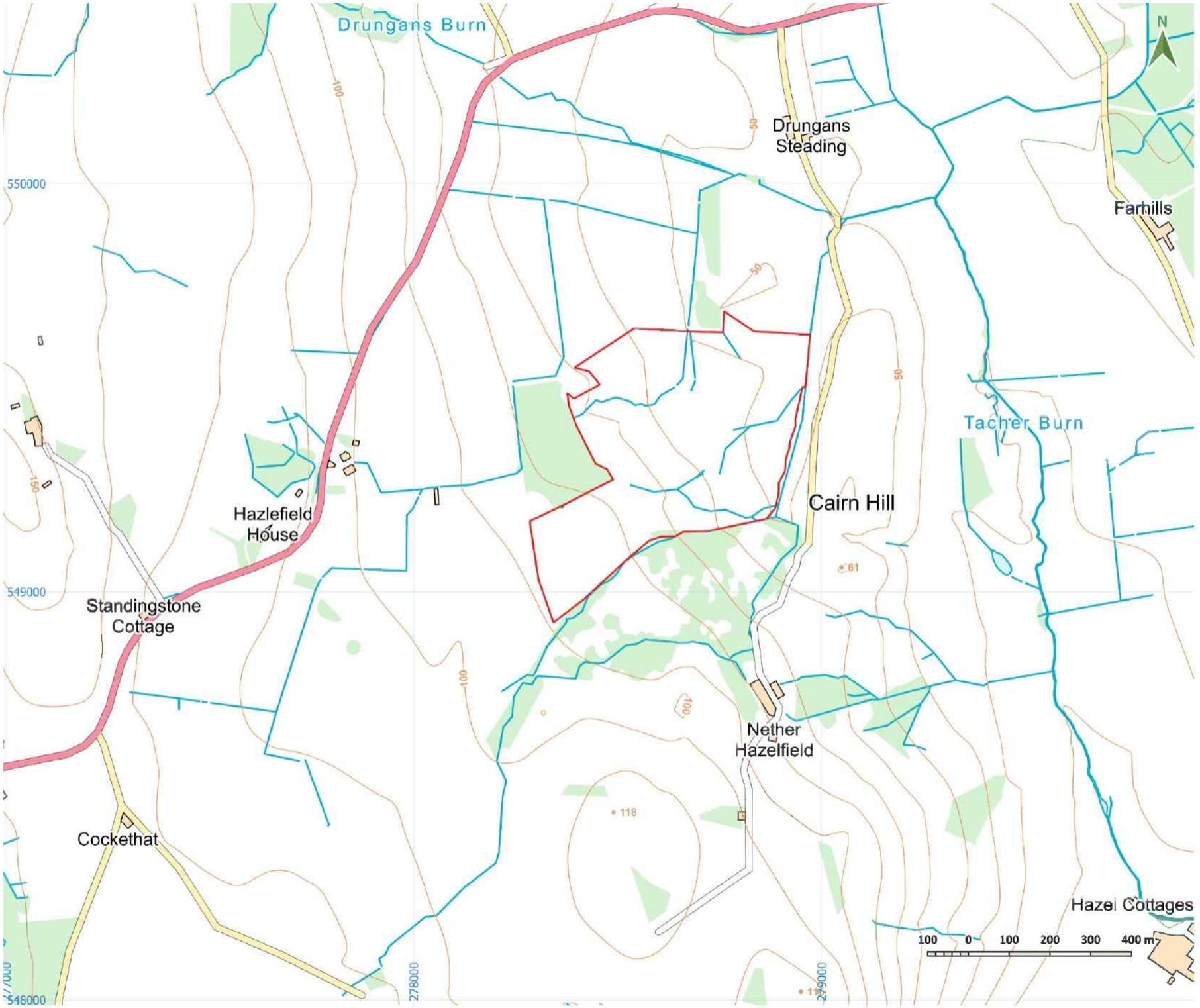
- GWDTE: a field guide
- A contribution to the risk-based assessment of GWDTE
- GWDTE 2: A quick guide to GWDTE
- GWDTE I: Go with the flow on survey.

[14] CIEEM 2018. Guidelines for Ecological Impact Assessment in the UK & Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester. Available at https://cieem.net/resource/guidelines-for-ecological-impact-assessment-ecia/. Accessed 01/08/2024.

[15] Confor 2018. Practice guide for forest managers to assess and protect Groundwater Dependent Terrestrial Ecosystems when preparing woodland creation proposals. Available at https://www.confor.org.uk/media/246950/practice-guide-on-ground-water-dependent-terrestrial-ecosystems.pdf. Accessed 01/08/2024.

[16] Land Use Planning System SEPA Guidance Note 31. Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems. Available at https://www.sepa.org.uk/media/144266/lups-gu31-guidance-on-assessing-the-impacts-of-development-proposals-on-groundwater-abstractions.pdf. Accessed 01/08/2024.

[redacted]



Map 1:
Physical features.

Physical features

Legend

- Site boundary

Physical features

- Point height (m)
- Contour (10 m)
- Building
- A Road
- Minor Road
- Waterbody
- Watercourse
- Woodland

Scale: 1:10,000 at A3

[redacted]

[redacted]

3 Baseline

3.1 In this section, the habitat baseline of the site is described in relation to its general characteristics, designations, habitats, vegetation communities & notable plant species.

General description

3.2 The site descends gently, with a gradient of 1:17, from 90 m to 50 m altitude, on a northeast-facing hillslope. It terminates in a shallow valley (see Map 1). Wetland & willow scrub flanks the north-western & southern boundaries, and there are extensive perennial rye-grass leys within and adjoining the remainder of the boundary. The wider landscape is dominated by predominately pastoral fields and there are small areas of conifer plantation & semi-natural habitats.

Designations

3.3 In this section, statutory & non-statutory nature conservation designations associated with the site are identified. The distribution of designated habitats & sites is illustrated in Map 2 & Map 3 (note that for clarity, woodland is not illustrated in these and subsequent maps).

Statutory designations

3.4 Statutory nature conservations designations provide a legal basis to the protection of certain sites and their specified features. Their distribution is illustrated in Map 2.

3.5 There are no statutory designations associated with the site. The closest is the Heart Moss Site of Special Scientific Interest that is 1.4 km to the southwest, and there are a range of coastal designations 1.8 km to the southeast.

Non-statutory designations

3.6 Non-statutory designations identify areas of natural heritage importance to assist planning & management decisions but they do not have the legal basis of statutory designations. Non-statutory designations within & around the site are illustrated in Map 3, and are described in the following sections.

Carbon & Peatland Map

3.7 The Carbon & Peatland Map[2] predicts there is no nationally-important, Class 1 or Class 2 peatland, or Class 5 soils within 0.7 km from the boundary.

Ancient Woodland Inventory

3.8 Ancient Woodland[3] is not present within the site nor within 1.1 km.

Habitats & vegetation

3.9 The conditions & results of the field survey are described in this section in relation to the ecology & floristics of the habitats & vegetation communities. Statistics on the absolute (ha) & relative (%) habitat & vegetation cover are provided in Table 3. Habitat distribution is illustrated in Map 4 as well as target notes, and labels for the NVC communities within the habitats.

Survey

3.10 Survey was undertaken on the 29th of July, 2024, and on the 25th of September, by [redacted], Principal Botanist at [redacted]. Conditions on the days of survey were ideal: overcast, with broken cloud and light wind speeds; and no precipitation. All parts of the site were accessible.

Habitat areas

3.11 Habitat areas are summarily described in this section; details are provided in Table 2. Note that the habitat areas in this section & Table 2 refer only to the red line survey boundary and not the isolated areas of wetland west of this.

3.12 Acid grassland is the most extensive habitat type within the site. It accounts for 6 ha (52 % of the total cover) and there is an additional 3 ha (30 %) in a mosaic with marshy grassland. Marshy grassland alone accounts for 1 ha (9 %). Collectively, the acid & marshy grasslands therefore account for 10 ha or 91 % of the site. The remaining habitats individually account for less than 0.4 ha (4 %) and they include: scrub; neutral grassland, tall ruderal herbs; spoil; and a mosaic between the ruderal & neutral grassland habitats.

Habitat & vegetation descriptions

3.13 Habitats & their constituent vegetation communities are described in this section in relation to their distribution, floristic composition, ecology, condition & management. Target Notes in Appendix 1 are referenced where applicable.

[redacted]

Map 2:
Statutory designations.

[redacted]

Statutory designations

Legend

- Site boundary

Statutory designations

- Site of Special Scientific Interest

Physical features

- Point height (m)
- Contour (10 m)
- Building
- A Road
- Minor Road
- Waterbody
- Watercourse

N

550000

549000

548000

278000

279000

Heart Moss

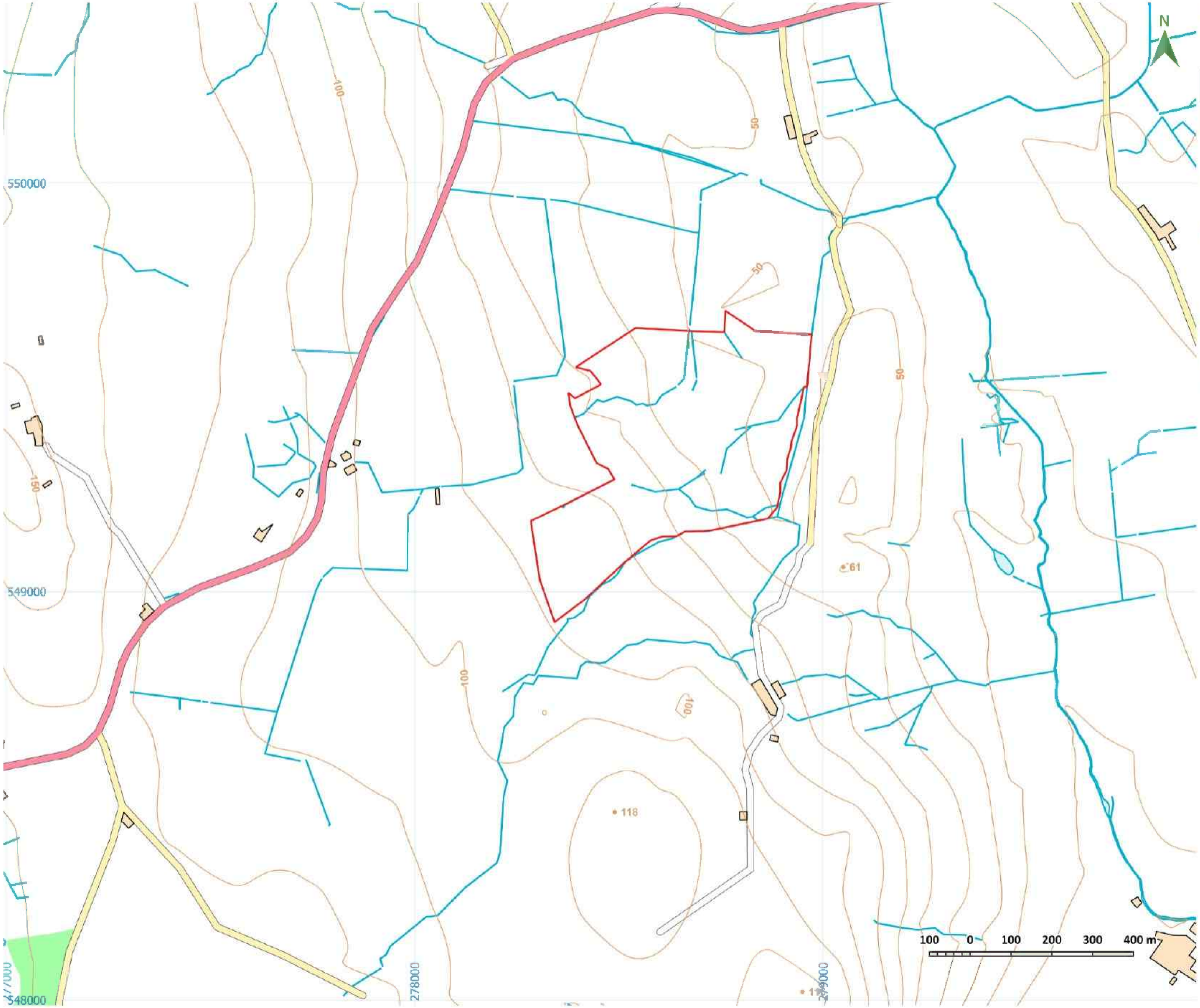
100 0 100 200 300 400 m

Scale: 1:10,000 at A3

[redacted]

[redacted]

Map 3:
Non-statutory designations.



[redacted]

Non-statutory designations

Legend

Site boundary

Non-statutory designations

Ancient Woodland Inventory

Long-Established (of plantation origin)

Physical features

Point height (m)

Contour (10 m)

Building

A Road

Minor Road

Waterbody

Watercourse

Scale: 1:10,000 at A3

100 0 100 200 300 400 m

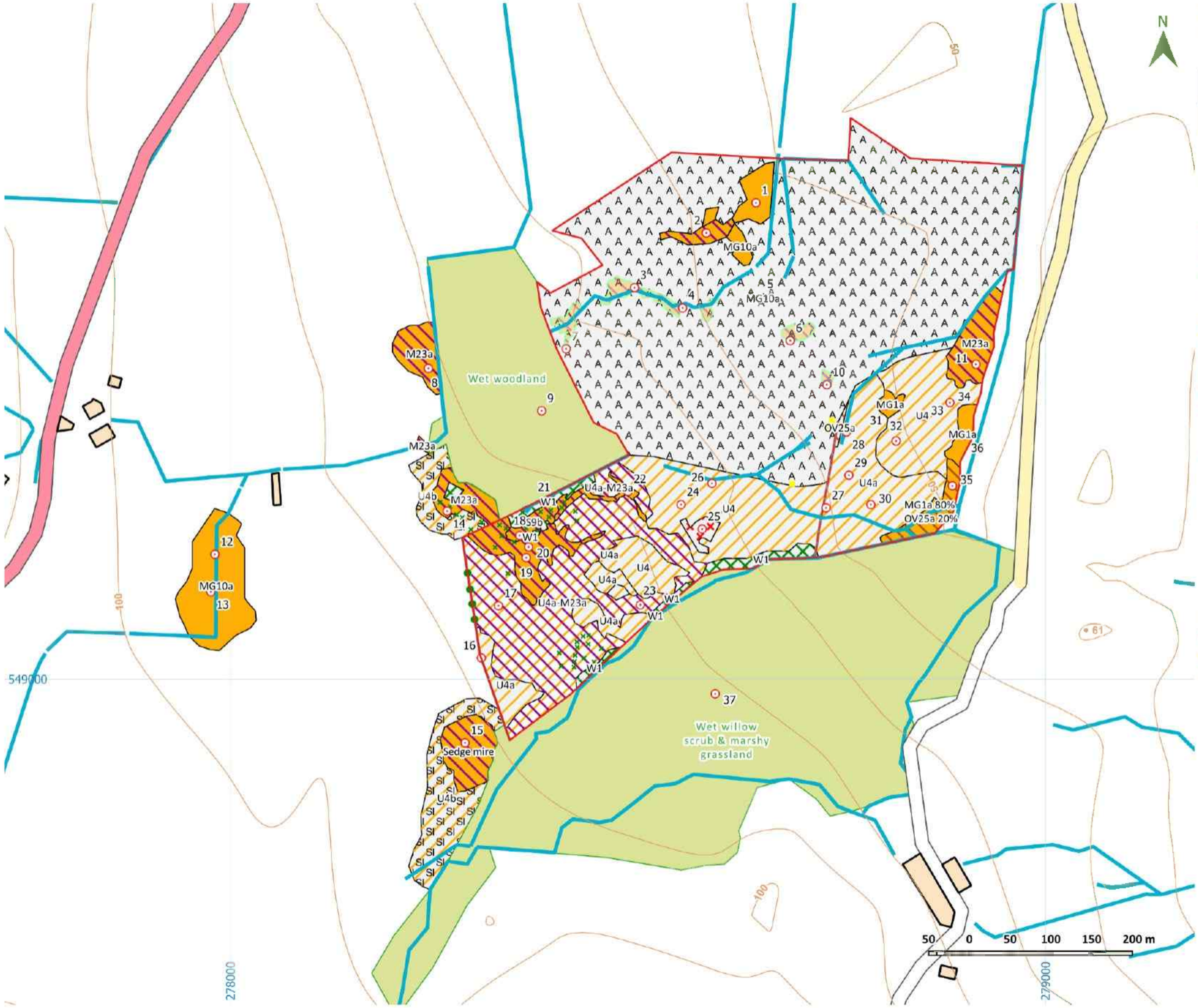
[redacted]

[redacted]

Map 4:
Phase 1 habitats.

[redacted]

Phase 1 habitats & NVC communities



Legend

- Site boundary
- Target notes

Phase 1 habitats

- Displaced MG10 &/or M23 vegetation
- A2.1 - Scrub - dense/continuous
- B1.1 - Acid grassland - unimproved
- B1.2 - Acid grassland - semi-improved
- B1.2-B5 mosaic
- B2.1 - Neutral grassland - unimproved
- B2.1-C3.1 mosaic
- B5 - Marsh/marshy grassland
- C3.1 - Other tall herb and fern - ruderal
- I2.2 - Spoil
- J1.1 - Cultivated/disturbed land - arable
- Drystone dyke

Scattered shrubs & trees

- Ash
- Willow
- Gorse

Physical features

- Point height (m)
- Contour (10 m)
- Building
- A Road
- Minor Road
- Watercourse

Scale: 1:5,000 at A3

[redacted]

Map contains:
- OS data © Crown copyright and database right (2024).

[redacted]

Table 2: List of corresponding Phase 1 habitats & National Vegetation Classification plant communities, and mosaics; and their absolute & relative areas within the red-line boundary.

Phase 1 habitat code & title	Area		National Vegetation Classification code & title	Area	
	Absolute (ha)	Relative (%)		Absolute (ha)	Relative (%)
A2.1 Scrub - dense/continuous	0.43	1.5	**W1** *Salix cinerea-Galium palustre* woodland	0.43	1.5
B1.1 Acid grassland - unimproved	6.02	20.9	**U4a** *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland, typical sub-community	6.02	20.9
B1.2-B5 transition	3.42	11.9	**U4a-M23a** transition	3.42	11.9
B2.1 Neutral grassland - unimproved	0.57	2.0	**MG10a** *Holcus lanatus-Juncus effusus* rush-pasture, typical sub-community	0.36	1.3
B2.1 Neutral grassland - unimproved			**MG1a** *Arrhenatherum elatius* grassland, *Festuca rubra* sub-community	0.21	0.7
B2.1-C3.1 mosaic	0.29	1.0	**MG1a-OV25a** mosaic	0.29	1.0
B5 Marsh/marshy grassland	1.36	4.7	**M23a** *Juncus effusus/acutiflorus-Galium palustre* rush-pasture, *Juncus acutiflorus* sub-community	1.1	3.8
B5 Marsh/marshy grassland			**M23b** *Juncus effusus/acutiflorus-Galium palustre* rush-pasture, *Juncus effusus* sub-community	0.14	0.5
B5 Marsh/marshy grassland			**S9b** *Carex rostrata* swamp, *Menyanthes trifoliata-Equisetum fluviatile* sub-community	0.12	0.4
C3.1 Other tall herb and fern - ruderal	0.03	0.1	**OV25a** *Urtica dioica-Cirsium arvense* community, *Holcus lanatus-Poa annua* sub-community	0.03	0.1
I2.2 Spoil	0.1	0.3	n.a.	0.1	0.3
J1.1 Cultivated/disturbed land - arable	16.58	57.6	n.a.	16.58	57.6
Totals:	**28.80**	**100.0**	**Totals:**	**28.80**	**100.0**

A2.1 Scrub - dense/continuous

3.14 Scrub is vegetation dominated by native shrubs, usually less than 5 m tall, and occasionally with a few scattered trees. It can be continuous or scattered. A single scrub NVC community is present.

W1 *Salix cinerea-Galium palustre* woodland

3.15 The W1 grey willow - marsh bedstraw woodland is located on the edges of the site, and is contiguous with more extensive areas extending to the north & south. Grey willow dominates the canopy almost exclusively, and bay-leaved willow is rare. Additional willows are scattered across the western end of the site. Below the canopy of the core area, the field layer is variable and has been grazed & poached by cattle.

3.16 The floristic assemblage in the field layer is moderately species-rich, even & distinctive. Yorkshire fog is abundant and this reduces the evenness of the vegetation. Otherwise, there is frequent to occasional: bottle sedge, *Calliergonella cuspidata*, common dog-violet, common sedge, creeping buttercup, floating sweet-grass, herb robert, marsh bedstraw, marsh pennywort, marsh thistle, selfheal, sharp-flowered rush, soft-rush, sorrel & water horsetail. See also Target Note 21 in Appendix 1.

B1.1 Acid grassland - unimproved

3.17 Unimproved acid grassland is usually associated with unenclosed hill-grazing on acid soils. It is generally species-poor and frequently grades into wet or dry dwarf shrub heath. Two forms of one NVC community are present within the habitat at [redacted].

U4 *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland

3.18 U4 sheep's-fescue - common bent - heath bedstraw grassland is mapped across areas of acid grassland that have been disturbed during the process of gorse-removal. This activity has resulted in the exposure of bare ground that has been colonised by a 'weedy' sward with abundant Yorkshire fog; and frequent to occasional: broad-leaved dock, common bent, greater bird's-foot trefoil, foxglove seedlings, knotgrass, marsh thistle, redshank, ribwort plantain & sorrel. See also Target Note 24 in Appendix 1.

U4a *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland, typical sub-community

3.19 The U4a typical sub-community is associated with persistent areas of acid grassland that have not been cleared of gorse. Consequently, a stable sward is present that is typical of the sub-community. Common bent & Yorkshire fog are dominant to abundant, with patchily frequent to occasional: broad-leaved dock, cock's-foot, common mouse-ear, creeping buttercup, creeping thistle, greater bird's-foot trefoil, lesser stitchwort, ribwort plantain, sharp-flowered rush, sorrel, sweet vernal grass & white clover. Patches of nettles & soft-rush are scattered throughout. Scattered false oat-grass is colonising, especially in northwest, suggesting the U4a grassland has

not been intensively grazed recently, although a small herd of cattle was present at the time of survey. There is also rare red hemp-nettle. See also Target Notes 29 & 30 in Appendix 1.

B1.2 Acid grassland - semi-improved

3.20 Agricultural improvement usually results in a decrease in the biodiversity of the grassland sward and dominance by a few productive grasses. The sward composition therefore relates the intensity &/or time since improvement. Semi-improved grasslands show signs of such improvement but maintain a relative even sward composition.

U4b *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland, *Holcus lanatus-Trifolium repens* sub-community

3.21 Outside of and to the west of the main site, there are two areas of U4b sheep's-fescue - common bent - heath bedstraw grassland, Yorkshire fog - white clover sub-community peripheral to a sedge mire and an area of M23a marshy grassland. The sward is very species-poor and dominated almost exclusively by Yorkshire fog and accumulations of its litter. Common bent, creeping buttercup, sorrel & sweet vernal grass are occasional.

B1.1-B5 acid grassland - marshy grassland transition

3.22 The B1.1-B5 acid grassland - marshy grassland transition is mapped across 3.4 ha at the western end of the site where there are discrete areas of both habitats and their associated NVC communities (U4a & M23a) as well as more extensive, transitional areas where their species assemblages are mixed. This distribution relates to the microtopography: raised areas are better-drained and associated with U4a acid grassland, whereas the depressions are waterlogged and associated with M23a marshy grassland; and there are extensive areas of transition.

3.23 Across the transitional area, Yorkshire fog is generally abundant with patchily abundant sharp-flowered rush & soft-rush. Alongside these dominants, in the drier areas, there is frequent to occasional: autumn hawkbit, creeping buttercup, greater bird's-foot trefoil, marsh thistle, pignut, *Rhytidiadelphus squarrosus*, ribwort plantain, selfheal, sorrel, tormentil, white clover. Damp areas have frequent to occasional: angelica, carnation sedge, common sedge, devil's-bit scabious, marsh thistle, meadowsweet, silverweed & sneezewort. See also Target Note 23 in Appendix 1.

B2.1 Neutral grassland – unimproved

3.24 Neutral grassland encompasses a wide range of grass-dominated communities occurring on mesic, neutral soils. Unimproved areas are not associated with management (such as fertiliser or re-seeding). A single NVC community is present in a couple of places across the main site (MG1a) and there is a satellite area of MG10a to the west..

MG1a *Arrhenatherum elatius* grassland, *Festuca rubra* sub-community

3.25 The tall-nodding heads of false oat-grass indicate the extent of the MG1a false oat-grass grassland, red fescue sub-community. It is located in marginal areas at the eastern of the site where grazing has not been intensive in recent years.

3.26 False oat-grass is very dominant within the sward of this community so its associates are limited to robust, productive herbs that are able to compete alongside it. Sorrel & Yorkshire fog are abundant to frequent; and there is frequent to occasional: broad-leaved dock, creeping thistle, creeping buttercup, foxglove & greater bird's-foot trefoil; and more rarely: red hemp nettle & lesser stitchwort. See also Target Notes 31 & 36 in Appendix 1.

MG10a *Holcus lanatus-Juncus effusus* rush-pasture, typical sub-community

3.27 A single area of the MG10a Yorkshire fog - soft-rush rush-pasture, typical sub-community is located to the west of the main area. It has been heavily-drained with a broad, deep drain (c. 2 m wide by 1 m deep). The species-poor vegetation has been partially improved by this and by grazing. IN the sward, there is abundant soft-rush & Yorkshire fog; frequent greater bird's-foot trefoil & sharp-flowered rush; and occasional creeping buttercup. Much of the sward was collapsed at the time of survey and had been lightly trampled by cattle.

3.28 The substrate is waterlogged, despite the intensive drainage, and this condition is likely to be sustained by groundwater because the water level in ditch is so low. See also Target Note 13 in Appendix 1.

B5 Marsh/marshy grassland

3.29 Marshy grassland is a diverse set of habitats including those dominated by rushes, sedges &/or tall herbs on substrates where the water table is close to the surface. Two NVC communities are identified within the site, as described in the following sections. One is a marshy grassland (M23a) and the other is more usually a swamp community, however, it is mapped here is a marsh because the water table is around or below the ground surface. In addition, a satellite area of sedge mire, to the west of the main area, is included

M23a *Juncus effusus/acutiflorus-Galium palustre* rush-pasture, *Juncus acutiflorus* sub-community

3.30 The M23a rush - marsh bedstraw rush-pasture, sharp-flowered rush sub-community is identified by the dominance of sharp-flowered rush alongside a mix of wetland herbs. The rush sward is tall, dense & rank and this limits the species-richness, evenness & distinctiveness of the vegetation that has been strongly influenced by a legacy of grazing. The following are frequent to occasional alongside the dominant sharp-flowered rush: greater bird's-foot trefoil, marsh bedstraw, marsh thistle, soft-rush, silverweed, sweet vernal grass, valerian, water mint & Yorkshire fog; and lesser spearwort, long-stalked yellow-sedge, marsh pennywort, pignut & sneezewort occur more rarely. See also Target Notes 8, 14, 19 & 20 in Appendix 1.

[redacted]

S9b *Carex rostrata* swamp, *Menyanthes trifoliata-Equisetum fluviatile* sub-community

3.31 A single area of the S9b bottle sedge swamp, bogbean - water horsetail sub-community is located in the northwest of the survey area alongside the W1 willow scrub that has a similar mix of species, except for the eponymous bottle sedge.

3.32 In the short sward that has been cropped & poached by cattle, bottle sedge is abundant with frequent sharp-flowered rush & water horsetail. There is also patchily frequent to occasional: bog pondweed, *Calliergonella cuspidata*, greater bird's-foot trefoil, lesser spearwort, marsh bedstraw, marsh pennywort, marsh thistle, ragged-robin, willow saplings & Yorkshire fog.

Sedge mire

3.33 A satellite area of sedge mire to the west of the main site is very distinctive but it does not correspond with any of the communities of the NVC (although it bears an affinity to a few). Consequently, no community is assigned.

3.34 The dense, 'grassy' sward is dominated by variable mixes or pure stands of abundant: common sedge, purple moor-grass & tawny sedge; frequent: marsh pennywort, valerian, willow saplings; and occasional: devil's-bit scabious, greater bird's-foot trefoil, knapweed, marsh bedstraw, marsh hawk's-beard, marsh thistle, pignut, sharp-flowered rush, sweet vernal grass, tormentil & water mint.

3.35 This wetland habitat is perched on a gentle slope that is otherwise well-drain, so it is suspected that diffuse groundwater emergence sustains the waterlogging, despite the potential drainage. See also Target Note 15 in Appendix 1.

C3.1 Other tall herb and fern – ruderal

3.36 Tall ruderal vegetation includes stands of tall perennial or biennial herbs more than 25cm high (e.g. rosebay willowherb, Japanese knotweed &/or nettles.

OV25a *Urtica dioica-Cirsium arvense* community, *Holcus lanatus-Poa annua* sub-community

3.37 Rank stands of nettles & creeping thistle alone and in patches throughout the MG1a neutral grassland are mapped as the OV25 nettle - creeping thistle community, Yorkshire fog - annual meadow-grass sub-community. Broad-leaved dock, sorrel & Yorkshire fog are also frequent alongside these species but the diminutive annual meadow-grass is limited by the dense sward of the taller, more productive herbs. This vegetation is located in the eastern end of the site. See also Target Note 35 in Appendix 1.

J1.1 Cultivated/disturbed land - arable

3.38 The arable fields are associated with MG7 perennial rye-grass leys that are intensively managed to provide a productive grass sward, for silage. Associates of the dominant perennial rye-grass include occasional, typical arable 'weeds', including: broad-leaved dock, common mouse-ear, creeping thistle, as well as frequent white clover that is sown alongside the perennial rye-grass. Once the productivity of the sward diminishes, it is ploughed and re-sown, so the habitat is defined as 'arable' in the guidance to draw the distinction from permanent grasslands.

Notable flora

3.39 It should be noted that this report is of a habitat & vegetation survey, not a floristic survey focused upon the detection of notable species. Floristic survey requires different search methods, patterns & timings; as well as an appropriate expert for each targeted group (e.g. vascular plants, bryophytes, lichens &/or fungi). However, in the course of habitat & vegetation survey, notable species are detected incidentally. These non-comprehensive records are provided & described in this section and their distribution illustrated in Map 5.

3.40 No species listed as being of more than Least Concern in the IUCN Red List[17] were recorded during the survey. This is a typical result for a site with a legacy of pastoral management. However, a locally distinctive assemblage of wetland plants is associated with the:

- W1 willow scrub
- S9b marsh.

3.41 In addition, the satellite 'sedge mire' marshy grassland has a distinctive assemblage of wetland species that only partially overlaps with the W1 willow scrub & S9b marsh. A subset of the latter habitats' assemblage is scattered throughout the M23a marshy grassland, at a low cover & number, because of the dominance of the rushes & Yorkshire fog; and grazing & poaching by cattle (e.g. Target Note 22 in Appendix 1). Accordingly, the M23a is not highlighted for its assemblage. Otherwise, the distinctive, wetland species include:

- angelica
- bottle sedge
- carnation sedge
- common sedge
- devil's-bit scabious
- herb robert
- lesser spearwort
- marsh bedstraw
- marsh hawk's-beard
- marsh pennywort
- meadowsweet
- selfheal
- sneezewort
- tawny sedge
- valerian
- water horsetail.

[17] IUCN Red List details are available at https://www.iucnredlist.org/about/background-history. Accessed 29/01/2022.

[redacted]

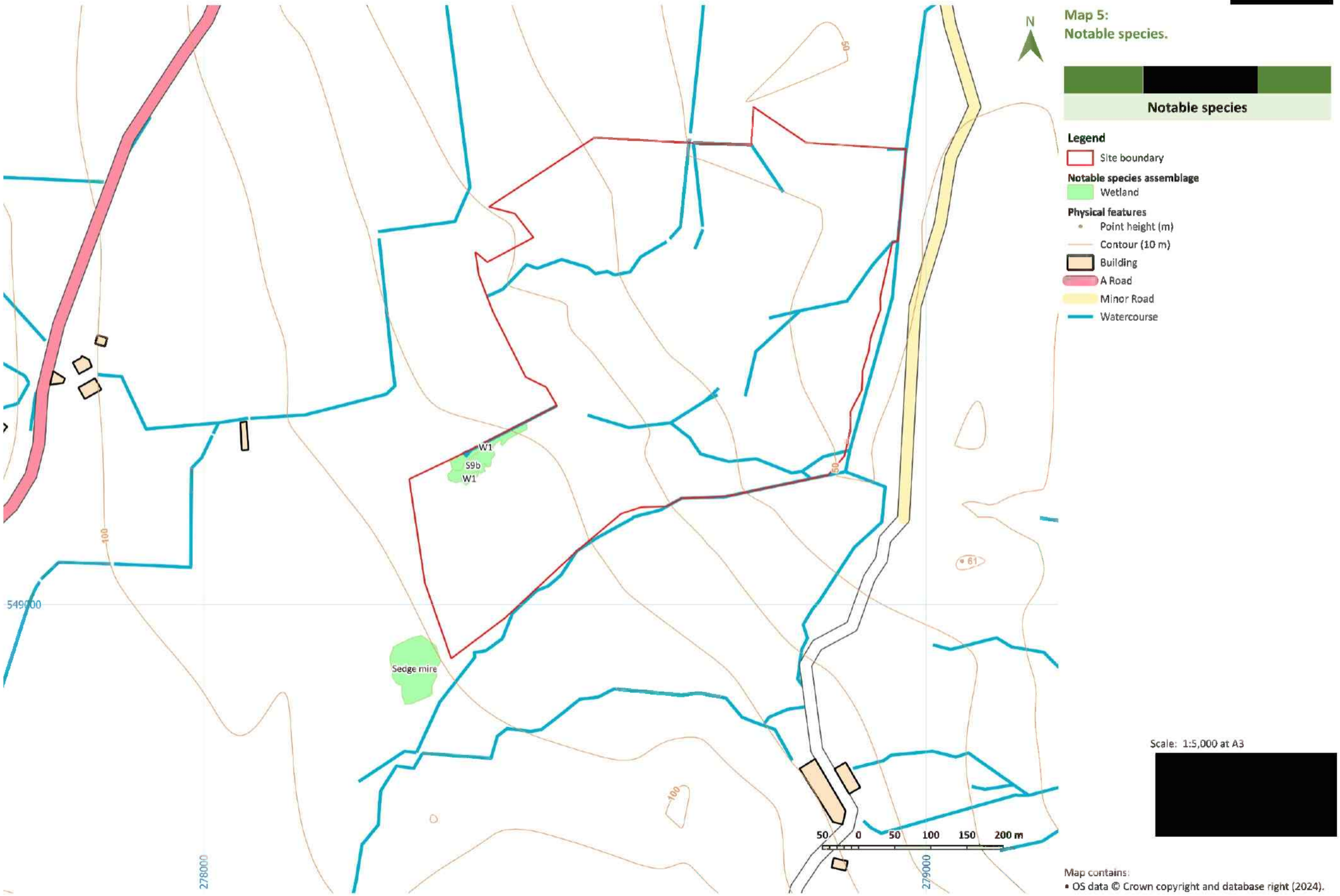
Displaced habitat

3.42 Recent management activity to extend silage production has displaced some minor areas of wetland habitat. These areas are illustrated in Map 4 where they have been mapped from aerial photography. The northern, displaced wetland areas were located alongside a watercourse that has been directed into a field drain, from where it crosses the red-line boundary (in the west, adjacent to the wet woodland; and note that the watercourse is hatched along its length to relate its modification). In addition, a few minor areas, to the southeast of the field drain, are now under spoil that has revegetated. In total, there is 0.32 ha of displaced wetland habitat that equates to 14 % of the MG10a neutral grassland &/or M23 marshy grassland habitat originally present on the site, in pure stands; or 5.6 %, when the U4-M23a mosaic is included in the total.

3.43 The precise identity of the displaced wetland areas is not apparent from aerial photography but it is likely to have been associated with the MG10a neutral grassland &/or either of the M23 marshy grassland sub-communities. Comparison to the neighbouring, persistent areas (see Target Notes 1, 2 & 11 in Appendix 1) suggest that grazing by cattle is likely to have depleted the floristic richness, evenness & distinction of the vegetation. Furthermore, the absence of persistent relicts in the former wetland locations suggests the same.

[redacted]

Map 5:
Notable species.



Scale: 1:5,000 at A3

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4 Assessment

4.1 In this section, the baseline is assessed against legislation, listings &/or initiatives to identify:

- Peatland condition
- Deep peat
- Ecological importance
- Groundwater dependency
- Notable species
- Constraints & mitigation
- Biodiversity enhancements.

Peatland Condition Assessment

4.2 Peatland Condition Assessment was not undertaken because there is no bog habitat present on the site, nor in its vicinity. This is also apparent in the Carbon & Peatland Map data for the area (see Map 3 & Paragraph 3.7).

Deep peat

4.3 No deep peat is present on the site.

Ecological importance

4.4 The ecological importance of the habitats and their constituent NVC communities is assessed in Table 3 and illustrated in Map 7.

4.5 Undisturbed semi-natural habitats across the site are assessed to be of Local importance. This includes the W1 willow scrub; U4a acid grassland; MG10a neutral grassland; marshy grassland; & tall ruderal vegetation. Their Local ecological importance relates the presence of semi-natural species assemblages & characteristics, despite modification through pastoral management. Furthermore, some of these habitats are highly to moderately valued in nature conservation designations & listings (e.g. marshy grassland). However, their limited extent that is much less than 1 % of the county resource, and this, and their modified condition, constrains the ecological importance to a local context.

4.6 The U4 acid grassland, U4b semi-improved acid grassland; and spoil are assessed to be of Site importance. The U4b is very species-poor and dominated by a single grass species (Yorkshire fog). Disturbance has resulted in either no vegetation across the spoil, or a species-poor, 'weedy' grassland across the U4 acid grassland following gorse-clearance.

Groundwater dependency

4.7 British Geological Society hydrogeological mapping identifies that the geology underlying the site is an unnamed igneous intrusion of the Late Silurian to Early Devonian[18]. It has the character of a "low productivity aquifer" where "flow is virtually all through fractures and other discontinuities", with "small amounts of groundwater in [the] near surface weathered zone and secondary fractures". There is therefore potential for the presence of Groundwater Dependent Terrestrial Ecosystems (GWDTE). GWDTE are assessed in Table 4 and their guidance & site-specific, groundwater-dependency distribution is illustrated in Map 8 & Map 9.

4.8 A low to moderate discharge of groundwater is apparent across the site and in the wider area. This is apparent from the waterlogging of wetlands perched on slopes that would be well-drained but for the persistent discharge of groundwater. In addition, there is an occasional scatter of base-enrichment indicators (common yellow-sedge & long-stalked yellow-sedge) that indicate the likely emergence of weakly base-enriched groundwater. Otherwise, the low gradients mean that there is significant retention of rain & surface water across the site. Consequently, the GWDTE are identified as Moderate, according to the mix of hydrological units and the relatively low discharge of groundwater. A single exception is the M23b marshy grassland, in the northeast, that is associated with a moderate to high level of discharge.

4.9 The area of sedge mire is distinctly located on a gently slope and surrounded by otherwise well-drained habitats. In the absence of a surface water supply to this habitat, the only source of persistent recharge is groundwater.

Notable species

4.10 Map 5 makes clear the local importance of the W1 willow scrub & S9b marsh within the site; and the satellite area of sedge mire to the west, for their collective species assemblage of plants listed as being of no more than Least Concern in the IUCN Red List[17].

Constraint

4.11 There are no legislative habitat constraints identified by the survey & assessment. This relates to the Local conservation importance of the habitats and the absence of peatland.

[18] British Geological Survey 1:625 000 hydrogeology mapping is at https://www.bgs.ac.uk/datasets/hydrogeology-625k/. Accessed 01/08/2024.

[redacted]

Map 6:
Peatland Condition Assessment.

[redacted]

Peatland Condition Assessment

There is no peatland.

Legend

- Site boundary

Physical features

- Point height (m)
- Contour (10 m)
- Building
- A Road
- Minor Road
- Watercourse

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278000

279000

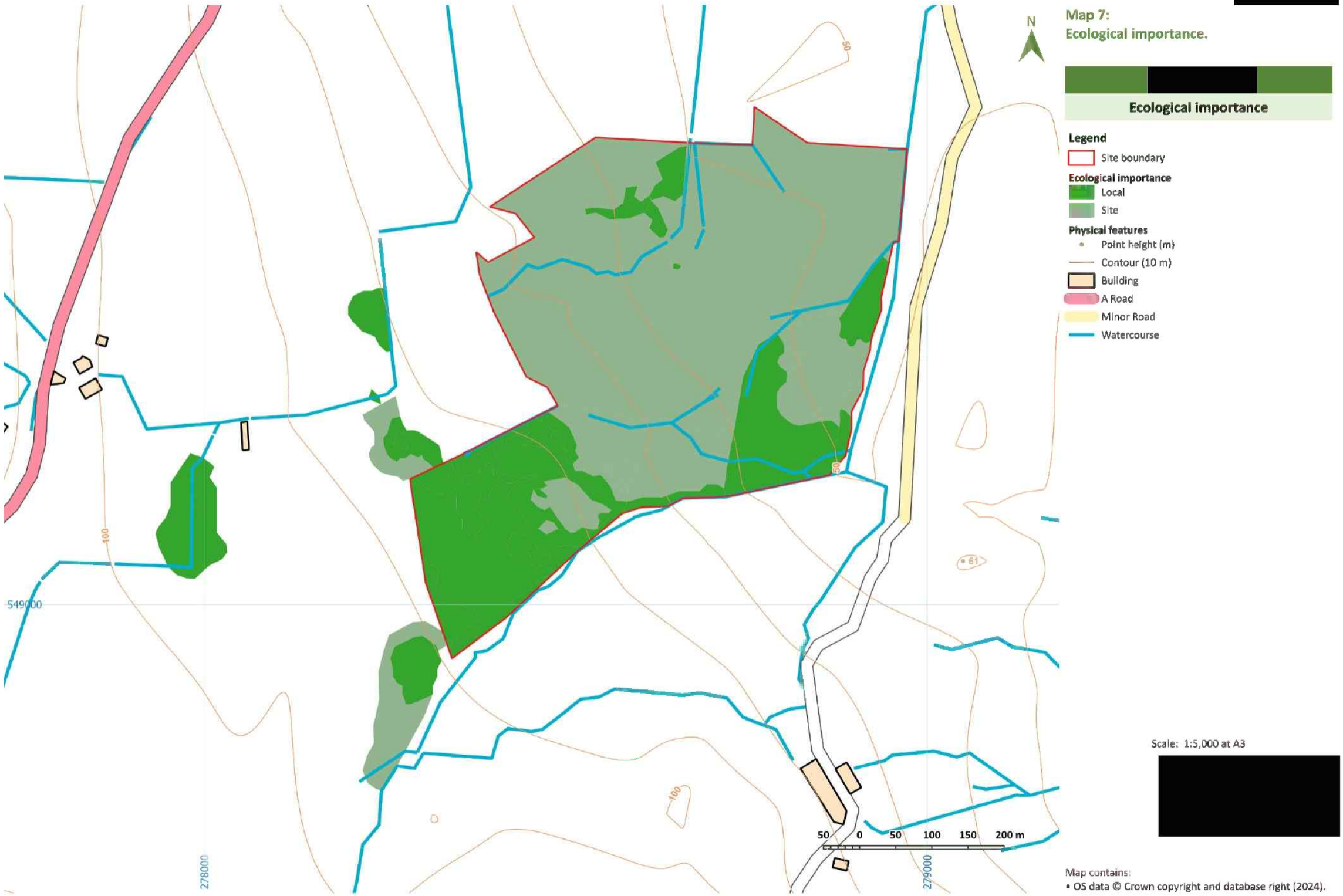
50 0 50 100 150 200 m

Scale: 1:5,000 at A3

[redacted]

[redacted]

Map 7:
Ecological importance.



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[redacted]

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Table 3: Assessment of ecological importance.

Phase 1 habitat code & title	National Vegetation Classification code & title	Notes	Importance
A2.1 Scrub - dense/continuous	W1 *Salix cinerea-Galium palustre* woodland	• Moderate areas that are marginal to greater extents to the north & south of the boundary. • Moderate species-richness, evenness & distinction. • Included within the Dumfries & Galloway Biodiversity Action Plan but not the Scottish Biodiversity List & Habitats Directive. • Habitat area not known in Dumfries & Galloway.	Local
B1.1 Acid grassland - unimproved	U4 *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland	• Species-poor, moderately even, indistinctive, secondary vegetation that is establishing onto ground disturbed by gorse clearance. • Dominated by a small number of species that are abundant in the general area or are common 'weeds'. • Included within the Dumfries & Galloway Biodiversity Action Plan but not the Scottish Biodiversity List & Habitats Directive. • Habitat area not known in Dumfries & Galloway.	Site
	U4a *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland, typical sub-community	• Species-poor, moderately even, vegetation that has been managed as pasture. • Dominated by a small number of productive species. • Included within the Dumfries & Galloway Biodiversity Action Plan but not the Scottish Biodiversity List & Habitats Directive. • Habitat area not known in Dumfries & Galloway.	Local
B1.2 Acid grassland - semi-improved	U4b *Festuca ovina-Agrostis capillaris-Galium* saxatile grassland, *Holcus lanatus-Trifolium repens* sub-community	• Small, patchy or mosaic areas of low species-richness, evenness & distinctiveness. • Included within the Dumfries & Galloway Biodiversity Action Plan but not the Scottish Biodiversity List & Habitats Directive. • Habitat area not known in Dumfries & Galloway.	Site
B2.2 Neutral grassland - semi-improved	MG10a *Holcus lanatus-Juncus effusus* rush-pasture, typical sub-community	• Single, minor area of low species-richness, evenness & distinctiveness. • Rather rank habitat trampled by livestock and modified by a legacy of drainage & pastoral management. • Included within the Dumfries & Galloway Biodiversity Action Plan but not the Scottish Biodiversity List & Habitats Directive. • Habitat area not known in Dumfries & Galloway.	Local
B5 Marsh/marshy grassland	M23 Juncus effusus/acutiflorus-Galium palustre rush-pasture • a Juncus acutiflorus sub-community • b Juncus effusus sub-community	• Moderately extensive areas of low to moderate species-richness, evenness & distinctiveness. • Modified by grazing and subject to poaching in the wettest areas. • Included within the Dumfries & Galloway Local Biodiversity Action Plan & Scottish Biodiversity List but not the Habitats Directive. • Habitat area is "at least 65 ha" in Dumfries & Galloway[9].	Local
	S9b Carex rostrata swamp, Menyanthes trifoliata-Equisetum fluviatile sub-community	• Minor area of moderate species-richness, evenness & distinctiveness. • Semi-natural characteristics including a wetland species assemblage are present. • Included within the Dumfries & Galloway Biodiversity Action Plan, Scottish Biodiversity List & Habitats Directive. • Habitat area not known in Dumfries & Galloway.	Local
	Sedge mire	• Minor area of moderate species-richness, evenness & distinctiveness. • Semi-natural characteristics including a wetland species assemblage are present. • Included within the Dumfries & Galloway Biodiversity Action Plan, Scottish Biodiversity List & Habitats Directive. • Habitat area not known in Dumfries & Galloway.	
C3.1 Other tall herb and fern - ruderal	OV25a *Urtica dioica-Cirsium arvense* community, *Holcus lanatus-Poa annua* sub-community	• Minor areas of habitat dominated by common, 'weeds'. • areas of habitat (≈1.0 ha). • Moderate species-richness, evenness & distinctiveness. • Not included within the Dumfries & Galloway Biodiversity Action Plan, Scottish Biodiversity List or Habitats Directive. • Habitat area not known in Dumfries & Galloway.	Local
I2.2 Spoil	n.a.	• Temporary storage of soil & granitic ballast.	Site

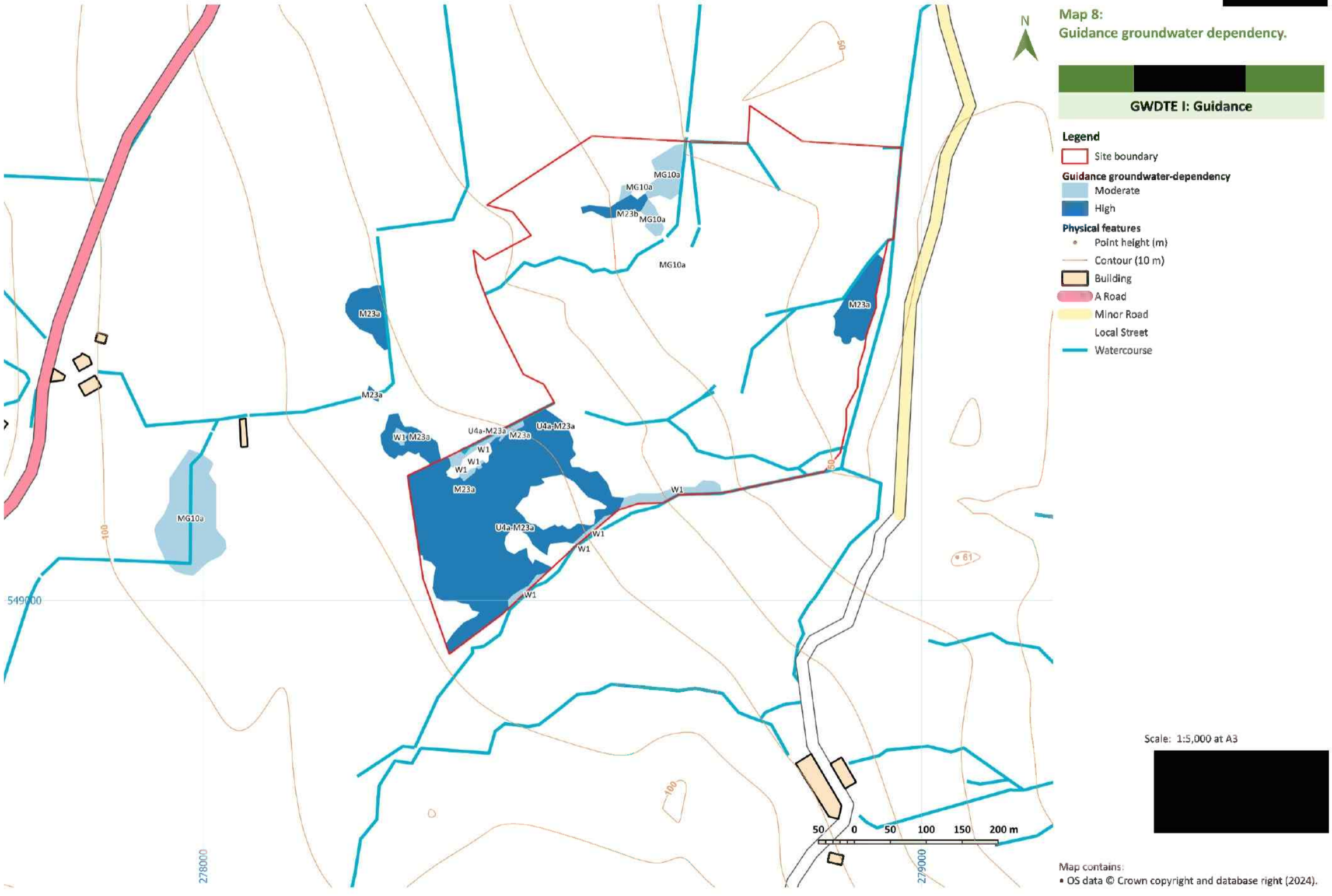
[redacted]

Table 4: Assessment of groundwater dependency.

Phase 1 habitat code & title	National Vegetation Classification code & title	Notes	Groundwater dependency	
			Guidance	Site-specific
A2.1 Scrub - dense/continuous	**W1** *Salix cinerea-Galium palustre* woodland	• Located on a broadly level step that retains rain & surface water. • Receives small amounts of groundwater seepage from upslope and this is most apparent in the presence of occasional common yellow-sedge & long-stalked yellow-sedge, both of which are indicators of base-enrichment.	Moderate	Moderate
B2.2 Neutral grassland - semi-improved	**MG10a** *Holcus lanatus-Juncus effusus* rush-pasture, typical sub-community	• Associated with a damp area of grassland that has been drained but remains wet. • The persistent waterlogging of the substrate is likely to be maintained by low levels of diffuse groundwater emergence, despite the large drain cut through the centre of this area.	Moderate	Moderate
B5 Marsh/marshy grassland	**M23a** *Juncus effusus/acutiflorus-Galium palustre* rush-pasture, *Juncus acutiflorus* sub-community	• Located on a broadly level surface, in water-shedding situations, as well as depressions that retain &/or conduct, rain & surface water. • Minor amounts of groundwaters emergence are indicated by waterlogged conditions on slopes and the occasional to rare presence of the base-enrichment indicators: common yellow-sedge & long-stalked yellow-sedge.	High	Moderate
	M23b *Juncus effusus/acutiflorus-Galium palustre* rush-pasture, *Juncus effusus* sub-community	• Evidently associated with moderate to high levels of groundwater discharge to a slope.	High	High
	S9b *Carex rostrata* swamp, *Menyanthes trifoliata-Equisetum fluviatile* sub-community	• As for the adjacent, W1 willow scrub above (although S9 is not listed as a GWDTE in guidance[16]).	n.a.	Moderate
	Sedge mire	• Although not included in the guidance[16], this area is included as a GWDTE because of its perched location on a slope. This relates persistent groundwater recharge to balance the discharge downslope.	n.a.	High

[redacted]

Map 8:
Guidance groundwater dependency.



GWDTE I: Guidance

Legend

- Site boundary

Guidance groundwater-dependency

- Moderate
- High

Physical features

- Point height (m)
- Contour (10 m)
- Building
- A Road
- Minor Road
- Local Street
- Watercourse

Scale: 1:5,000 at A3

[redacted]

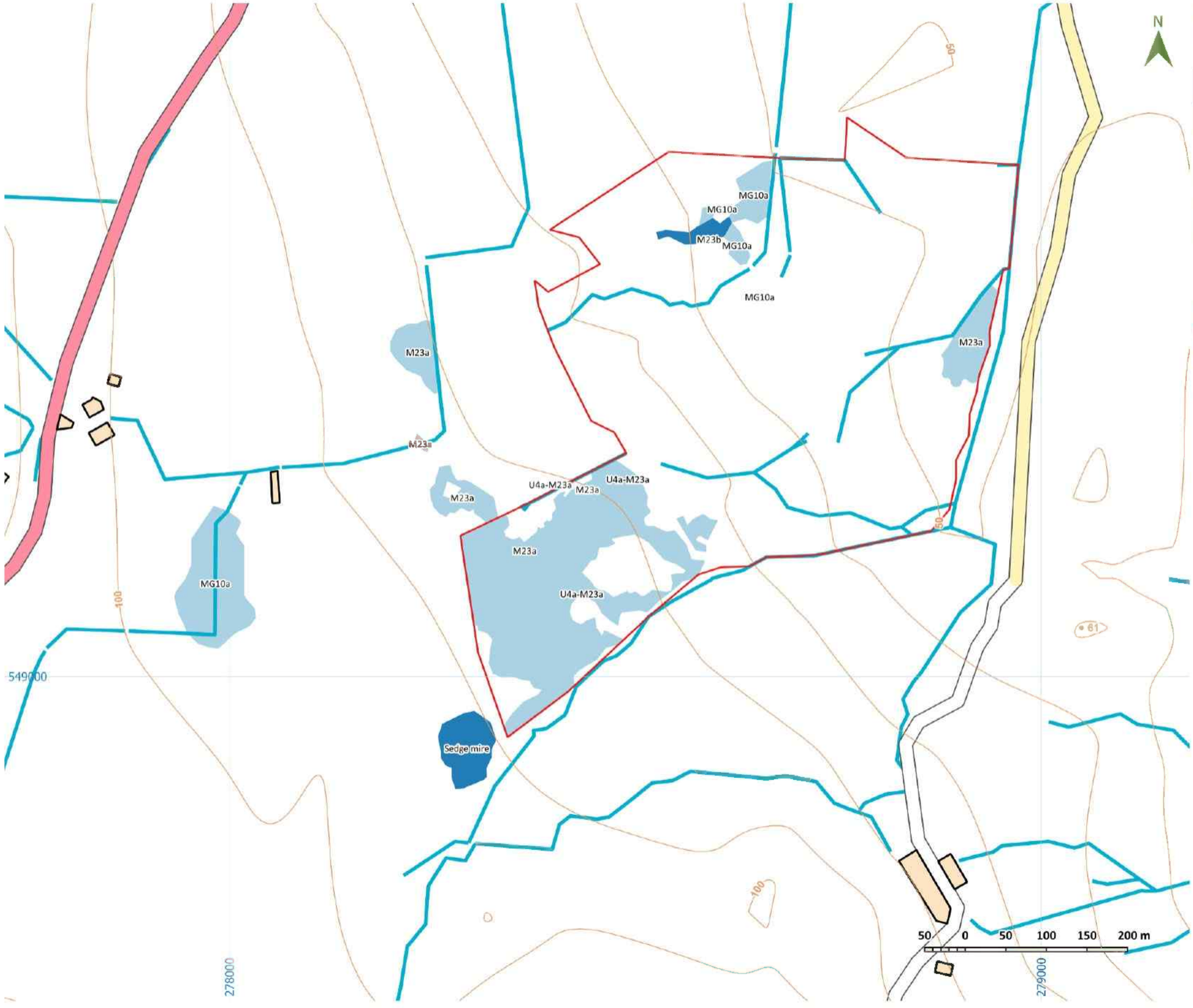
Map contains:
- OS data © Crown copyright and database right (2024).

[redacted]

Map 9:
Site-specific groundwater dependency.

[redacted]

GWDTE II: Site-specific



Legend

- Site boundary

Site-specific groundwater-dependency

- Moderate
- High

Physical features

- Point height (m)
- Contour (10 m)
- Building
- A Road
- Minor Road
- Local Street
- Watercourse

Scale: 1:5,000 at A3

[redacted]

Map contains:
- OS data © Crown copyright and database right (2024).

Mitigation

4.12 Although wetland elements are widely dispersed across the western end of the site, and marginally at the eastern end, the key areas of habitat are the:

- 'sedge mire' marshy grassland
- S9b marsh/marshy grassland
- W1 willow scrub.

4.13 These habitat areas are located in the northwest and are indicated by their notable species assemblages in Map 5. Persistence of this wetland habitat and its constituent species is a reflection of the waterlogged substrate that has resisted drainage and other impacts (e.g. grazing, ploughing or burning). Conservation of these areas will therefore maintain the most viable & distinctive habitat, and the wetland species assemblage of the site. Furthermore, this wetland habitat is contiguous with more beyond the site boundary, to which it functions as a buffer and as a component part.

4.14 A change in land use from pastoral to arable/silage will cease the current influence of cattle that is evident in the close-cropped sward and poaching of the soft, wet substrate (e.g. Target Note 12 in Appendix 1). Their influence is also apparent across the U4a-M23a acid & marshy grassland mosaic that is generally species-poor, uneven & indistinctive because of the legacy of grazing and periodic episodes of improvement that is now waning.

4.15 Effects from ongoing agricultural activity can be managed with a standard buffer strip of 4 m to 6 m width around the wetland. This will prevent direct effects (e.g. ploughing or vehicle passes) & indirect impacts (e.g. soil in-wash). Such strips are already present, and effective, around the sedge mire & M23a marshy grassland contiguous with the western end of the site. Establishment of this buffer should be combined with an avoidance of drainage, to collectively maintain: the waterlogged conditions, physical integrity & nutrient status of the wetland.

Silage production

4.16 The potential area for silage production is illustrated in Map 10. The 10.69 ha area identified in the map avoids the key wetland, at the western end, and the area of less distinctive marshy grassland at the eastern end. To protect the key wetland area (in the west), a buffer is proposed that is between 5 m & 30 m wide. This buffer is currently associated with an indistinctive area of marshy grassland. The location of the buffer also seeks to maximise the potential for silage production, which requires to be undertaken in straight lines with room for a tractor & trailer to turn. As such, the buffer is likely to be longer than mapped because of the 'awkward corners' for machinery at its eastern & western ends.

4.17 Statistics on the absolute & relative loss of habitats within the silage production area are in Table 5. Within the 10.69 ha area identified as having potential for silage production, there are marginal areas of indistinctive marshy grassland; acid grassland; neutral grassland; spoil & tall ruderal vegetation. In relative terms, within the red-line boundary, the loss of scrub is 63 %, and of marshy grassland: 32 %. Otherwise, there is a total loss (within the context of the red-line boundary) of acid grassland, neutral grassland, tall ruderal & spoil. These indistinctive and grazing-modified habitats are of Local to Site importance.

Table 5: Habitat areas & loss associated with conversion to silage production.

Importance		Area of loss (ha)	Red-line total (ha)	%-age loss
A2.1 Scrub - dense/continuous	W1	0.27	0.43	62.8
B1.1 Acid grassland - unimproved	U4 & U4a	6.02	6.02	100.0
B1.2-B5 transition	U4a-M23a transition	3.40	3.40	100.0
B2.1 Neutral grassland - unimproved	MG1a	0.21	0.21	100.0
B2.1-C3.1 mosaic	MG1a-OV25a mosaic	0.29	0.29	100.0
B5 Marsh/marshy grassland	M23a	0.35	1.10	31.8
C3.1 Other tall herb and fern - ruderal	OV25a	0.03	0.03	100.0
I2.2 Spoil		0.10	0.10	100.0

[redacted]

Map 10:
Silage production potential, wetland areas & buffer.

[redacted]

Production & wetland

Legend

- Site boundary

Potential for silage production

- Silage production
- Wetland buffer
- Wetland habitat

Physical features

- Point height (m)
- Contour (10 m)
- Building
- A Road
- Minor Road
- Local Street
- Watercourse

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50 0 50 100 150 200 m

Scale: 1:5,000 at A3

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5 Conclusions

5.1 There are no **statutory designations** associated with the site.

5.2 The **Carbon & Peatland Map** predicts there is no nationally-important peatland, or peat soils.

5.3 **Ancient Woodland** is not present within the site nor within 1.1 km.

5.4 **Habitats**: Acid grassland is the most extensive habitat type within the site. It accounts for 6 ha (52 % of the total cover) and there is an additional 3 ha (30 %) in a mosaic with marshy grassland. Marshy grassland alone accounts for 1 ha (9 %). Collectively, the acid & marshy grasslands therefore account for 10 ha or 91 % of the site. The remaining habitats individually account for less than 0.4 ha (4 %) and they include: scrub; neutral grassland, tall ruderal herbs; spoil; and a mosaic between the ruderal & neutral grassland habitats.

5.5 No **notable species** were recorded but a locally distinctive wetland assemblage is identified.

5.6 **Peatland Condition Assessment** was not undertaken because there is no bog habitat.

5.7 No **deep peat** is present on the site.

5.8 **Ecological importance** of the habitats ranges from Site to Local.

5.9 **GWDTE** of a Moderate groundwater-dependency are present within the site.

5.10 **Habitat constraints** are not identified.

5.11 **Mitigation** focuses on the retention of key wetland areas (as indicated in Map 5).

5.12 There is potential for 10.69 ha of **silage production** while retaining key areas of wetland habitat.

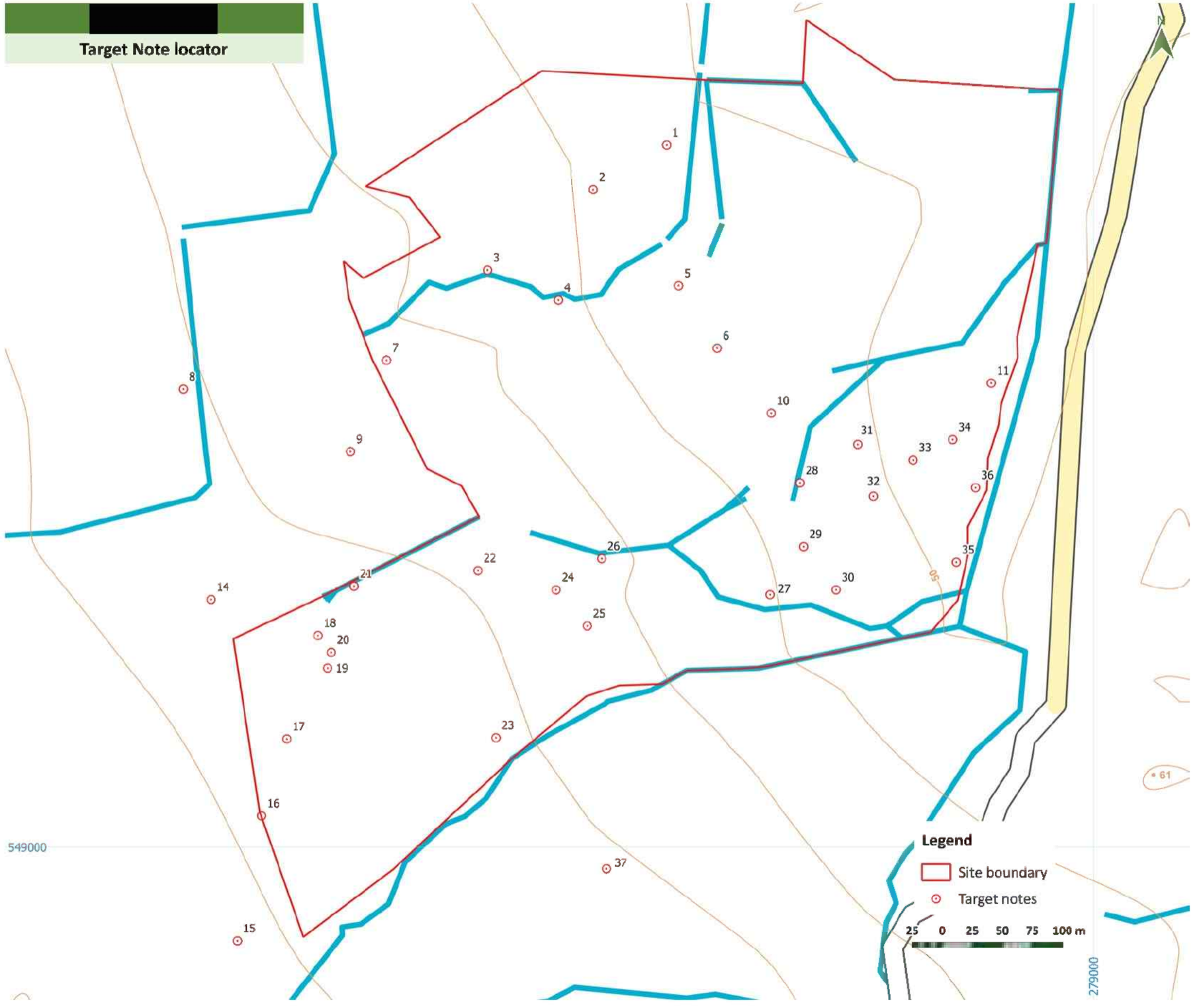
[redacted]

Appendix 1

Target Notes

[redacted]

Target Note locator



[redacted]

Target No. & co-ords.	Description	Photograph
1 278645 549584	**MG10a neutral grassland** The MG10a here has a diffuse, braided watercourse through its centre. The absence of distinctive wetland species suggests this may be an ephemeral feature. Otherwise, Yorkshire fog is almost exclusively dominant below the open sward of soft-rush.	
2 278584 549547	**M23b marshy grassland** The M23b marshy grassland here is associated with an obvious discharge of groundwater. Yorkshire fog is dominant in the sward, with abundant soft-rush, and frequent to occasional: brooklime, cuckooflower, greater bird's-foot trefoil, hemlock water dropwort, marsh willowherb, redshank, reed canary grass & sorrel. The surface of the marshy grassland is somewhat quaking and it has been poached by cattle. Some of the exposed substrate has been colonised by freshwater sponge.	
3 278496 549480	**Field drain / watercourse** The watercourse here has been culverted into a field drain. Adjacent wetland areas have been modified by the installation of the field drain so a pastoral grassland is now present with occasional wetland relics, including: floating sweet-grass & marsh foxtail.	
4 278555 549455	**Displaced wetland area** A wetland area formerly alongside the watercourse (that has now been directed into a drain) has been displaced from here. The area is now associated with an indistinctive, pastoral grassland.	

Target No. & co-ords.	Description	Photograph
5 278655 549467	**MG10a neutral grassland relict** This area of MG10a neutral grassland relict is marginal to a more extensive area that has been displaced by direction of the neighbouring watercourse intro a field drain. The vegetation has abundant soft-rush & Yorkshire fog; and there is frequent to occasional: creeping buttercup, silverweed & sorrel.	
6 278687 549415	**Displaced wetland** An area of former wetland has been displaced from here due to groundworks and the deposition of associated spoil.	
7 278412 549405	**Culvert & displaced wetland** Creation of a culvert here, to direct the former watercourse into a field drain, loss of M23 or MG10a vegetation	
8 278243 549381	**M23a marshy grassland** The M23a marshy grassland here is very rank. Sharp-flowered rush is dominant with frequent: greater bird's-foot trefoil, marsh thistle, soft-rush, sweet vernal grass& Yorkshire fog; and occasional lesser spearwort & long-stalked yellow-sedge.	

[redacted]

Target No. & co-ords.	Description	Photograph
9 278382 549329	**Wet woodland** The wet woodland here has a partial canopy of alder, birch & grey willow at various stages of maturity (from thickets of saplings to large, mature individuals). A very variable field layer underlies the canopy in which wetland elements are abundant; and there are minor areas of neutral grassland with tufted hair-grass. Non-native trees are occasional such as Sitka & hollyberry cotoneaster (Cotoneaster coriaceous).	
10 278732 549361	**Displaced wetland** An area of former wetland has been displaced from here due to groundworks and the deposition of associated spoil.	
11 278915 549386	**M23a marshy grassland** Disturbance of this area of M23a marshy grassland has resulted in a cover of around 10 % bare ground. Otherwise, sharp-flowered rush & Yorkshire fog are abundant, with frequent to occasional: greater bird's-foot trefoil, marsh pennywort, pignut, marsh thistle, marsh bedstraw & sneezewort.	 
12 277981 549153	**Ditch** This wide ditch is vegetated with abundant floating sweet-grass, and frequent brooklime & water-cress.	

Target No. & co-ords.	Description	Photograph
13 277976 549107	**MG10a neutral grassland** This area of heavily-drained rush pasture has abundant soft-rush & Yorkshire fog; frequent greater bird's-foot trefoil & sharp-flowered rush; and occasional creeping buttercup. The substrate remains mesic and is likely to be sustained by groundwater as the water level in ditch is so low. Much of the sward was collapsed at the time of survey.	
14 278266 549206	**M23a marshy grassland** The M23a marshy grassland here is very rank with sharp-flowered rush and frequent: greater bird's-foot trefoil, marsh thistle, silverweed, sweet vernal grass, valerian, water mint & Yorkshire fog.	
15 278288 548922	**Sedge mire** This distinctive sedge mire does not correspond with the NVC so no community is assigned. It has a varied sward of common sedge, purple moor-grass & tawny sedge, with frequent: marsh pennywort, valerian, willow saplings & small shrubs; and occasional: devil's-bit scabious, greater bird's-foot trefoil, knapweed, marsh bedstraw, marsh hawk's-beard, marsh thistle, pignut, sharp-flowered rush, sweet vernal grass, tormentil & water mint.	
16 278308 549026	**Drystone dyke** The drystone dyke is crudely built of large, rounded, granitic boulders. It is now tumbledown. Across the surface of the boulders there is a scant cover of crustose lichens (e.g. *Rhizocarpon*), and mosses (e.g. Homalothecium sericeum, *Hypnum lacunosum*, *Racomitrium heterostichum* & *Orthotrichum rupestre*.	

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Target No. & co-ords.	Description	Photograph
17 278329 549090	**Line of trees** Eight ash trees and a hawthorn line the tumbledown drystone dyke, with a wire fence, here. The trees & shrub are lightly wind-pruned. Epiphytes on the ashes especially include a scatter of crustose & thallose lichens; and the mosses *Frullania dilatata*, *Homalothecium sericeum* & *Metzgeria furcata*; and more occasionally: *Brachythecium rutabulum* & *Kindbergia praelonga* on lower bole.	
18 278355 549176	**S9b marsh** This area of S9b marsh is classed as such, rather than swamp, because the water table is at or just below the ground surface (rather than above). It is heavily poached & grazed by sheltering cattle. In the sward, bottle sedge is abundant with frequent sharp-flowered rush & water horsetail. There is also patchily frequent to occasional: bog pondweed, *Calliergonella cuspidata*, greater bird's-foot trefoil, lesser spearwort, marsh bedstraw, marsh pennywort, marsh thistle, ragged-robin, willow saplings & Yorkshire fog.	
19 278363 549149	**M23b marshy grassland** In this area of M23b marshy grassland, the rank, tall sward is dominated by sharp-flowered rush, soft-rush & Yorkshire fog grown through by greater bird's-foot trefoil. Marsh thistle is occasional and there is rare valerian.	
20 278366 549162	**Scattered willows** The scattered willows are mostly grey and rarely, bay-leaved willow; and they are up to 4 m tall. They all have a clear browse line as a result of grazing by livestock and possibly, deer.	

Target No. & co-ords.	Description	Photograph
21 278385 549217	**W1 wet woodland** This area of wet wetland is very species-rich, even & distinctive, although the canopy is dominated exclusively by grey. Below this, the field has abundant Yorkshire fog; and frequent to occasional: bottle sedge, *Calliergonella cuspidata*, common dog-violet, common sedge, creeping buttercup, floating sweet-grass, herb robert, marsh bedstraw, marsh pennywort, marsh thistle, selfheal, sharp-flowered rush, soft-rush, sorrel & water horsetail.	
22 278488 549230	**Poached wetland** The wetland is poached so there is much bare soil but with frequent to locally abundant: bog pondweed, bulbous rush, carnation sedge, lesser spearwort, long-stalked yellow-sedge, marsh thistle, sharp-flowered rush & Yorkshire fog. Additional, rare species are derived from the wetland list in Target Note 11, and these most consistently include: devil's-bit scabious, meadowsweet & valerian.	
23 278503 549091	**U4a-M23a acid grassland-marshy grassland mosaic & transitions** The complex mosaic of vegetation here includes recognisable areas of U4a acid grassland & M23a marshy grassland and more extensive areas of transitions between them. As a result, the vegetation composition is very variable. Yorkshire fog is generally abundant with patchily abundant sharp-flowered rush & soft-rush. Alongside these dominants, in the drier areas there is frequent to occasional: autumn hawkbit, creeping buttercup, greater bird's-foot trefoil, marsh thistle, pignut, *Rhytidiadelphus squarrosus*, ribwort plantain, selfheal, sorrel, tormentil, white clover. Damp areas have frequent to occasional: angelica, carnation sedge, common sedge, devil's-bit scabious, marsh thistle, meadowsweet, silverweed & sneezewort.	

Target No. & co-ords.	Description	Photograph
24 278553 549214	**U4 grassland** The U4 grassland is associated with ground that has recently been disturbed during the removal of dense gorse shrubs. As a result, bare ground is patchy within the recovering sward composed of abundant Yorkshire fog, with frequent to occasional: broad-leaved dock, common bent, greater bird's-foot trefoil, foxglove seedlings, knotgrass, marsh thistle, redshank, ribwort plantain & sorrel.	
25 278579 549184	**Spoil** Granitic spoil is located here, with soil heaps on either side.	
26 278591 549240	**Spoil** Lines of spoil parallel the survey boundary here, with the same disturbed U4 vegetation as described at Target Note and much bare substrate.	
27 278731 549210	**Drystone dyke** Drystone dyke as described at Target Note 6 but with frequent gorse, and occasional: bramble, foxglove & hawthorn.	
28 278756 549303	**Broad-leaved dock & creeping thistle** Broad-leaved dock & creeping thistle are frequent among the acid grassland here.	

Target No. & co-ords.	Description	Photograph
29 278759 549250	**U4a acid grassland** The U4a acid grassland here has a dense sward of abundant common bent & Yorkshire fog, with patchily frequent to occasional: broad-leaved dock, cock's-foot, creeping buttercup, creeping thistle, greater bird's-foot trefoil, ribwort plantain, sorrel & white clover. Patches of nettles & soft-rush are scattered throughout. Scattered false oat-grass is colonising, especially in northwest, suggesting this grassland has not been grazed recently. There is also rare red hemp-nettle.	
30 278786 549214	**U4a acid grassland** This area of U4a vegetation is undisturbed by gorse clearance and was grazed by cattle at the time of survey. Common bent & Yorkshire fog are dominant in the grass sward; with frequent sorrel & sweet vernal grass: and occasional: common mouse-ear, creeping buttercup, greater bird's-foot trefoil, lesser stitchwort, sharp-flowered rush & white clover.	
31 278804 549335	**MG1a neutral grassland** False oat-grass is dominant in the MG1a neutral grassland, with abundant sorrel & Yorkshire fog; and frequent: creeping thistle, creeping buttercup, greater bird's-foot trefoil; and occasional red hemp nettle & lesser stitchwort.	
32 278817 549292	**Bare ground** Disturbance associated with gorse-removal here has resulted in patches of bare ground that are being colonised by broad-leaved dock, creeping thistle & redshank.	

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Target No. & co-ords.	Description	Photograph
33 278850 549322	**Wetland plants** A low cover & number of wetland plants are located within a few metres of the target note. They include: gypsywort, sharp-flowered rush & water horsetail.	
34 278883 549339	**U4b acid grassland** The U4b here is not grazed or own so it is becoming rank with Yorkshire fog and accumulations of its leaf litter.	
35 278886 549237	**OV25 tall ruderal** Tall, ruderal vegetation here is intermixed with the MG1a neutral grassland. Broad-leaved dock, creeping thistle, nettles & sorrel are variably dominant to frequent.	
36 278902 549299	**MG1a neutral grassland** This area of MG1a neutral grassland is very rank with a tall, dominant sward of false oat-grass & Yorkshire fog. Only robust forbs are able to compete with the grasses: broad-leaved dock, creeping thistle & foxglove are occasional.	
37 278595 548982	**Wet willow scrub & marshy grassland** This area is a mosaic of willow scrub & marshy grassland. Grey willow dominates the scrub canopy, with occasional alder & birch. Purple moor-grass & bog-myrtle dominate the marshy grassland, in a tall, rank sward, in the openings among the grey willow scrub.