Drains west of Greenlands Pond and Greenlands Mire
Historic Environment Assessment

Project	Dorset Peatlands Project
Site NGR (centre both areas)	401386,83781
Site area (combined)	32.8 ha.
Client	The Dorset Peat Partnership
Client contact	Grace Herve, Andrew Norris
Document Author(s)	Matthew Williams MIfA
Document date	November 23

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Introduction

This report has been prepared by Matt Williams of Fearn Heritage and Archaeology. Matt is a Member of the Chartered Institute for Archaeologists (5721); a brief CV is provided in Appendix 1. The report has been produced to support a feasibility study for the restoration of selected peatland sites in Dorset. The project is part of the Nature for Climate Peatland Grant Scheme (NCPGS) which is being delivered by Natural England between 2021 and 2025.

This report focusses on two areas of peat known as 'Drains west of Greenland's pond' and 'Greenland's Mire' (hereafter the 'Drains Site' and 'Mire Site' respectively) (Figure 1). They have been identified as potentially appropriate for restoration by the Dorset Peat Partnership (DPP), a sub-group of the Dorset Catchment Partnership. DPP were awarded a Discovery Grant in December 2021 from the NCPGS towards restoration of Dorset Heaths and Mires.

Thanks to Grace Herve of the Dorset Wildlife Trust, Andrew Norris and Sarah Oakley of Forestry England and Gareth Owen of the New Forest National Park for their help and guidance with this report.

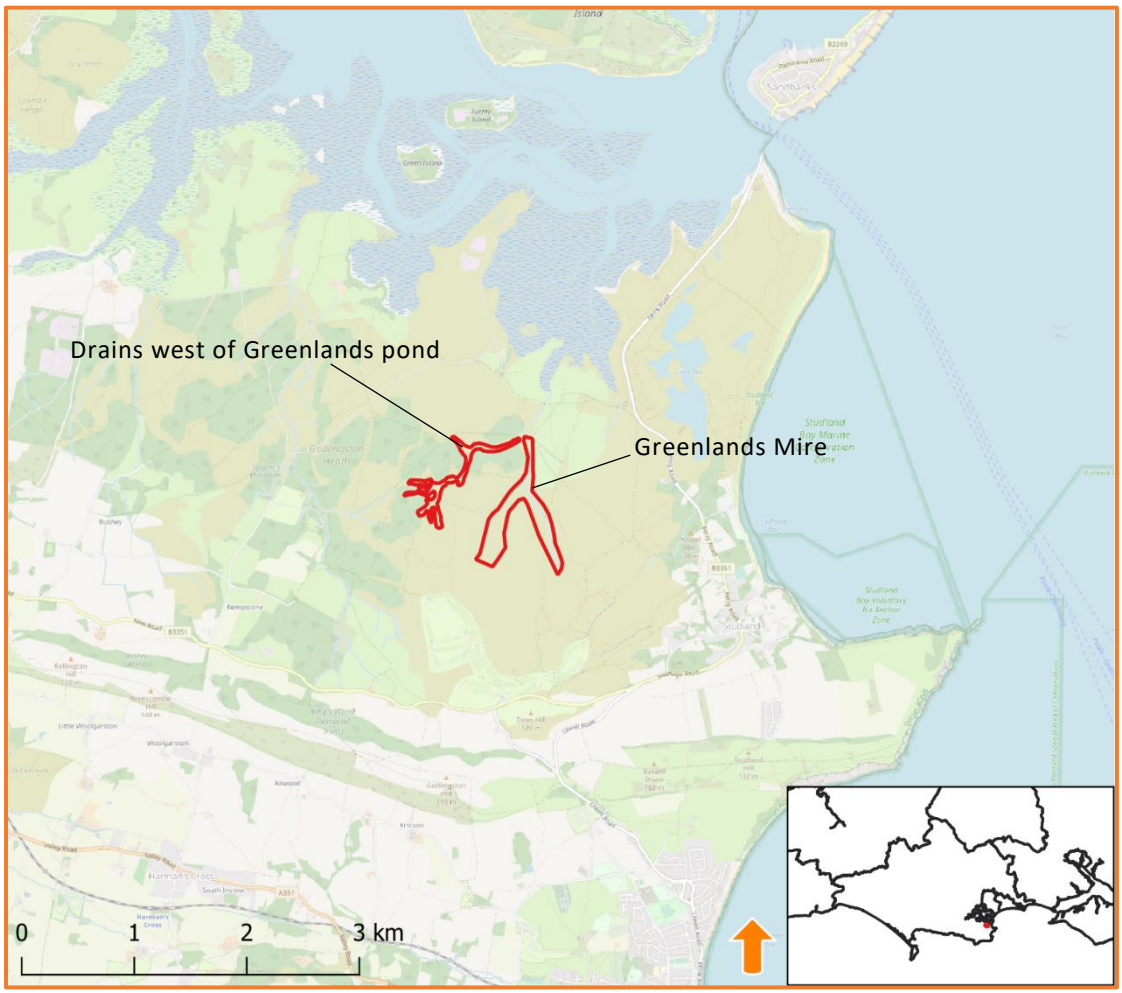

Figure 1 - Site boundary in red. Inset shows Dorset County. Base map data © OpenStreetMap contributors and available from https://www. openstreetmap.org

Aims

The aims of this report are to:

- identify known heritage assets and potentially important historic features within the Site;
- assess the impact of restoration proposals;
- provide advice to avoid or minimise negative impact on heritage features, including methods for archaeological recording where appropriate and
- identify non-carbon benefits to heritage assets

Methodology

Guidance

The format of this assessment follows Annex 5 of the NCPGS: Restoration Grant Guide for Applicants 2022 and the guidance included in the DPP Invitation to Quote.

Assessment methodology

The assessment methodology consisted of the following:

- Identify known historic features and past surveys
- Carry out additional scoping surveys where required
- Assess the importance of the assets and the impact of the proposed changes
- Produce recommendations and advice

Scales for the significance (importance) of a heritage asset, the level of impact and significance of the impact follow those defined in NCPGS Annex 5. In addition, a heritage asset value of 'very low' has been added to describe very common, Post Medieval landscape features such as drains, plantation ridge and furrow, and tracks. These are often recorded in the HER and inform on past use of the peatlands but are not considered important as they are very common feature types which usually date to the 19th or 20th centuries.

Sources consulted

Heritage data sources for known assets were:

- Historic England National Record for the Historic Environment
- DHER monuments (100m Site buffer)
- Forestry England Historic Environment Record
- National Trust HBSMR
- SHINE data

Maps and data sources used to support existing information and identify new heritage features were:

- DHER events
- Environment Agency LiDAR data (2020)
- National Library of Scotland data including 1st ed. 25" Ordnance Survey and historic aerial photographs
- High resolution aerial photographs and Google satellite imagery

Where possible, the above data was collated in GIS using QGIS 3.6.

New heritage features were identified and transcribed into a shapefile layer.

Constraints and limitations

GIS data and rectified maps may not be accurate.

Desk Assessment

Site Description

The Drains Site is managed by Forestry England and is currently under a Higher Tier Countryside Stewardship Agreement (ref 1232999). There are no SHINE features within the Site and no heritage management requirements within the Site area. The Drains Site comprises a channel approximately 1.1km long running northeast off Newton Heath towards Greenlands Farm with several tributaries and channels within an area of ridge and furrow adjoining at the southern end (Figure 1). The land around the Drains Site is open heath, some of which has been recently cleared of conifer plantation. The Site itself is a lowlying shallow valley which is very wet and tussocky. Historic maps indicate that plantation was established around 1950 and it appears to have been cleared recently.

The bedrock geology varies between sand and clay across the area; superficial deposits consist of occasional alluvial deposits of clay, silt and gravel and some glacial head deposits of clay, silt and gravel (BGS 2023). Fourteen cores were taken along the central north south section of the Drains Site. They showed the peat to be over a metre thick in the south and gradually becoming shallower to around 0.50m thick to the north. Peat in a core on the high ground to the north of the channel was only 0.10m thick. Seven cores in the east of the Site showed the peat to be up to 1.22m thick in the centre of the channel and 0.30m at the south edge.

The Mire Site is managed by the National Trust and is currently under a Higher Tier Countryside Stewardship Agreement (ref 628972). There are no SHINE features within the Site and no heritage management requirements within the Site area. The Mire Site comprises a forked channel 3.2km long which runs north from two points on Godlingston Heath and joins about 400m before the northern end of the Site (Figure 1). The channels are filled with water and relatively wide and sinuous (Figure 3). The northern part has been partially interrupted as a result of restoration work in the past. They are visible on the 1887 6" Ordnance Survey map as areas of marsh. Map evidence suggests that the Site has never been used for plantation.

As in the Drains Site, the bedrock geology of the Mire Site varies between sand and clay across the area; superficial deposits consist of occasional alluvial deposits of clay, silt and gravel and some glacial head deposits of clay, silt and gravel (BGS 2023). Nine cores were taken in the north part of the Mire Site. Peat in the northernmost core, within the trees, was 0.39m thick, whereas the peat to the south was generally more than 1m thick. The thick peat in the channels at both Sites suggests that they have remained waterlogged.

Previous Impacts

The majority of the Drains Site was plantation by the middle of the 20th century. The channels that comprise the Mires Site were not planted and appear to have been natural drainage for the surrounding land. This may have caused erosion of archaeological deposits within and below the peat.

There are no historic landfill areas within the Sites and no historic extraction pits are recorded in the DHER in either Site.

Known historic features and pasts surveys

Both Sites were within the Wild Purbeck project area. This project examined Historic England Archive and University of Cambridge aerial photographs, Environment Agency and Channel Coast Observatory LiDAR, and online imagery such as Google Earth. The data was inputted into the DHER. All the known features within the Sites were recorded during this project.

A scheduled barrow cemetery (NHLE 1013837) is located 300m to the south of the Drains Site. It comprises five bowl barrows and a bell barrow on the western part of Goldlingston Heath; it overlooks the Drains Site to the north. Another scheduled bowl barrow (NHLE 1013839) is located 300m south of the Mire Site, it also overlooks the Site from higher ground. The setting

of these barrows contributes to their importance. The barrows are recorded in the gazetteer as feature 1.

The centre of the Drains Site is within an area of Post Medieval and Early Modern trackways (MDO30853); the main group of tracks runs north south over the Site but are not recorded within the Site area (Figure 8) although they are visible in the Site area in the LiDAR (Figure 4) and multispectral imagery (Figure 7); a track on the same alignment is also marked on the historic OS maps (Figure 5). This groups of tracks extends into the south west part of the Mire Site.

There are also several scattered 'Early Modern or Second World War trackways' (MDO30857) in the east of the Mire Site and are probably the same origin as MDO30853. All these features were transcribed from 1946 aerial photographs as part of the Wild Purbeck project; they are recorded in the gazetteer as feature 2. A small tenement is marked on early maps on the north boundary of the Drains Site (NT HBSMR 112537). It appears to be on the track just outside the Site (Figure 8). The NT HBSMR also records a Post Medieval gravel pit on Studland Heath (112537). It is recorded as (5) in the gazetteer.

Additional Survey

The following sources were analysed as additional survey:

Source	Site coverage	New feature ref
High-res aerial imagery	100%	None
EA LiDAR 1m res DTM	100%	None
1947 aerial imagery	100%	None
1887 25" Ordnance Survey	100%	3
CASI multispectral imagery	100%	None

Table 1

The high-resolution aerial photography shows numerous modern tracks crossing the Drains Site. The northern part of the Drains Site appears darker green where the wet conditions encourage vegetation but this is less apparent to the south. In the Mire Site the drainage channels are visible as sinuous watercourses which run the full length of the Site. No additional features were noted in either Site.

The LiDAR shows both Sites to be relatively flat and featureless compared to the ridges, tracks and boundaries visible across the heath in general (Figure 4). This is not unexpected as the Site visit confirmed that both Sites are low lying and very wet. Historic maps suggest that they have been marshy ground prior to drainage and therefore unsuitable for activity. Within the Sites are occasional straight boundaries and tracks which are not on the 1940s aerial photography and are therefore likely to be forestry features. These clearly cut across the earlier tracks (2) recorded in the DHER. The forestry tracks and boundaries are not considered archaeologically important.

Medieval or Post Medieval enclosures or woodbanks (MDO7967) are recorded in the DHER 200m to the northwest of the Site (Figure 8). No similar features are visible in the LiDAR within the Sites (Figure 4).

Several very faint tracks are just visible on the 1947 aerial photograph (Figure 6). These were recorded in the DHER as part of the Wild Purbeck project and no new features were noted.

The early OS maps show no change to the Sites until 1961, this suggests that the plantations were established in the 1950s. The 1900 25" OS map shows open heath with some marsh in the restoration areas and a stream in the Mire Site. Several old paths cross the heath including the tracks recorded in the DHER (MDO30853) and as feature 2.

Occasional clay pits are also marked on the early OS maps. One of these is within the Drains Site and is recorded in the gazetteer as feature 3. It is one of many Post Medieval extraction pits on the heath and is considered of low importance.

CASI multispectral Imagery is available for these Sites from DEFRA data download website. The data was collected in 2022. The data was manipulated in QGIS and gave varying results - the clearest image is shown in (Figure 7) and is set to Red band: 0-2839, Green band: 0-2881, Blue band: 0-10664. This shows the dry areas as yellow and the wetter, more vegetated areas as blue. The old plantation ridge and furrow is very clear and doesn't appear to have covered the channels of either Site. In the Drains Site a branch of the Post Medieval tracks MDO30853 can be seen running southwest across the Site and modern tracks can be seen crossing the Site and forming part of an enclosure which shows as a yellow rectangle. These features are not visible on the 1947 aerial photographs and are probably post Second World War; they are recorded in the gazetteer as feature 4. On the Mire Site the water channels are very clear but no additional archaeological features can be seen.

Site visit

A Site visit to the restoration area in the north of the Drains Site was carried out on 10th February 2023. The weather was clear and bright. The reasons for the visit were to check the setting of the barrow cemetery and assess the condition of the Site.

The barrow is 1km from the north of the Site and was not visible from the restoration area. The visit confirmed that the Drains Site follows the lower ground and is very wet and tussocky; walking over the Site was extremely difficult and no archaeological features were noted. A short visit to the north of the Mire Site confirmed that the ground conditions were similar and again no additional features were noted.

Figure 2 - Looking south west along northern restoration area of the Drains Site

Consultation

Steve Wallis, Senior Archaeologist at Dorset Council, was consulted on 16th December 2022. He had no further information on the Site. Should mitigation be required, he recommended considering methods used at the Coastal Realignment Project at RSPB Arne; information and links were provided.

The National Trust Archaeologist, Martin Papworth, was consulted on 30th March regarding archaeological potential within the Sites; although there were no specific assets he did draw attention to recent waterlogged finds at Holnicote, Exmoor which demonstrate that significant remains can be preserved below the peat.

Kat Hopwood-Lewis of Natural England gave general advice on Site visits and provided updated guidance advice throughout the project.

Gazetteer

Table 2 below lists the heritage features that may be affected by the works; they are shown in Figure 8.

No.	Resource(s)	Description
1	NHLE	Barrow cemetery (NHLE 1013837) and barrow (1013839) to the south of the Sites
2	DHER	Post Medieval, modern and possibly WWII tracks (MLO30853, MLO30857)
3	OS 6" 1887	Clay pit
4	Multispectral imagery	Post Medieval, modern and possibly WWII tracks associated with feature 2
5	National Trust HBSMR	Post Medieval gravel pit (112566)

Table 2

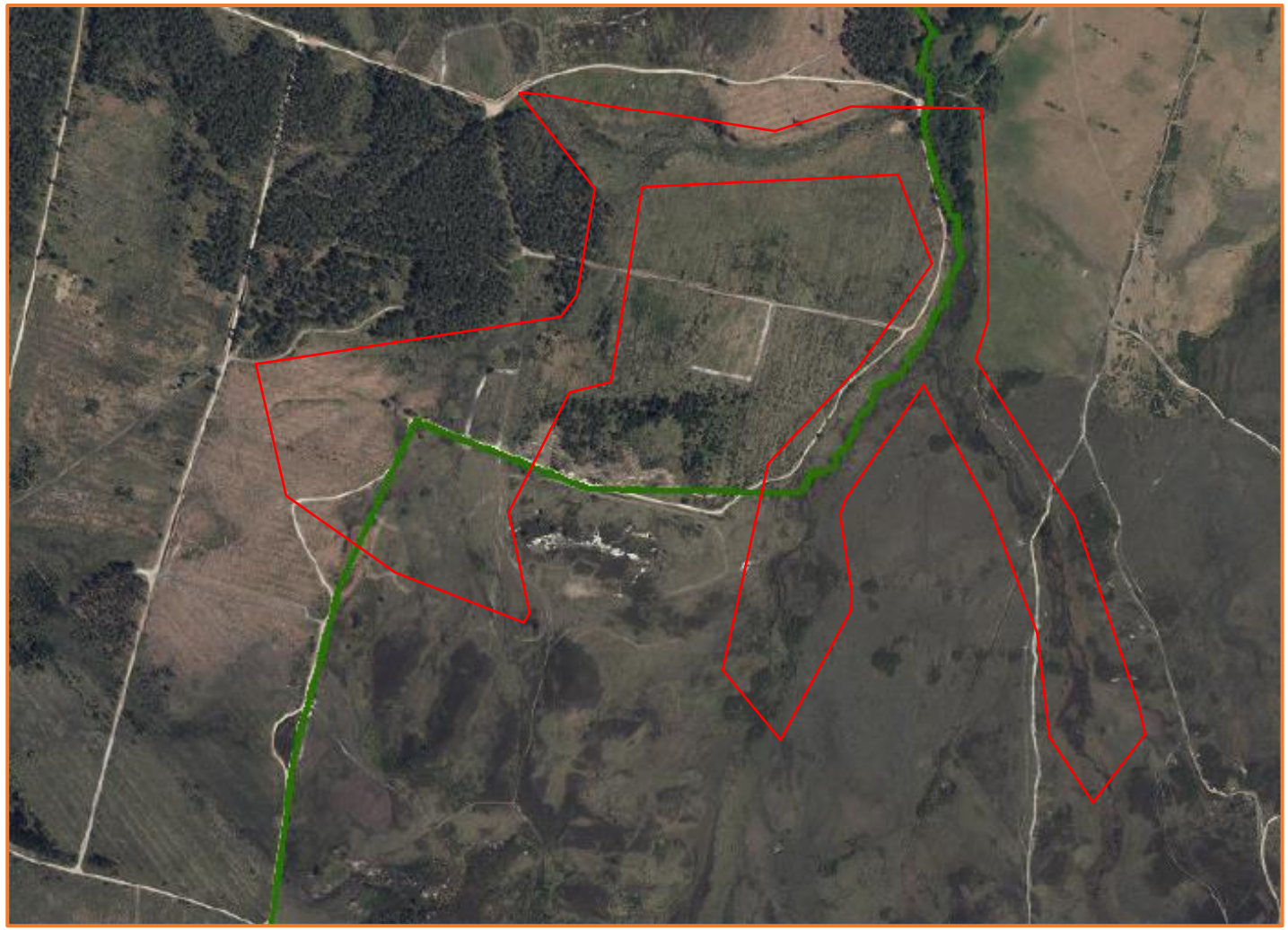

Figure 3 - High resolution AP of the general area of the Site in red. Image produced by the Dorset Wildlife Trust ©Getmapping and Bluesky International Ltd 2022

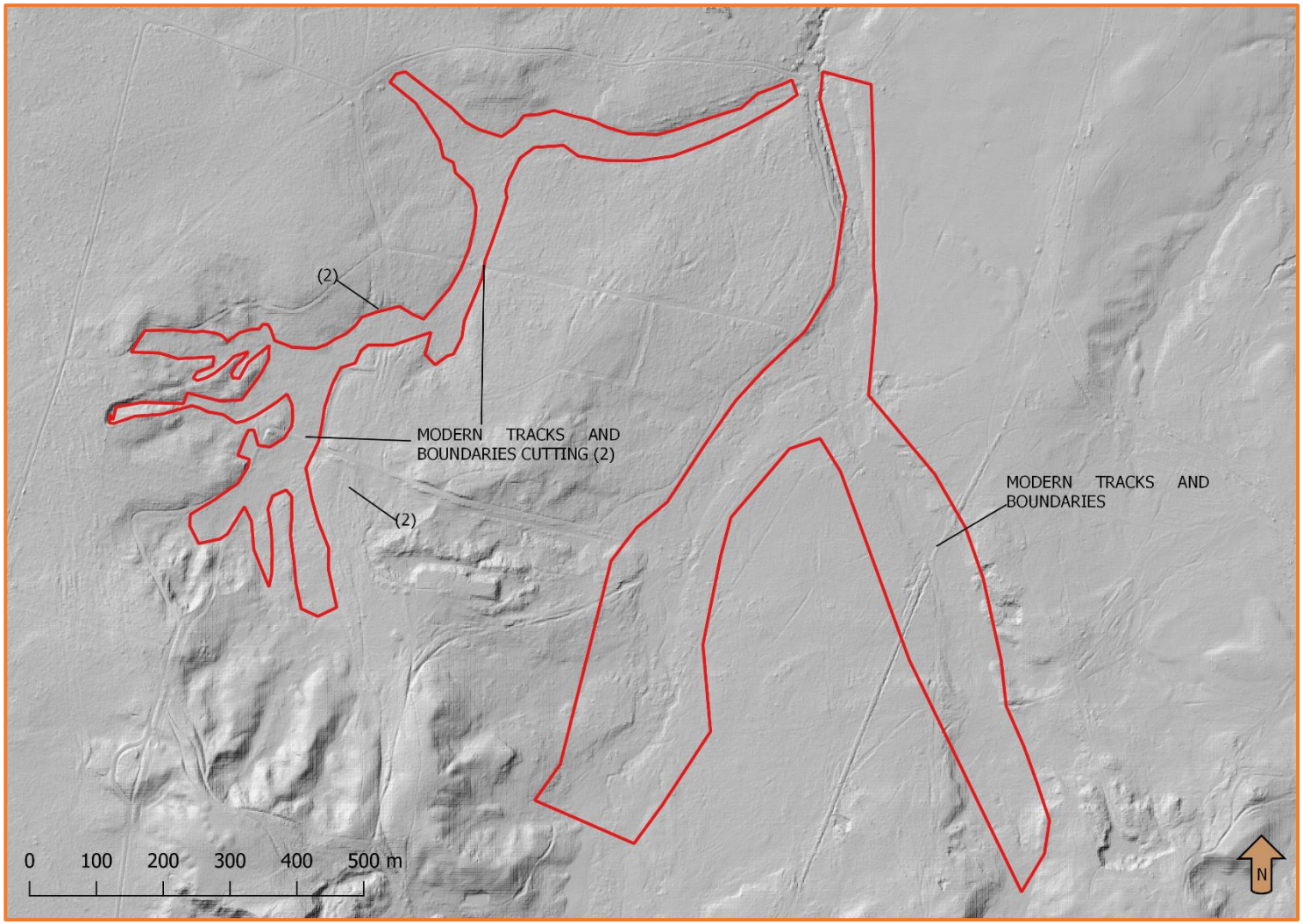

Figure 4 - EA 1m resolution LiDAR. Image from DEFRA used under Open Government License

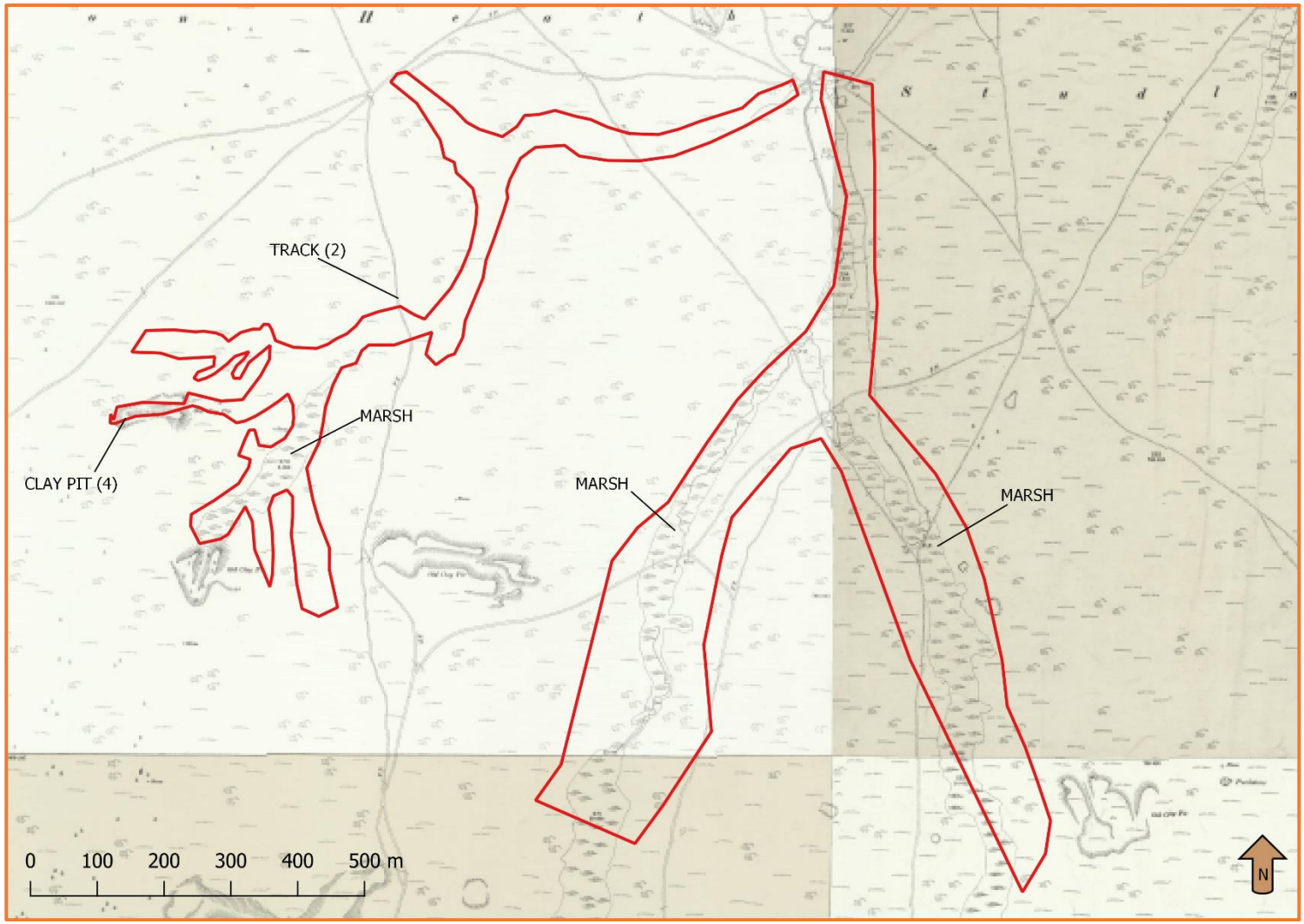

Figure 5 - 1887 1st ed OS 25". Reproduced with the permission of the National Library of Scotland

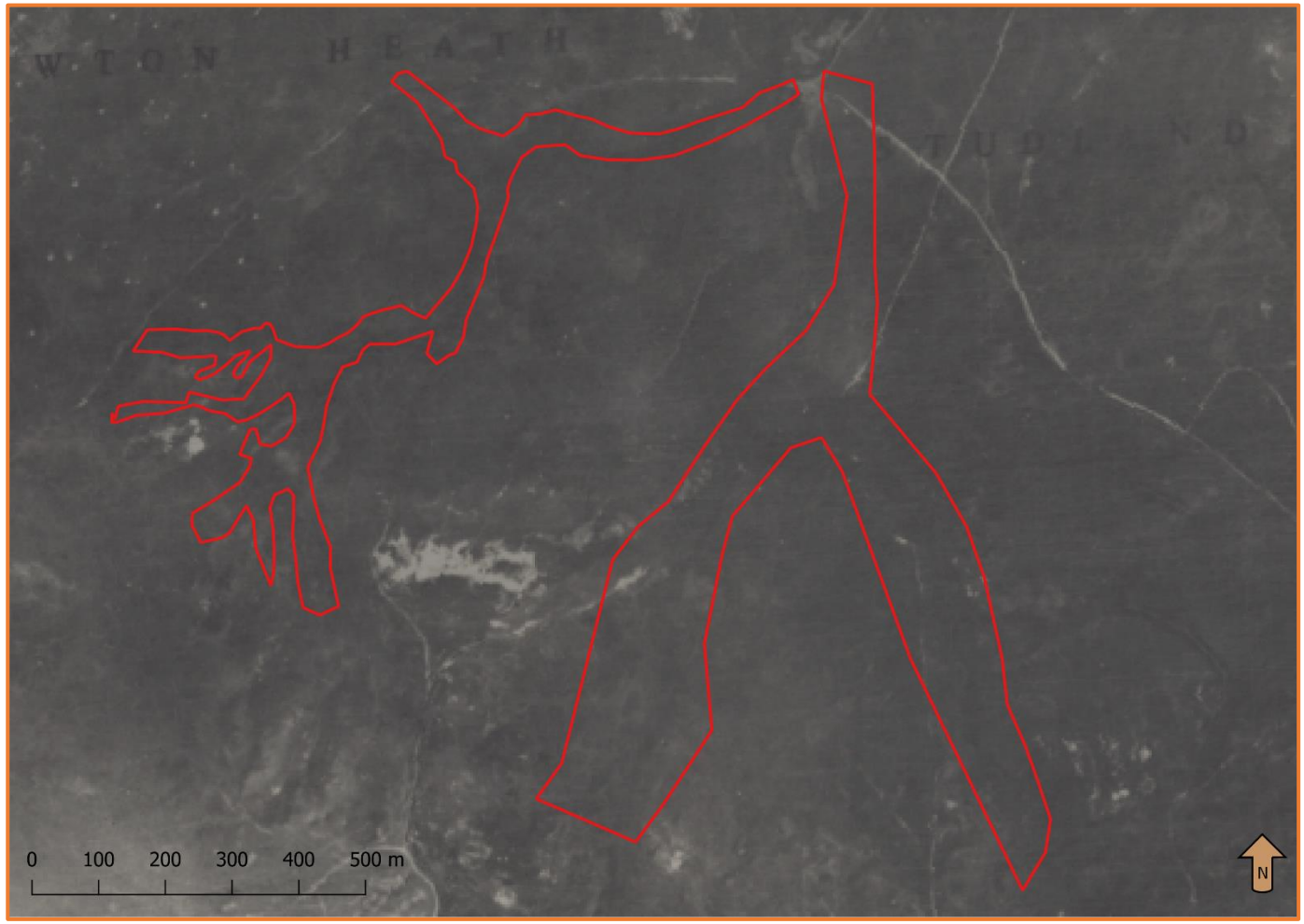

Figure 6 – 1947 aerial image. Reproduced with the permission of the National Library of Scotland

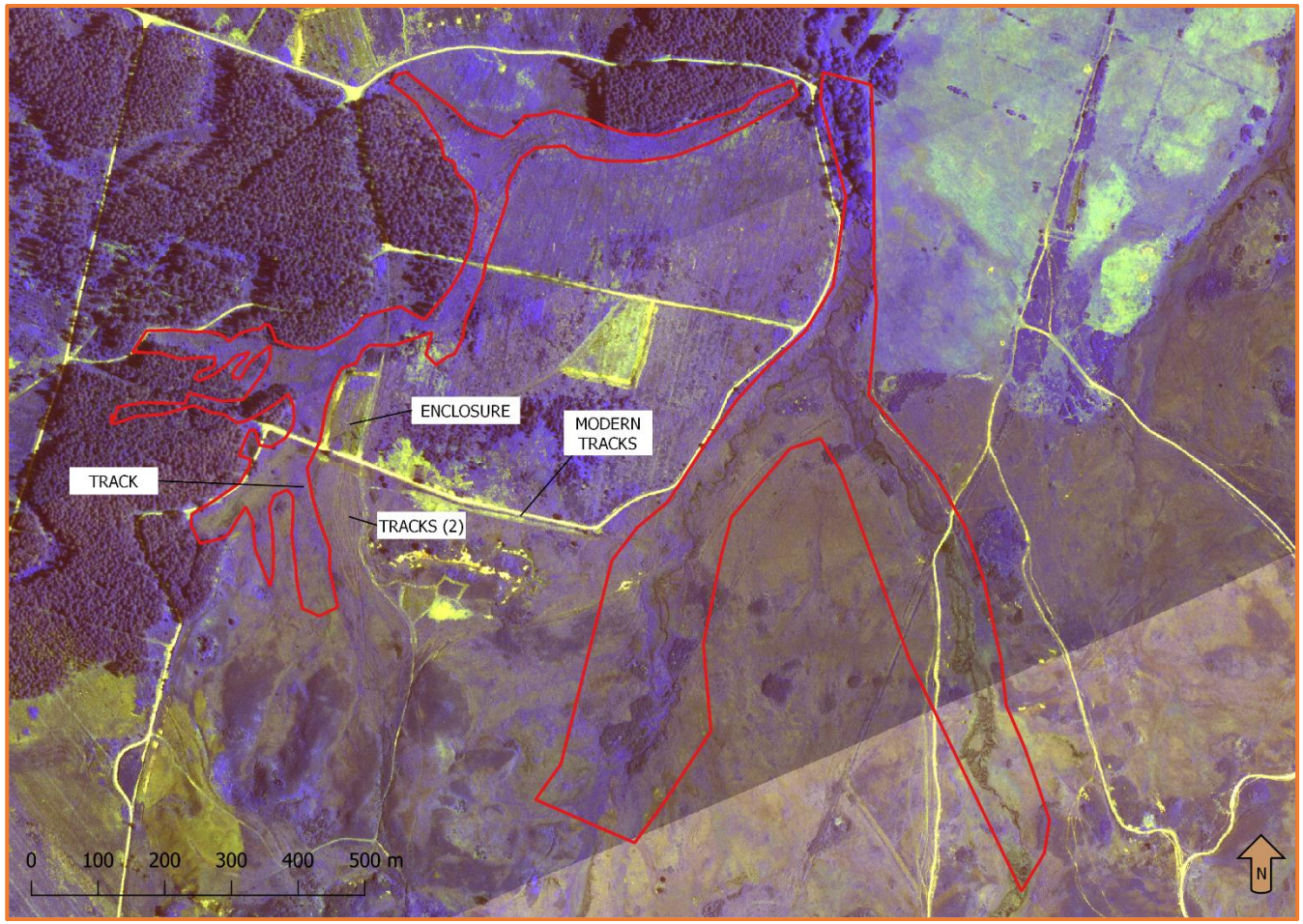

Figure 7 - CASI multispectral image of the Sites. Data from DEFRA used under Open Government License

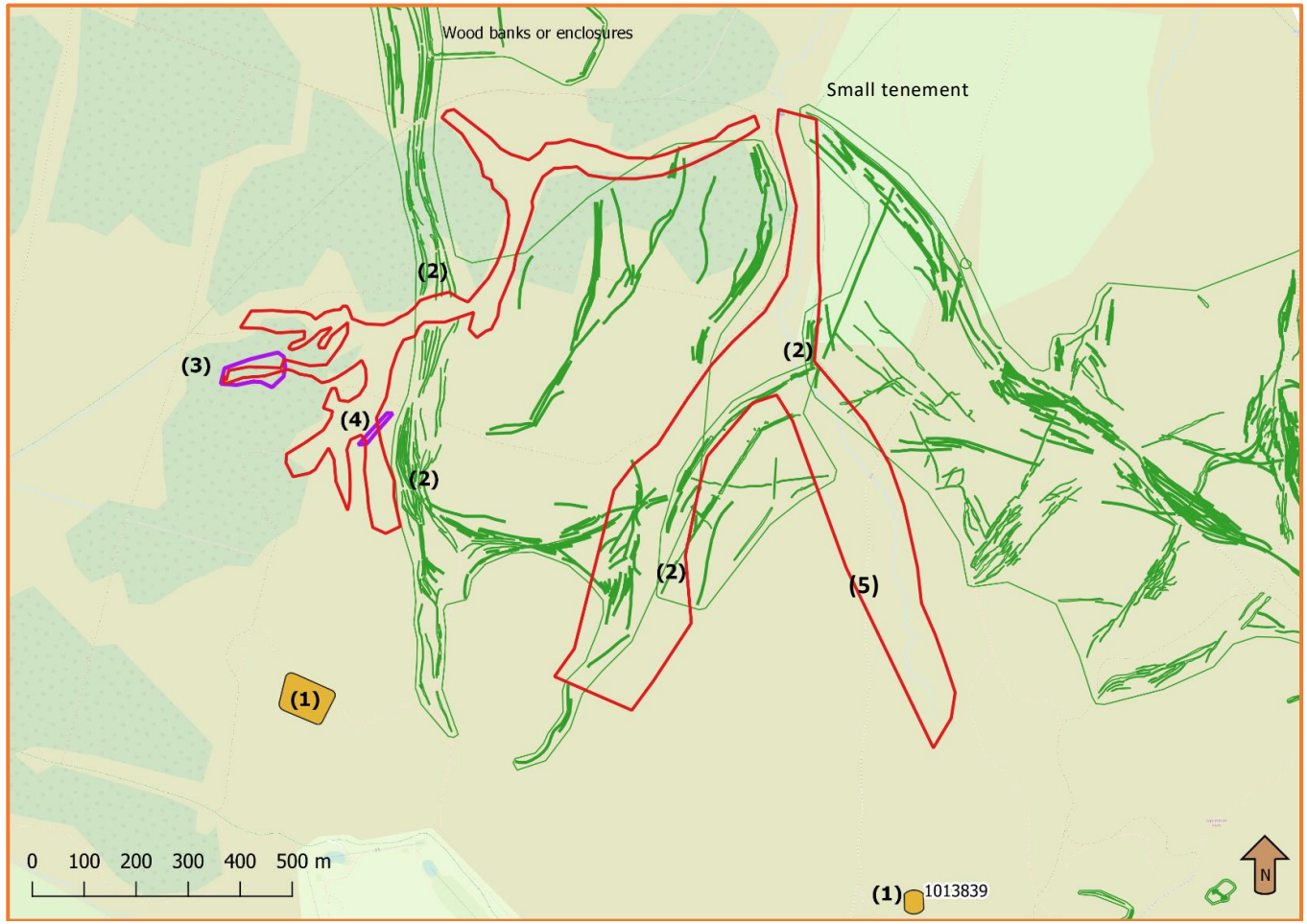

Figure 8 - All heritage features. Base map data © Openstreetmap contributors and available from https://www. openstreetmap.org

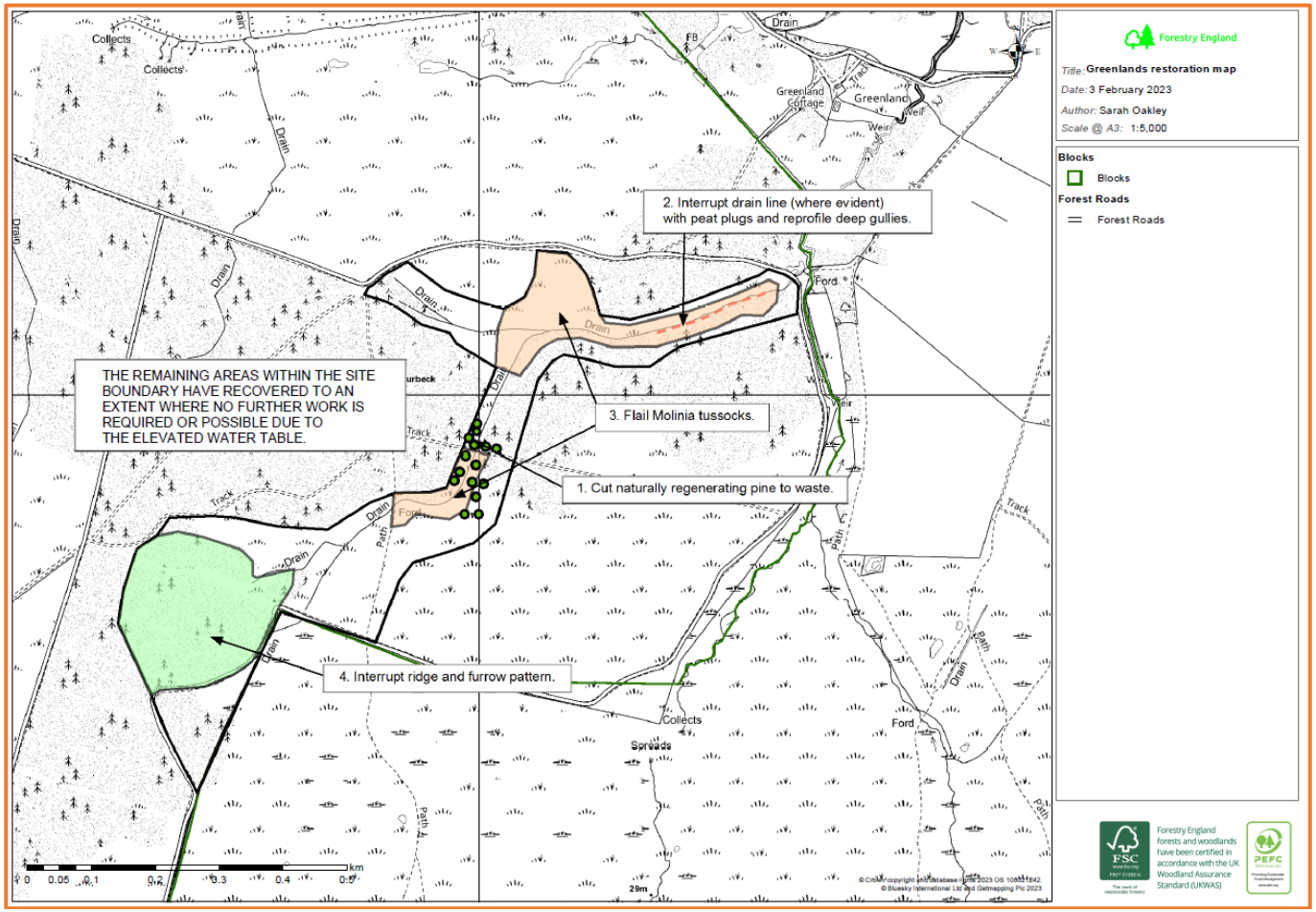

Figure 9 - Restoration proposals Drains Site showing new boiundary.

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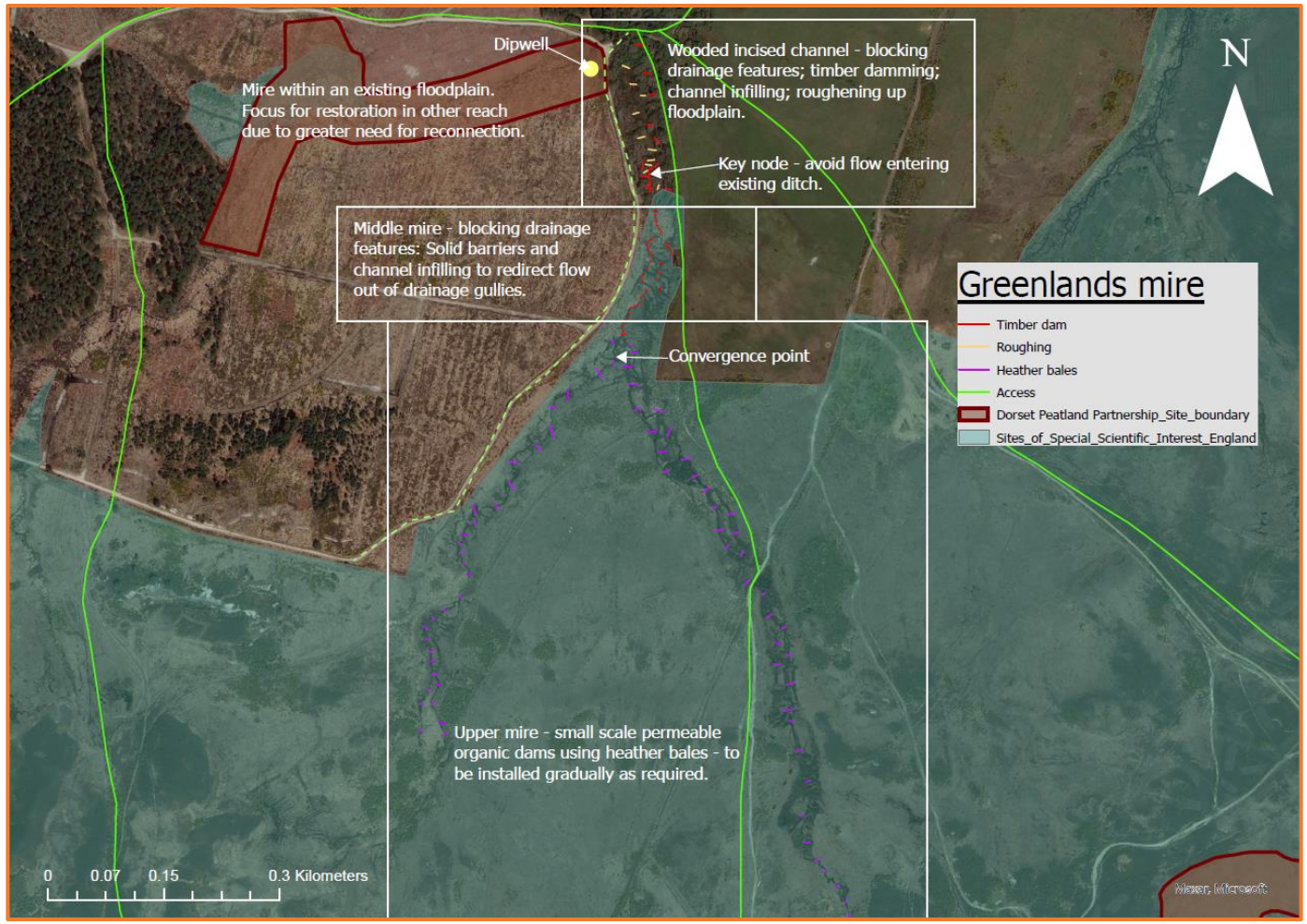

Figure 10 - Restoration proposals Mire Site (showing previous Drains Site boundary)

Impact Assessment

Assessment for unknown archaeological deposits for both Sites

The archaeology of the area comprises Bronze Age barrows and numerous widespread features associated with the Post Medieval use of the Heath for mineral extraction, occasional military training and plantation. Evidence for prehistoric activity other than barrows is very rare, although a findspot of flint flakes is recorded near the Agglestone, 1km to the east. There is very little evidence for activity on the Heath between the Bronze Age and Post Medieval periods other than the maintenance of the Heath itself.

The barrows on the surrounding heaths are located on high ground, often at the edge of a ridge, and therefore the potential for the discovery of an unknown barrow within the low-lying Sites is negligible. The location of prehistoric settlement or activity sites is less certain and, as with all heathland sites, there is potential for unknown archaeological deposits below the peat. During the Iron Age to Medieval periods the heath would have been grazed and it is possible that some of the myriad tracks and old field boundaries originate during these periods, but the potential for unknown features of this date within the Site is very low.

Overall, the potential for unknown features or finds within the Site is low and, given the low impact of the works, no trial trenching or on watching brief is recommended. However, some measures can be taken during the works to avoid damage to potential buried archaeological deposits. Machines should only use the agreed access routes; material for blocks and bunds should be taken from existing banks, if this is not possible the contractor should ensure that borrow pits do not go through the peat. This will avoid damage to mineral layers sealed below the peat layers. Site staff should contact the relevant archaeologist if archaeological remains are discovered.

Drains Site restoration proposals

The restoration area of the Drains Site was altered slightly during the production of this report to include the area of ridge and furrow and exclude several channels. Figure 9 shows the new boundary; this does not affect the assessment.

The aims and objectives of the restoration would be to:

- Fell trees (natural regeneration) that are impinging on the mire extent and drying it out.
- Create a series of peat plugs as well as reducing the size of the gullies along the remaining drain line to raise the water table within the mire.
- Cut the dense perched Molinia tussocks by flail to encourage Sphagnum colonisation.
- Interrupt the ridge and furrow topography to restore a more raised water table and reduce runoff.

The objective is to restore a raised water table in the mire to encourage Sphagnum expansion and ultimately peat formation. Flailing the Molinia tussocks would also facilitate and encourage Sphagnum colonisation. Removal of the regen would also reduce drying out of the mire and further natural regen would be suppressed by the raised water table.

Drains Site potential impacts

The following will physically impact archaeological features:

- Tracking, turning or driving (especially in wet conditions)
- Excavating for plug material
- Breaking up ridge and furrow

The works will cause temporary noise and visual impact during the operation phase. The restoration will result in very minor changes to the appearance of the landscape, consisting of

fewer trees and tussocks, and the creation of standing waters. No permanent visual impact is anticipated.

Drains Site potential benefits

Raising the water level may help to preserve unknown waterlogged archaeological deposits within the Heath.

Drains Site assessment

The Drains Site restoration proposals are focussed in the north of the Site. There is very limited intervisibility between this area and the scheduled barrow cemetery (1) and the works would have a very low impact on the landscape; overall the impact on the setting of the cemetery is considered negligible.

Features (2) and (4) are Post Medieval, modern or WWII tracks. The features follow an old path marked on early OS maps which is still an extant track across the heath. Numerous similar routes cross the heath and they are considered of very low importance. The restoration work will be carried out north of (2) but there may be some minor impact from machines tracking in the area but overall there will be a negligible impact on (2) and (4). No mitigation is recommended.

The clay pit (3) is a Post Medieval feature relating to the recent use of the heath prior to plantation; there are numerous similar extraction pits on the heath, many of which are recorded on early OS maps. It is still visible as a slight earthwork and now forms a part of the water drainage system in the west of the Site. It is considered of low importance. The restoration work in this area involves breaking up the plantation ridge and furrow. The creation of the ridge and furrow and the plantation trees will have already impacted the top of the clay pit, and the work is considered to have a negligible impact. Overall the impact on the clay pit will be negligible. The evidence in the DHER and other sources is considered a sufficient record and no additional site investigation or recording is recommended.

Mire Site restoration proposals

A plan of the proposals is shown in Figure 10. The proposals comprise:

- Timber dams
- Heather bale dams
- Infilling channels
- Surface roughening

Mire Site potential benefits

Raising the water level may help to preserve unknown waterlogged archaeological deposits within the Heath.

Mire Site assessment

The Mire Site restoration proposals follow the water courses. There is moderate intervisibility between the restoration areas and the scheduled barrow (1) but the works would have a very low visual impact on the landscape and overall the impact on the setting of the barrow is considered negligible.

Within Site 2 the historic tracks (2) are considered of very low importance. Inserting heather bales, timber dams and blocks in the channels would have a no impact on these features. The Post Medieval gravel pit (5) is also considered of very low importance. The heather bales may increase the water levels in the pit but the feature would still be visible, and as such the impact is considered low.

The work will require significant machine tracking in the area and there is likely to be a low impact on the tracks (2) from machine movements. The evidence in the DHER and other sources is considered a sufficient record prior to any impact and no additional site investigation or recording is recommended.

Drain and Mire Sites Summary

In summary the heritage impact will be on Post Medieval features related to occasional gravel extraction and the later drainage of the heath. Many of these features still drain the heath and will be blocked as part of the proposals, and therefore changing them is an essential part of the project. The blocks will flood the features and they will slowly fill with material which will make them less obvious in the landscape; however, the shape of the cut will remain within the ground and the overall line will be visible as a chain of water features. In this respect the impact on them is very low as they are, in some way, preserved below ground and in the landscape. In addition, all the features are already recorded in some way, either as existing heritage features within the DHER or in surveys such as historic maps, aerial images and LiDAR. These records provide a detailed record of the features prior to the works and would be sufficient for any future research on the drainage of the heath.

Site work plan

1. Before and after pictures should be taken by the contractors and sent to DPP.

Contingencies

Should unexpected archaeological remains be encountered during the works, work in the affected area should stop and the relevant person should be contacted immediately so that mitigation plans can be agreed. Contact details are:

Drains Site Archaeologist:

Gareth Owen

Direct Line: 01590 646652

Mobile: 07880 383988

Email: Gareth.Owen@newforestnpa.gov.uk

Mire Site:

Dr Martin Papworth

National Trust Archaeologist

Direct Line: 01747 873277

Mobile: 07771 974394

Email: martin.papworth@nationaltrust.org.uk

Archiving and data dissemination

New archaeological asset shapefiles will be sent to DHER including a possible barrow noted from the CASI imagery which is outside the Site area.

References

British Geological Survey (BGS) https://mapapps2.bgs.ac.uk/geoindex accessed 01/03/2023

DEFRA Historic landfill sites https://www.data.gov.uk/dataset/17edf94f-6de3-4034-b66b-004ebd0dd010/historic-landfill-sites accessed 6/11/22

DEFRA SHINE data https://www.myshinedata.org.uk/look-up-a-record accessed 9/12/22

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Google Satellite *http://www.google.cn/maps/vt?lyrs=s@189&gl=cn&x={x}&y={y}&z={z}* accessed 14/11/22

Historic England (2021) *Peatland Restoration and the Historic Environment: An Introduction to the Cultural Heritage of Peatlands Historic England* https://historicengland.org.uk/images-books/publications/peatland-restoration-historic-environment/standards-environmentally-sustainable-peatland-restoration-projects/

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Historic England (2022) National Record for the Historic Environment data *https://historicengland.org.uk/listing /the-list/open-data-hub/* accessed 18/11/22

National Library of Scotland historic mapping *https://geo.nls.uk/maps/* 14/11/22

Natural England data Countryside Stewardship data https://magic.defra.gov.uk/*MagicMap.aspx* accessed 21/11/22

Open StreetMap *https://tile.openstreetmap.org/{z}/{x}/{y}.png* accessed 14/11/22

Appendix 1

MATT WILLIAMS MCIFA

Matt will be the project lead. He has worked in professional archaeology and heritage management for over 20 years, starting as an excavator and moving on to heritage planning consultancy, project management and heritage resource management. His CV is attached.

Matt currently works part time for the RSPB as the Reserves Archaeologist for England and Wales. One of his key roles is providing heritage management advice to RSPB Managers and Wardens. This includes advice on:

- peatland and heathland restoration;
- heritage risk of potential land acquisitions;
- potential physical impact of removing plantation, tree planting and excavating lagoons;
- impact of changing water levels when re-creating coastal wetlands;
- vegetation control on earthworks and historic buildings and
- planning advice

Matt is used to making swift assessments of the significance of heritage features and identifying the attributes that make them important. This is often done without a site visit, using HER data and images such as RSPB aerial photographs and online data (e.g. NLS online historic mapping).

Over the last two years Matt has been involved in RSPB projects to restore peatland and heathland. He has visited the peat restoration areas at Lake Vrynwy, where he gave an on-site presentation to RSPB ecologists and reserve staff on peat restoration techniques and the heritage resource. This covered how the heritage resource should be assessed and how to mitigate the potential impact of restoration techniques including blocking grips and re-profiling. The presentation used several on site examples. The resources for the presentation were:

- IUCN Peatland Restoration Techniques. An Introduction (2015)
- NCPGS Guide for Applicants (Feb 2023 draft)
- Peatlands and the Historic Environment (Historic England 2021)
- Cadw Peatland Restoration and the Historic Environment – Guidance Note (2021 draft provided by Cadw)
- The Past and the Peat. Archaeology and peatland restoration on Exmoor (Bray 2015)

Matt is competent in GIS applications including ArcPro and QGIS, and is used to producing concise and focussed reports to strict deadlines.