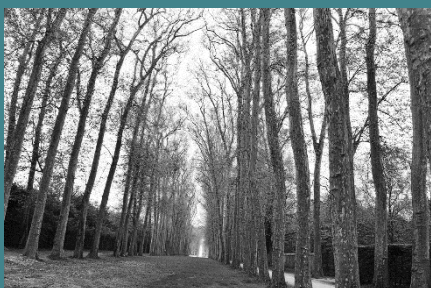


FPCR | environment
& design



Proof of Evidence:

Appendices - Ecology & Nature Conservation

LPA REF: 3/2025/0196
APPEAL REF: 6006485

Client

Hallam Land

Project

**Land South of Longsight Road,
Langho**

Date

March 2026

CONTENTS

Appendix A: Arboricultural Technical Note (Ancient Woodland and Veteran Trees)

Appendix B: Lowland Meadow Monitoring & Corrective Measures

Appendix C: Soil Assessment

Appendix D: Hydrological Assessment

Appendix E: Extracts from Rodwell

APPENDIX A:

ARBORICULTURAL TECHNICAL NOTE: ANCIENT WOODLAND & VETERAN TREES

FPCR | environment
& design



Technical Note on Arboricultural Matters : Ancient Woodland Buffer Zones

LPA REF: 3/2025/0196

Client

Hallam Land

Project

Land South of Longsight Road,

Langho

Date

February 2026

FIGURES

Annotated Tree Retention Plan (9361-T-03 Rev C)

Annotated Tree Retention Plan (9361-T-04 Rev C)

Rev	Issue Status	Prepared/Date	Approved/Date
-	v1	EC / 25/02/26	HCK / 25/02/26

- 1.1 Woodland W1, locally known as Green Nook Wood, situated in the northeast of the Longsight Road, Langho site consisted of a mixture of broadleaf species which included, but was not limited to, ash *Fraxinus excelsior*, beech *Fagus sylvatica*, English oak *Quercus robur*, silver birch *Betula pendula*, sycamore *Acer pseudoplatanus*, alder *Alnus glutinosa* and Scots pine *Pinus sylvestris*, along with understorey species that included hawthorn *Crataegus monogyna*, holly *Ilex aquifolium* and hazel *Corylus avellana*. The woodland had an open structure with limited understorey, and the component trees displayed features characteristic of woodland trees with upright forms and storm damage, along with some damage from horses kept on site. The woodland had been subject to little past management, although a small number of trees adjacent to Longsight Road had been felled.
- 1.2 An assessment carried out in October 2024, in accordance with guidance contained within British Standard 5837:2012 'Trees in Relation to Design, Demolition and Construction - Recommendations' (hereafter referred to as BS5837), identified W1 as being of high arboricultural value and Retention Category A. A single veteran tree T-75, was identified within W1. This tree was situated well within the woodland and is at little risk from development and as such has not been discussed further within this note. Since producing the Arboricultural Assessment (February 2025), the Ancient Woodland Inventory for this region has been updated and W1 has been identified as an Ancient Woodland. This classification is reflected in the Lancashire County Council Local Nature Recovery Strategy and the Multi Agency Geographic Information for the Countryside (MAGIC) website.
- 1.3 Standing Advice in relation to ancient woodland, ancient and veteran trees is jointly prepared by the Forestry Commission and Natural England to provide advice, guidance, and recommendations and to form the Government's position when deciding planning applications for developments which potentially affect these entities. Standing Advice goes on to state the types of potential impacts that can occur, both direct and indirect to Ancient Woodlands and how those impacts should be assessed. Regarding impacts, it advises on the importance of avoiding impacts, mitigating impacts that can't be avoided and compensating for any loss or damage. Mitigation measures to reduce against harmful effects that can be included within development proposals include screening barriers, noise and/or light reduction and the provision of appropriate buffer zones.
- 1.4 Standing Advice states, "For ancient woodlands, the proposal should have a buffer zone of at least 15 metres from the boundary of the woodland to avoid root damage (known as the root protection area). While Standing Advice doesn't differentiate between Root Protection Areas (RPA) and Buffer Zones, in accordance with the guidance set out BS5837, a RPA is defined as 'the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability'. 'For single stemmed trees, the RPA should be calculated as an area equivalent to a circle with a radius 12 times the stem diameter. The calculated RPA should be capped to 707m² which equals to an RPA of 15m radius.'
- 1.5 The RPA for W1 which has been calculated based on the largest stem recorded within the woodland (excluding T-75 the single veteran tree which was recorded separately) provides a RPA of 12m radius based on a 1000mm stem diameter. It should be noted, being based on the largest stem diameter recorded within W1, this RPA is exaggerated and much larger than would be necessary for most trees within the woodland, but does capture all the other smaller trees whose RPAs would be smaller.

- 1.6 As opposed to an RPA, which is provided from the tree stem, a buffer zone should be provided from the Ancient Woodland Boundary identified on the MAGIC website. This is to provide protection for soils not just the woodland trees. Standard guidance recommends that a 15m buffer is provided from the mapped woodland boundary.
- 1.7 For the appeal site, this buffer encompasses the entirety of crown spread and most of the RPA, albeit there are two small sections where the RPA extends 1m beyond the buffer zone. This is due to how the Ancient Woodland boundary has been mapped and the RPA plotted based on the mapped canopy edge. These areas are inconsequential with the Buffer Zone provided being 2-3m beyond the RPA in most areas, and these areas remain outside the built development and in the green open space shown on the Illustrative Masterplan.
- 1.8 An updated Annotated Tree Retention Plan (9361-T-03_C & 9361-T-04_C) has been produced based on the latest proposed Illustrative Site Layout and is appended to the note. This identifies that there are no dwellings, driveways or roads within 10m of either the Buffer Zone and RPA or 25m from the mapped woodland edge. While there are gardens which extend within this area, there are no gardens within the 15m buffer zone or within the calculated RPA. As such it is not anticipated that the proposals will result in any root damage which could result in the deterioration of the Ancient Woodland and the proposals comply with all guidance given within Standing Advice.
- 1.9 Should there be a requirement to provide a footpath link within the Ancient Woodland buffer, this footpath would need to be installed using a no dig solution such as a cellular confinement system. The use of such construction methods would ensure there would be no detriment to the Ancient Woodland or damage to the soil within the buffer zone through compaction. Government guidance on ancient woodland, ancient trees and veteran trees, states that "You can allow access to buffer zones if the habitat is not harmed by trampling" so the provision of this footpath should be deemed acceptable provided a suitable tree friendly construction solution is used.
- 1.10 There are further potential direct and indirect impacts from development which also need to be considered when assessing if a development will result in the deterioration of Ancient Woodland. These can include future pressure to prune trees, changes to hydrology and other ecological factor which have been discussed further within the Ecological Proof of Evidence prepared by Mr Kurt Goodman.
- 1.11 With regards to future pressure to prune trees, it should be noted that properties are, at their closest, positioned 19m from the edge of tree canopies and rear boundary of gardens are 9m from the canopy edge. Based up the current size and species of the trees within the woodland and their likely future growth, it is highly unlikely that any tree crowns will extend beyond the garden boundary. Properties and gardens are also situated to the southwest of the woodland, this is of importance as the area of greatest shading influence is to the northeast in the opposite direction. As such there should be no issues regarding loss of light, overshadowing and general tree detritus dropping within gardens which can lead to pressure from future residents to prune or remove trees.
- 1.12 Based on the current illustrative proposals and the buffer which has been provided there should be no requirement for future pruning or maintenance of trees along the woodland edge and it is considered that a sustainable, harmonious and long-term relationship between the trees and properties could be achieved. As W1, is also afforded protection by a Tree

Preservation Order, (TPO 3/19/3/238 Green Nook Wood 2024) any future works which may come forward post development would be at the discretion of the LPA so the future management of this woodland would be controlled, likely through a future Woodland Management Plan which could be imposed as a condition of planning approval.

- 1.13 Finally, site topography is an influencing factor that need to be considered regarding potential hydrological effect on the woodland. The site is not flat and generally falls away to a small stream which runs along the edge of the woodland before rising back up within the woodland towards to site's northern and eastern boundaries. As such it can be assumed that water runoff from the development site will not enter the woodland instead being caught within the stream along the woodland edge. As such assuming controls are in place limiting water runoff into this stream t which could be secured through a suitably worded condition of planning approval then there will be no potential hydrological impacts to the woodland because of the development of the site.

FPCR Environment and Design Ltd

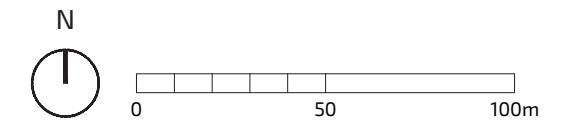
Registered Office: Lockington Hall, Lockington, Derby DE74 2RH
Company No. 07128076. [T] 01509 672772 [E] mail@fpcr.co.uk [W] www.fpcr.co.uk

This report is the property of FPCR Environment and Design Ltd and is issued on the condition it is not reproduced, retained or disclosed to any unauthorised person, either wholly or in part without the written consent of FPCR Environment and Design Ltd. Ordnance Survey material is used with permission of The Controller of HMSO, Crown copyright 100019980.



This drawing is the property of FPCR Environment and Design Ltd and is issued on the condition it is not reproduced, retained or disclosed to any unauthorised person, either wholly or in part without written consent of FPCR Environment and Design Ltd.

Ordnance Survey Mastermap - Crown Copyright. All rights reserved. Licence Number: 100019980 (Centremapslive.com).



Notes:

All dimensions to be verified on site. Do not scale this drawing, use figure dimensions only. Drawing to be read in conjunction with Arboricultural Assessment and Appendix A - Tree Schedule. The exact position of individual trees or species included as part of a tree group, woodland or hedgerow should be checked and verified site prior to and decisions for foundation design, tree operations or construction activity being undertaken. Further survey work would be required for calculation foundation depths.

- Tree/Group to be Retained
- Tree/Group proposed to be removed subject to relevant permissions
- Category U - Unsuitable for retention on arboricultural grounds
- Hedgerow Proposed to be Retained
- Hedgerow proposed to be removed subject to relevant permissions
- Woodland Proposed to be Retained
- Root Protection Area (Shown for retained trees only)
- Ancient Woodland Boundary as Identified on Multi Agency Geographic Information for the Countryside (MAGIC)
- Ancient Woodland Buffer Zone in Accordance with Standing Advice (15m)
- Individual/Group number and BS5837:2012 Category
- Individual/Group Afforded protection by TPO 3/19/3/238 Green Nook Wood 2024
- Indicative Shade Pattern (in accordance with BS5837:2012 where appropriate)

rev	date	description	drwn/chkd
-	06.01.25	First Issue	EC
B	27.10.25	Revision	EC
C	25.02.26	Annotations Added	EC

client
Hallam Land Management Limited
 project
Longsight Road, Langho

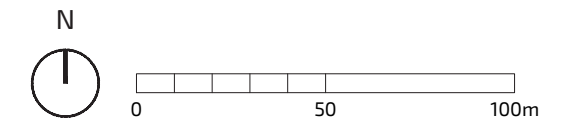
title
ANNOTATED TREE RETENTION PLAN scale
 1:2000 @ A3

number
9361-T-03 status rev
 - C



This drawing is the property of FPCR Environment and Design Ltd and is issued on the condition it is not reproduced, retained or disclosed to any unauthorised person, either wholly or in part without written consent of FPCR Environment and Design Ltd.

Ordnance Survey Mastermap - Crown Copyright. All rights reserved. Licence Number: 100019980 (Centremapslive.com).



Notes:

All dimensions to be verified on site. Do not scale this drawing, use figure dimensions only. Drawing to be read in conjunction with Arboricultural Assessment and Appendix A - Tree Schedule. The exact position of individual trees or species included as part of a tree group, woodland or hedgerow should be checked and verified site prior to and decisions for foundation design, tree operations or construction activity being undertaken. Further survey work would be required for calculation foundation depths.

- Tree/Group to be Retained
- Tree/Group proposed to be removed subject to relevant permissions
- Category U - Unsuitable for retention on arboricultural grounds
- Hedgerow Proposed to be Retained
- Hedgerow proposed to be removed subject to relevant permissions
- Woodland Proposed to be Retained
- Root Protection Area (Shown for retained trees only)
- Ancient Woodland Boundary as Identified on Multi Agency Geographic Information for the Countryside (MAGIC)
- Ancient Woodland Buffer Zone in Accordance with Standing Advice (15m)
- Individual/Group number and BS5837:2012 Category
- Individual/Group Afforded protection by TPO 3/19/3/238 Green Nook Wood 2024
- Indicative Shade Pattern (in accordance with BS5837:2012 where appropriate)

rev	date	description	drwn/chkd
-	06.01.25	First Issue	EC
B	27.10.25	Revision	EC
C	25.02.26	Annotations Added	EC

client
Hallam Land Management Limited

project
Longsight Road, Langho

title
TREE RETENTION PLAN scale
1:2000 @ A3

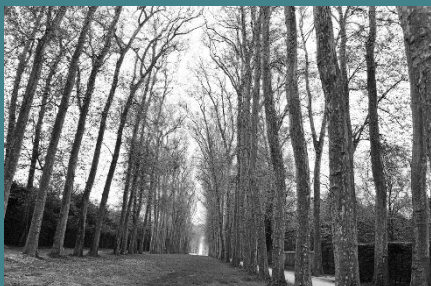
number
9361-T-04 status
- rev
C



APPENDIX B:

LOWLAND MEADOW MONITORING & CORRECTIVE MEASURES

FPCR | environment
& design



Appendix B: Lowland Meadow Monitoring and Corrective Measures.

LPA REF: 3/2025/0196
APPEAL REF: 6006485

Client

Hallam Land

Project

**Land South of Longsight Road,
Langho**

Date

March 2026

CONTENTS

1.0 INTRODUCTION 1

2.0 OBJECTIVES 1

3.0 MONITORING 3

4.0 RISK REGISTER & CORRECTIVE MEASURES 0

Rev	Issue Status	Prepared/Date	Approved/Date
-		IH / 25.03.26	KG / 25.03.26

1.0 INTRODUCTION

2.0 OBJECTIVES

- 2.1 The objective of the Lowland meadow translocation within the Site is to maintain a grassland community which continues to meet the qualifying criteria for the habitat type and to increase the condition from poor to Good.

Lowland Meadow Grassland Classification

- 2.2 UKhab 2.0 includes a habitat definition for Lowland Meadow which specifies that assigning this classification to a community requires it to meet all three of the following criteria:

a) Close correspondence with the following NVC communities is a prerequisite for this habitat type: MG4, MG5, MG8 (MG1c-e, MG2, MG7c) (As defined by *British Plant Communities Volume 3*¹).

b) Meets at least two of these three criteria:

1. >15 species m² (including grasses and excluding bryophytes);

2. >30% cover of broadleaved herbs and sedges (excluding White Clover, Creeping Buttercup and injurious weeds); and

3. <10% cover of rye grasses and White Clover *Trifolium repens*.

c) AND EITHER ≥4 of the listed indicators at least 'present' on the DAFOR scale.

OR ≥3 of the listed indicators at least 'occasional' on the DAFOR scale (but not limited to field corners or edges).

- 2.3 The following species list identifies the appropriate indicator species. Species already recorded or known within the community are highlighted in bold and are most relevant to this site:

- 2.4 Agrimony, Autumn hawkbit, Betony, Bird's foot trefoil, Black knapweed, Bugle, Burnet saxifrage, Carnation sedge, Chalk milkwort, Common bistort, Common milkwort, Common meadow-rue, Common sedge, Cowslip, Devil's bit scabious, Dropwort, Dyer's greenweed, Eyebright, Fen bedstraw, Field scabious, Glaucous sedge, Goat's beard, Great burnet, Greater bird's foot trefoil, Lady's bedstraw, Lady's mantle, marsh bedstraw, Marsh marigold, Marsh valerian, Meadow vetchling, Meadowsweet, Heath milkwort, Narrow-leaved water dropwort, Orchids (Various), Ox-eye daisy, Pepper saxifrage, Pignut, Ragged robin, Rough hawkbit, Salad burnet, Saw-wort, Sneezewort, Tormentil, Water avens, Water mint, Wood anemone, Yellow rattle.

Condition Assessment Objectives

- 2.5 The translocated area of Lowland Meadow will be managed to achieve good condition, within an expected timescale of 10-years, as specified by the time-to-target condition set by the Defra Statutory Biodiversity Metric. However, the legal mechanism underpinning the Habitat Management and Monitoring Plan will secure the appropriate management of the lowland meadow for 30 years and if good condition has been achieved within the expected 10 year

¹ Rodwell, J.S. (1992). *British Plant Communities: Volume 3 Grasslands and Montane Communities*. Cambridge University Press

timeframe, corrective measures and adaptive management (see below) can be utilised, if appropriate, to ensure the target habitat and condition are achieved.

- 2.6 In order to achieve good condition, the Lowland meadow will have to pass 5 or 6 criteria, including essential criterion A and additional criterion F, as listed in the table below and assessed via Site monitoring. All criteria are targeted to pass as part of the management strategy, with allowance for failure in one of B-D,

Condition Assessment Criteria	
A	The parcel represents a good example of its habitat type, with a consistently high proportion of characteristic indicator species present relevant to the specific habitat type. Note – this criterion is essential for achieving Moderate or Good condition for non-acid grassland types only.
B	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20 per cent is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.
C	Cover of bare ground between 1% and 5%, including localised areas, for example, rabbit warrens.
D	Cover of bracken <i>Pteridium aquilinum</i> less than 20% and cover of scrub (including bramble) less than 5%.
E	Combined cover of species indicative of suboptimal condition and physical damage (such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging activities) accounts for less than 5% of total area. If any invasive non-native species (as listed on Schedule 9 of WCA) are present, this criterion is automatically failed.
F	There are 10 or more vascular plant species per m ² present, including forbs that are characteristic of the habitat type. Note – this criterion is essential for achieving Good condition for non-acid grassland types only.

- 2.7 The key criterion in the assessment of condition, as specified within the Statutory Metric condition assessment for Medium, High and Very High Distinctiveness grasslands is Criterion A.
- 2.8 In order to quantify the assessment of this criterion, to be a 'good example' it is our consideration that as a pre-requisite for passing this criterion is that the community not only passes, but it should meet all criteria b) 1, 2, & 3 of the Lowland Meadow broad habitat definition within UKHab.
- 2.9 In addition, to quantify the assessment on whether a 'consistently high proportion' of relevant indicator species are present within communities an assessment is made using the quadrat data. To pass this criterion, the quadrat data from Site monitoring should show at least two indicators as frequent and at least three more at occasional, with scope for surveyor's professional judgement.
- 2.10 In order to provide a quantitative assessment of the frequency of indicator species within a community the following categories are applied to the quadrat data collected:

- Rare - present in 0-20% of quadrats;
- Occasional – Present in 21-50% of quadrats; and
- Frequent - Present in >50% of quadrats

2.11 The 'Indicator species relevant to the specific habitat type' are defined in the first instance by the habitat definitions in UKHab 2.0, as provided above, with scope for professional judgement for additional inclusions.

3.0 MONITORING

3.1 The Site will be monitored at varying degrees from establishment and through its long-term management. Initially the Site will be monitored in years 1, 2, 3 & 5 by suitably experienced ecologists to review how the establishment of the proposed habitat enhancement is progressing. The key observations during this period will be to determine whether habitats are successfully improving and whether replacement planting or reseedling may be required.

3.2 Following that, during years 10-30, monitoring of the Site will be undertaken every 5 years beginning at year 10. The key elements of this monitoring will be to review whether the long-term management practices have achieved and maintained target habitat type and condition. During this period, adaptive management measures will be reviewed to determine whether there are any opportunities to alter management to encourage additional habitat enhancements

3.3 HMMP Management Plan & Habitat Monitoring Progress Reports will be submitted in each monitoring year. The monitoring reports will include the results of the habitat monitoring which has taken place in the period since the previous report. A review of the management prescriptions will be undertaken and any amendments and proposed corrective measures where needed will be provided. The reports will review the implementation of management prescriptions per habitat. The following Section provides an overview of potential risks, triggers and corrective measures of relevance to the lowland meadow translocation and enhancement.

4.0 RISK REGISTER & CORRECTIVE MEASURES

Risk Factor	Trigger for Action	Corrective Measures
Establishment of non-native invasive species	Monitoring identifies the presence of any invasive non-native species	Initiate a programme of eradication of invasive non-native species. Specialist advice should be sought to ensure the appropriate eradication measures for any species identified.
Vigorous grass growth limiting species diversity.	Sward 'collapsing' due to lushness prior to cutting or palatable/productive grasses are identified as dominating the sward (over 20%):	Remove early spring re-growth of grass by either taking an additional cut, or by introducing grazing in March/April (If ground conditions allow. If further monitoring shows continued vigorous grass growth introduce yellow rattle seed: 1) after the hay cut, chain harrow the grassland three times in immediate succession and in a different direction each time. 2) Broadcast yellow rattle seed at a rate of 2.5kg/ha, then roll immediately with a flat roller. 3) If there is sufficient grass growth following sowing, take another cut before the end of year removing arisings.
Poor species diversity / Species Composition / Poor representation of lowland meadow indicators.	If at year 5 onwards, monitoring shows less than 15 species per average m ² Monitoring shows community is not a good match for NVC community MG5 Lowland Meadow indicators below threshold to pass criterion A of condition assessment.	Informed by the monitoring results, one or a combination of the following options could be actioned as remedial measure(s). 1) Introduce additional target species using green hay from a local lowland meadow grassland or using a suitable seed mix from a local supplier, to supplement the existing community composition (See note below on potential local green hay and seed suppliers). a) The parcels will be cut short in the late July / August of year 1. Following this cut, chain harrow the grassland three times in succession and in a different direction each time to create ~50% bare ground. b) Apply green hay or seed mix within 1 week of above action. The green hay should be collected (where possible) using a single chop harvester feeding into a rear entry muck spreader,

Risk Factor	Trigger for Action	Corrective Measures
		<p>which can be used to spread the hay on the receptor site. A mower conditioner should not be used. The hay must be transferred and spread the same day that it is collected. The green hay should ideally be cut and transported on a cool and cloudy day.</p> <p>c) Once spread, area to be rolled to ensure maximum contact between seeds and bare ground, as well as minimising loss from wind blow and bird feeding.</p> <p>2) Adjustments to timing, frequency, height of cut and collect regime.</p> <p>3) Introduce aftermath grazing following cut and collect, using cattle or horses. Or adjustments to aftermath grazing regime.</p>
Poor sward height diversity	Where <20% of the sward is <7cm and <20% of the sward is >7cm.	<p>Ensure 20% of the sward is left un-mown per year as part of the hay cut, with the unmown areas being changed each year on rotation. Adjust cutting height.</p> <p>OR</p> <p>Introduce aftermath grazing at low stocking density of livestock to encourage variable sward heights.</p>
Scrub or bracken encroachment	Scrub and or bracken cover greater than 5% or 20% respectively	Initiate programme of scrub and/or bracken removal as required.
Damage to habitats from public access e.g. damage from recreational activities, fly-tipping etc	Annual monitoring records damage to greater than 5% of the community.	<p>Fly-tipping should be removed. Confirm suitable signage and access controls are in place and remain effective.</p> <p>Lightly scarify any compacted ground and re-seed with green hay from within the site.</p>

Risk Factor	Trigger for Action	Corrective Measures
Establishment of species indicative of sub-optimal condition	Where species indicative of sub-optimal comprise >5% of sward	<p>Appropriate timing of hay cut should control most undesirable species. High undesirable cover is often associated with excessive bare ground particularly due to poaching, trampling or over grazing. These causes will be addressed in the first instance, if of relevance.</p> <p>If none of the above factors apply, a second cut in September can control the spread.</p> <p>If problems persist, initiate a programme of hand pulling, before flowering, using a spade or hoe just below ground level.</p>
No bare ground	Bare ground less than 1%	<p>Introduce aftermath grazing following cut and collect, using cattle or horses.</p> <p>Alternatively, bare ground can be introduced by lightly chain harrowing or raking the grassland following the cut and collect.</p> <p>Finally, adjusting the cutting height locally within the field to scalp the grassland to create small patches of bare ground could be used.</p> <p>Use of herbicides will be prohibited.</p>

Note on Local Green Hay and Seed suppliers.

Green Hay

Green hay donor sites should be within one hour of the receptor site or within a 20km radius of the Site.

The closest known lowland meadow habitat to the Site Boundary is within Park Brook Pastures Biological Heritage Site, located 1km from the Site boundary. The citation for Park Brook Pastures confirms the lowland meadow extant within the BHS shares a number of species in common with the Site, including: Common Knapweed, Meadow Vetchling, Common Bird's-foot-trefoil, Great Burnet, Devil's-bit Scabious and Betony.

An additional 102 known Lowland meadow grasslands are located within 20km of the Site Boundary.

Seed houses

Cumbria Wildflowers. Provide plug plants and seed mixes from harvested wild seed collected from UK species rich habitats.

Heritage Wild Flowers, in North Leeds offer a selection of wild harvested and nursely grown native wildflower seeds.
<https://www.heritagewildflowers.co.uk/>

APPENDIX C:

SOIL ASSESSMENT



Patrick Stephenson Ltd
Agricultural Consultants

Soil Ecology Report

Langho

February 2026

Prepared by: Patrick Stephenson BSc (Hons) Agriculture

Contents	Page No.
1.0 Introduction	3
2.0 Method	3
3.0 Location	3
4.0 Site Characteristics	3
Appendix 1 - Site Locations	4
Appendix 2 -Lab results	5

1.0 Introduction

Patrick Stephenson Limited was approached by Hallam Land, to undertake a detailed Soil Survey of the agricultural land for two blocks of land located between Longsight Road and Whalley Road, Langho. Located at Grid Reference SD7034 2631, and SD 6934 9238.

2.0 Method

The method used was to sample the two areas in a 'W' formation to ensure a representative sample of topsoil and sub soil for both locations (Appendix 1). The sampling was carried out by Patrick Stephenson with 34 years of experience in land classification and nutrient management. The site one was identified as Area 1 AA TOP and AA SUB, Area 2 identified as BB Top and BB Sub. These were then sent to UKAS accredited lab (LANCROP) for detailed analysis (Appendix 2). This was to support the ecological survey carried out and the proposed use of these two areas:

Soils were examined using a hand-held Dutch Auger. Borings were carried out as described with the topsoil taken from within the topsoil profile and the subsoil taken from the subsoil profile.

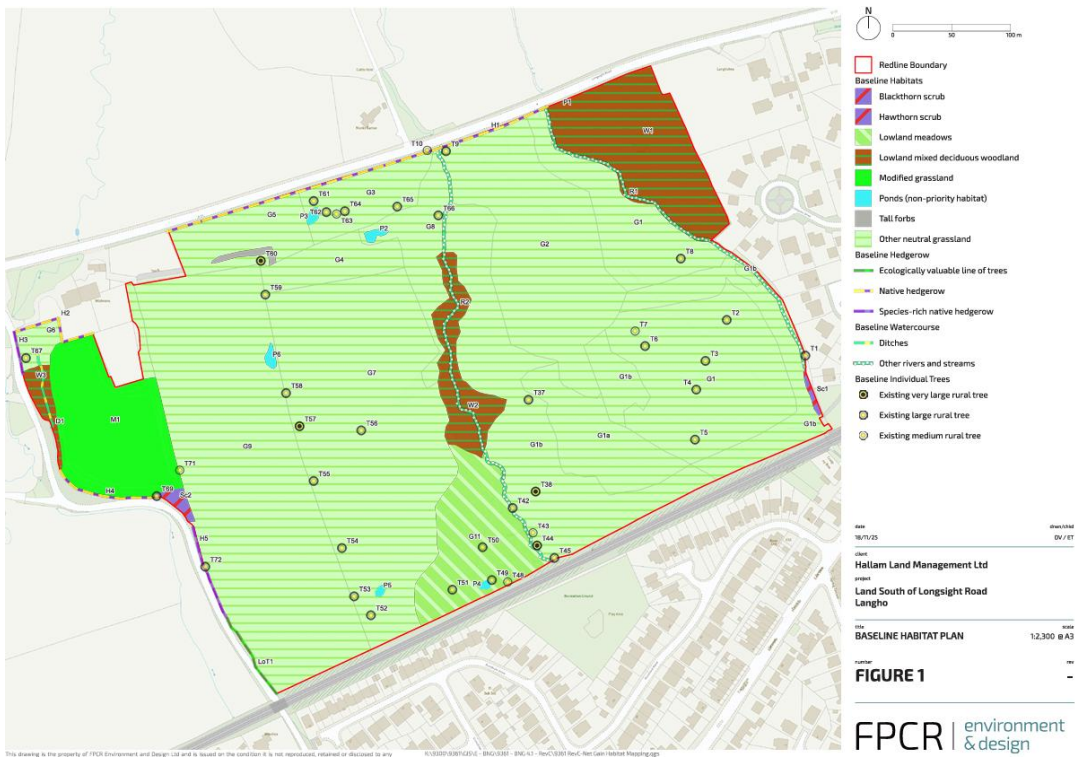
3.0 Location

The Application Site is located immediately to the south of Longsight Road (A59), below Langho railway station. The areas assessed were firstly to the south of the scheme either side of the brook adjacent to the railway line and secondly in the northwest corner adjacent to Whitehalgh Lane.

4.0 Site Characteristics

The site adjoining Whitehalgh Lane was in semi-improved grassland slightly undulating sloping to down towards Longsight Road. The second site adjacent to the brook was unimproved permanent grassland. The land had moderate slopes to the brook and was undulating.

Appendix 1 Site Locations



Appendix 2 Lab results

Analysis Results (SOIL)

Customer	ARABLE ADVISOR	Distributor	MR P STEPHENSON BEECH LODGE 66 MIDDLETON ROAD PICKERING NORTH YORKSHIRE YO18 8NH
Sample Ref	4 LANGHO AA TOP	Date Received	02/03/2026 (Date Issued: 20/03/2026)
Sample No	G221029/01 / LANGHO AA		
Crop	GRAZED GRASS (CATTLE)		

Soil Characteristics	Result	Low	Normal	High			
pH	6.4						
Org. Matter - DUMAS (%)	6.9						
C.E.C. (meq/100g)	13.8						
Soil Respiration (mg/kg)	159						
C:N Ratio	11.5						
Texture Class	SALO						
Org. Carbon Stock (t/ha)	51.1						
Bulk Density (lab) (g/cm3)	0.85						
Major Nutrients	Result	0	1	2-	2+	3	4+
Phosphorus (ppm)	15						
Potassium (ppm)	57						
Magnesium (ppm)	76						
Secondary and Micro Nutrients	Result	Deficient	Maintenance	High			
Calcium (ppm)	2422						
Sulphur (ppm)	7						
Sodium (ppm)	55						
Boron (ppm)	1.23						
Copper (ppm)	9.9						
Iron (ppm)	1111						
Manganese (ppm)	38						
Molybdenum (ppm)	0.03						
Zinc (ppm)	5.3						

Released by **Chris**Laboratory Manager on behalf of Lancrop Laboratories

Wellington Road, The Industrial Estate
Pocklington, York, YO42 1DN
Tel: + 44 1759 305116 www.lancrop.com

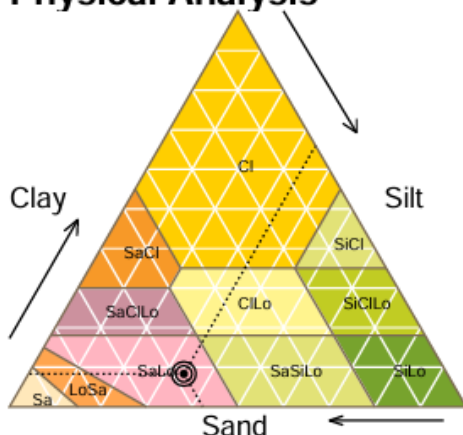
PAAG
Professional Agricultural Analysis Group

Analysis Results (SOIL)

Customer ARABLE ADVISOR
Sample Ref 4 LANGHO AA TOP
Sample No G221029/01 / LANGHO AA
Crop GRAZED GRASS (CATTLE)

Distributor MR P STEPHENSON
Date Received 02/03/2026 (Date Issued: 20/03/2026)

Physical Analysis



Analysis	Result (%)
Sand	57.67
Silt	34.01
Clay	8.32
Soil Type	SaLo Sandy Loam

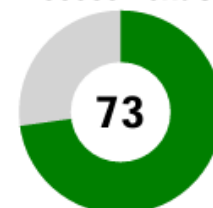
Property	Assessment
Available Water	Low to Medium
Drainage Rate	Rapid
Inherent Fertility	Low to Medium
Potential C.E.C.	Low to Medium
Leaching Risk	High to Moderate
Warming Rate	Rapid

Biological Analysis



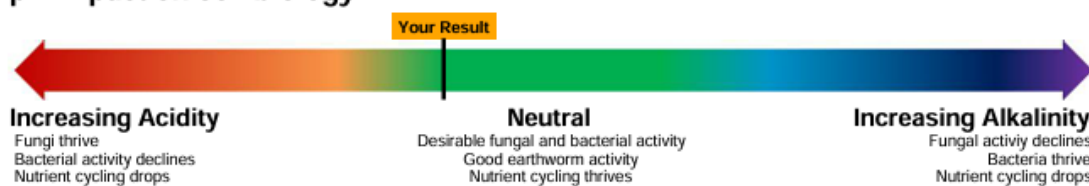
Analysis	Result	Ideal
Solvita Burst CO2-C (ppm)	159	>70
Organic Carbon (%)	4	
Total Nitrogen (%)	0.35	
C:N Ratio	11.5	10-12
Calculated Parameters		Result
Microbial Biomass (mg/kg)	3528	
Solvita Potentially Mineralizable Nitrogen (kg N/ha)	93	
Soil Assessment Score	73/100	

Soil Assessment Score



Microbial Biomass and Potentially Mineralizable N are calculated from the Solvita CO2-C Burst. The Potentially Mineralizable N assumes ideal conditions. Soil Assessment Score is calculated from biological, chemical and physical results.

pH impact on soil biology



Analysis Results (SOIL)

Customer ARABLE ADVISOR
Sample Ref 4 LANGHO AA TOP
Sample No G221029/01 / LANGHO AA
Crop GRAZED GRASS (CATTLE)

Distributor MR P STEPHENSON
Date Received 02/03/2026 (Date Issued: 20/03/2026)

Analysis	Result	Guideline	Comments
pH	6.4	6.0	Adequate level. Maintain pH to ensure optimum nutrient availability and ideal conditions for an active soil biology.
Org. Matter - DUMAS (%)	6.9	3.0	Good. Soils with medium to high levels of organic matter would generally be expected to have a good potential fertility and good structure, moisture retention and water infiltration. Ensure appropriate soil management practices are used to maintain organic matter levels.
C.E.C. (meq/100g)	13.8	15.0	Cation Exchange Capacity indicates a slightly low nutrient holding ability - soil applied nutrients could be readily leached. Where possible foliar applied nutrients should be recommended.
Soil Respiration (mg/kg)	159	70	Typical aerobic microbial activity and mineralisation potential. Soil management practices may further improve biological fertility.
C:N Ratio	11.5	10.0	Normal. A low C:N ratio in the soil encourages microbial activity and the amount and rate of nutrients made available to the plants through mineralisation. A ratio of 10 - 12 indicates the potential for a good rate of decomposition of organic residue and retention of applied organic materials.
Texture Class	SALO		
Org. Carbon Stock (t/ha)	51.1	34.0	The calculated level of organic carbon (active + humus) within one hectare when soil bulk density is either assumed (1.3g/cm ³) or has been overwritten with a disturbed soil measured value (if SCA Extra has been requested) and soil depth is 15cm. Please see footnotes for calculation if you wish to adapt. Multiply the OC stock value by the field area (hectares) to indicate level of carbon stored within the field.
Bulk Density (lab) (g/cm ³)	0.85	1.20	Bulk density by general definition is the weight of soil in a given volume. The less soil weight or the greater the amount of pore space per volume, the lower the bulk density. Lower bulk densities (to an extent) have more favourable characteristics such as good soil structure, water/air infiltration, nutrient mobility and root growth potential. Higher bulk densities (>1.5g/cm ³) are likely to be compacted soils and characteristics will be the opposite, resulting in lower amounts of stored carbon per volume. The bulk density result here is derived from the disturbed soil method (soil particle density) and does not take into account stone volume and pore space.
Phosphorus (ppm)	15	16	(Index 1) 50 kg/ha P ₂ O ₅ (40 units/acre).
Potassium (ppm)	57	121	(Index 0) 60 kg/ha K ₂ O (48 units/acre). Avoid applications in spring if there is a history of Hypomagnesaemia.

Wellington Road, The Industrial Estate
 Pocklington, York, YO42 1DN
 Tel: + 44 1759 305116 www.lancrop.com

PAAG
 Professional Agricultural Analysis Group

Analysis Results (SOIL)

Customer	ARABLE ADVISOR	Distributor	MR P STEPHENSON
Sample Ref	4 LANGHO AA TOP	Date Received	02/03/2026 (Date Issued: 20/03/2026)
Sample No	G221029/01 / LANGHO AA		
Crop	GRAZED GRASS (CATTLE)		

Analysis	Result	Guideline	Comments
Magnesium (ppm)	76	51	(Index 2) PRIORITY FOR LIVESTOCK HEALTH. Apply 25 kg/ha MgO (20 units/acre) every three to four years. Further applications may be required if there is a history of hypomagnesaemia.
Calcium (ppm)	2422	2000	Adequate level.
Sulphur (ppm)	7	10	Consider treatment for optimum grass growth.
Sodium (ppm)	55	90	PRIORITY FOR LIVESTOCK HEALTH.
Boron (ppm)	1.23	0.50	Adequate level.
Copper (ppm)	9.9	8.0	Adequate level.
Iron (ppm)	1111	50	Adequate level.
Manganese (ppm)	38	40	Consider treatment for optimum grass growth.
Molybdenum (ppm)	0.03	<0.5	No problems anticipated.
Zinc (ppm)	5.3	7.0	PRIORITY FOR LIVESTOCK HEALTH.

Additional Comments

The guidelines shown are for optimum livestock health. Except for P and K where guidelines and recommendations are for grazed grass according to RB209.

Additional technical bulletins are available at www.lancrop.com

Please Note

Whilst every care is taken to ensure that the Results from Analysis are as accurate as possible, it is important to note that the analysis relates to the sample received by the laboratory, and is representative only of that sample. No warranty is given by the laboratory that the Results from Analysis relates to any part of a field or growing area not covered by the sample received. It is important to ensure that any soil, leaf, silage or fruitlet sample sent for analysis is representative of the area requiring analysis and that samples are obtained in accordance with established sampling techniques. A leaflet containing instructions on how to take soil, leaf, herbage, silage and fruit samples for analysis is available from the laboratory on request. Uncertainty measurements of results are available on request

Wellington Road, The Industrial Estate
Pocklington, York, YO42 1DN
Tel: + 44 1759 305116 www.lancrop.com

PAAG
Professional Agricultural Analysis Group

Analysis Results (SOIL)

Customer ARABLE ADVISOR

Distributor MR P STEPHENSON
BEECH LODGE
66 MIDDLETON ROAD
PICKERING
NORTH YORKSHIRE
YO18 8NH

Sample Ref 4 LANGHO AA SUB

Date Received 02/03/2026 (Date Issued: 20/03/2026)

Sample No G221029/02 / LANGHO AA

Crop GRAZED GRASS (CATTLE)

Soil Characteristics	Result	Low	Normal	High			
pH	5.7						
Org. Matter - DUMAS (%)	1.8						
Lime Req. (t/ha)	3.0						
C.E.C. (meq/100g)	9.8						
Soil Respiration (mg/kg)	237						
C:N Ratio	13.1						
Texture Class	CLLO						
Org. Carbon Stock (t/ha)	16.0						
Bulk Density (lab) (g/cm3)	1.02						
Major Nutrients	Result	0	1	2-	2+	3	4+
Phosphorus (ppm)	2						
Potassium (ppm)	28						
Magnesium (ppm)	66						
Secondary and Micro Nutrients	Result	Deficient	Maintenance	High			
Calcium (ppm)	1460						
Sulphur (ppm)	4						
Sodium (ppm)	41						
Boron (ppm)	0.70						
Copper (ppm)	6.6						
Iron (ppm)	732						
Manganese (ppm)	43						
Molybdenum (ppm)	0.03						
Zinc (ppm)	5.2						

Released by **Chris**.....Laboratory Manager on behalf of Lancrop Laboratories

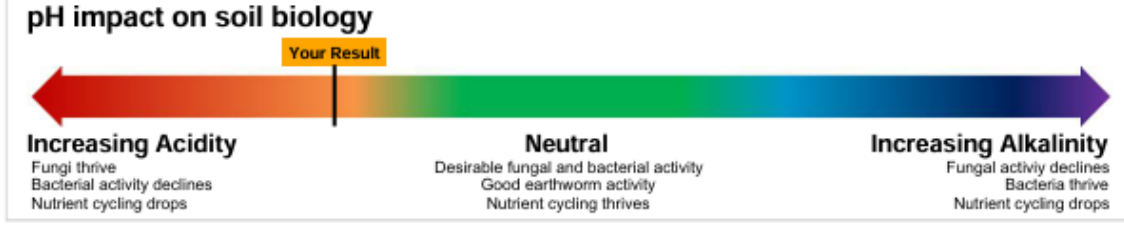
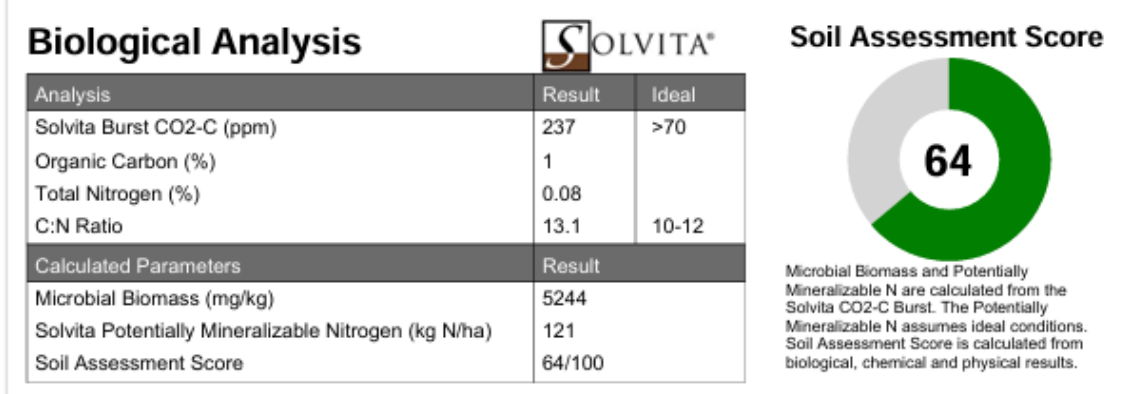
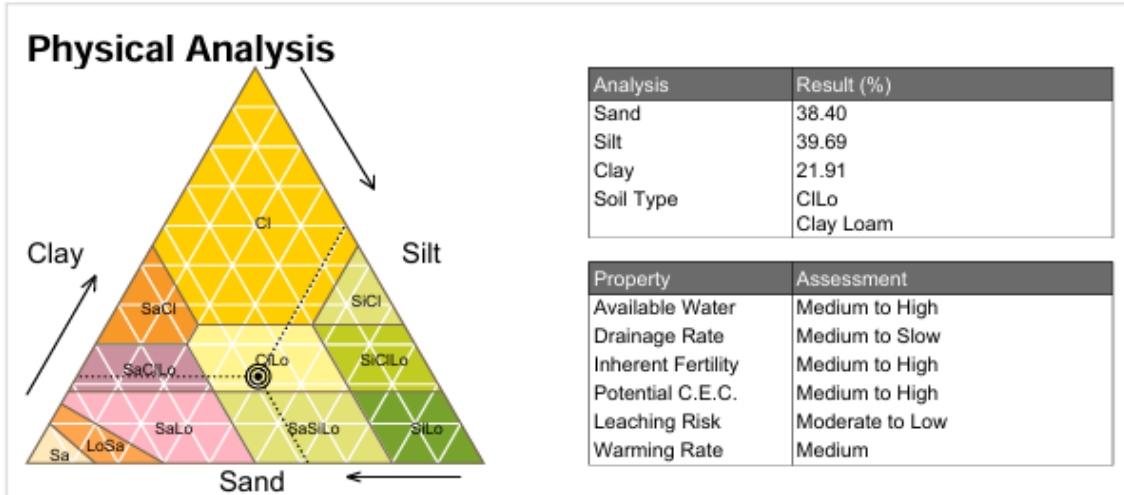
Wellington Road, The Industrial Estate
Pocklington, York, YO42 1DN
Tel: + 44 1759 305116 www.lancrop.com

PAAG
Professional Agricultural Analysis Group

Analysis Results (SOIL)

Customer ARABLE ADVISOR
Sample Ref 4 LANGHO AA SUB
Sample No G221029/02 / LANGHO AA
Crop GRAZED GRASS (CATTLE)

Distributor MR P STEPHENSON
Date Received 02/03/2026 (Date Issued: 20/03/2026)



Analysis Results (SOIL)

Customer ARABLE ADVISOR
Sample Ref 4 LANGHO AA SUB
Sample No G221029/02 / LANGHO AA
Crop GRAZED GRASS (CATTLE)

Distributor MR P STEPHENSON
Date Received 02/03/2026 (Date Issued: 20/03/2026)

Analysis	Result	Guideline	Comments
pH	5.7	6.0	Slightly low. An acidic environment will reduce soil nutrient availability and the efficiency of any applied fertilisers or organic materials. A sub optimum pH will also impact on soil microbial populations and rates of activity. Refer to lime requirement.
Org. Matter - DUMAS (%)	1.8	3.0	Low. Soils with medium to high levels of organic matter would generally be expected to have a good potential fertility and good structure, moisture retention and water infiltration. Investigate soil conditions to establish if soil management practices can improve levels of organic matter.
Lime Req. (t/ha)	3.0		
C.E.C. (meq/100g)	9.8	15.0	Cation Exchange Capacity indicates a low nutrient holding ability - soil applied nutrients will be readily leached. Where possible foliar applied nutrients should be recommended.
Soil Respiration (mg/kg)	237	70	High aerobic microbial activity and mineralisation potential. Ensure appropriate soil management practices are used to maintain biological fertility.
C:N Ratio	13.1	10.0	High. A low C:N ratio in the soil encourages microbial activity and the amount and rate of nutrients made available to the plants through mineralisation. A ratio of 12 - 25 indicates the potential for a slow rate of decomposition of organic residue and a high retention of applied organic materials.
Texture Class	CLLO		
Org. Carbon Stock (t/ha)	16.0	34.0	The calculated level of organic carbon (active + humus) within one hectare when soil bulk density is either assumed (1.3g/cm ³) or has been overwritten with a disturbed soil measured value (if SCA Extra has been requested) and soil depth is 15cm. Please see footnotes for calculation if you wish to adapt. Multiply the OC stock value by the field area (hectares) to indicate level of carbon stored within the field.
Bulk Density (lab) (g/cm ³)	1.02	1.20	Bulk density by general definition is the weight of soil in a given volume. The less soil weight or the greater the amount of pore space per volume, the lower the bulk density. Lower bulk densities (to an extent) have more favourable characteristics such as good soil structure, water/air infiltration, nutrient mobility and root growth potential. Higher bulk densities (>1.5g/cm ³) are likely to be compacted soils and characteristics will be the opposite, resulting in lower amounts of stored carbon per volume. The bulk density result here is derived from the disturbed soil method (soil particle density) and does not take into account stone volume and pore space.
Phosphorus (ppm)	2	16	(Index 0) 80 kg/ha P ₂ O ₅ (64 units/acre).

Wellington Road, The Industrial Estate
 Pocklington, York, YO42 1DN
 Tel: + 44 1759 305116 www.lancrop.com

PAAG
 Professional Agricultural Analysis Group

Analysis Results (SOIL)

Customer ARABLE ADVISOR
Sample Ref 4 LANGHO AA SUB
Sample No G221029/02 / LANGHO AA
Crop GRAZED GRASS (CATTLE)

Distributor MR P STEPHENSON
Date Received 02/03/2026 (Date Issued: 20/03/2026)

Analysis	Result	Guideline	Comments
Potassium (ppm)	28	121	(Index 0) 60 kg/ha K ₂ O (48 units/acre). Avoid applications in spring if there is a history of Hypomagnesaemia.
Magnesium (ppm)	66	51	(Index 2) PRIORITY FOR LIVESTOCK HEALTH. Apply 25 kg/ha MgO (20 units/acre) every three to four years. Further applications may be required if there is a history of hypomagnesaemia.
Calcium (ppm)	1460	2000	Below optimum level. If pH low, and Mg adequate, consider using calcium liming material.
Sulphur (ppm)	4	10	Consider treatment for optimum grass growth.
Sodium (ppm)	41	90	PRIORITY FOR LIVESTOCK HEALTH.
Boron (ppm)	0.70	0.50	Adequate level.
Copper (ppm)	6.6	8.0	PRIORITY FOR LIVESTOCK HEALTH.
Iron (ppm)	732	50	Adequate level.
Manganese (ppm)	43	5	Adequate level.
Molybdenum (ppm)	0.03	<0.5	No problems anticipated.
Zinc (ppm)	5.2	7.0	PRIORITY FOR LIVESTOCK HEALTH.

Additional Comments

The guidelines shown are for optimum livestock health. Except for P and K where guidelines and recommendations are for grazed grass according to RB209.

Additional technical bulletins are available at www.lancrop.com

Please Note

Whilst every care is taken to ensure that the Results from Analysis are as accurate as possible, it is important to note that the analysis relates to the sample received by the laboratory, and is representative only of that sample. No warranty is given by the laboratory that the Results from Analysis relates to any part of a field or growing area not covered by the sample received. It is important to ensure that any soil, leaf, silage or fruitlet sample sent for analysis is representative of the area requiring analysis and that samples are obtained in accordance with established sampling techniques. A leaflet containing instructions on how to take soil, leaf, herbage, silage and fruit samples for analysis is available from the laboratory on request. Uncertainty measurements of results are available on request

Wellington Road, The Industrial Estate
 Pocklington, York, YO42 1DN
 Tel: + 44 1759 305116 www.lancrop.com

PAAG
 Professional Agricultural Analysis Group

Analysis Results (SOIL)

Customer ARABLE ADVISOR

Distributor MR P STEPHENSON
BEECH LODGE
66 MIDDLETON ROAD
PICKERING
NORTH YORKSHIRE
YO18 8NH

Sample Ref 4 LANGHO BB TOP

Date Received 02/03/2026 (Date Issued: 20/03/2026)

Sample No G221029/03 / LANGHO AA

Crop GRAZED GRASS (CATTLE)

Soil Characteristics	Result	Low	Normal	High			
pH	5.4						
Org. Matter - DUMAS (%)	1.9						
Lime Req. (t/ha)	4.0						
C.E.C. (meq/100g)	11.7						
Soil Respiration (mg/kg)	184						
C:N Ratio	12.3						
Texture Class	CLLO						
Org. Carbon Stock (t/ha)	15.9						
Bulk Density (lab) (g/cm3)	0.96						
Major Nutrients	Result	0	1	2-	2+	3	4+
Phosphorus (ppm)	< 2						
Potassium (ppm)	38						
Magnesium (ppm)	73						
Secondary and Micro Nutrients	Result	Deficient	Maintenance	High			
Calcium (ppm)	1633						
Sulphur (ppm)	1						
Sodium (ppm)	23						
Boron (ppm)	0.75						
Copper (ppm)	6.4						
Iron (ppm)	429						
Manganese (ppm)	178						
Molybdenum (ppm)	0.03						
Zinc (ppm)	5.7						

Released by **Chris**.....Laboratory Manager on behalf of Lancrop Laboratories

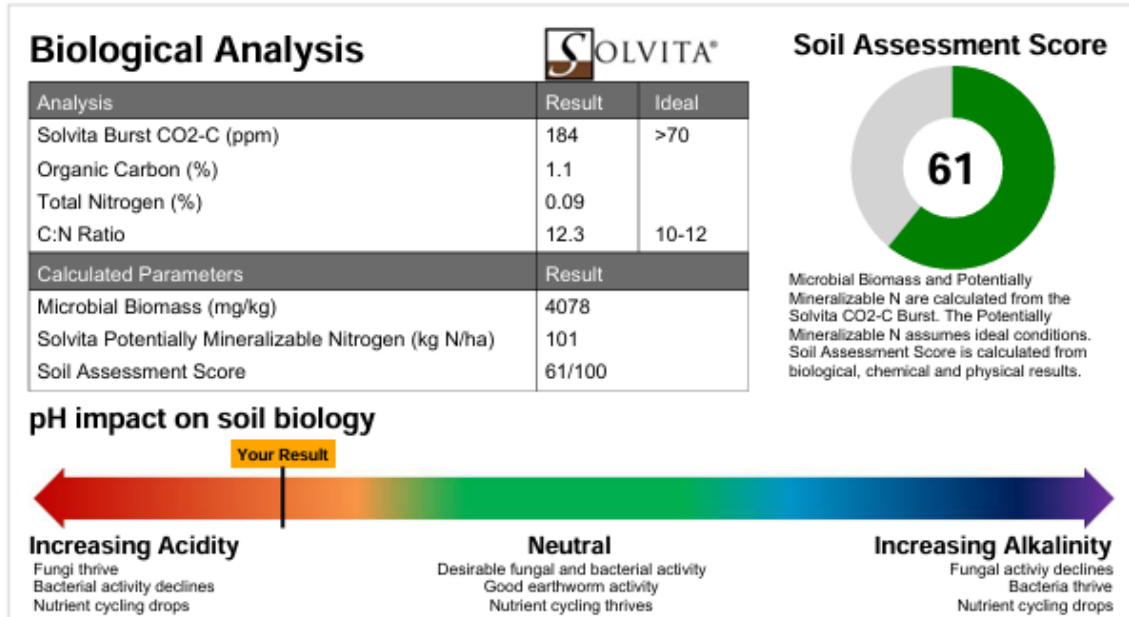
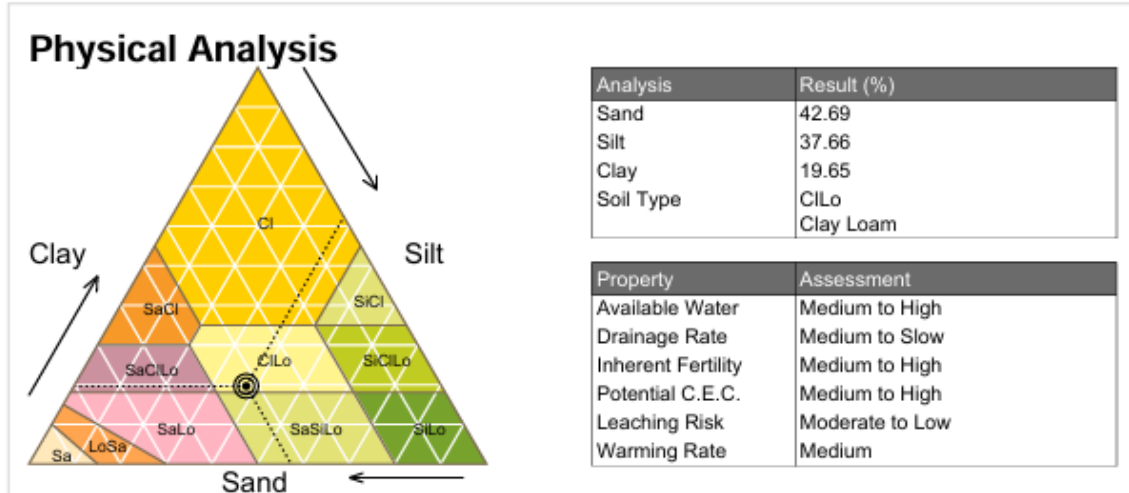
Wellington Road, The Industrial Estate
Pocklington, York, YO42 1DN
Tel: + 44 1759 305116 www.lancrop.com

PAAG
Professional Agricultural Analysis Group

Analysis Results (SOIL)

Customer ARABLE ADVISOR
Sample Ref 4 LANGHO BB TOP
Sample No G221029/03 / LANGHO AA
Crop GRAZED GRASS (CATTLE)

Distributor MR P STEPHENSON
Date Received 02/03/2026 (Date Issued: 20/03/2026)



Analysis Results (SOIL)

Customer ARABLE ADVISOR

Distributor MR P STEPHENSON

Sample Ref 4 LANGHO BB TOP

Date Received 02/03/2026 (Date Issued: 20/03/2026)

Sample No G221029/03 / LANGHO AA

Crop GRAZED GRASS (CATTLE)

Analysis	Result	Guideline	Comments
pH	5.4	6.0	Low. An acidic environment will reduce soil nutrient availability and the efficiency of any applied fertilisers or organic materials. A sub-optimum pH will also impact on soil microbial populations and rates of activity. Refer to lime requirement.
Org. Matter - DUMAS (%)	1.9	3.0	Low. Soils with medium to high levels of organic matter would generally be expected to have a good potential fertility and good structure, moisture retention and water infiltration. Investigate soil conditions to establish if soil management practices can improve levels of organic matter.
Lime Req. (t/ha)	4.0		
C.E.C. (meq/100g)	11.7	15.0	Cation Exchange Capacity indicates a slightly low nutrient holding ability - soil applied nutrients could be readily leached. Where possible foliar applied nutrients should be recommended.
Soil Respiration (mg/kg)	184	70	High aerobic microbial activity and mineralisation potential. Ensure appropriate soil management practices are used to maintain biological fertility.
C:N Ratio	12.3	10.0	High. A low C:N ratio in the soil encourages microbial activity and the amount and rate of nutrients made available to the plants through mineralisation. A ratio of 12 - 25 indicates the potential for a slow rate of decomposition of organic residue and a high retention of applied organic materials.
Texture Class	CLLO		
Org. Carbon Stock (t/ha)	15.9	34.0	The calculated level of organic carbon (active + humus) within one hectare when soil bulk density is either assumed (1.3g/cm ³) or has been overwritten with a disturbed soil measured value (if SCA Extra has been requested) and soil depth is 15cm. Please see footnotes for calculation if you wish to adapt. Multiply the OC stock value by the field area (hectares) to indicate level of carbon stored within the field.
Bulk Density (lab) (g/cm ³)	0.96	1.20	Bulk density by general definition is the weight of soil in a given volume. The less soil weight or the greater the amount of pore space per volume, the lower the bulk density. Lower bulk densities (to an extent) have more favourable characteristics such as good soil structure, water/air infiltration, nutrient mobility and root growth potential. Higher bulk densities (>1.5g/cm ³) are likely to be compacted soils and characteristics will be the opposite, resulting in lower amounts of stored carbon per volume. The bulk density result here is derived from the disturbed soil method (soil particle density) and does not take into account stone volume and pore space.
Phosphorus (ppm)	16	16	(Index 0) 80 kg/ha P2O5 (64 units/acre).

Wellington Road, The Industrial Estate
Pocklington, York, YO42 1DN
Tel: + 44 1759 305116 www.lancrop.com

PAAG
Professional Agricultural Analysis Group

Analysis Results (SOIL)

Customer ARABLE ADVISOR
Sample Ref 4 LANGHO BB TOP
Sample No G221029/03 / LANGHO AA
Crop GRAZED GRASS (CATTLE)

Distributor MR P STEPHENSON
Date Received 02/03/2026 (Date Issued: 20/03/2026)

Analysis	Result	Guideline	Comments
Potassium (ppm)	38	121	(Index 0) 60 kg/ha K ₂ O (48 units/acre). Avoid applications in spring if there is a history of Hypomagnesaemia.
Magnesium (ppm)	73	51	(Index 2) PRIORITY FOR LIVESTOCK HEALTH. Apply 25 kg/ha MgO (20 units/acre) every three to four years. Further applications may be required if there is a history of hypomagnesaemia.
Calcium (ppm)	1633	2000	Below optimum level. If pH low, and Mg adequate, consider using calcium liming material.
Sulphur (ppm)	1	10	Consider treatment for optimum grass growth.
Sodium (ppm)	23	90	PRIORITY FOR LIVESTOCK HEALTH.
Boron (ppm)	0.75	0.50	Adequate level.
Copper (ppm)	6.4	8.0	PRIORITY FOR LIVESTOCK HEALTH.
Iron (ppm)	429	50	Adequate level.
Manganese (ppm)	178	5	Possibility of interference with the availability of Fe.
Molybdenum (ppm)	0.03	<0.5	No problems anticipated.
Zinc (ppm)	5.7	7.0	PRIORITY FOR LIVESTOCK HEALTH.

Additional Comments

The guidelines shown are for optimum livestock health. Except for P and K where guidelines and recommendations are for grazed grass according to RB209.

Additional technical bulletins are available at www.lancrop.com

Please Note

Whilst every care is taken to ensure that the Results from Analysis are as accurate as possible, it is important to note that the analysis relates to the sample received by the laboratory, and is representative only of that sample. No warranty is given by the laboratory that the Results from Analysis relates to any part of a field or growing area not covered by the sample received. It is important to ensure that any soil, leaf, silage or fruitlet sample sent for analysis is representative of the area requiring analysis and that samples are obtained in accordance with established sampling techniques. A leaflet containing instructions on how to take soil, leaf, herbage, silage and fruit samples for analysis is available from the laboratory on request. Uncertainty measurements of results are available on request

Wellington Road, The Industrial Estate
 Pocklington, York, YO42 1DN
 Tel: + 44 1759 305116 www.lancrop.com

PAAG
 Professional Agricultural Analysis Group

Analysis Results (SOIL)

Customer ARABLE ADVISOR

Distributor MR P STEPHENSON
BEECH LODGE
66 MIDDLETON ROAD
PICKERING
NORTH YORKSHIRE
YO18 8NH

Sample Ref 4 LANGHO BB SUB

Date Received 02/03/2026 (Date Issued: 20/03/2026)

Sample No G221029/04 / LANGHO AA

Crop GRAZED GRASS (CATTLE)

Soil Characteristics	Result	Low	Normal	High			
pH	5.3						
Org. Matter - DUMAS (%)	6.2						
Lime Req. (t/ha)	5.0						
C.E.C. (meq/100g)	10.4						
Soil Respiration (mg/kg)	268						
C:N Ratio	12.4						
Texture Class	SALO						
Org. Carbon Stock (t/ha)	42.7						
Bulk Density (lab) (g/cm3)	0.79						
Major Nutrients	Result	0	1	2-	2+	3	4+
Phosphorus (ppm)	5						
Potassium (ppm)	90						
Magnesium (ppm)	104						
Secondary and Micro Nutrients	Result	Deficient	Maintenance	High			
Calcium (ppm)	1338						
Sulphur (ppm)	2						
Sodium (ppm)	25						
Boron (ppm)	1.02						
Copper (ppm)	9.3						
Iron (ppm)	1178						
Manganese (ppm)	43						
Molybdenum (ppm)	0.03						
Zinc (ppm)	8.3						

Released by **Chris** Laboratory Manager on behalf of Lancrop Laboratories

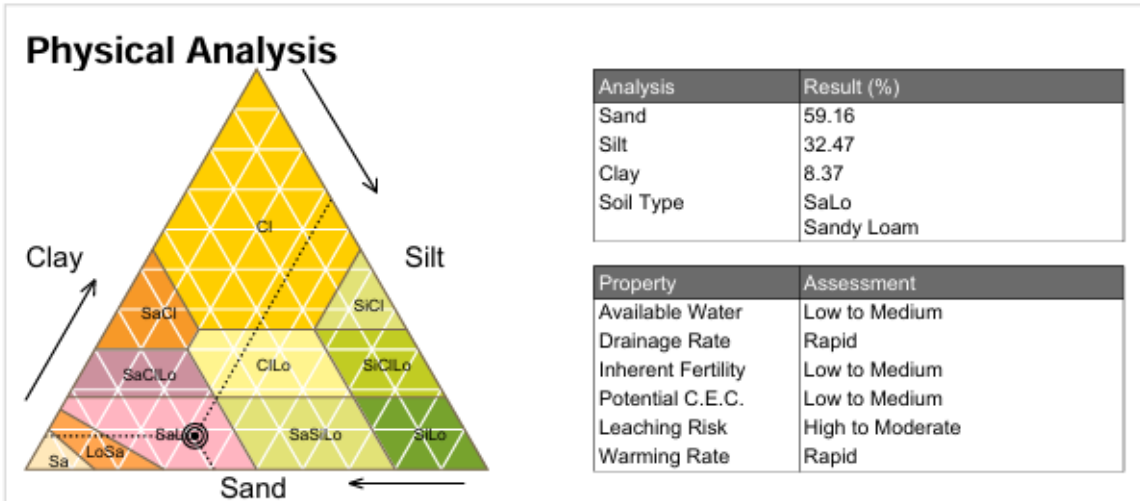
Wellington Road, The Industrial Estate
Pocklington, York, YO42 1DN
Tel: + 44 1759 305116 www.lancrop.com

PAAG
Professional Agricultural Analysis Group

Analysis Results (SOIL)

Customer ARABLE ADVISOR
Sample Ref 4 LANGHO BB SUB
Sample No G221029/04 / LANGHO AA
Crop GRAZED GRASS (CATTLE)

Distributor MR P STEPHENSON
Date Received 02/03/2026 (Date Issued: 20/03/2026)

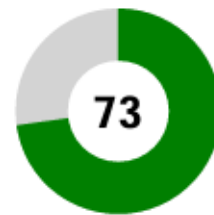


Biological Analysis



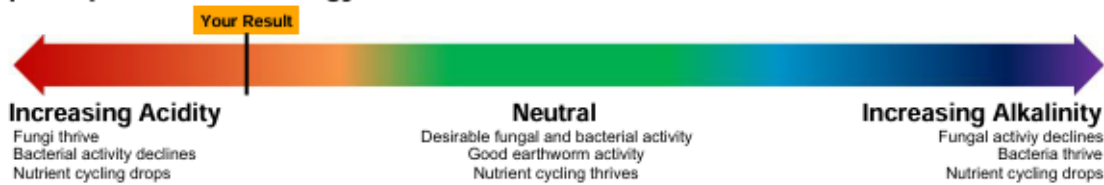
Analysis	Result	Ideal
Solvita Burst CO2-C (ppm)	268	>70
Organic Carbon (%)	3.6	
Total Nitrogen (%)	0.29	
C:N Ratio	12.4	10-12
Calculated Parameters		Result
Microbial Biomass (mg/kg)	5926	
Solvita Potentially Mineralizable Nitrogen (kg N/ha)	145	
Soil Assessment Score	73/100	

Soil Assessment Score



Microbial Biomass and Potentially Mineralizable N are calculated from the Solvita CO2-C Burst. The Potentially Mineralizable N assumes ideal conditions. Soil Assessment Score is calculated from biological, chemical and physical results.

pH impact on soil biology



Analysis Results (SOIL)

Customer ARABLE ADVISOR
Sample Ref 4 LANGHO BB SUB
Sample No G221029/04 / LANGHO AA
Crop GRAZED GRASS (CATTLE)

Distributor MR P STEPHENSON
Date Received 02/03/2026 (Date Issued: 20/03/2026)

Analysis	Result	Guideline	Comments
pH	5.3	6.0	Low. An acidic environment will reduce soil nutrient availability and the efficiency of any applied fertilisers or organic materials. A sub-optimum pH will also impact on soil microbial populations and rates of activity. Refer to lime requirement.
Org. Matter - DUMAS (%)	6.2	3.0	Good. Soils with medium to high levels of organic matter would generally be expected to have a good potential fertility and good structure, moisture retention and water infiltration. Ensure appropriate soil management practices are used to maintain organic matter levels.
Lime Req. (t/ha)	5.0		
C.E.C. (meq/100g)	10.4	15.0	Cation Exchange Capacity indicates a slightly low nutrient holding ability - soil applied nutrients could be readily leached. Where possible foliar applied nutrients should be recommended.
Soil Respiration (mg/kg)	268	70	High aerobic microbial activity and mineralisation potential. Ensure appropriate soil management practices are used to maintain biological fertility.
C:N Ratio	12.4	10.0	High. A low C:N ratio in the soil encourages microbial activity and the amount and rate of nutrients made available to the plants through mineralisation. A ratio of 12 - 25 indicates the potential for a slow rate of decomposition of organic residue and a high retention of applied organic materials.
Texture Class	SALO		
Org. Carbon Stock (t/ha)	42.7	34.0	The calculated level of organic carbon (active + humus) within one hectare when soil bulk density is either assumed (1.3g/cm ³) or has been overwritten with a disturbed soil measured value (if SCA Extra has been requested) and soil depth is 15cm. Please see footnotes for calculation if you wish to adapt. Multiply the OC stock value by the field area (hectares) to indicate level of carbon stored within the field.
Bulk Density (lab) (g/cm ³)	0.79	1.20	Bulk density by general definition is the weight of soil in a given volume. The less soil weight or the greater the amount of pore space per volume, the lower the bulk density. Lower bulk densities (to an extent) have more favourable characteristics such as good soil structure, water/air infiltration, nutrient mobility and root growth potential. Higher bulk densities (>1.5g/cm ³) are likely to be compacted soils and characteristics will be the opposite, resulting in lower amounts of stored carbon per volume. The bulk density result here is derived from the disturbed soil method (soil particle density) and does not take into account stone volume and pore space.
Phosphorus (ppm)	5	16	(Index 0) 80 kg/ha P2O5 (64 units/acre).

Wellington Road, The Industrial Estate
 Pocklington, York, YO42 1DN
 Tel: + 44 1759 305116 www.lancrop.com

PAAG
 Professional Agricultural Analysis Group

Analysis Results (SOIL)

Customer	ARABLE ADVISOR	Distributor	MR P STEPHENSON
Sample Ref	4 LANGHO BB SUB	Date Received	02/03/2026 (Date Issued: 20/03/2026)
Sample No	G221029/04 / LANGHO AA		
Crop	GRAZED GRASS (CATTLE)		

Analysis	Result	Guideline	Comments
Potassium (ppm)	90	121	(Index 1) 30 kg/ha K ₂ O (24 units/acre). Avoid applications in spring if there is a history of Hypomagnesaemia.
Magnesium (ppm)	104	51	(Index 3) Adequate level.
Calcium (ppm)	1338	2000	Below optimum level. If pH low, and Mg adequate, consider using calcium liming material.
Sulphur (ppm)	2	10	Consider treatment for optimum grass growth.
Sodium (ppm)	25	90	PRIORITY FOR LIVESTOCK HEALTH.
Boron (ppm)	1.02	0.50	Adequate level.
Copper (ppm)	9.3	8.0	Adequate level.
Iron (ppm)	1178	50	Adequate level.
Manganese (ppm)	43	5	Adequate level.
Molybdenum (ppm)	0.03	<0.5	No problems anticipated.
Zinc (ppm)	8.3	7.0	Adequate level.

Additional Comments

The guidelines shown are for optimum livestock health. Except for P and K where guidelines and recommendations are for grazed grass according to RB209.

Additional technical bulletins are available at www.lancrop.com

Please Note

Whilst every care is taken to ensure that the Results from Analysis are as accurate as possible, it is important to note that the analysis relates to the sample received by the laboratory, and is representative only of that sample. No warranty is given by the laboratory that the Results from Analysis relates to any part of a field or growing area not covered by the sample received. It is important to ensure that any soil, leaf, silage or fruitlet sample sent for analysis is representative of the area requiring analysis and that samples are obtained in accordance with established sampling techniques. A leaflet containing instructions on how to take soil, leaf, herbage, silage and fruit samples for analysis is available from the laboratory on request. Uncertainty measurements of results are available on request

Wellington Road, The Industrial Estate
Pocklington, York, YO42 1DN
Tel: + 44 1759 305116 www.lancrop.com

PAAG
Professional Agricultural Analysis Group

APPENDIX D:

HYDROLOGICAL ASSESSMENT: ANCIENT WOODLAND



Technical Note

SITE NAME: LAND SOUTH OF LONGSIGHT ROAD, LANGHO

PREPARED FOR: HALLAM LAND MANAGEMENT LIMITED

DATE: 30/03/2026

49343-ECE-XX-XX-RP-C-0003
CH/JSC

30 March 2026

Hydrogeological Technical Note Land South of Longsight Road, Langho

Client: Hallam Land Management Limited
Project: Land South of Longsight Road, Langho

Eastwood Consulting Engineers have been appointed to prepare a brief Hydrogeological Technical Note in relation to the proposed residential development of Land South of Longsight Road, Langho. The purpose of this note is to comment on the hydrological resources in relation to the adjacent Green Nook Wood.

- Based on the Topographic Survey and the Environment Agency surface water flood maps, there is a large catchment outside of the site draining to the woodland watercourse from the east and south. This includes water from the south of the railway as there is an underpass allowing the flow of water towards the site.
- The Topographic Survey shows that a small portion of the site, land east of the Public Right of Way (PRoW) naturally flows to the woodland watercourse.
- The majority of the site east of the PRoW is proposed to be public open space and would therefore continue to drain to the watercourse adjacent the woodland and therefore have negligible impact on any base flow of the watercourse.
- The portion of the site to the east of the PRoW that is proposed to be developed would drain to the western watercourse as part of the development, however this is only a small portion of

the wider woodland watercourse catchment and should not have a notable impact on the water resource.

- The topography across the woodland area shows this to sit at an elevated position to that of the watercourse and any existing flow regime across this woodland area would continue to occur post development.
- In summary, the proposed development is not expected to have a detrimental impact on the woodland water resource.

Eastwood

CONSULTING ENGINEERS



APPENDIX E:

EXTRACTS FROM RODWELL

Extracts from Rodwell, J.S. (1992). *British Plant Communities: Volume 3 Grasslands and Montane Communities*. Cambridge University Press

Page 62: MG5: *Centaureo-Cynosuretum cristati* Grassland

62

enclosures, but some is relatively recent, like the 'narrow rig' of eighteenth- and nineteenth-century Parliamentary enclosures (see, for example, Orwin & Orwin 1938, Baker & Butlin 1973, Taylor 1975). Moreover, many grasslands with even very old ridge-and-furrow have been improved without disturbing the ancient ploughing patterns. Long-existing swards, including stands of the *Centaureo-Cynosuretum*, may, of course, occur on land that has no such signs of ploughing whatever.

What is characteristic of the community is a history of treatment which has traditionally comprised grazing, the taking of a hay crop and the light application of natural organic manures. The climate in the English lowlands is generally sufficiently mild to permit grazing throughout the winter, and stock are usually left on the grassland until the end of April when the fields are shut up for hay and lightly dressed, traditionally with farmyard manure. The hay is mown in June and the stock turned out again to graze the aftermath. Where there has been an unbroken regime of this kind, stands of the community may be of great age and show a pleasing richness and diversity. In some areas, as in the south-west Midlands, such stands often occur on land which bears the wide ridge-and-furrow typical of medieval ploughing and this gives sites an additional archaeological interest. However, the community can be maintained wherever an approximation to the traditional scheme has been applied on otherwise suitable sites and fragmentary stands are common in relatively recently created artificial habitats. These, too, may be species-rich.

Most of the floristic variation between the sub-communities is related to edaphic differences. The community as a whole is characteristic of deep brown soils of generally loamy to clayey texture but these vary considerably in their pH and calcium content, in trophic state and in their soil moisture regime. The *Lathyrus* sub-community is typically found on fairly mesotrophic and circumneutral brown earths of usually heavy texture, derived from clays and shales (such as the Lower Lias and Keuper Marl) or superficial deposits of low calcium content. On deep soils which are more calcareous but less mesotrophic, the *Galium* sub-community is characteristic. Such brown calcareous earths are often of lighter texture and develop from alluvium, loess and head, frequently, though not exclusively, over calcareous bedrocks such as Chalk and Carboniferous Limestone. The *Danthonia* sub-community extends the range of the community on to the upland margins where oligotrophic and calcium-deficient brown earths, sometimes of rather sandy texture and usually derived from siliceous material, have been bulked up and improved by repeated manuring. Such soils are superficially acid but show no signs of podzolisation.

Substantial proportions of finer particles in these soils may impede drainage and lead to gleying, especially in

hollows, beside streams or in areas of higher rainfall. Such profiles will be colder in spring and the start of new growth may be held back but they are also frequently marked out by the patchy occurrence of *Filipendula ulmaria* (especially where there is no grazing) or *Juncus* spp. (particularly where stock have access).

Zonation and succession

Zonations in the *Centaureo-Cynosuretum* are usually related to edaphic patterns and, even in enclosed fields subject to a uniform treatment, there may be soil differences which reflect heterogeneities in the parent material. Within the *Galium* sub-community, an increase in Mesobromion species (such as *Koeleria macrantha* and *Sanguisorba minor*) is often related to a rise in calcium content and pH as the soil thins towards limestone exposures. Such patterns are commonly part of a complete transition from the *Centaureo-Cynosuretum* to calcicolous grassland on the Carboniferous Limestone of the Yorkshire Dales where meadows on till or head abut on to, or surround, rocky outcrops (cf. Ivimey-Cook & Proctor 1966b on comparable zonations in The Burren). In a similar fashion, there may be an increase of species typical of calcifugous grasslands and heaths in the *Danthonia* sub-community where its characteristic brown earths grade to rankers or podzolised soils over siliceous material.

The patchy occurrence of *Juncus* spp. or *F. ulmaria* within stands of the *Centaureo-Cynosuretum* represents truncated zonations to the *Holco-Juncetum* or *Filipendulion* mires which are mediated by the soil moisture status. Such patterns are a common feature of meadows on undulating topography and frequently accentuate ridge-and-furrow with fragmentary strips of *F. ulmaria* or *Juncus* spp. on the less well-drained soils of the furrows. Alongside streams there may be a more complete gradation to poor-fen vegetation.

Occasionally, differences in treatment may be evident as zonations within enclosed meadows as, for example, where narrow belts of rich *Centaureo-Cynosuretum* remain on steeper banks within fields or around margins which have escaped improvement. Generally, however, differences in treatment style have a gradual successional effect upon the community which is evident in a range of intermediates between the *Centaureo-Cynosuretum* and more improved and productive grassland types. Two changes of practice are of particular importance.

The first is an increase of grazing pressure. Growth starts quite early in the regions where the community occurs and stands may provide a valuable supplementary bite towards the end of April. If grazing is continued into the summer, and especially if it is heavy, there is an eventual decrease in the richness of the sward. Early-flowering species such as *Orchis morio* are then unable to

MG5 *Centaureo-Cynosuretum cristati* grassland

63

set seed and there is a gradual expansion of rosette hemicryptophytes. The occurrence of the poisonous *Colchicum autumnale* in stands of the community has sometimes led to their being set aside for hay but some farmers have destroyed this species so as to allow an expansion of grazing. In fact, *C. autumnale* is more toxic during the early part of the season than in summer (Butcher 1954). Frequent mowing of the community, as occurs in some churchyards and on some verges and lawns, appears to have a similar effect to an increase in grazing. Although such treatment may permit the survival of an impoverished form of the *Centaureo-Cynosuretum*, the trend is for the sward to be converted eventually to the *Lolio-Cynosuretum*.

This change may be further encouraged by the second, now very widespread, alteration in treatment. This is the replacement of the traditional farmyard manure by artificial mineral fertilisers. These enhance the growth of the grasses to the detriment of the dicotyledons. *Lotus corniculatus* and *Leontodon hispidus* are often the first species to be lost from the vegetation but a much greater impoverishment accompanies the rise in productivity in the long term.

More drastic treatments of the community involve ploughing or the use of total weedkillers such as paraquat and re-seeding to produce *Lolio-Cynosuretum* or various kinds of ley.

Such artificial successions to pasture depend ultimately on the maintenance of grazing. When the *Centaureo-Cynosuretum* or its derivatives are ungrazed, there is an expansion of coarser grasses and an eventual invasion of shrubs. The *Lathyrus* and *Galium* sub-communities seem to progress to various types of *Arrhenatheretum* or, on more calcareous soils, to one of the coarser Mesobromion swards. The exact nature of the succession may also be influenced by the fertiliser regime on the original meadow. Ungrazed stands of the *Danthonia* sub-community may be directly invaded by heath shrubs or *Ulex europaeus*. The results of careless grazing are sometimes evident as mosaics of *Centaureo-Cynosuretum* with patches of coarse grassland or heath.

Distribution

Stands of the community occur throughout the British lowlands but the centre of distribution is on the claylands of the Midlands. Even here, however, agricultural improvement has drastically reduced the extent of the community. The sub-communities are distributed largely in relation to local and regional variations in soil type. The *Lathyrus* sub-community is the most widespread type with the *Galium* sub-community showing a more restricted occurrence, largely over calcareous bedrocks. The *Danthonia* sub-community extends the altitudinal range of the community on to the upland margins of the Welsh borderlands and northern England.

In the harsh montane climate of the northern Pennines the community is replaced by the *Anthoxanthum-Geranium* community. As with this other increasingly restricted meadow type, verge stands provide a valuable reserve.

Affinities

The *Centaureo-Cynosuretum* has been widely recognised in recent descriptive accounts with the increasing interest in the conservation of 'Old Meadows', although attention has generally been concentrated on richer stands and rarer species have been used for its characterisation. Phytosociologically, the community is distinct in its particular balance of more common and widespread species of agricultural grasslands and it clearly belongs among the pastures and meadows of the Cynosurion.

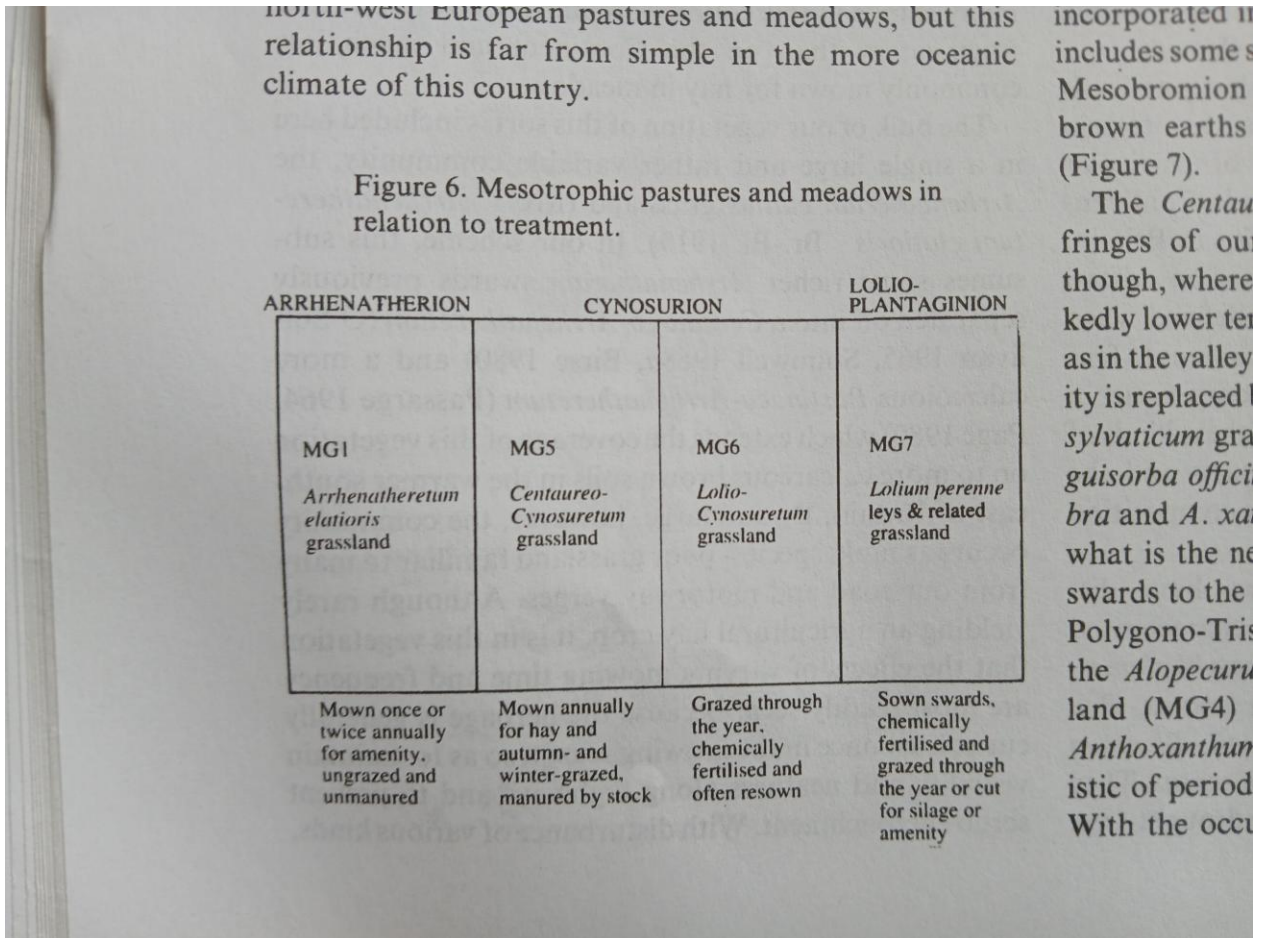
Although the great variety of agricultural treatments may blur the floristic distinctions between the community and the closely-related *Lolio-Cynosuretum*, the higher frequency (and often abundance) of the following species are especially characteristic of the *Centaureo-Cynosuretum*: *Lotus corniculatus*, *Centaurea nigra*, *Rhinanthus minor*, *Briza media*, *Carex flacca*, *Lathyrus pratensis*, *Leontodon hispidus*, *Chrysanthemum leucanthemum* and *Primula veris*. Most of these species are also characteristic of the *Anthoxanthum-Geranium* community but there the northern species *Geranium sylvaticum* and *Alchemilla glabra* effect an adequate separation and represent a transition to the alpine meadows of the Trisetion.

There is a considerable floristic overlap between the *Centaureo-Cynosuretum* and the coarse swards of the *Arrhenatherion* on the one hand and the calcicolous grasslands of the Mesobromion on the other. Distinctions in the former case are rarely difficult to make because *A. elatius* and tall herbs are usually totally excluded or held in check by grazing. There is, however, a close similarity between some stands of the *Galium* sub-community of the *Centaureo-Cynosuretum* and some Mesobromion swards such as the *Holcus-Trifolium* sub-community of the *Festuca ovina-Avenula pratensis* grassland. Similarly, it is sometimes difficult to make a distinction between the *Danthonia* sub-community and certain types of calcifugous grasslands. Problems of separation here reflect real lines of continuous floristic variation in relation to soil characteristics.

The occasional presence of species such as *Filipendula ulmaria* and *Juncus* spp. in the *Centaureo-Cynosuretum* represents floristic transitions to mires of the *Filipendulion* and *Holco-Juncion*. The lack of dominance by such species and the absence of the full range of associates usually serve to distinguish between the vegetation types involved.

The *Centaureo-Cynosuretum* was first described from

Page 22: Introduction to Mesotrophic Grasslands- Figure 6



FPCR Environment and Design Ltd

Registered Office: Lockington Hall, Lockington, Derby DE74 2RH
Company No. 07128076. [T] 01509 672772 [E] mail@fpcr.co.uk [W] www.fpcr.co.uk

This report is the property of FPCR Environment and Design Ltd and is issued on the condition it is not reproduced, retained or disclosed to any unauthorised person, either wholly or in part without the written consent of FPCR Environment and Design Ltd. Ordnance Survey material is used with permission of The Controller of HMSO, Crown copyright 100019980.