



Browndown Ranges (north), Gosport, Hampshire

Analytical Earthwork Survey and Aerial Investigation
and Mapping

Olaf Bayer, Fiona Small and Mark Bowden



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Cover image: Northern frontlines, earthwork survey area 1, east of the track, looking west. Scale 1m. 06/05/2021 [Olaf Bayer. © Historic England Archive. AF00452/P001]

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Summary

As part of the Gosport Heritage Action Zone Historic England's Archaeological Investigation Team undertook a detailed study of Browndown Ranges (north). The project's principal aim was to better understand the extent and layout of a series of recently discovered First World War practice trenches.

Analytical earthwork survey and aerial investigation and mapping took place between 2019 and 2022. Features recorded include a probable round barrow of presumed early Bronze Age date, an extensive area of First World War practice trenches, a Second World War Heavy Anti-Aircraft Battery, and a series of Second World War and later grenade ranges.

The First World War trenches at Browndown Ranges (north) stand out as one of the best preserved and most complex examples in England. They represent at least two phases of trench digging and reflect two distinct activities: the practice excavation of trenches for troops to learn trench construction techniques, as well as to build individual fitness and group cohesion; and the provision of 'text book' training environments, mimicking sections of the Western Front, where troops learned to live and fight in trenches.

Contributors

Analytical earthwork survey was undertaken by Magnus Alexander, Olaf Bayer, Mark Bowden, Jonathan Last and Fiona Small, with help from Jim Rylatt and Nick Molteno. Luke Griffin and the Historic England Archive team managed and delivered the aerial photography loan. Aerial Investigation and Mapping was undertaken by Fiona Small. Unmanned Aerial System (UAS) mapping and photography was undertaken by Steven Baker, Olaf Bayer and Dave Went. Aerial photography was undertaken by Damian Grady. Terrestrial photography was undertaken by Olaf Bayer and James O. Davies. The report was authored by Olaf Bayer, Fiona Small and Mark Bowden. Roger JC Thomas provided invaluable discussion of twentieth-century military features. Illustrations were prepared by Olaf Bayer and Fiona Small. Wayne Cocroft, Sarah Newsome and Matthew Oakey commented on the final text. The project was managed by Wayne Cocroft.

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Martin Brown of Tetra Tech provided useful discussion of the Browndown trenches

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UAS survey was conducted in December 2019, with additional flights in May 2021 and April 2022. The majority of the analytical earthwork survey was conducted in January and February 2020. Further site visits to check survey data or in response to new earthwork exposure caused by gorse fires took place in April 2021, May 2021, April 2022, December 2022 and July 2023. Aerial Investigation and Mapping was conducted between November 2018 and January 2019. This report was written in April-July 2020 and July-September 2023.

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Contents

Introduction	2
Location	2
Historic Context	4
Methodology	12
UAS survey	12
Analytical Earthwork Survey	12
Aerial Investigation and Mapping	12
Results	13
Prehistoric features	13
Round Barrow	13
First World War features	14
Practice trenches	14
Later twentieth-century activity	46
Heavy Anti-Aircraft Battery	46
Grenade ranges	46
Trackways	52
Other Activity	53
Discussion	54
Prehistoric and possible medieval activity	54
First World War practice trenches	55
Context	55
When and by who were the Browdown trenches created?	56
Summary	58
Conclusions	59
References	60

Appendix 1: Methodologies.....	65
UAS Survey	65
Drone-captured photogrammetry	65
Analytical Earthwork Survey	67
Aerial Investigation and Mapping.....	68
Other Sources	68
Assessment and mapping.....	68
Appendix 2: Scaled Survey Drawings	71

Illustrations¹

Figure 1: Browndown location. [© Historic England. Topography derived from 2m elevation data ©Airbus Defence and Space Ltd; Bluesky International Ltd; Getmapping PLC. All other mapping derived from OS open data © Crown copyright and database right 2023]..... 1

Figure 2: Browndown topography. [© Historic England. Topography derived from 1m lidar data © Environment Agency copyright and/or database right (2023). All rights reserved. Base mapping © Crown Copyright and database right 2023. All rights reserved. Ordnance Survey Licence number 100024900.] 3

Figure 3: Browndown aerial view 2022. [© Historic England. Photography ©Airbus Defence and Space Ltd; Bluesky International Ltd; Getmapping PLC] 3

Figure 4: Plan of the Encampments in the Neighbourhood of Portsmouth under the command of the Rt Hon. Lieu. Gen. Lord George Henry Lennox, plan 1st July to 13th November 1782 [Reproduced with permission of Royal Collection Trust / © Her Majesty Queen Elizabeth II 2020 <https://www.rct.uk/collection/734032.ba>] 6

Figure 5: 1810 OS first edition 1 inch mapping. [© Historic England. Mapping © and database right Crown Copyright and Landmark Information Group Ltd (All rights reserved 2023). Licence numbers 000394 and TP0024]..... 6

Figure 6: 1839 Rowner parish tithe map. [© Historic England, base mapping © The National Archives 31-215] 7

Figure 7: OS 6 inch mapping published 1869. [© Historic England. Mapping © and database right Crown Copyright and Landmark Information Group Ltd (All rights reserved 2023). Licence numbers 000394 and TP0024]..... 7

Figure 8: OS 6 inch mapping published 1892. [© Historic England. Mapping © and database right Crown Copyright and Landmark Information Group Ltd (All rights reserved 2023). Licence numbers 000394 and TP0024]..... 8

Figure 9: OS 6 inch mapping published 1909. [© Historic England. Mapping © and database right Crown Copyright and Landmark Information Group Ltd (All rights reserved 2023). Licence numbers 000394 and TP0024]..... 8

1 Where available hyperlinks are included to high resolution scans of images on the [Historic England Aerial Photo Explorer](#)

Figure 10: OS 6 inch mapping published 1932. [© Historic England. Mapping © and database right Crown Copyright and Landmark Information Group Ltd (All rights reserved 2023). Licence numbers 000394 and TP0024]..... 9

Figure 11: OS 1:2500 mapping published 1965. [© Historic England. Mapping © and database right Crown Copyright and Landmark Information Group Ltd (All rights reserved 2023). Licence numbers 000394 and TP0024]..... 9

Figure 12: OS 1:2500 mapping published 1976. [© Historic England. Mapping © and database right Crown Copyright and Landmark Information Group Ltd (All rights reserved 2023). Licence numbers 000394 and TP0024]..... 10

Figure 13: Location of survey areas. [© Historic England. Base mapping © Crown Copyright and database right 2023. All rights reserved. Ordnance Survey Licence number 100024900]..... 10

Figure 14: Round barrow extracted from OS 1976 1:2500 mapping. [© Historic England. Mapping © and database right Crown Copyright and Landmark Information Group Ltd (All rights reserved 2023). Licence numbers 000394 and TP0024]..... 11

Figure 15: National Mapping Programme mapping for Browdown. After Hamel and Lambert (2011). [© Historic England. Base mapping derived from OS open data © Crown copyright and database right 2023]..... 11

Figure 16: Aerial Investigation and Mapping results [© Historic England. Base mapping © Crown Copyright and database right 2023. All rights reserved. Ordnance Survey Licence number 100024900]..... 16

Figure 17: Looking west along Privett Road in June 1923. Evidence of disturbed ground and slight earthworks of the south-western part of Browdown trenches can be seen in the top-right-hand corner (bisected by the wing-strut of the plane). The road from Gomer Fort to the ranges can be seen coming in from the bottom-right-hand corner, meeting Privett Road at Browdown Camp. [CCC8602/665 27-JUN-1923 – © Historic England, Crawford Collection]..... 17

Figure 18: A photo-mosaic of the rectified 1923 military oblique and 1946 RAF vertical showing the earthwork traces of the training trenches on Browdown Common. [CCC8602/665 27-JUN-1923 – © Historic England. Crawford Collection, and extract of RAF/3GTUD/IK/163 PTIII 5110 2-APR-1946 Historic England Archive, RAF Photography] 18

Figure 19: Looking north-west from Fort Gomer in 1923. A possible trench can be seen in the top left-hand corner of the photograph, the south-eastern edge of Browdown. A number of trenches can also be seen on the south-western (left) side of the Fort Gomer. [Extract of SZ5899/2 27-JUN-1923. Historic England Archive, RAF Photography] 19

Figure 20: A view of the remains of the trench systems on Browdown Common in March 1942. Part of the Browdown ranges can be seen at the bottom edge of the photograph and Browdown Camp (bottom right). The grassy strip between the heath and ranges is the old campground [Extract of RAF/HLA/426/6 041 24-MAR-1942. Historic England Archive, RAF Photography]..... 20

Figure 21: Browdown (north) in June 1942 [Historic England Archive, RAF Photography. Extract of [RAF/HLA/623/6 113 21-JUN-1942](#)] 21

Figure 22: Browdown trenches in April 1946 [Historic England Archive, RAF Photography. Extract of [RAF/3GTUD/IK/163 PTIII 5110 2-APR-1946](#)]..... 22

Figure 23: Browdown trenches in October 1950 [Historic England Archive, RAF Photography. Extract of [RAF/541/TRG/51 4047 12-OCT-1950](#)] 23

Figure 24: Browdown trenches in April 1951 [Historic England Archive, RAF Photography. Extract of [RAF 540/453 4214 05-APR-1951](#)]..... 24

Figure 25: Browdown trenches in April 1953 [Historic England Archive, RAF Photography. Extract of [RAF/L82/F766/0349 21-APR-1953](#)] 25

Figure 26: Browdown trenches in March 1959 [Historic England Archive, RAF Photography. Extract of [58/RAF/2722 0010 02-MAR-1959](#)] 26

Figure 27: Browdown trenches in December 1961 [Historic England Archive, RAF Photography. Extract of [RAF 58/4844 025 18-DEC-1961](#)] 27

Figure 28: Browdown trenches in December 1966 [Historic England Archive, RAF. Photography Extract of [RAF/7234 0002 V 23-FEB-1966](#)] 28

Figure 29: View of the trenches in the centre of Browdown Ranges (north) looking south-west. [Damian Grady © Historic England Archive [HEA 26943_032 19-APR-2011](#)] 29

Figure 30: View of the trenches in the centre of Browdown Browdown Ranges (north) looking south-east. [Damian Grady © Historic England Archive [HEA 26943_036 19-APR-2011](#)] 29

Figure 31: Digital Elevation Model of Browdown trenches derived from 03/12/2019 Historic England UAS photography and visualised as a 16 direction hillshade [© Historic England]..... 30

Figure 32: Environment Agency lidar DSM data 16 direction hillshade visualisation [© Historic England, derived from 1m lidar data © Environment Agency copyright and/or database right (2023)]..... 30

Figure 33: Earthwork survey area 1. [© Historic England. Base mapping © Crown Copyright and database right 2023. All rights reserved. Ordnance Survey Licence number 100024900]..... 32

Figure 34: Diagram of First World War fire trench section from ‘Notes on Trench Warfare for Infantry Officers’ (Anon 1916b, fig 7)..... 33

Figure 35: First World War trench layout from ‘Notes on Trench Warfare for Infantry Officers’ (Anon 1916b, fig 2)..... 33

Figure 36: Northern frontlines, earthwork survey area 1, scale 1:500. [© Historic England. Base mapping © Crown Copyright and database right 2023. All rights reserved. Ordnance Survey Licence number 100024900]. Profile X-Y across frontline ‘fire’ trench A..... 34

Figure 37: Northern frontlines, earthwork survey area 1, looking north-west, 06/05/2021 [Steven Baker. © Historic England Archive. DP326063]..... 35

Figure 38: Northern frontlines, earthwork survey area 1, looking west, 22/04/2021 [James O. Davies. © Historic England Archive. DP276025]..... 36

Figure 39: Northern frontlines, earthwork survey area 1, east of the track, looking north-west, 22/06/2023. [Olaf Bayer. © Historic England Archive. AF00452/P002] 36

Figure 40: Southern frontlines, earthwork survey area 3, looking west, scale 1m, 06/05/2021 [Olaf Bayer. © Historic England Archive. AF00452/P003]..... 37

Figure 41: Southern frontlines, earthwork survey area 3, looking east, scale 1m, 06/05/2021 [Olaf Bayer. © Historic England Archive. AF00452/P004]..... 37

Figure 42: Irregular trench complex, earthwork survey area 1, scale 1:500 (page 40). [© Historic England. Base mapping © Crown Copyright and database right 2023. All rights reserved. Ordnance Survey Licence number 100024900] 39

Figure 43: Irregular trench complex, earthwork survey area 1, looking south-west, 06/05/2021 [Steven Baker. © Historic England Archive. DP326065]..... 41

Figure 44: Irregular trench complex, earthwork survey area 1, looking south-west, 23/04/2021 [Olaf Bayer. © Historic England Archive. AF00452/P005]..... 41

Figure 45: Infilled trench exposed in section by unauthorised digging in earthwork survey area 1, looking south, 01/04/2021 [Olaf Bayer. © Historic England Archive. AF00452/P006]..... 42

Figure 46: Infilled trench exposed in section by unauthorised digging and damage caused by BMX bikes in earthwork survey area 1, looking south, 06/05/2021 [Steven Baker. © Historic England Archive. DP326064]..... 42

Figure 47: Earthwork survey area 2, location. [© Historic England. Base mapping © Crown Copyright and database right 2023. All rights reserved. Ordnance Survey Licence number 100024900]..... 43

Figure 48: Earthwork survey area 2, detail, scale 1:500 (page 44). [© Historic England. Base mapping © Crown Copyright and database right 2023. All rights reserved. Ordnance Survey Licence number 100024900] 43

Figure 49: Trench with elongated crenelations, earthwork survey area 2, looking north-east, 23/01/2021 [Olaf Bayer. © Historic England Archive. AF00452/P007] 45

Figure 50: Crescent-shaped platform, earthwork survey area 1, looking south, 1m scale, 23/01/2021 [Olaf Bayer. © Historic England Archive. AF00452/P008]..... 45

Figure 51: Concrete pipe inserted into earlier trench, earthwork survey area 2, looking south, scale 1m, 23/01/2021 [Olaf Bayer. © Historic England Archive. AF00452/P009]... 47

Figure 52: Concrete anti-aircraft gun holdfast, earthwork survey area 2, looking south, 1m scale, 01/04/2021 [Olaf Bayer. © Historic England Archive. AF00452/P010]..... 47

Figure 53: Grenade range, earthwork survey area 1, scale 1:500. [© Historic England. Base mapping © Crown Copyright and database right 2023. All rights reserved. Ordnance Survey Licence number 100024900] 48

Figure 54: Grenade range, earthwork survey area 1, looking north-east, 1m scale, 23/01/2021 [Olaf Bayer. © Historic England Archive. AF00452/P011] 48

Figure 55: Abandoned barbed wire and stakes, between earthwork survey areas 1 and 3, looking south, 1m scale, 19/08/2023 [Olaf Bayer. © Historic England Archive. AF00452/P012]..... 49

Figure 56: Plan of proposed grenade range [source Gosport Borough Council] 50

Figure 57: Damage caused to irregular trench system by BMX track, earthwork survey area 1, looking north. 1m scale. 01/04/2023 [Olaf Bayer. © Historic England Archive. AF00452/P013]..... 51

Figure 58: Damage caused to irregular trench system by BMX track, earthwork survey area 1, looking west. [Damian Grady © Historic England Archive. [35065_007 08-06-2021](#)]..... 51

Figure 59: Ecological management scrape between earthwork survey areas 1 and 2, looking north-east, 08/04/2022. [Olaf Bayer. © Historic England Archive. AF00452/P014] 52

Figure 60: Browndown trenches, Gosport: the three overlapping drone flight areas (yellow, purple and green) covering the overall study area (red) and the positions of the ground control targets listed in Table 1. UAS survey targets December 2019. [© Historic England. Photography ©Airbus Defence and Space Ltd; Bluesky International Ltd; Getmapping PLC] 64

Figure 61: Location of earthwork survey drawings (figs 62-66), scale 1:5000. [© Historic England. Base mapping derived from OS open data © Crown copyright and database right 2023 and OS Master Map © Crown Copyright and database right 2023. All rights reserved. Ordnance Survey Licence number 100024900] 71

Figure 62: Browndown trenches, Gosport. Analytical earthwork survey area 1.1, scale 1:500. [© Historic England Archive. AF00452/D001] 72

Figure 63: Browndown trenches, Gosport. Analytical earthwork survey area 1.2, scale 1:500. [© Historic England Archive. AF00452/D002] 73

Figure 64: Browndown trenches, Gosport. Analytical earthwork survey area 2.1, scale 1:500. [© Historic England Archive. AF00452/D003] 74

Figure 65: Browndown trenches, Gosport. Analytical earthwork survey area 2.2, scale 1:500. [© Historic England Archive. AF00452/D004] 75

Figure 66: Browndown trenches, Gosport. Analytical earthwork survey area 2.3, scale 1:500. [© Historic England Archive. AF00452/D005] 76

Figure 67: Browndown trenches, Gosport. UAS photography derived orthophoto, 03/12/2019, scale 1:2000. [Dave Went. © Historic England Archive. AF00452/D0006].. 77

Figure 68: Browndown trenches, Gosport. UAS photography derived 16 direction hillshade model, 03/12/2019, scale 1:2000. [Dave Went. © Historic England Archive. AF00452/D0007]..... 78

Figure 69: Browndown trenches, Gosport. UAS photography derived simple local relief model, 03/12/2019, scale 1:2000. [Dave Went. © Historic England Archive. AF00452/D0008]..... 79

Figure 70: Browndown trenches, Gosport. UAS photography derived orthophoto, 08/04/2022, scale 1:2000. [Olaf Bayer. © Historic England Archive. AF00452/D0009] .. 80

Tables

Table 1: Control points used for improving the accuracy of the orthophotograph and digital surface model (see fig 60) 66

Table 2: Mapping layer content and drawing conventions, based on AIM standards..... 70



Figure 1: Browdown location. [© Historic England. Topography derived from 2m elevation data ©Airbus Defence and Space Ltd; Bluesky International Ltd; Getmapping PLC. All other mapping derived from OS open data © Crown copyright and database right 2023]

Introduction

As part of Gosport Heritage Action Zone (HAZ) Historic England's (HE) then Archaeological Survey and Investigation (AS&I) and Aerial Investigation and Mapping (AIM) teams undertook a detailed study of archaeological features at Browdown Ranges (north), Gosport. This work was carried out in parallel with an analytical earthwork survey of Apple Dumpling motte-and-bailey castle (Bowden 2013) and an aerial survey of Gosport (Small 2020). The project focused on a series of recently discovered First World War practice trenches (Kennedy 2014; Hamel and Lambert 2011). The project aimed to understand the extent, layout and development of the trenches at Browdown, and to raise awareness of these features as an educational resource and visitor attraction (Cocroft 2019).

Research for the project took place between late 2019 and 2022. Features recorded include a probable round barrow of presumed early Bronze Age date, an extensive area of First World War practice trenches, a Second World War Heavy Anti-Aircraft Battery and a series of Second World War and later grenade ranges.

The First World War trenches at Browdown Ranges (north) stand out as one of the best preserved and most complex examples in England. They comprise at least two phases of activity. They also reflect two distinct activities: firstly the practice excavation of trenches for troops to learn trench construction techniques, and to build individual fitness and group cohesion; secondly the provision of 'text book' training environments, mimicking sections of the Western Front, in which troops learned how to live and fight in trenches.

Location

Centred on SZ 58250 99650, Browdown Ranges (north) are located in an area of mostly open heathland between Gosport and Lee-on-the-Solent (fig 1). They are bounded to the east by the River Alver, to the south by Privett Road (the B333 between Gosport and Lee-on-the-Solent) and to the north-west by an area of made-ground resulting from twentieth-century sand and gravel extraction back-filled with municipal waste (Gosport Borough Council 2003). To the north-west is Alver Valley Country Park (figs 1 and 2). The ranges lie at between 2.5 and 7m OD on a now isolated area of sand and gravel terrace deposits associated with the River Alver, overlying Palaeogene sand, silt and clay of the Selsey Sand Formation (BGS 2023). The area is essentially level but drops steeply towards an unnamed watercourse close to its southern edge, and more gradually to the River Alver on its eastern edge (fig 2).

Browdown Ranges (north) is part of the Ministry of Defence (MoD) training estate. It does not currently have any Public Rights of Way across it. However, there is *de facto* public access and this area is frequently used by local people for dog walking (RPS 2003). To the south, parts of Browdown camp are now in private ownership, whilst Browdown Ranges (south) remain in MoD ownership. At the time of the current survey the area was covered by a mosaic of thick gorse, bracken, heather and long grass, framed on its northern and southern edges by areas of deciduous woodland (figs 2-3). It is crossed by several unmetalled tracks and paths.



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Figure 3: Browndown aerial view 2022. [© Historic England. Photography ©Airbus Defence and Space Ltd; Bluesky International Ltd; Getmapping PLC]

Historic Context

Despite its rural setting, Browndown is located on the western edge of the urban centres of Gosport and Portsmouth (see fig 1). Portsmouth Harbour has been home to the British fleet since the end of the medieval period. As a consequence, a naval and wider military presence has been fundamental to the development of both towns. Military activity at Browndown is first evidenced in the late eighteenth century. Cartographic evidence from 1782 shows camps of the *Light Infantry* and the *16th Light Dragoons* in an enclosed field (*Square Close* see below) on the north-west corner of the study area (fig 4). The majority of the study area is shown as unenclosed land. Note that the area is referred to as '*Bare Down*', this further refutes any suggestion that the *Browndown* place-name was originally named after the Brune family (see Bowden 2023, 2). Ordnance Survey mapping published in 1810 shows the study area as unenclosed heathland with a track running along its north-western edge linking the coast road with the crossing of the Alver at Apple Dumping Bridge (fig 5).

The 1839 tithe map (fig 6) shows the study area lying within a south-west protrusion of Rowner Parish, surrounded to the south, west and north-west by Titchfield parish, and by Alverstoke parish to the east. The study area comprises parts of six land parcels. Most of the study area consists of a central large unenclosed area, *The Warren*, and part of a smaller enclosed field, *Square Close*, to the north-west. A series of four small water meadows (*Yonder Causey Mead*, *Upper Broadmead*, *Broadmead* and *Gomer Meadow*), each defined by water courses, form its eastern edge. *Square Close*, *The Warren* and *Yonder Causey Mead* were owned by Charles Prideaux-Brune esq, whilst *Upper Broadmead*, *Broadmead* and *Gomer Meadow* were all owned by The Right Hon Jonathan Peel.

Ordnance Survey mapping published in 1869 (fig 7) shows little change to the study area apart from two small enclosed areas of woodland and a gravel pit at the northern end of '*The Warren*'. Immediately to the south of the study area military activity is evidenced by '*Browndown Camp Fields*' and a hutted encampment. This was the precursor to present day Browndown Camp. The camp was initially constructed for the Royal Marines stationed at Forton Barracks, Gosport in 1877. A series of firing ranges were constructed between the camp and the beach, and the camp expanded during the late nineteenth and early twentieth-centuries (Small 2020, 52-8). From 1900 the Royal Marines held their shooting cup there, and from 1919 the Royal Marines Small Arms School was based at Browndown (Friends of Stokes Bay 2023).

Mapping published in 1892 (fig 8) shows the study area in broadly the same state apart from the removal of the dividing water courses between the meadows on its eastern edge. A major addition immediately to the south of the study area is the construction of the Gosport to Lee-on-the-Solent Railway, opened in 1894, and Browndown Halt station (Catford 2020). To the south-east, Browndown Camp contains additional buildings. A series of War Department boundary stones (figs 8-9, numbered 3 to 13) were erected along the southern and eastern edges of the study area. This boundary indicates that although land to the south and east was in military ownership by this date, the study area was still in private ownership.

The First World War is bracketed by two phases of Ordnance Survey mapping published in 1909 and 1932 (figs 9 and 10). No major changes are seen inside the study area, and neither map shows any detail of military activity. Just outside the study area the eastern extent of Lee-on-the-Solent is now apparent. Browndown Warren appears to have remained in the ownership of the Prideaux-Brune family until after the First World War. It is likely that land was either leased or loaned to the War Department during the war. The land was eventually sold to the military in March 1925 (Land Registry 2020) and Browndown Warren was included in a written description of the extent of military lands at Browndown and Rowner in May 1928 (HMSO 1928). Consequently, the War Department boundary stones (see figs 8 and 9) are no longer shown on 1932 mapping (fig 10). Despite being constructed in the 1850s, Fort Gomer, to the east of the Alver is first depicted on the 1932 mapping.

The first phase of post-Second World War mapping published in 1965 (fig 11) shows the first military feature to be depicted inside the study area. This consists of a rectangular fenced compound (measuring approximately 62m by 35m) near the eastern edge of the study area. Close to the centre of this compound are a row of three small structures each measuring slightly less than 5m by 3.5m. These features have been identified as a grenade range (see below). In addition to the grenade range, a much more extensive network of tracks and footpaths is evident across the area. The grenade range is no longer depicted in Ordnance Survey mapping published in 1976 (fig 12). The round barrow in the south-west corner of the study area is depicted for the first time. Further tracks have been created and the area broadly resembles that seen today.

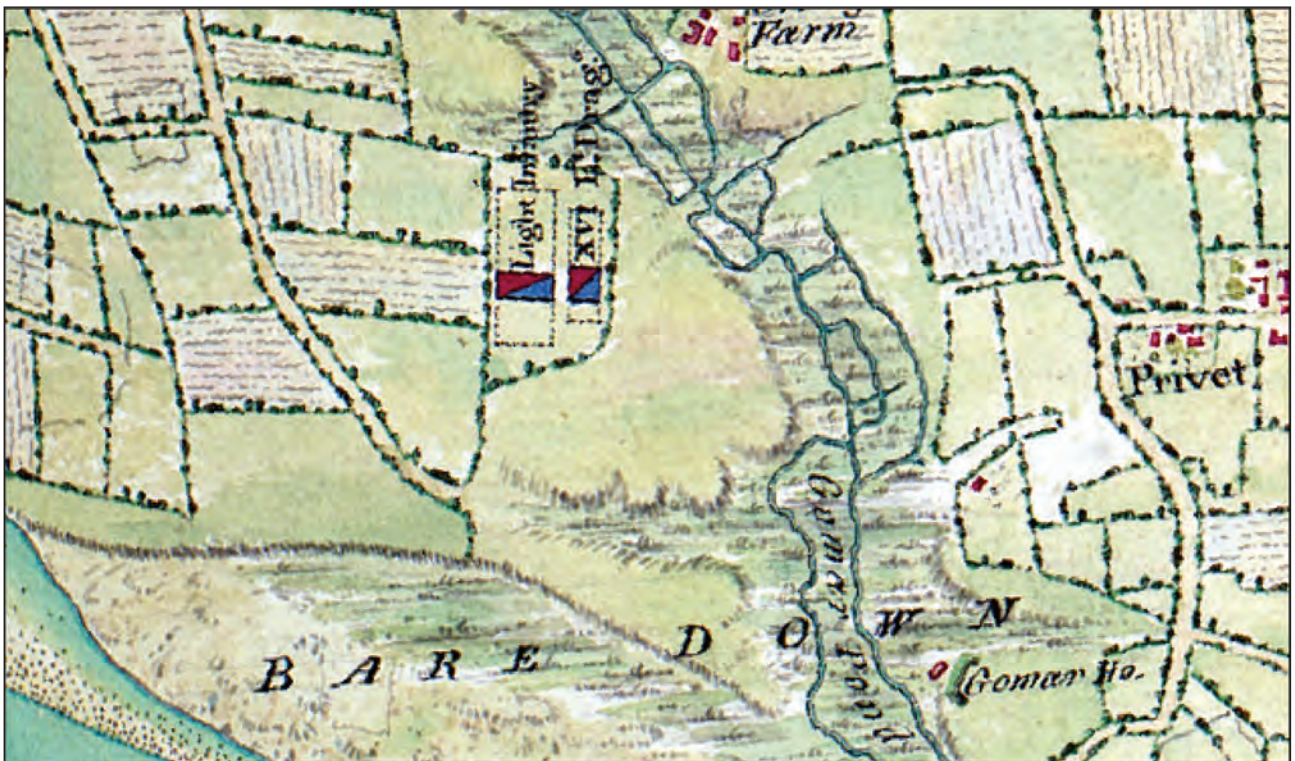


Figure 4: Plan of the Encampments in the Neighbourhood of Portsmouth under the command of the Rt Hon. Lieu. Gen. Lord George Henry Lennox, plan 1st July to 13th November 1782 [Reproduced with permission of Royal Collection Trust / © Her Majesty Queen Elizabeth II 2020 <https://www.rct.uk/collection/734032.ba>]



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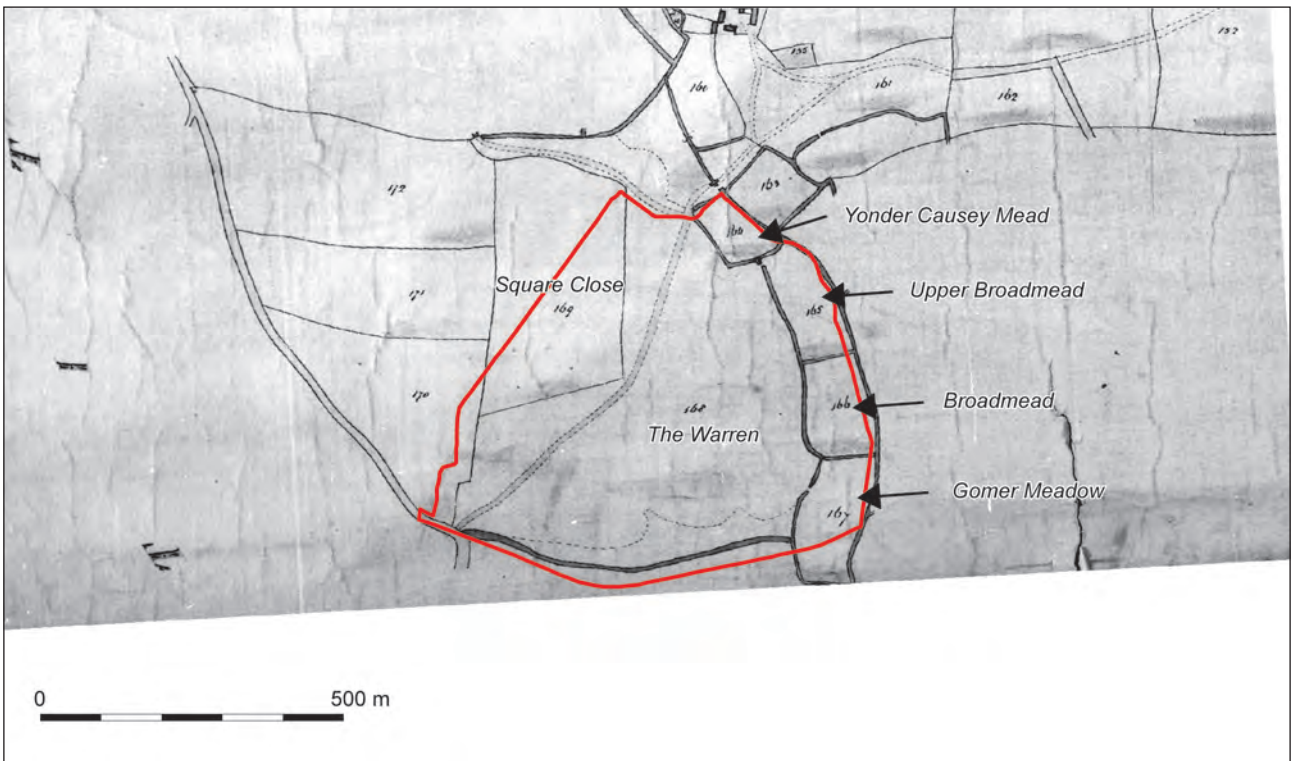


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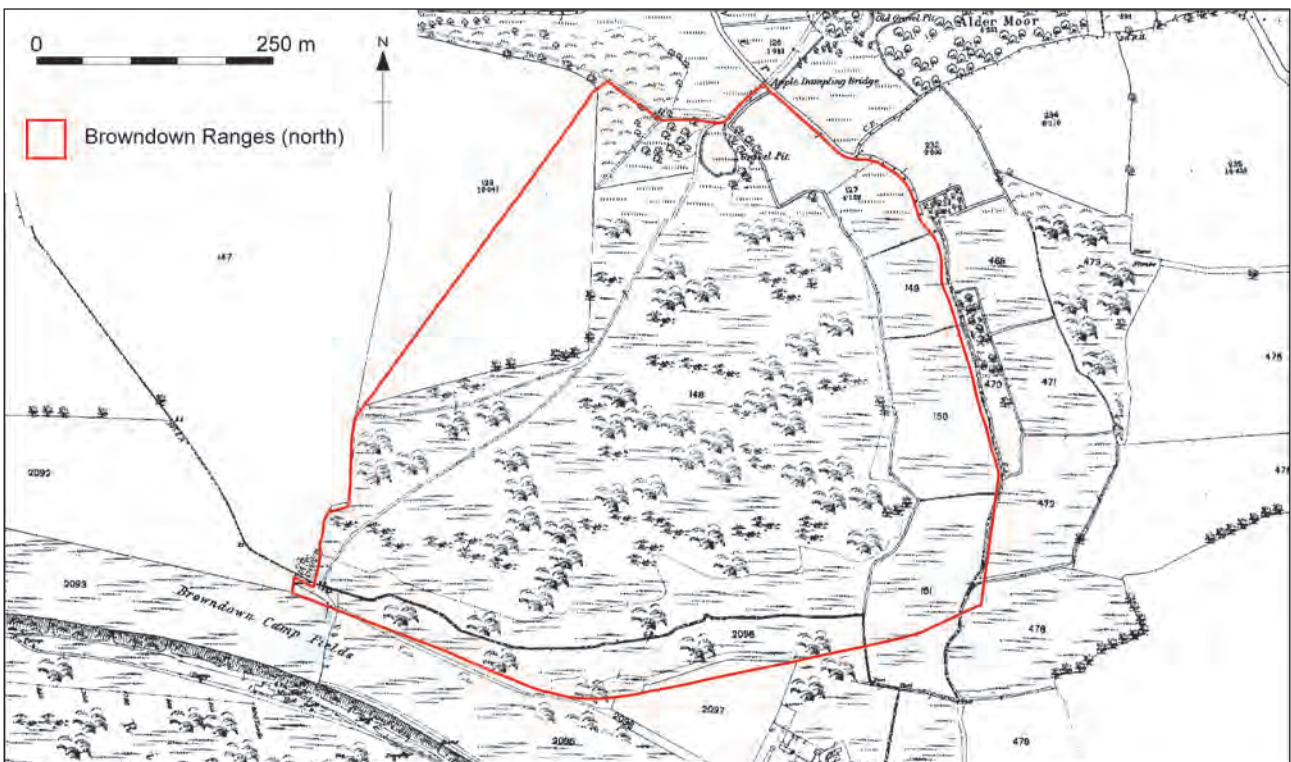


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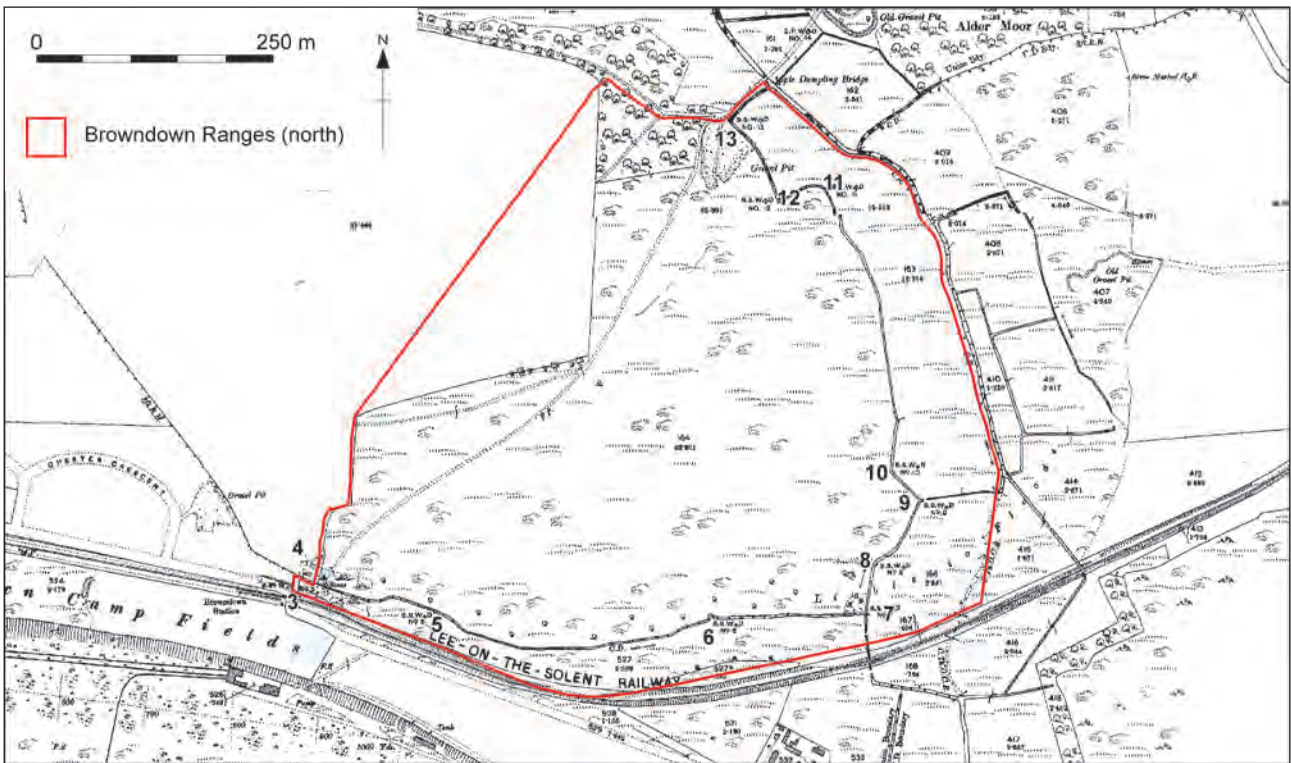


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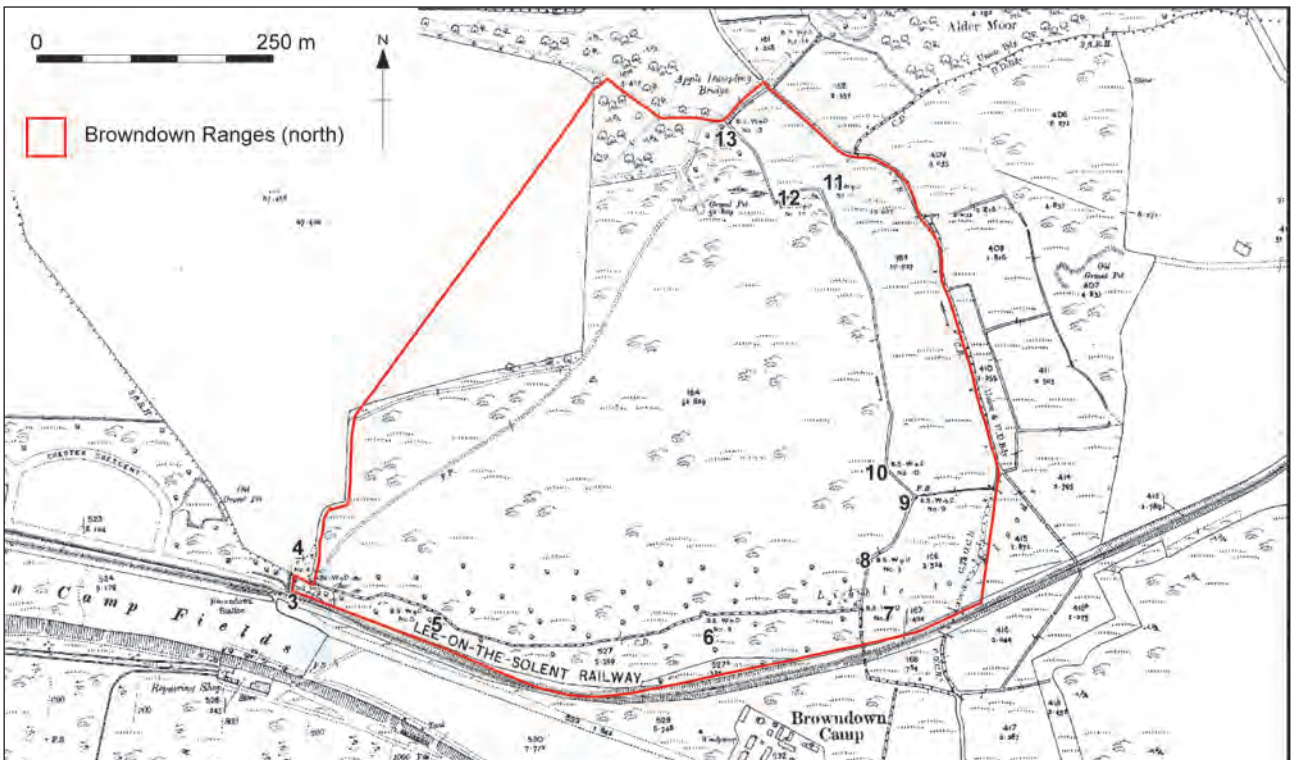


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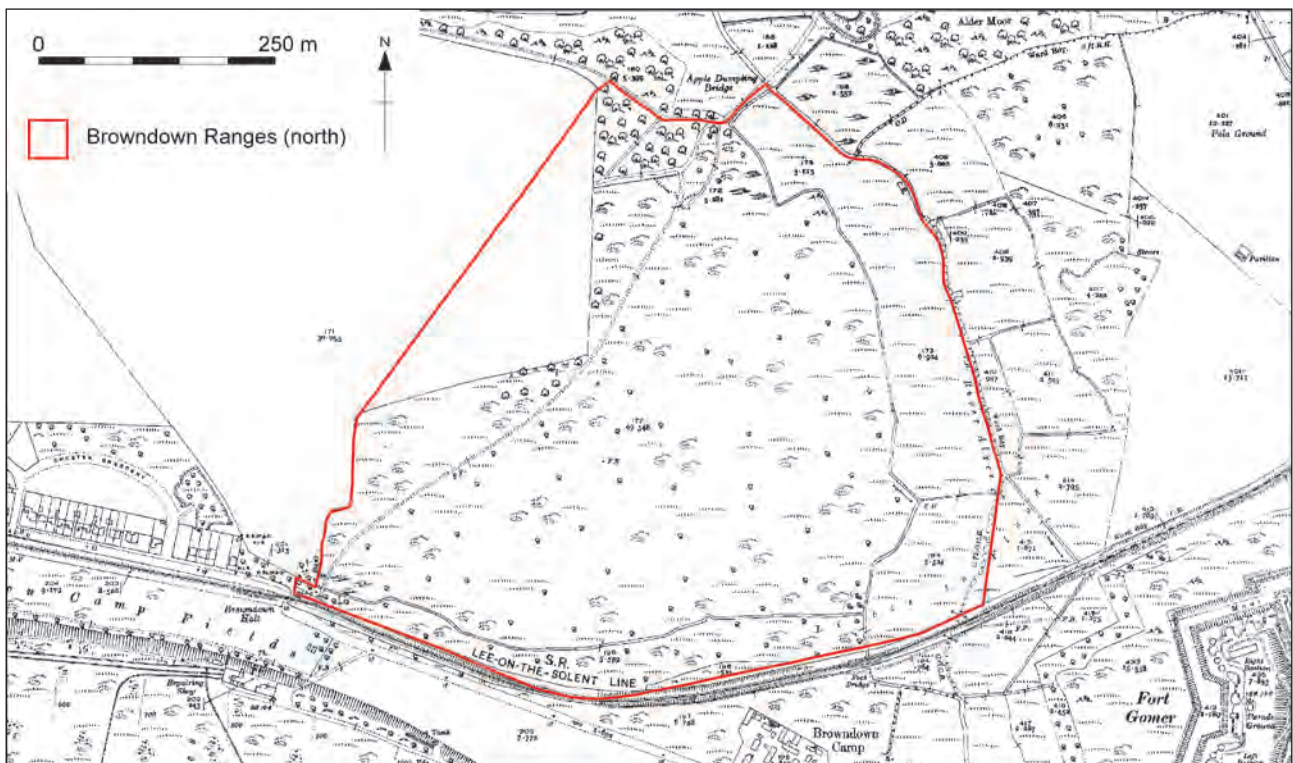


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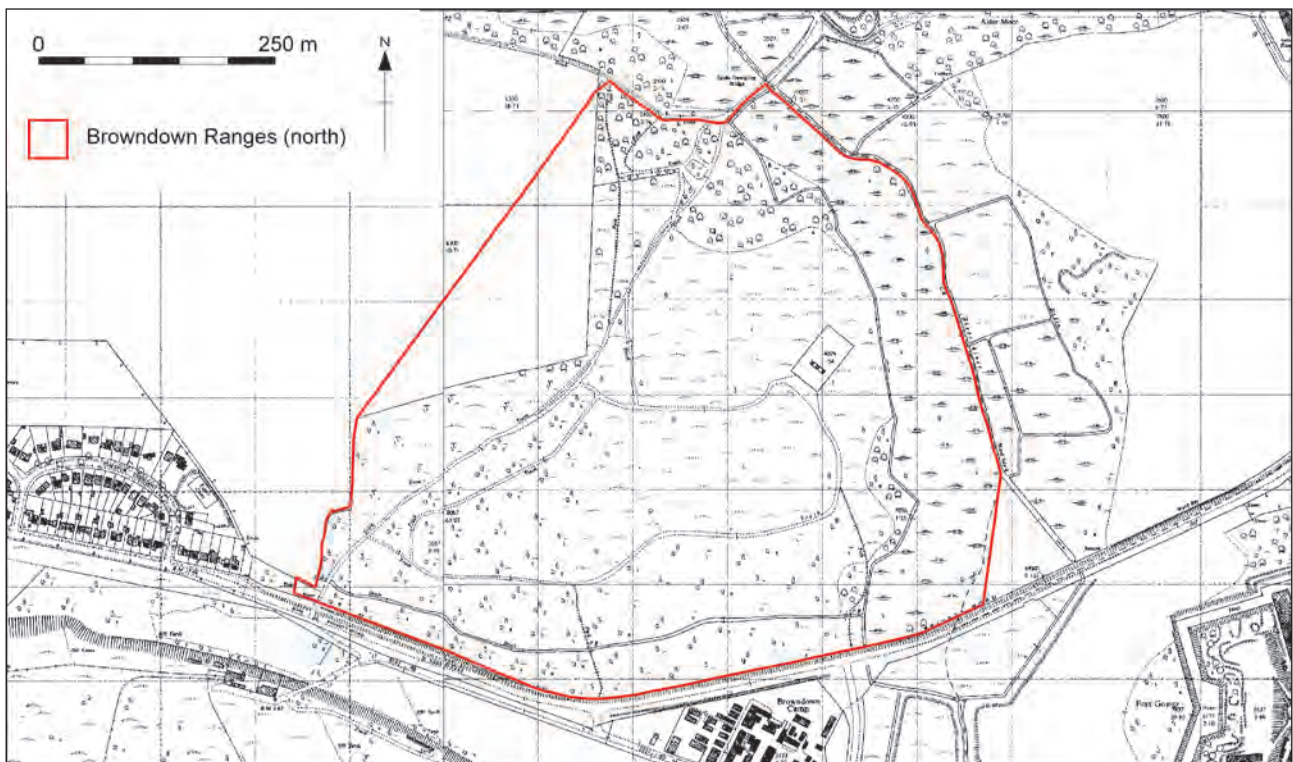


Figure 11: OS 1:2500 mapping published 1965. [© Historic England. Mapping © and database right Crown Copyright and Landmark Information Group Ltd (All rights reserved 2023). Licence numbers 000394 and TP0024]

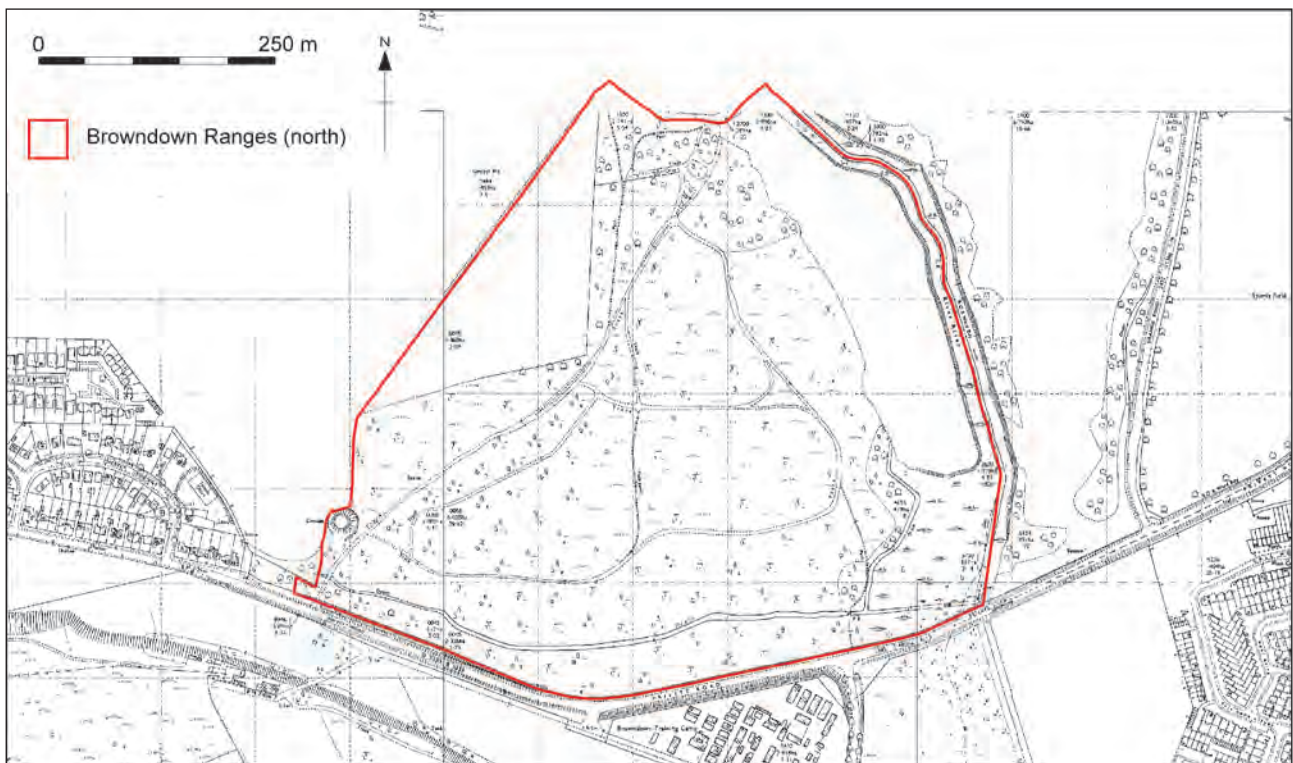


Figure 12: OS 1:2500 mapping published 1976. [© Historic England. Mapping © and database right Crown Copyright and Landmark Information Group Ltd (All rights reserved 2023). Licence numbers 000394 and TP0024]

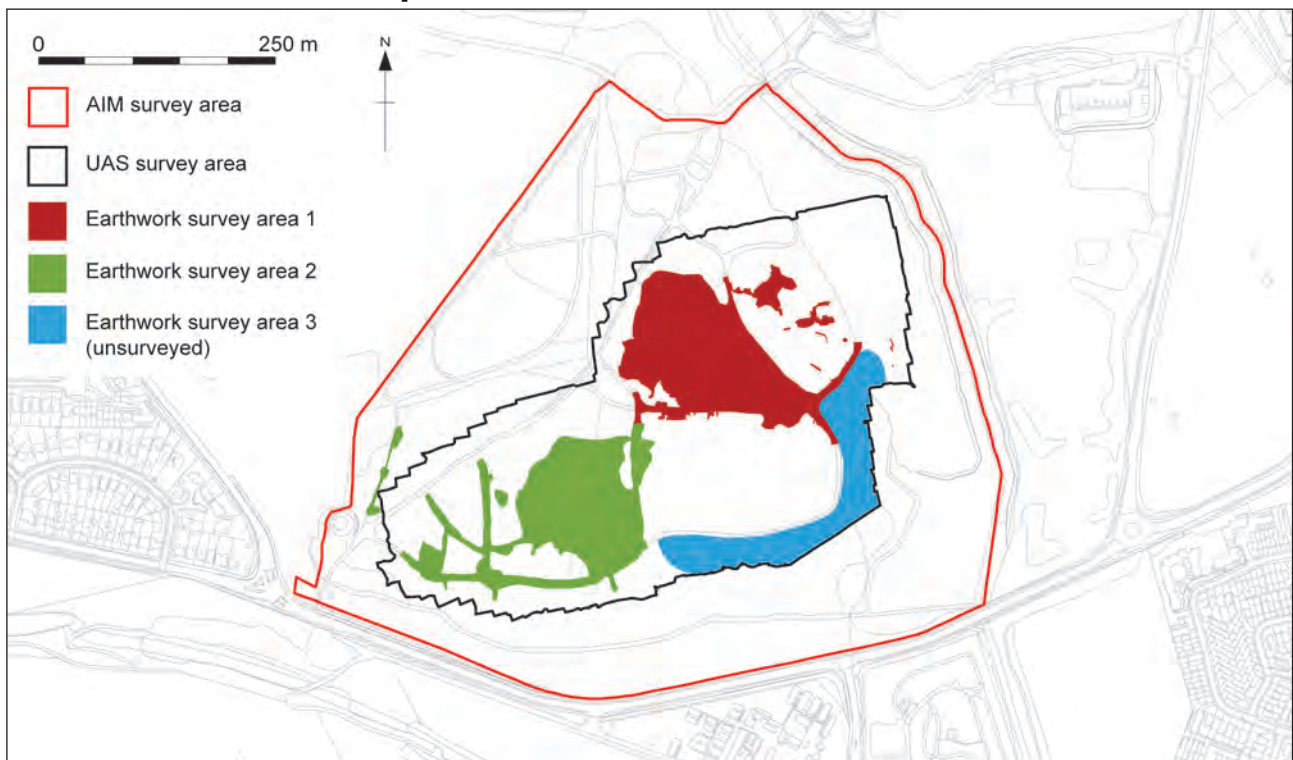


Figure 13: Location of survey areas. [© Historic England. Base mapping © Crown Copyright and database right 2023. All rights reserved. Ordnance Survey Licence number 100024900]

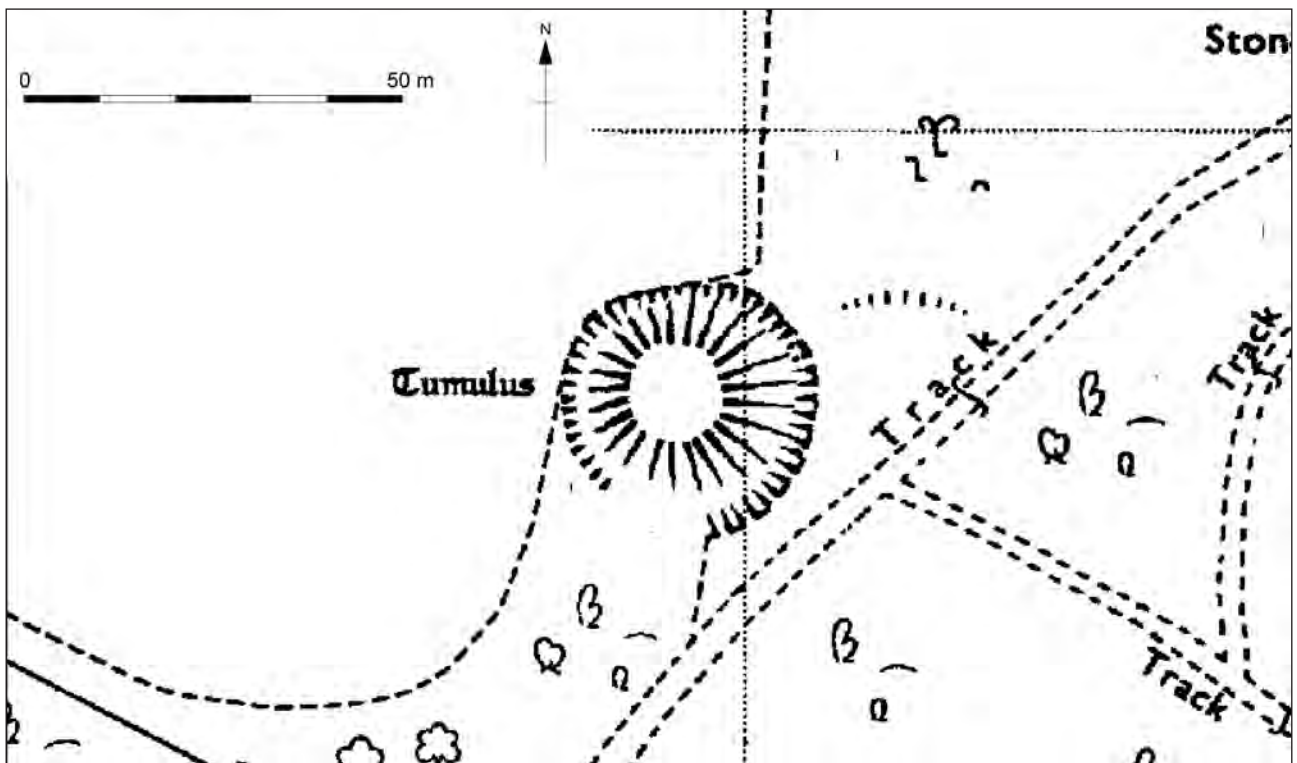


Figure 14: Round barrow extracted from OS 1976 1:2500 mapping. [© Historic England. Mapping © and database right Crown Copyright and Landmark Information Group Ltd (All rights reserved 2023). Licence numbers 000394 and TP0024]

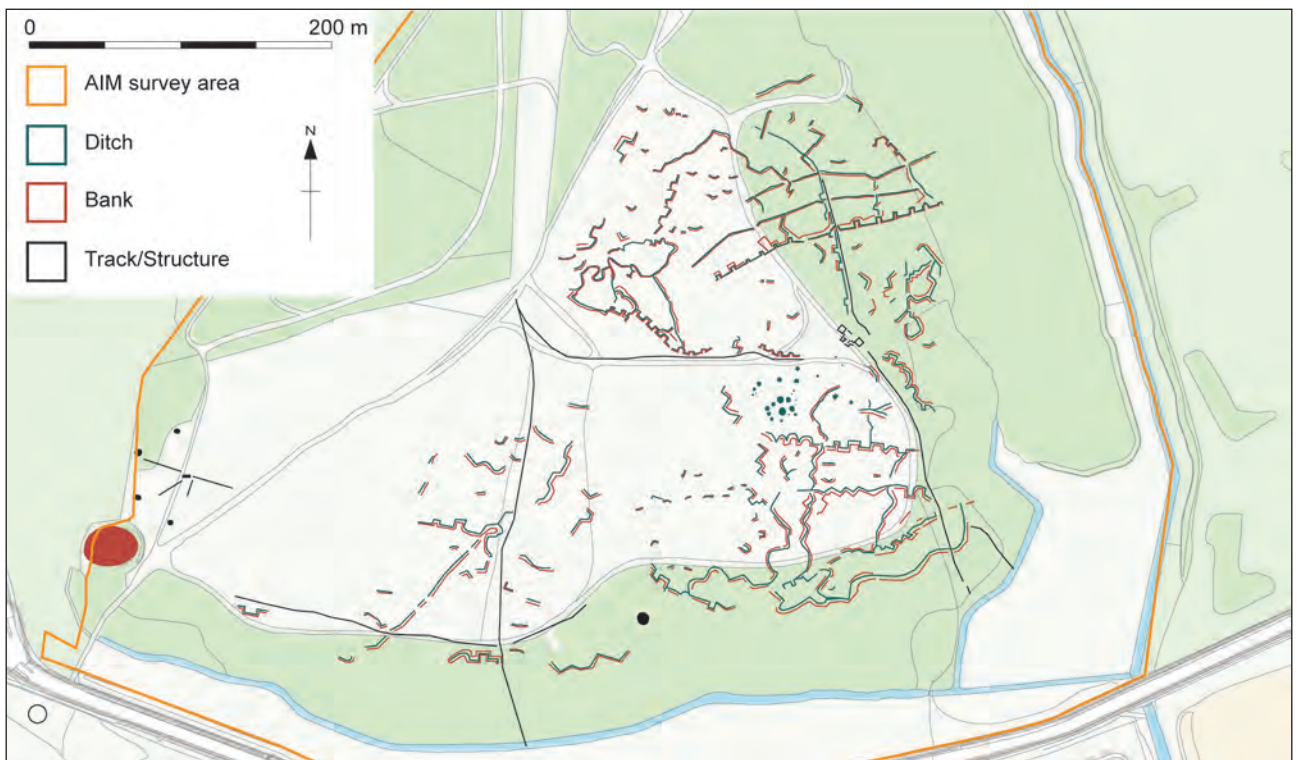


Figure 15: National Mapping Programme mapping for Browdown. After Hamel and Lambert (2011). [© Historic England. Base mapping derived from OS open data © Crown copyright and database right 2023]

Methodology

UAS survey

Undertaken in early December 2019, Unmanned Aerial System (UAS) survey covered an area of approximately 15.2ha (see figs 13 and 60). A detailed methodology is given in appendix 1. UAS survey created a high resolution spatially accurate orthophoto and digital elevation model of the site (see figs 31 and 61-63). The state of vegetation at the time of the survey precluded the extensive identification of archaeological features using this technique. However, a range of features identified by the UAS survey did provide accurate contextual mapping for analytical earthwork survey, as well as additional control points for improving the rectification and georeferencing of historic aerial photography. A further mapping flight was undertaken in April 2022 to record new areas of burning and ecological management (fig 64).

Analytical Earthwork Survey

Approximately 4.4 ha of level 3 analytical earthwork survey (Historic England 2017) was undertaken in early 2020 (see figs 62-66). Even in mid-winter much of the site was covered in dense vegetation, mostly gorse, bracken and heather. A rapid walk-over survey identified three areas where detailed survey was possible (see fig 13). Earthwork survey was undertaken in open areas 1 (north-east) and 2 (south-west) in January/February 2020. Survey work in woodland area 3 (south-east) was planned for late March 2020 but was postponed due to the first COVID19 lockdown. Further attempts to conduct detailed survey in area 3 were abandoned due to continuing COVID19 restrictions and lack of team capacity. Smaller scale recording was carried out between July 2020 and December 2022 in survey areas 1 and 2 on earthworks newly exposed by gorse fires and vegetation management. A detailed methodology is given in appendix 1.

Aerial Investigation and Mapping

The AIM study focused on the area of Browdown Ranges (north) (see figs 1 to 13 for extent), and was conducted between November 2018 and January 2019. The study was undertaken as part of a wider AIM study encompassing the whole of Gosport Borough (Small 2020). Figure 16 shows all features recorded by the AIM study. A detailed methodology and list of sources used is given in appendix 1.

Results

Prehistoric features

Round Barrow

A large round mound, recorded as a probable barrow (Historic England Research Record [HERR 461580](#)), is situated at SZ 5789 9956 on the south-western edge of Browdown Ranges (north). It is not scheduled. When examined in March 2020 this feature was covered by thick vegetation. As a result of restrictions imposed by the first COVID19 lockdown recording of the barrow was restricted to a visual inspection by a single investigator and a series of taped measurements.

The mound was first recorded as a 'highly suspicious tump' in the Ordnance Survey (OS) Object Name Book ([HERR 461580](#), Authority 1). The date of this entry is uncertain, but it is associated with the initials of OGS Crawford who was Archaeology Officer at the OS from 1922 to 1940 and who lived relatively locally, at Netley. The entry was presumably made shortly before 1936, when the next recorded comment was made. This was in correspondence to the OS from local antiquary Captain G Civil, who wrote, "*It is situated on WD [War Department] land, much trenched for bombing [grenade] practice, but it is certainly no part of such work though a shallow trench has been cut in it. It is bigger than any common round barrow that I have seen; was apparently ringed with a ditch; the locality has produced flints of Bronze Age type; and to confuse matters, I recently found in a rabbit burrow in the mound itself a large sherd of black pottery with obvious signs of wheel turning, presumably Roman*" ([HERR 461580](#), Authority 2).

The site was visited by Field Investigator VJ Burton for the OS Archaeology Division in 1955. He recorded that it was a large mound, "*probably a bowl barrow very much cut about by trenching etc, c. 24m in diameter & 2.2m high and completely overgrown by furze and brambles*" ([HERR 461580](#), Authority 3). The mound was subsequently surveyed for the OS 1:2500 map by Alan Phillips in 1969 and was accepted as a prehistoric barrow, or 'Tumulus', for OS mapping ([HERR 461580](#), Authorities 4 and 5; fig 14).

The monument is currently difficult to observe because of its dense coverage of gorse and mature trees but it is a circular mound measuring approximately 23.4m north to south and 23.8m east to west within a ditch which is extant and sharply defined except on the south side. The overall diameter of the monument is about 30.5m. The mound is about 2.0m high and has been extensively disturbed by military trenching and burrowing animals. The ditch is only 0.3m deep externally to the east but up to 1.0m deep to the north and west. To the north the outer edge of the ditch has been enhanced by the construction of a later bank on its outer lip; this bank turns to run to the north.

First World War features

The principal objective of the project was to enhance understanding of First World War practice trenches on Browdown Ranges (Cocroft 2019). These features were first recorded from the air in 2011 as part of the South East Rapid Coastal Zone Assessment National Mapping Project (SERCZA NMP). The trenches are described as including “... both front-line and communication trenches – the front-line practice trenches are predominantly crenellated as this pattern prevented artillery shells travelling along the length of the trench, and would also slow enemy progress if the trench was captured. A central command post and a series of bomb craters thought to be the result of target practice, were also visible on aerial photographs taken in the 1940s” (Hamel and Lambert 2011, 24) (see fig 15). The trenches were subsequently traced on the ground by Robert Harper of Gosport Borough Council (Kennedy 2014).

In a gazetteer of First World War Fieldworks in England the trenches are described as an:

“Opposed systems of trenches with no-man’s-land. Pillbox suggests reuse in WWII for anti-invasion defence. The system may have originated as coastal defence, protecting the south flank of Fort Rowner in WW1 and been adapted for training later in or post-war” (Historic England 2017b, 10).

Practice trenches

Aerial evidence

Using a range of aerial sources spanning 1923 to the present day (see appendix 1) the AIM study mapped approximately 15ha of military earthworks and structures spread across the study area (see fig 16). These features represent a complex, multiphase palimpsest of military activity spanning from the First World War to the late twentieth-century.

Because of vegetation cover over much of the site it has proved difficult to survey archaeological features from present day aerial photographs or light detection and ranging (lidar). However, historic aerial photographs taken during and after the Second World War, held by the Historic England Archive, show the ranges when they were less overgrown, and parts were still in use. It is from these photographs that the trenches were initially identified in 2011 during the SERCZA NMP survey undertaken by Wessex Archaeology for Historic England (Hamel and Lambert 2011, 24).

Much of what survives of the trenches has been concealed beneath gorse, heather, bracken and heath grasses which have been allowed to take over the site since the Second World War. Although periodic clearance has taken place, regrowth is rapid and dense, making aerial survey difficult. As a consequence, the AIM survey has relied heavily on historic aerial photographs taken from the 1940s to 1960s when the site was less overgrown and the earthworks more visible.

To date, no aerial photographs of the trenches in use (between 1914 and 1918) have been identified, but a single military oblique taken in 1923, looking west along Privett Road with

the military camp at Browndown on the right, does show some of the trenches in the south-western corner of the site, partially obscured by one of the struts of the aircraft's wing (fig 17). When rectified, the outlines of two sets of crenellated trenches can be seen, and it is evident that they are already overgrown and out of use (see discussion of elongated crenellated trenches below). The top of the beach where the Browndown firing ranges are located can be seen on the left of this photograph. The Lee-on-the-Solent railway line can be seen curving between Browndown camp and the entrenched heathland (fig 18).

A second photograph (fig 19) taken on the same occasion (SZ5899/2 27-JUN-1923) looks south-east across the Lee-on-the-Solent railway line in the direction of Fort Gomer (now removed). The furthest south-eastern extent of Browndown Warren can just be seen in the top left-hand corner of the photograph. An area of disturbed ground here is likely to be the the south-eastern corner of the practice trenches. A further group of trenches can be seen in the bottom left-hand corner of image immediately south-west of Fort Gomer. These trenches appear fresh and possibly in use.

Historic vertical aerial photographs taken by the RAF for reconnaissance purposes during the Second World War and the post-war (1944-1950) RAF aerial photographic survey of Great Britain (Operation REVUE) have been more informative than the earlier images, recording the entire site over several decades, revealing the remains of the abandoned trench systems as well as traces of Second World War and later re-use of the site.

The earliest of these photographs date from March (fig 20) and June (fig 21) 1942 and show the remains of the two opposing systems of interconnecting trenches, as well as what appear to be individual lengths of short trench and pits, possibly fox holes and slit trenches. What is clear is that some trenches are deeper and more defined than others, with some only visible as slight linear depressions on these early photographs suggesting different phases of activity on the range. What is not clear from the aerial photographic evidence is whether the main system of opposing trenches was a static training ground with small sections of practice trench dug around this for entrenchment training or whether it was continually added to through its period of use by subsequent groups of soldiers. Fainter infilled trenches within the system do suggest some reorganisation and re-cutting of at least part of the system over time. By the time these photographs were taken the main First World War trench layout had already been abandoned for over 20 years with vegetation growth and degradation of the trenches making it difficult to see the details of the trench network.

The site was subsequently photographed in 1946 (fig 22), and then at intervals in the two decades following the war in 1950, 1951, 1953, 1959, 1961 and 1966 (figs 23 to 28). Most photographs were taken in spring or late autumn when vegetation obscured parts of the site, but one set was taken in mid-December 1961 when vegetation had died back enough to reveal details of the trench system. Though these photographs were taken 50 years after the trenches were first dug, they have proved to be the most informative photographs for mapping the remains of the trenches. The current project used existing aerial photographs and lidar images available at the time of the earlier SERCZA NMP survey (Hamel and Lambert 2011, 24), but also had access to new aerial photographs taken by Historic England (see for example figs 29 and 30). UAS derived imagery of the site was captured in December 2019 and processed using Structure from Motion (SfM) software to create a georeferenced model of the site allowing greater locational and

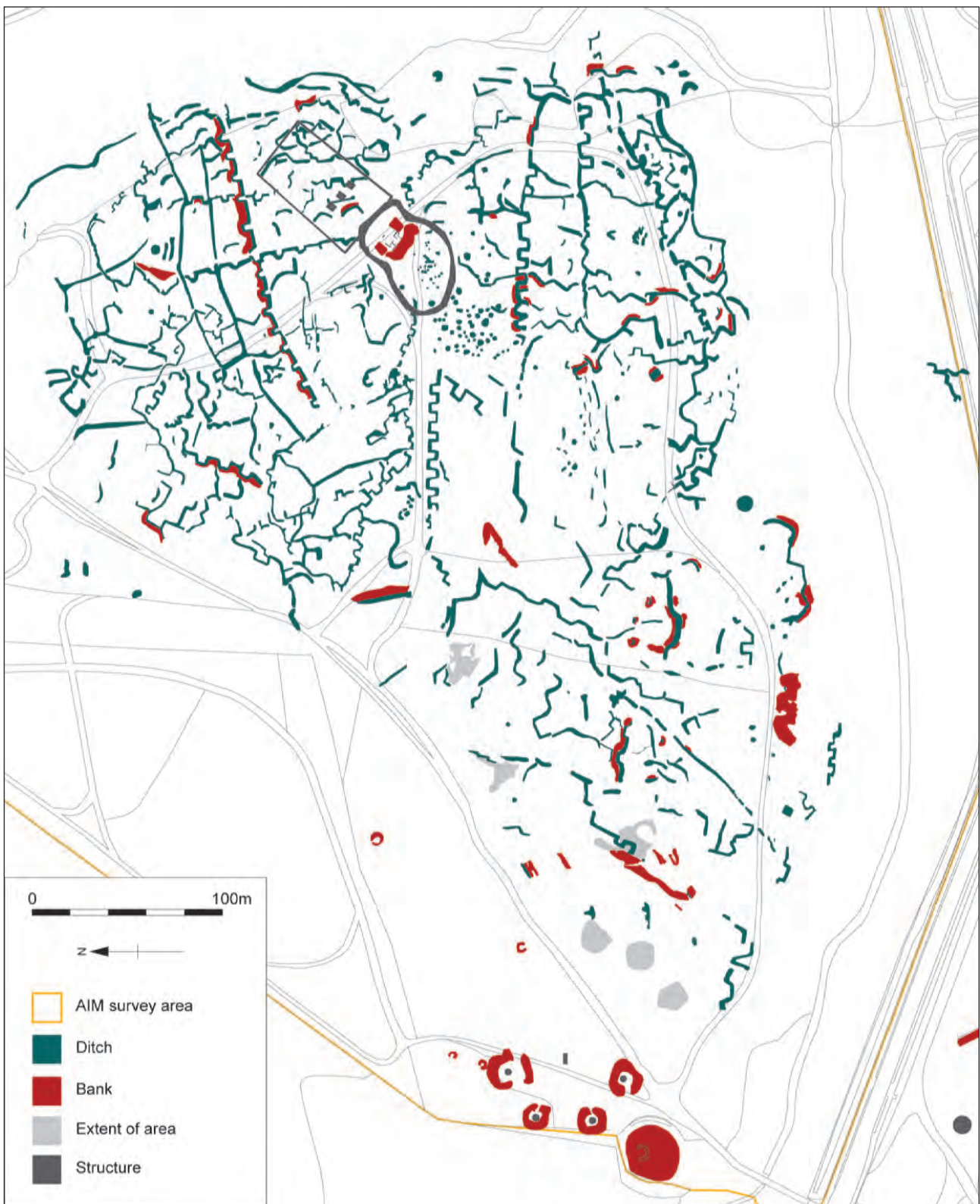


Figure 16: Aerial Investigation and Mapping results [© Historic England. Base mapping © Crown Copyright and database right 2023. All rights reserved. Ordnance Survey Licence number 100024900]

visual accuracy (figs 31 and 67-69). This also proved more informative than the existing Environment Agency lidar (fig 32) which could not penetrate the thick heath vegetation which had largely died back when the UAS survey was carried out. The combined clarity of the UAS derived model and its locational accuracy has enabled the most comprehensive aerial survey of the trench system to date to be produced.



Figure 17: Looking west along Privett Road in June 1923. Evidence of disturbed ground and slight earthworks of the south-western part of Browndown trenches can be seen in the top-right-hand corner (bisected by the wing-strut of the plane). The road from Gomer Fort to the ranges can be seen coming in from the bottom-right-hand corner, meeting Privett Road at Browndown Camp. [CCC8602/665 27-JUN-1923 – © Historic England, Crawford Collection]

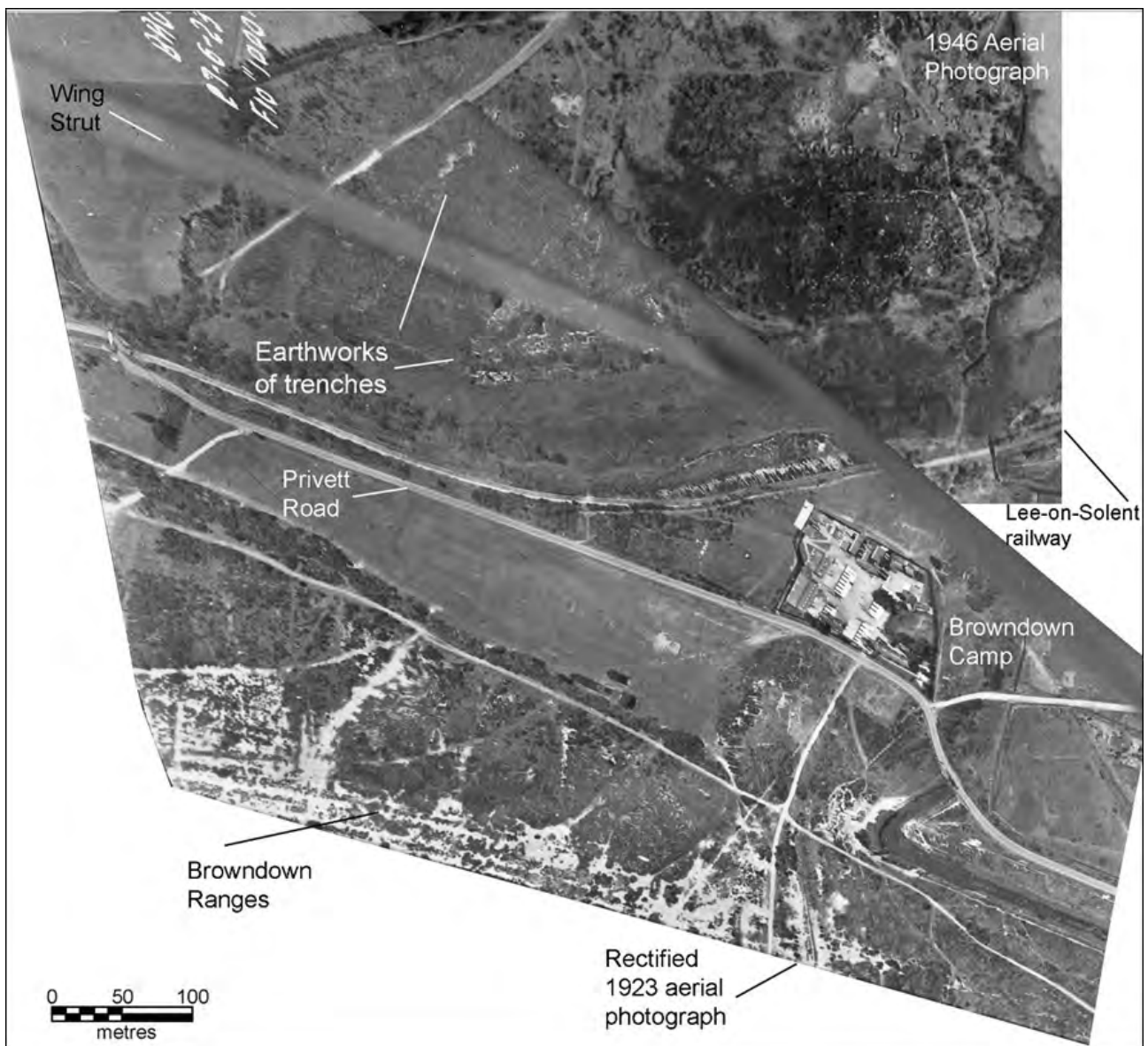


Figure 18: A photo-mosaic of the rectified 1923 military oblique and 1946 RAF vertical showing the earthwork traces of the training trenches on Browdown Common. [CCC8602/665 27-JUN-1923 – © Historic England. Crawford Collection, and extract of RAF/3GTUD/IK/163 PTIII 5110 2-APR-1946 Historic England Archive, RAF Photography]



Figure 19: Looking north-west from Fort Gomer in 1923. A possible trench can be seen in the top left-hand corner of the photograph, the south-eastern edge of Browndown. A number of trenches can also be seen on the south-western (left) side of the Fort Gomer. [Extract of SZ5899/2 27-JUN-1923. Historic England Archive, RAF Photography]



Figure 20: A view of the remains of the trench systems on Browndown Common in March 1942. Part of the Browndown ranges can be seen at the bottom edge of the photograph and Browndown Camp (bottom right). The grassy strip between the heath and ranges is the old campground [Extract of RAF/HLA/426/6 041 24-MAR-1942. Historic England Archive, RAF Photography]

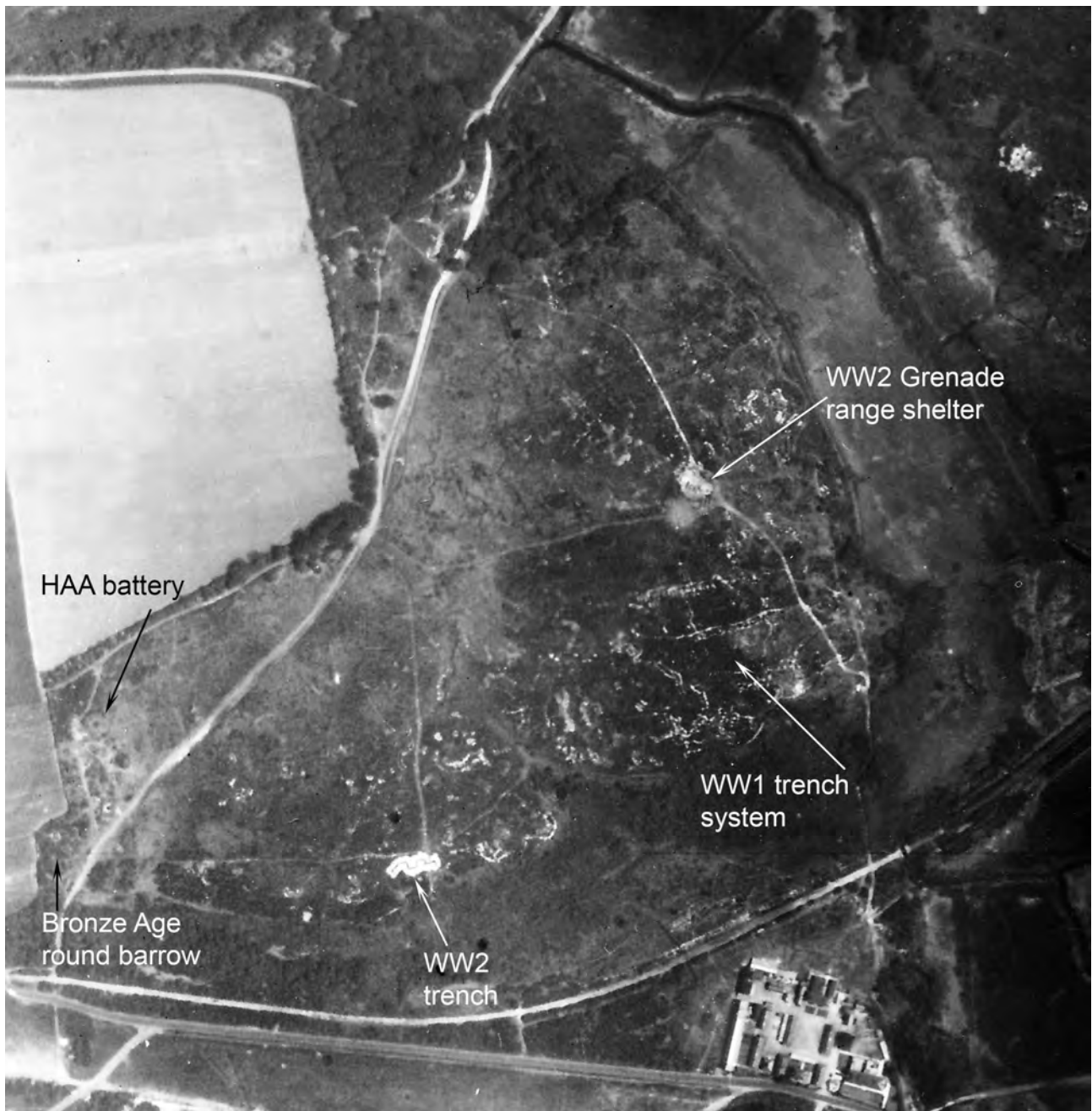


Figure 21: Browdown (north) in June 1942 [Historic England Archive, RAF Photography. Extract of [RAF/HLA/623/6 113 21-JUN-1942](#)]



Figure 22: Browndown trenches in April 1946 [Historic England Archive, RAF Photography. Extract of [RAF/3GTUD/IK/163 PTIII 5110 2-APR-1946](#)]



Figure 23: Browndown trenches in October 1950 [Historic England Archive, RAF Photography. Extract of RAF/541/TRG/51 4047 12-OCT-1950]



Figure 24: Browndown trenches in April 1951 [Historic England Archive, RAF Photography. Extract of [RAF 540/453 4214 05-APR-1951](#)]



Figure 25: Browndown trenches in April 1953 [Historic England Archive, RAF Photography. Extract of RAF/L82/F766/0349 21-APR-1953]



Figure 26: Browndown trenches in March 1959 [Historic England Archive, RAF Photography. Extract of 58/RAF/2722 0010 02-MAR-1959]



Figure 27: Browndown trenches in December 1961 [Historic England Archive, RAF Photography. Extract of [RAF 58/4844 025 18-DEC-1961](#)]



Figure 28: Browndown trenches in December 1966 [Historic England Archive, RAF. Photography Extract of [RAF/7234 0002 V 23-FEB-1966](#)]



Figure 29: View of the trenches in the centre of Browdown Ranges (north) looking south-west. [Damian Grady © Historic England Archive [HEA 26943_032 19-APR-2011](#)]



Figure 30: View of the trenches in the centre of Browdown Ranges (north) looking south-east. [Damian Grady © Historic England Archive [HEA 26943_036 19-APR-2011](#)]

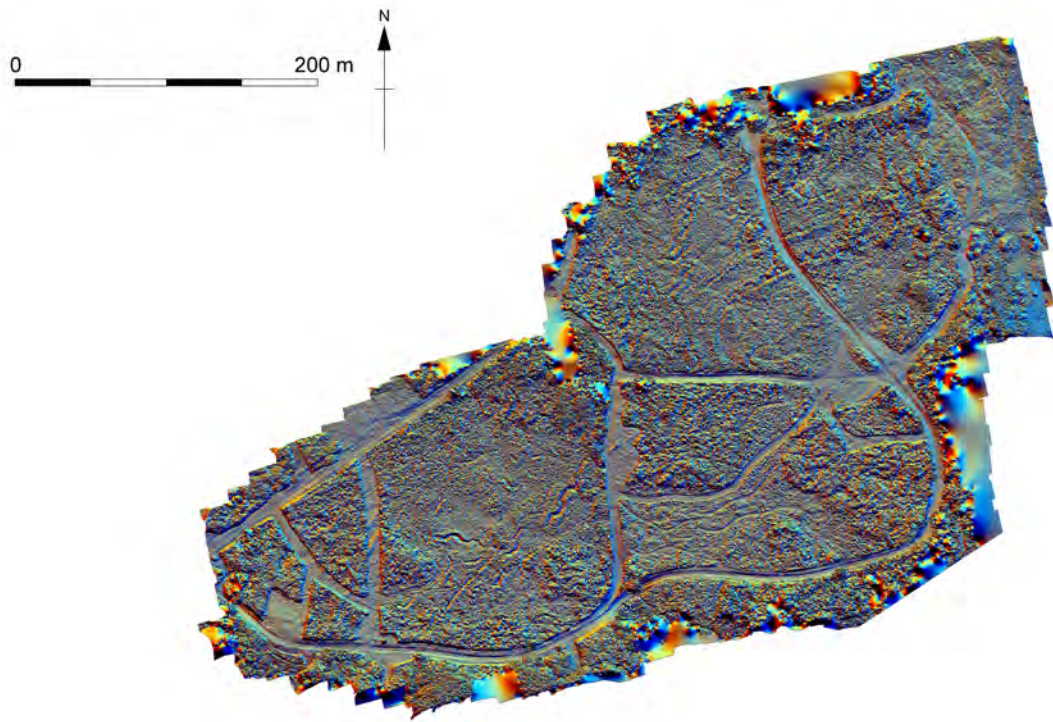


Figure 31: Digital Elevation Model of Browdown trenches derived from 03/12/2019 Historic England UAS photography and visualised as a 16 direction hillshade [© Historic England]

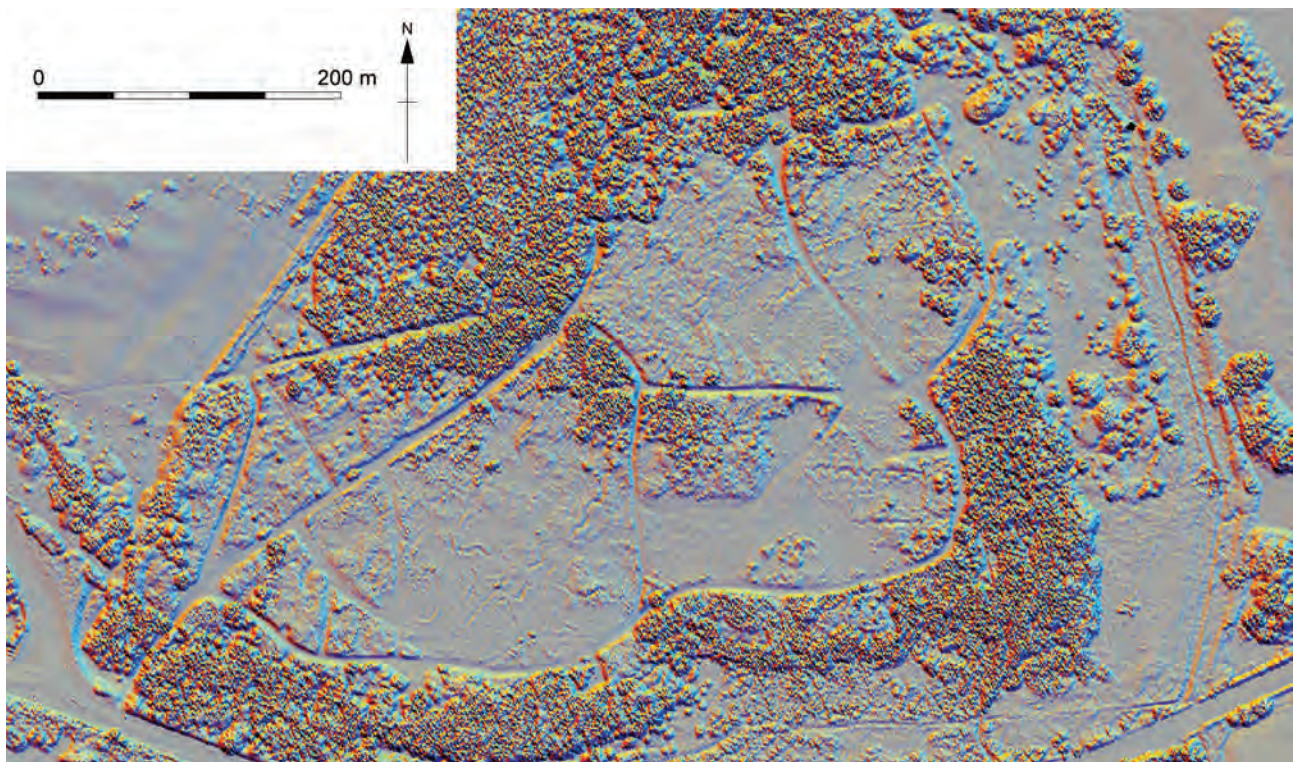


Figure 32: Environment Agency lidar DSM data 16 direction hillshade visualisation [© Historic England, derived from 1m lidar data © Environment Agency copyright and/or database right (2023)]

The earthwork evidence

Opposing Frontlines

The most easily recognisable features at Browndown are a complex of opposing frontline trenches on the eastern side of the study area, approximately 3.5ha in extent (see fig 33). Echoing trench layouts shown in field manuals (e.g. Solano 1916 and Anon 1916a & b) (see figs 34 and 35) and seen on the Western Front, the complex consists of two opposing sets of crenellated frontline or 'fire' trenches, with associated support and reserve trenches, linked by perpendicular communication trenches. The opposing sets of trenches are separated by an approximately 130m wide 'no-man's-land'.

Elements of the northern part of this complex were investigated within earthwork survey area 1. At the time of survey (January 2000 to December 2022) these features were most exposed to the west of the main north-west to south-east track in area 1 (fig 36). The southernmost major feature recorded is a 43m length of crenellated 'fire' trench (fig 36, feature A-A, and figs 37-38). The fire trench is approximately 2.5m wide by 1m deep. It consists of a series of 9m wide forward-facing fire bays, separated by 2.5m wide traverses. Traces of parapet and *parados*¹ banks, up to 0.35m in height, survive on the forward and rear edges of the trench respectively. No internal structural elements (e.g. fire-steps) were observed in this or any of the other trenches at Browndown.

20m to the north of the frontline is a 55m length of straight 'support' trench up to 2m wide and approximately 0.7m deep (fig 36, feature B-B). A 0.25m high *parados* was recorded to the north of the 'support' trench. A more irregular 'reserve' trench was recorded between 8 and 16m to the north of the support trench (fig 36, feature C-C). This trench was harder to discern, but where present, is approximately 0.3m deep by 2m wide. The fire and support trenches are connected by an irregular 'communication' trench, up to 4m wide and 0.8m deep (see fig 36, feature D-D). A discrete negative feature between the fire and support trenches is likely to be a shelter bay (fig 36, feature E and see also fig 42, feature E). Additional well-preserved elements of the northern frontlines were recorded to the east of the track (see cover image). A site visit at the time of writing (June 2023) showed that much wider areas of these trenches to the east of the track have been exposed by a gorse fire (fig 39).

Although parallel with the northern frontline complex (fig 36, features A, B, C), a 41m length of steep sided, straight trench (figs 36 and 42, feature F), measuring approximately 1m wide by 0.20m deep, is very different in character to surrounding features, and is most probably later in date. At its western end it cuts the bank associated with part of an irregular trench complex and aligns with an infilled portion of trench (fig 42).

Substantial areas of the 'no-man's-land' have been disturbed by subsequent phases of trench digging and, more comprehensively, by the later construction of grenade ranges (see below). Most of the southern 'fire trench' is currently covered in thick vegetation. However, observations made at its eastern end, as it emerges from thick gorse into more

1 A *parados* is a bank constructed immediately behind a trench, giving protection from being fired on from the rear and preventing the occupants of the trench being seen in silhouette

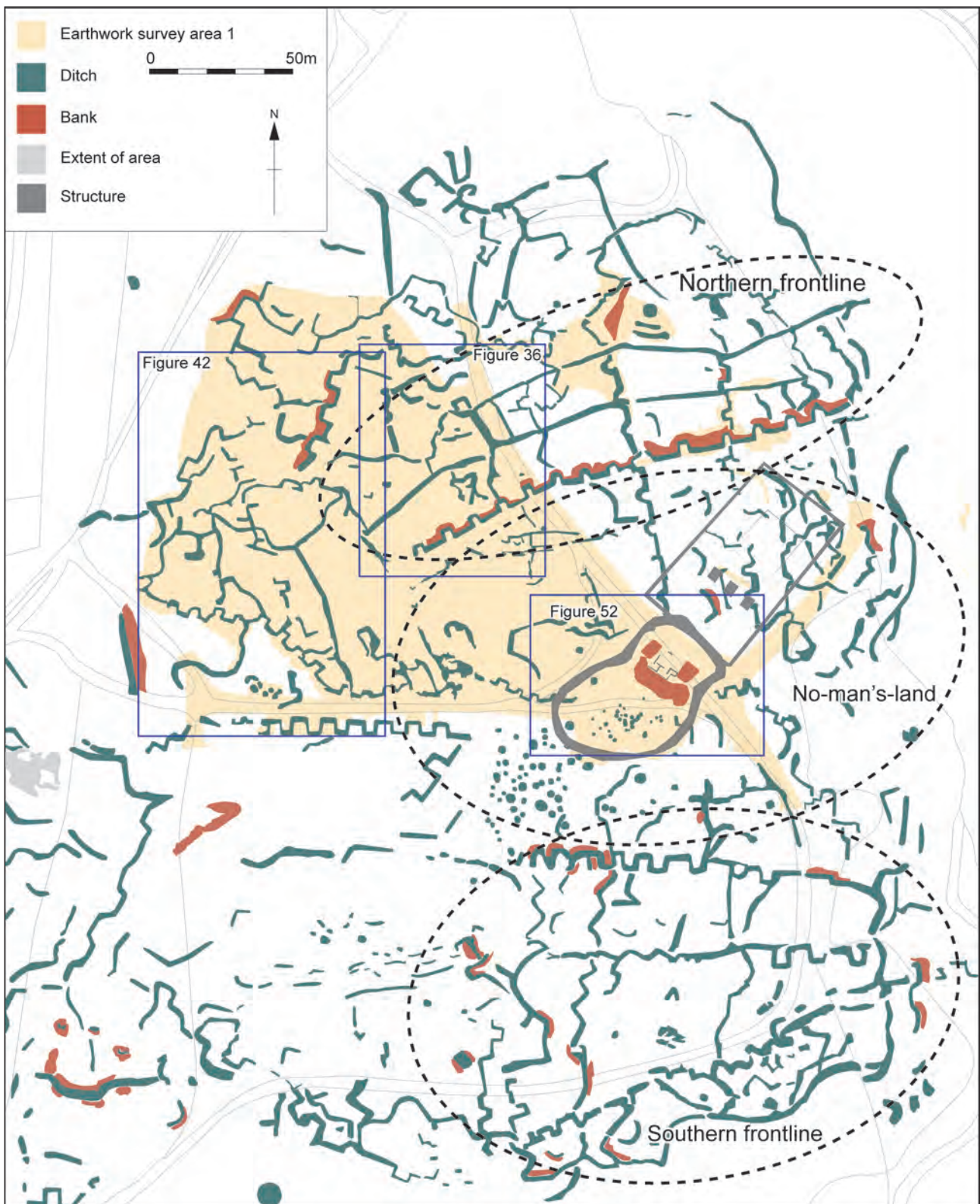


Figure 33: Earthwork survey area 1. [© Historic England. Base mapping © Crown Copyright and database right 2023. All rights reserved. Ordnance Survey Licence number 100024900]

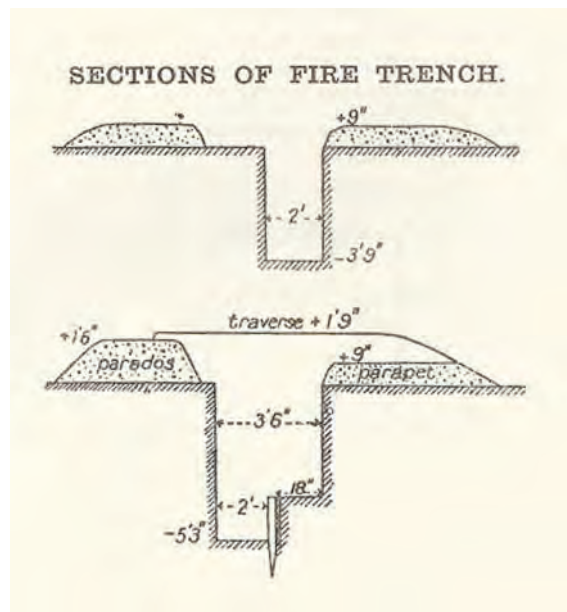


Figure 34: Diagram of First World War fire trench section from 'Notes on Trench Warfare for Infantry Officers' (Anon 1916b, fig 7)

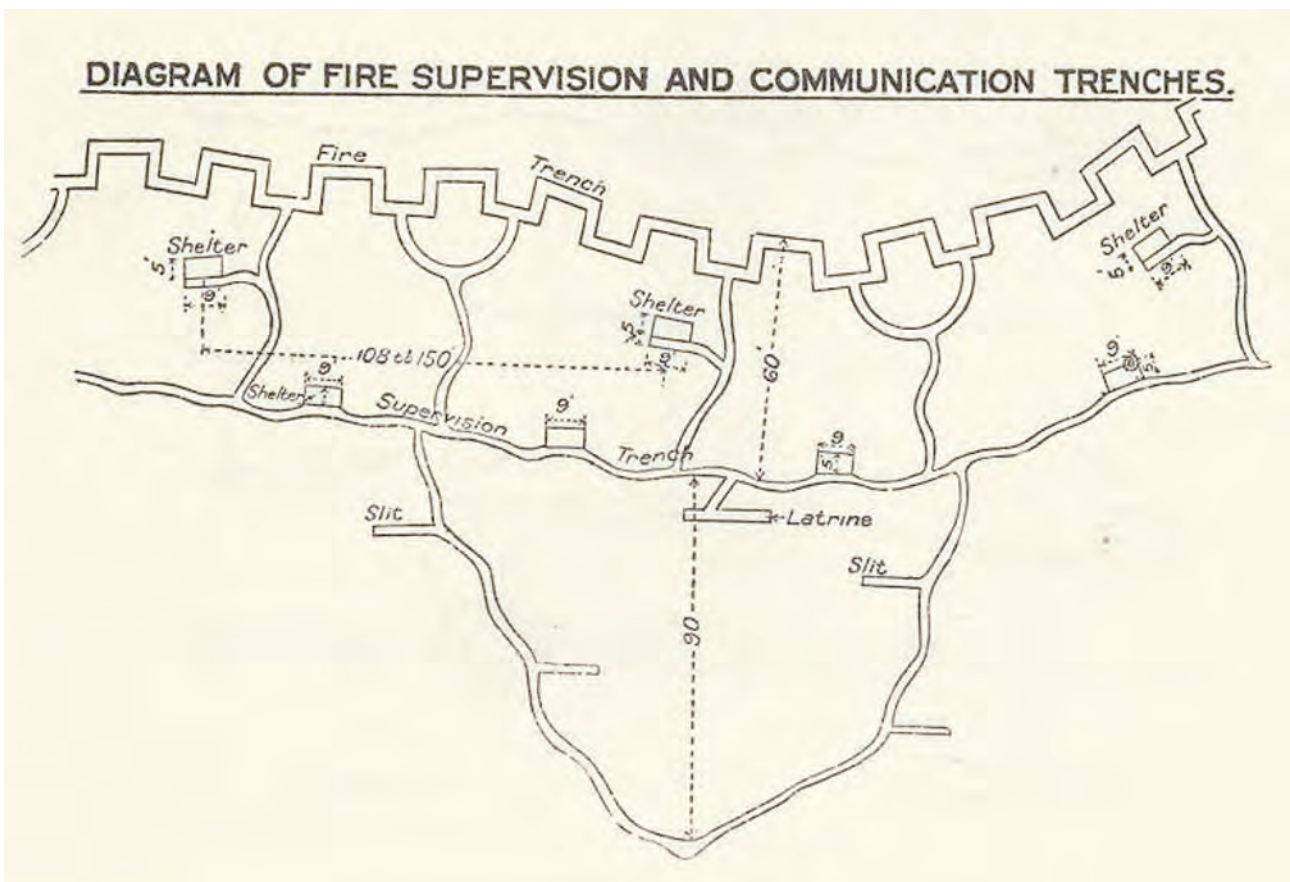


Figure 35: First World War trench layout from 'Notes on Trench Warfare for Infantry Officers' (Anon 1916b, fig 2)

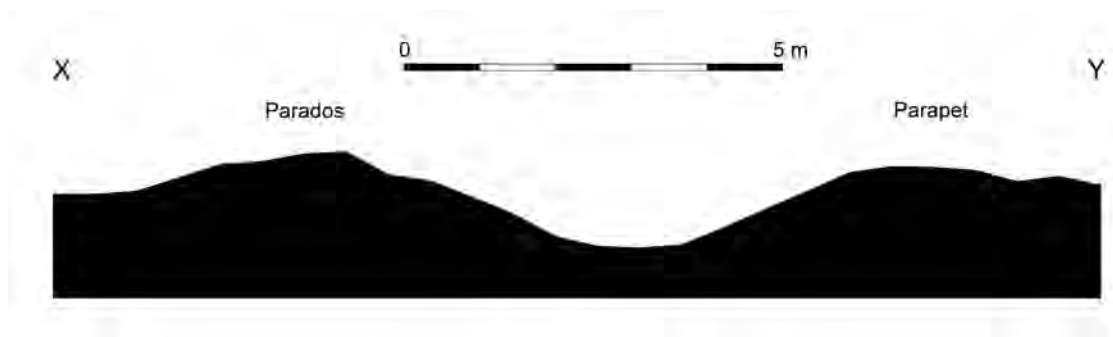
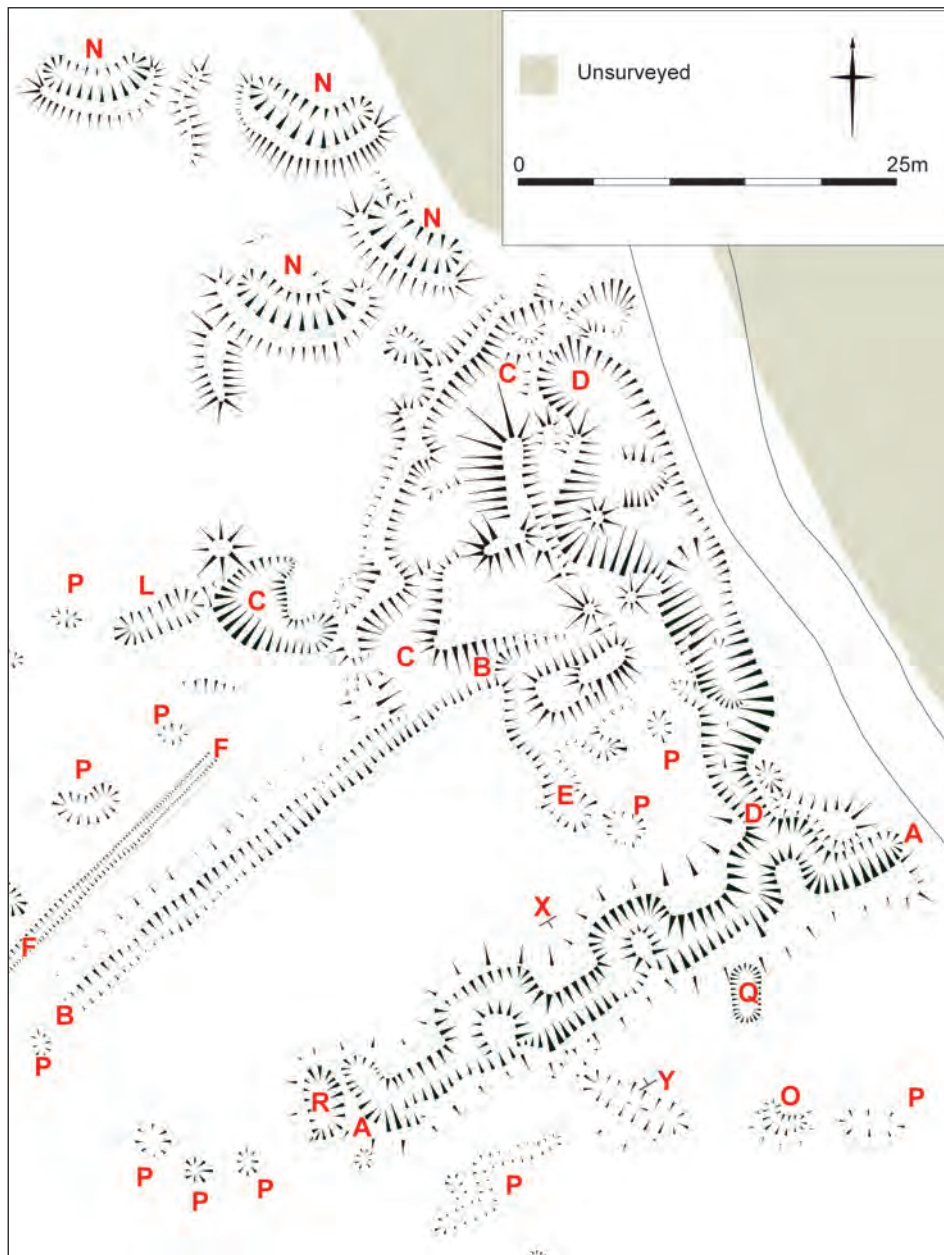


Figure 36: Northern frontlines, earthwork survey area 1, scale 1:500. [© Historic England. Base mapping © Crown Copyright and database right 2023. All rights reserved. Ordnance Survey Licence number 100024900]. Profile X-Y across frontline 'fire' trench A.

open woodland, suggest that it is well preserved. A rapid walkover survey suggests that the southern communication, support and reserve trenches are also well preserved under woodland in abandoned survey area 3 (figs 40-41). It is interesting to note that the extent of the southern component of the opposing frontlines is constrained by local topography as the land falls towards the unnamed water course on the southern edge of the site.

The earliest aerial photographic evidence of the opposing frontline trench complex is from June 1923 (fig 19). Elements of the south-east corner of the southern frontlines are just visible in the corner of the photograph suggesting a First World War origin for this complex.



Figure 37: Northern frontlines, earthwork survey area 1, looking north-west, 06/05/2021 [Steven Baker. © Historic England Archive. DP326063]



Figure 38: Northern frontlines, earthwork survey area 1, looking west, 22/04/2021 [James O. Davies. © Historic England Archive. DP276025]



Figure 39: Northern frontlines, earthwork survey area 1, east of the track, looking north-west, 22/06/2023. [Olaf Bayer. © Historic England Archive. AF00452/P002]



Figure 40: Southern frontlines, earthwork survey area 3, looking west, scale 1m, 06/05/2021 [Olaf Bayer. © Historic England Archive. AF00452/P003]



Figure 41: Southern frontlines, earthwork survey area 3, looking east, scale 1m, 06/05/2021 [Olaf Bayer. © Historic England Archive. AF00452/P004]

Irregular trench complexes

Adjacent to the 'text book' opposing frontlines are several areas of more irregular trench complexes. The most extensive of these was investigated on the western edge of earthwork survey area 1 (figs 42-44). At approximately 1ha in extent, this complex comprises a series of interconnected elements of crenellated, wavy, and straight trenches. Trenches are up to 3.8m wide by 0.9m deep with elements of parapet/parados banks surviving in some locations. In places elements of these trenches have been slighted by more recent vehicle tracks (fig 42, feature G) and other areas appear to have been infilled (fig 42, features H). Unauthorized digging in summer 2020 exposed a section across a back-filled trench, confirming the presence of infilled trench elements not apparent on the surface (see figs 45-46). The digging occurred after earthwork survey had been completed in survey area 1. Its location is indicated in fig 42 (location I). The earliest aerial photographic evidence of this irregular trench complex is from March 1942 (fig 22). These features show no sign of recent disturbance suggesting a pre-1942 date for their construction.

Isolated lengths of crenellated trench

Several isolated lengths of crenellated trench were also recorded (e.g. fig 42 feature J-J). The earliest aerial photographic evidence of these trenches is from March 1942 (fig 22). Most of these features show little sign of recent disturbance suggesting a pre-1942 date for their construction. A single example towards the south-west corner of the site, and closer to the heavy anti-aircraft battery (see below) shows evidence of recent disturbance or excavation.

In addition to trenches with regular right-angled crenellations, several trenches with more elongated, wavy crenellations were investigated in area 2 of the earthwork survey (fig 48 feature K-K, and fig 49). Typically constructed with a south-west/north-east orientation and in lengths of up to 40m, these trenches are up to 4.5m wide by 1.25m deep and are flanked by substantial banks on either side. Some individual crenellations are up to 15m in length. Although not 'text book' examples of First World War trenches, disturbances in the same location and on the same orientation as these features can be seen on June 1923 aerial photography (see figs 19 and 20), suggesting that they are of First World War date. It is possible that some of the isolated lengths of crenellated trench were the result of practicing digging trenches (cf Appleby et al. 2015, 39; Brown and Osgood 2009, 30), in contrast to the opposing frontlines and irregular trench complexes which seem more likely to have been used for practicing living and fighting in trenches.

Other trenches

A number of other, generally shorter, lengths of trench were recorded, predominantly in earthwork survey area 2 (fig 48). This includes several straight (fig 48, features L), as well as 'U' or 'V'-shaped trenches (fig 48, features M). Several of these trenches run parallel with the principal south-west to north-east axis of the main elongated crenellated trenches. These features are up to 2m wide and between 0.3 and 0.8m deep, many with banks to one side. The majority of these features are visible on aerial photography from 1942 (see fig 22). Some show traces of recent upcast whilst many show no sign of recent

disturbance. A pre-1942 date of construction is suggested for these features.

Semi-circular platforms

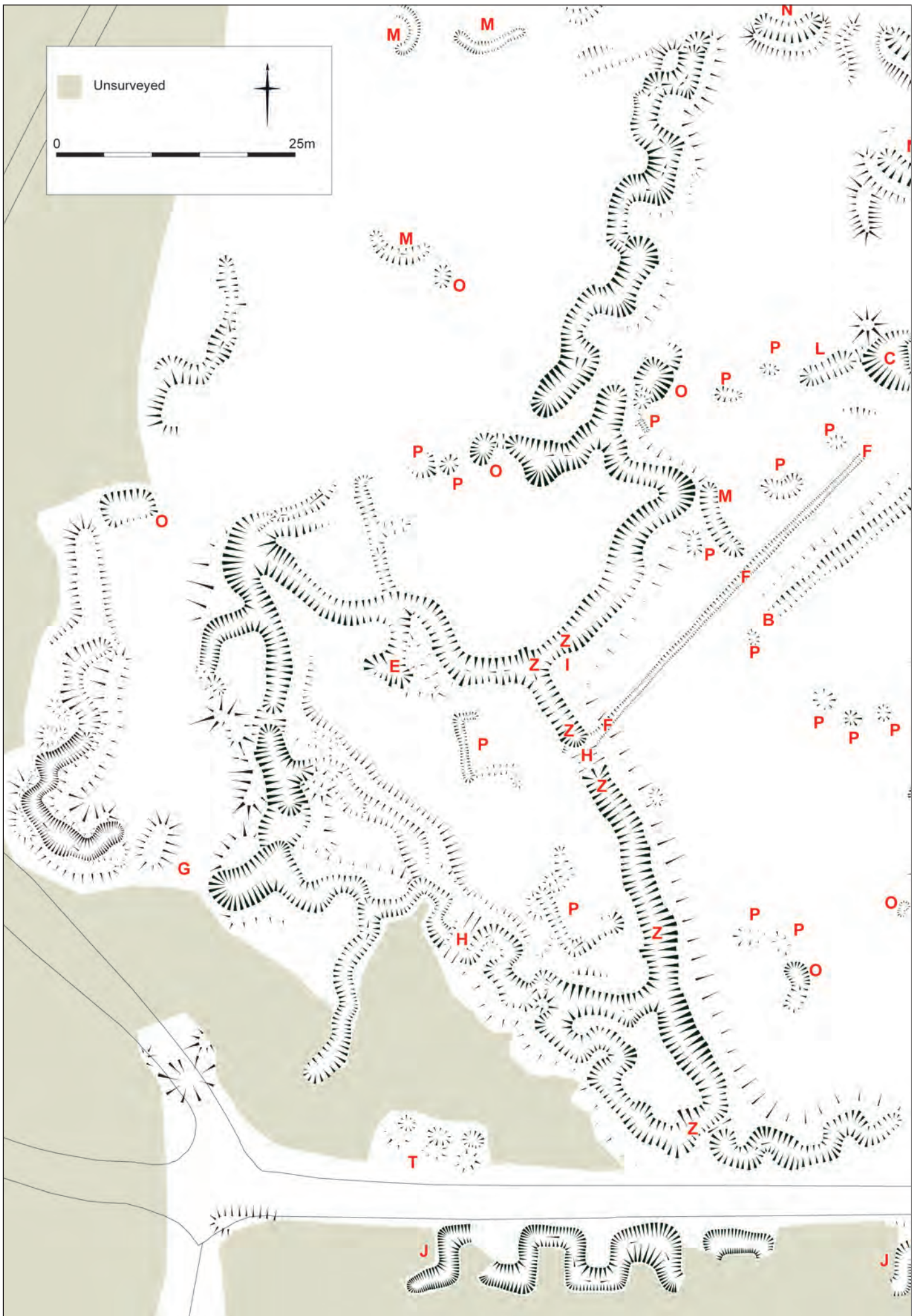
A group of four semi-circular platforms were identified towards the northern edge of earthwork survey area 1 (fig 36 features N). Each comprises a semicircular level platform fronted by a crescent of ditch 0.2-0.3m deep by 1m wide, with an external bank up to 0.25m high by 2.5m wide (fig 50). These features may be mortar/light artillery positions (Roger JC Thomas pers comm 2023). The features show no sign of recent disturbance on March 1942 aerial photography (see fig 22), indicating a pre-1942 date of construction.

Pits and shallow trenches


A range of other smaller pits and short shallow trenches were recorded across earthwork survey areas 1 and 2. The most substantial (figs 36, 42 and 48, features O) are up to 4m by 2m in extent by 0.6m deep, often with surrounding banks, or spoil heaps to one side. Several other, generally much smaller and shallower (< 0.25m deep), features were also recorded (figs 36, 42 and 48, features P). All of these more discrete features are necessarily harder to identify on aerial photography and as a result are more difficult to define chronologically. It is considered likely that many of these features relate to post Second World War activity. For example, in at least two instances they are dug into probable First World War features (fig 36 features Q and R), and in a further example (fig 48, feature S) contains a length of substantial concrete pipe used as a crawl-way/ tunnel (fig 51).

A group of three sub-circular pits (fig 42, features T) were identified on the northern edge of the east/west trackway that forms the southern edge of earthwork survey area 1. The pits measure between 1.8 and 2.5m in diameter and up to 0.45m deep, with associated mounds, up to 0.25m high on their southern sides. It is suggested that these features are 'foxholes' designed to conceal troops on the track edge. These features show no sign of recent disturbance on March 1942 aerial photography (fig 22), indicating a pre-1942 date of construction.

Figure 42: Irregular trench complex, earthwork survey area 1, scale 1:500 (page 40). [© Historic England. Base mapping © Crown Copyright and database right 2023. All rights reserved. Ordnance Survey Licence number 100024900]



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Figure 43: Irregular trench complex, earthwork survey area 1, looking south-west, 06/05/2021 [Steven Baker. © Historic England Archive. DP326065]



Figure 44: Irregular trench complex, earthwork survey area 1, looking south-west, 23/04/2021 [Olaf Bayer. © Historic England Archive. AF00452/P005]



Figure 45: Infilled trench exposed in section by unauthorised digging in earthwork survey area 1, looking south, 01/04/2021 [Olaf Bayer. © Historic England Archive. AF00452/P006]



Figure 46: Infilled trench exposed in section by unauthorised digging and damage caused by BMX bikes in earthwork survey area 1, looking south, 06/05/2021 [Steven Baker. © Historic England Archive. DP326064]

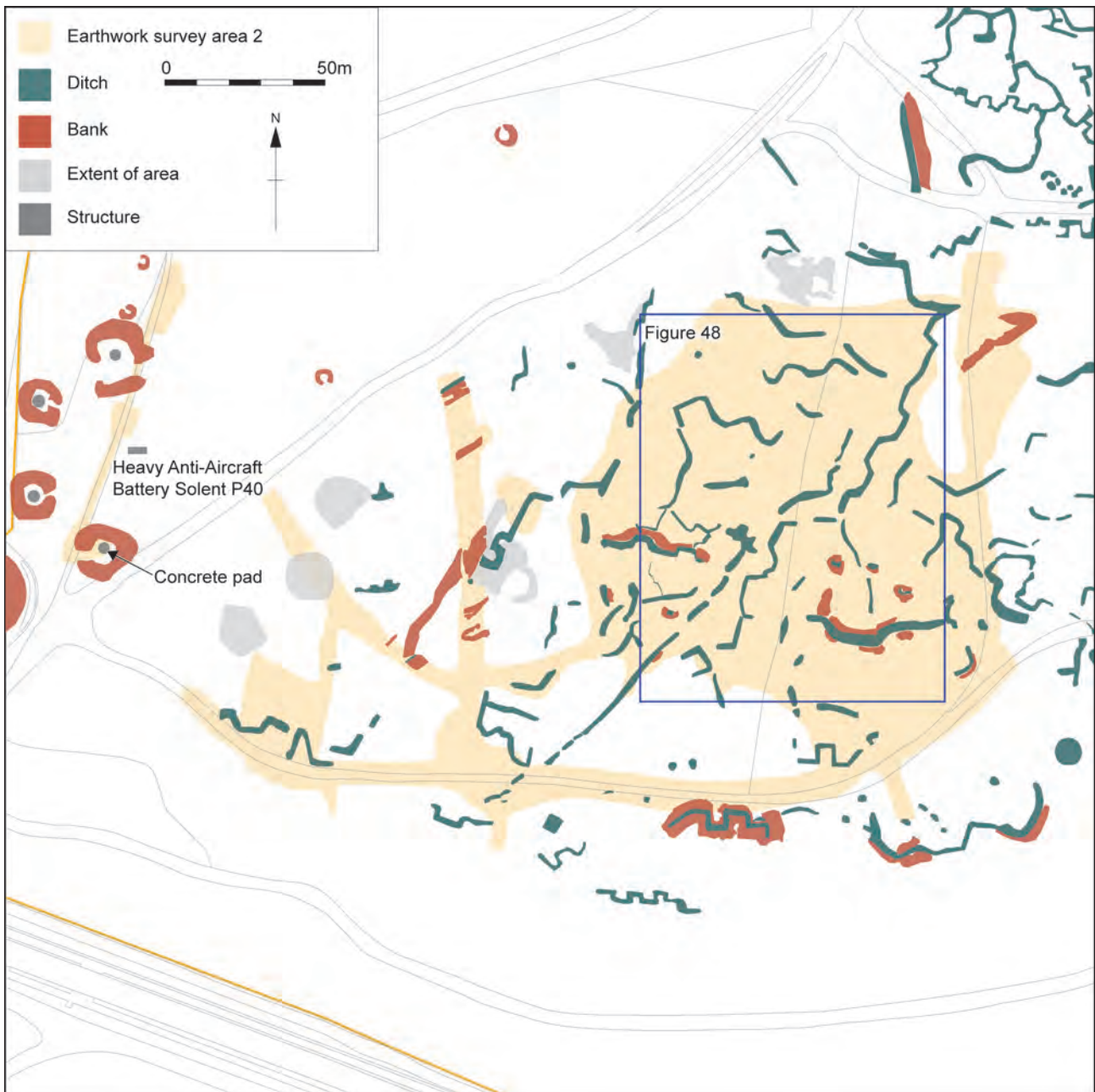


Figure 47: Earthwork survey area 2, location. [© Historic England. Base mapping © Crown Copyright and database right 2023. All rights reserved. Ordnance Survey Licence number 100024900]

Figure 48: Earthwork survey area 2, detail, scale 1:500 (page 44). [© Historic England. Base mapping © Crown Copyright and database right 2023. All rights reserved. Ordnance Survey Licence number 100024900]

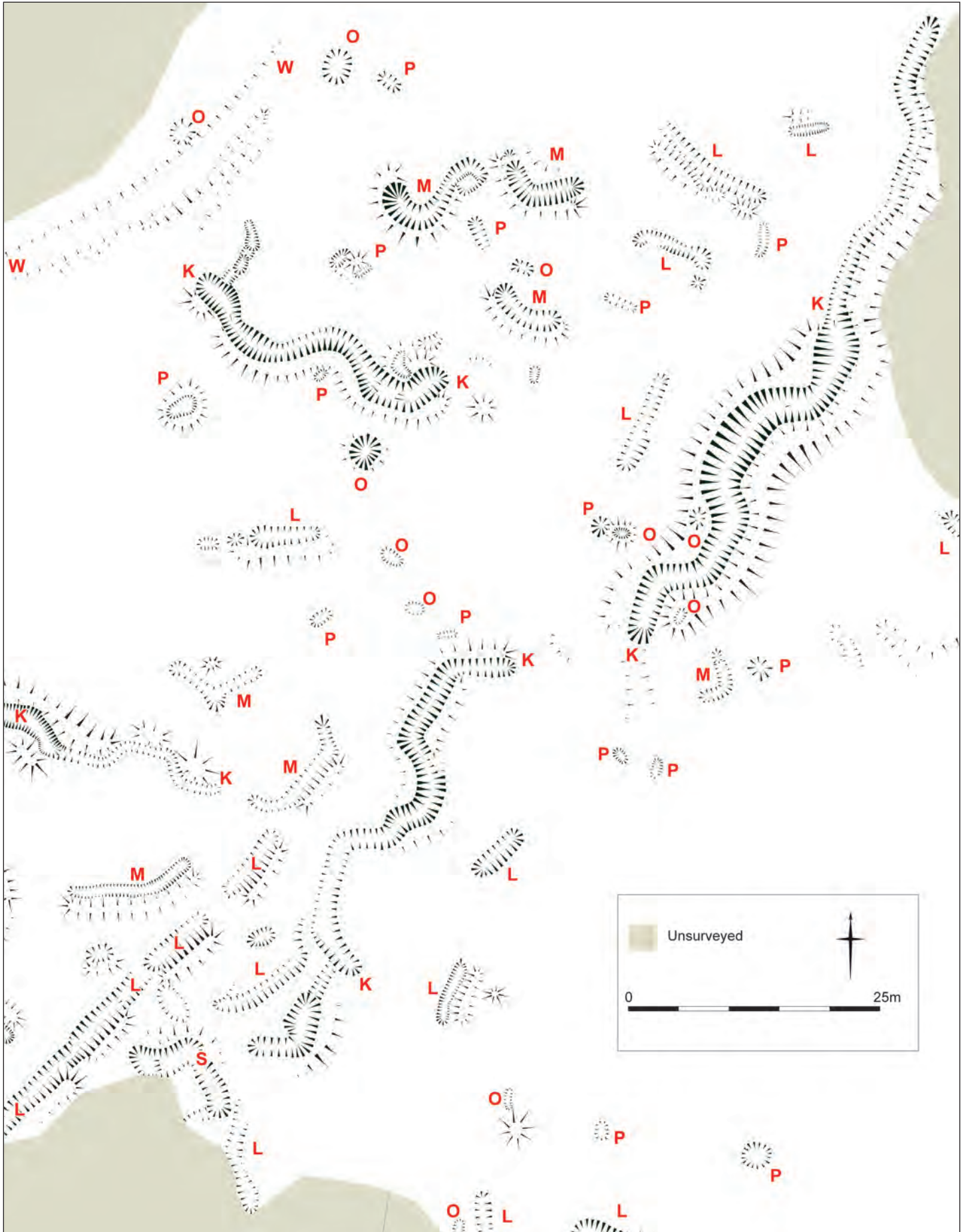




Figure 49: Trench with elongated crenulations, earthwork survey area 2, looking north-east, 23/01/2021 [Olaf Bayer. © Historic England Archive. AF00452/P007]



Figure 50: Crescent-shaped platform, earthwork survey area 1, looking south, 1m scale, 23/01/2021 [Olaf Bayer. © Historic England Archive. AF00452/P008]

Later twentieth-century activity

The site remains in MoD hands and continues as a training area to the present day. A handful of spent ammunition cartridges found in earthwork survey area 2 date from the Second World War, as does a Mill's grenade base plug from the same area. Other spent cartridges date to the 1990s and 2000s (Jim Rylatt pers comm). The concrete pipe inserted into a trench in earthwork survey area 2 (fig 48, feature S and fig 51) probably reflects later twentieth-century training. It is likely that many of the smaller features recorded in earthwork survey areas 1 and 2 are also later twentieth-century in date (figs 36, 42 and 48, features O and P, and fig 36, features Q and R)

Heavy Anti-Aircraft Battery

Aerial evidence

On the western edge of the heath at SZ 5792 9961, between March and June 1942 a Heavy Anti-Aircraft Battery (HAA) (Solent P40) was established with four 3.7-inch static guns covering the western end of Stokes Bay (Dobinson 2001, 578; HERR 1413411). RAF aerial photographs taken in June 1942 (fig 21) show the site with four embanked enclosures forming an arc open to the east with a single rectangular hut, probably the command post, located at the centre of the arc (fig 47). Some distance to the east of the round barrow, the remains of a single length of crenellated trench surrounded by freshly exposed upcast material can be seen on the photographs taken in March and June 1942 (see figures 20 and 21). This trench had clearly been recently excavated or re-dug, possibly functioning as an air raid shelter trench for the crew manning the HAA emplacement rather than new entrenchment practice works. A path can be seen linking the HAA site to the trench.

Earthwork evidence

Few surface traces of the HAA site were identified on the ground due to thick gorse in this area. Elements of the southern-most gun position were recorded. This consisted of anti-aircraft holdfast mounting No. 2b Mk. II (Roger J C Thomas pers comm 2023), comprising a subcircular concrete pad measuring approximately 3.5m in diameter with associated inset metalwork (figs 47 and 52) and two very slight banks.

Grenade ranges

Aerial and earthwork evidence

The remains of a grenade range are visible within the 'no-man's land' separating the two sets of opposing frontline trenches. First appearing in photographs taken in March 1942 (fig 20), these features are likely to date from the Second World War, but may have earlier origins (see mention of 'bombing practice' in the 1936 OS surveyor's description of the round barrow ([HERR 461580](#), Authority 2)). The photographs show the remains of a rectangular roofless structure c10m by 5m at SZ 5837 9970, on the line of the north-



Figure 51: Concrete pipe inserted into earlier trench, earthwork survey area 2, looking south, scale 1m, 23/01/2021 [Olaf Bayer. © Historic England Archive. AF00452/P09]



Figure 52: Concrete anti-aircraft gun holdfast, earthwork survey area 2, looking south, 1m scale, 01/04/2021 [Olaf Bayer. © Historic England Archive. AF00452/P010]

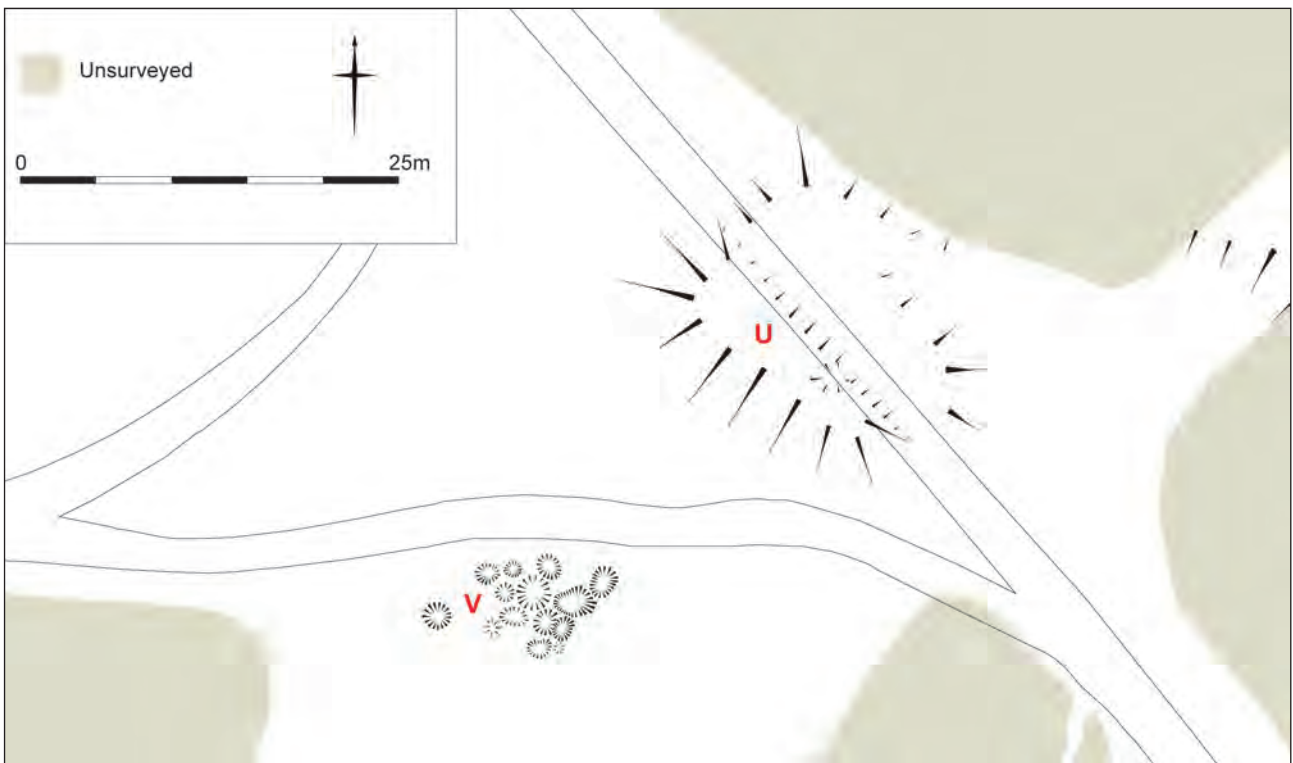


Figure 53: Grenade range, earthwork survey area 1, scale 1:500. [© Historic England. Base mapping © Crown Copyright and database right 2023. All rights reserved. Ordnance Survey Licence number 100024900]



Figure 54: Grenade range, earthwork survey area 1, looking north-east, 1m scale, 23/01/2021 [Olaf Bayer. © Historic England Archive. AF00452/P011]



Figure 55: Abandoned barbed wire and stakes, between earthwork survey areas 1 and 3, looking south, 1m scale, 19/08/2023 [Olaf Bayer. © Historic England Archive. AF00452/P012]

west/south-east track across the site. This is the concrete shuttered shelter from which the grenades were thrown in a south-westerly direction. It is likely that the 'command post' (Hamel and Lambert 2016, 24) and 'pill box' (Historic England 2017b, 10) mentioned by previous researchers, is in fact this structure.

Traces of the shelter survive alongside and beneath the present-day north-south track as a spread earthwork approximately 22m wide by up to 0.6m high (fig 53, feature U and fig 53 and fig 54). The impact zone to the south-west of the shelter is pock-marked with numerous small craters. These craters form two distinct groups. Between 20m and 30m from the concrete shelter is a small cluster of craters between 1- 2m in diameter and 0.1-0.2m in depth, some with associated up cast mounds (features V, fig 53), about the average distance a grenade could be manually thrown (Roger J C Thomas pers comm 2020).

Further to the south-west, between 40m and 60m from the shelter is a second, larger and more dispersed group of craters, possibly from different grenades which were launched by mechanical means. These craters are on average twice as big as the nearer grenade craters. Numerous fragments of hand grenade casing were found across the impact area.

The grenade range appears to have been un-fenced during its initial use, but photographs taken in 1951 (fig 24) suggest there is an irregular fence or barbed wire enclosure around the concrete shelter, and photographs taken in 1961 (fig 27) show the entire range, including a small cratered impact zone 20m to the south-west, enclosed within a line of vegetation suggesting it was fenced-off by this stage. A dump of barbed wire and stakes immediately to the south of the range is likely to be the remains of this fencing (fig 55).

When photographed in 1966 (fig 28) the grenade range shelter had been demolished and the enclosing fence removed, and a new grenade range installed immediately to the north-east. This new site was enclosed by a rectangular fenced compound (40m x 60m) centred at SZ 5840 9974. Within the south-western end of this compound were three rectangular huts, each measuring 3.5m x 4.5m and set 3.5m apart. A large (pale) rectangular target area 16m x 18m filled much of the north-eastern half of the enclosure. The row of three huts was for introduction, training and debriefing of trainees, and grenades were launched into the target area from bays set between the huts. The area immediately to the south of this enclosure also appears to have been disturbed and was possibly a second less formal grenade range (Roger J C Thomas pers comm 2020). The range enclosure and huts were shown on 1965 OS mapping (fig 11), but are absent from the 1976 revision (fig 12).

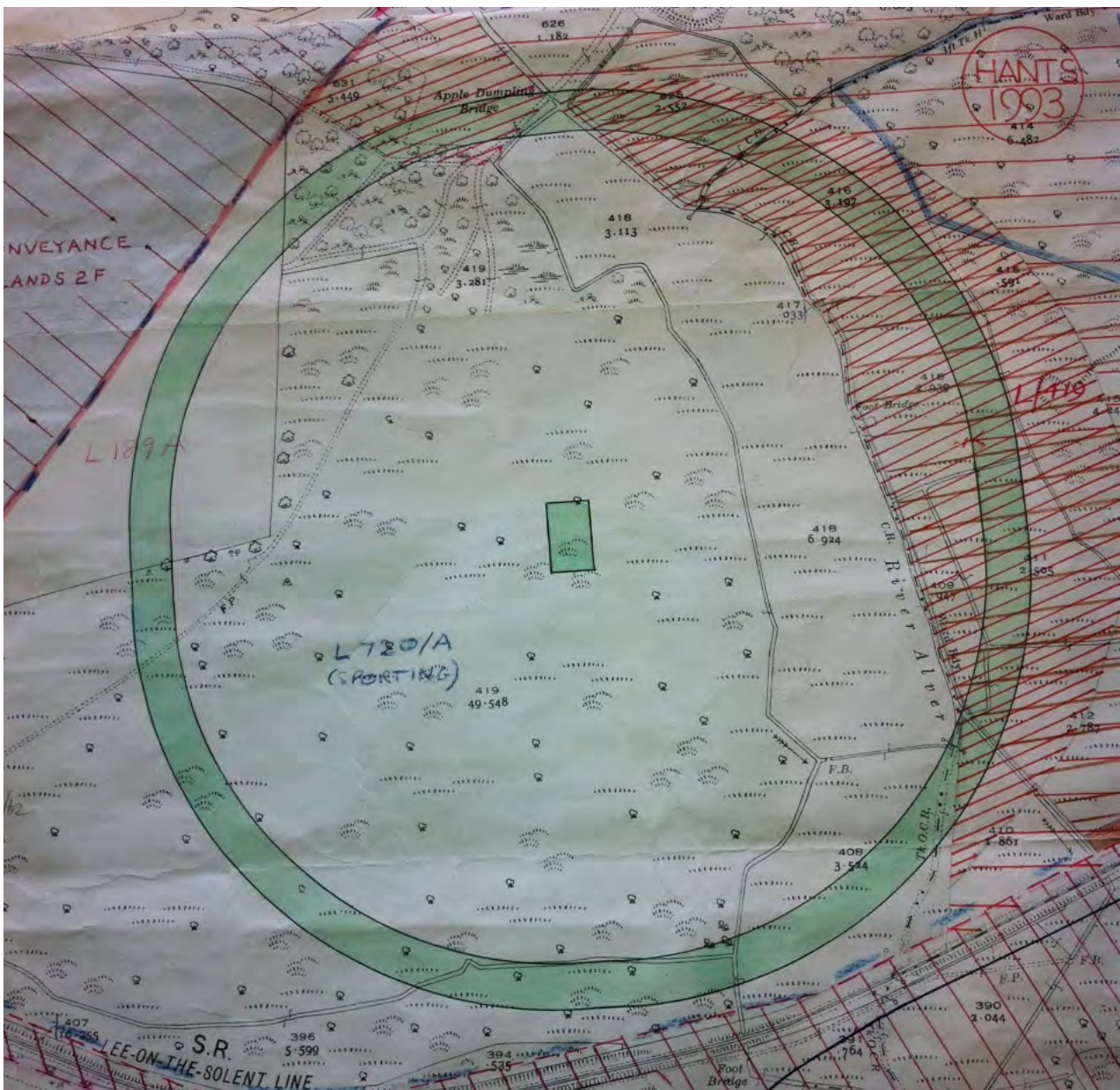


Figure 56: Plan of proposed grenade range [source Gosport Borough Council]



Figure 57: Damage caused to irregular trench system by BMX track, earthwork survey area 1, looking north. 1m scale. 01/04/2023 [Olaf Bayer. © Historic England Archive. AF00452/P013]



Figure 58: Damage caused to irregular trench system by BMX track, earthwork survey area 1, looking west. [Damian Grady © Historic England Archive. [35065_007 08-06-2021](#)]



Figure 59: Ecological management scrape between earthwork survey areas 1 and 2, looking north-east, 08/04/2022. [Olaf Bayer. © Historic England Archive. AF00452/P014]

An extract of mapping (fig 56) purported to date from 1938 shows the location of a ‘New Grenade Range at Browdown’. The site of the range is marked as a green rectangle and the limit of the danger area marked around the entire area as a green circle. This site lies immediately to the north of the Second World War range and immediately to the west of the post-war grenade range, all approximately central to the encircling danger area. What is not clear is whether the grenade range annotated on the map of 1938 was a speculative or actual location of a pre-war grenade range. However, there is some question surrounding the actual date of this map. The accompanying legend is annotated with: “*Pumping Station – area sold 3-10-58 to Gosport B.C-G254*”, and an addition in another hand dated 9/5/62.

Trackways

Aerial and earthwork evidence

Historic mapping and aerial photography (figs 7-12 and 20-28) show the proliferation of trackways across the study area, particularly since the Second World War. Linear features recorded towards the northern edge of earthwork survey area 2 (fig 48 features W) are part of a now obsolete trackway first visible on April 1951 aerial photography (fig 24).

Other Activity

A portion of the irregular trench complex in earthwork survey area 1 was damaged by the unauthorised construction of a BMX/mountain bike track. This occurred during the 2020 COVID19 lockdown whilst nearby purpose-built facilities were closed. The extent of the damage is indicated in (fig 42, features Z; see also figs 57-58). The impacted trench had already been recorded prior to the damage occurring.

In April 2022 several machine-dug scrapes for ecological management were observed. In places these have impinged on earlier earthworks (fig 59 and fig 70 features 1-7).

Discussion

Prehistoric and possible medieval activity

The ditched mound investigated in the south-west corner of the study area is almost certainly a round barrow, as previously recorded. Despite Civil's claim, quoted above, it is not exceptionally large for a bowl barrow. These burial mounds have a wide size range, with diameters between 12m and 32m being common, though most are less than 25m. Heights of the surviving mounds are determined by erosion, and especially by ploughing, as much as by original construction but barrows over 2m high are not uncommon and some can be at least twice that height. The great majority of bowl barrows are of Early Bronze Age date but some were re-modelled and re-used in later periods and some new ones were constructed, particularly in the early medieval period. The location initially appears unusual for a prehistoric burial mound but this may be misleading; barrows were constructed in a wide variety of locations but the surviving earthwork population tends to be in upland areas because those in low-lying situations have largely been levelled by ploughing.

There was clearly much activity in the Alver Valley throughout prehistory, as evidenced by numerous finds of artefacts from lower Palaeolithic to Iron Age in date (see e.g. HERR records [234391](#), [234396](#), [234410](#), [234464](#), [461573](#) and [461580 - Authority 2](#); Kemp and Rogers 1984). It has also been suggested that the motte near Apple Dumpling Bridge, 0.75km to the north-east, was a barrow originally (Hampshire [HER 22561](#); Bowden 2023) though there is no evidence for this and it may be a misunderstanding of a comment by Civil that the motte 'resembled' a barrow (1951, 42). There are other possible examples of barrows in Alverstoke (see fig 1 and Hampshire Historic Environment Record [HER 19010](#)). Round barrows are well known on the heathland of the southern counties but are rare on the Hampshire coastal plain.

A feature of this mound that is unusual, but not unknown, for a bowl barrow, is the good preservation and sharp profile, in part, of its surrounding ditch. This might suggest a more recent date for the mound or at least a more recent modification. Another possibility for the origin of this mound is that it was a windmill mound of 12th-century or later date. Ironically, the motte near Apple Dumpling Bridge has in the past been erroneously interpreted as a windmill mound and specifically as the site of the documented mill belonging to Quarr Abbey; this it cannot be because it is the wrong side of the river (and demonstrably a motte – Bowden 2023). However, the mound under discussion here could be the site of that mill because it is close to Chark or Cherque where the monks had their mill, or it could be that the Cherque mill refers to an as yet undiscovered water mill. This mound falls within the higher end of the range of sizes for windmill mounds, which can be up to 30m in diameter and 2.0m high (information from [HERR database](#)), though that height would be exceptional and matched in Hampshire only by the mound known as Windmill Ball at Hale in the New Forest, which has also been suggested as a possible barrow ([HERR 217170](#)). Damage to the top of the mound under discussion prevents the observation of distinctive features that might lead to definite identification as a mill mound.

The possibility must be considered that this is a prehistoric burial mound that has been modified by use as a windmill mound in the medieval period. This would explain the good condition of the surrounding ditch and possibly the find of wheel-made pottery, which might be medieval, rather than Roman as Civil thought. The mound has certainly been modified by military use in the nineteenth and twentieth centuries.

First World War practice trenches

Context

Driven by advances in military technology defensive trenches became increasingly important in the late nineteenth century and first decade of the twentieth-century (Anon 1908, 48-63; Brown 2017, 7-8; Murray 2013). From as early as 1908 the War Office manual of '*Military Engineering*' gives detailed descriptions of the construction and layout of trenches (Anon 1908; 1911). Whilst in theory trench systems were part of the British Army's repertoire at the outset of the First World War in summer 1914, it was not until open, mobile warfare ground to a halt, and fixed frontlines formed during autumn/winter 1914, that their absolute importance became apparent (Brown 2017, 9; Griffiths 2004, 5). Experiences from the Western Front soon began to influence the training being given to thousands of new troops in Britain. This experience was communicated in person (Brown 2017, 9), and in pamphlets/manuals (e.g. Solano 1916; Anon 1914, 1916a & b, 1917a & b). As such there is a high degree of uniformity seen in the morphology of trenches and trench systems found at training camps in Britain and on the battlefields of the First World War (Brown & Field 2007, 170-172).

A standard British First World War trench system (see figs 34 and 35) comprised a crenellated front line, or 'fire trench', designed to give covering fire to other parts of the line and prevent blast or gun fire travelling down the trench. Behind this was the support or supervision trench and then the reserve lines. These were linked by perpendicular communications trenches with a zigzag plan to give maximum protection from enfilade (along the trench) gunfire or shell bursts. Projecting forward of the front line were spurs of trench, or saps, acting as listening and observations posts. Shelter bays were constructed along the communications and support trenches, some of which were covered or underground, which accommodated command and first aid posts/dressing stations. Further to the rear of the system were all the vital services necessary to maintain the troops and military operations: dugouts, cookhouses, Officers Command Posts, Communications (telephone) post, accommodation, the water supply, shelters and latrines.

Trench complexes for training troops in trench warfare were created in Britain from as early as 1914 (Thomas 1997) and became more widespread by 1915/16 (Brown 2017, 12-13). These practice trenches were created for several reasons. Trenches were dug to establish and maintain physical fitness and unit cohesion amongst new recruits (Appleby et al. 2015, 39; Brown and Osgood 2009, 30). They also provided a context to learn new skills, not only in how to dig, reinforce, repair and adapt trenches, but once created, in how to live and fight in them (Brown and Osgood 2009, 37).

Over the last twenty years there has been a growing recognition of, and interest in, the physical remains of the First World War in the UK. This was drawn into sharper focus by the centenary of the war (e.g. Appleby et al. 2015; Cocroft and Stamper 2018). Practice trenches are recognized as a widely distributed and numerous class of First World War field monument (Brown 2004, 2017; Historic England 2017b; Kendall 2018 16-20; Kenney and Hopewell 2015). Surviving as either extant earthworks or infilled/subsurface archaeological features, many examples have been investigated from the air (e.g. Carpenter et al. 2018, 81), by earthwork survey (e.g. Brown and Field 2007; Carpenter et al. 2018, 23; Newman 2011, 240), geophysical survey (e.g. Brown and Osgood 2009, 42; Pyper et al. 2021; Saunders 2017, fig 3), and by excavation (e.g. Brown and Osgood 2009, 44; Brown and Thompson 2018; Moore and Burgess 2016; Pyper et al. 2021; Ullathorne 2006; Saunders 2017).

Although there are a handful of references to practice trenches being created in 1914 (Brown 2004, 55; and see Thompson 1914 below), the majority appear to have been created from early 1915 onwards. Examples include trench complexes at Redmires, near Sheffield (Ullathorne 2006), Breary Banks, North Yorkshire (HERR [1479860](#)), and at Blaeberry Hill, Northumberland (Moore and Burgess 2016). These sites were created to train locally recruited 'Service' or 'Pals' battalions prior to their relocation to larger training centres, and eventual deployment on the continent (Kendall 2018, 16).

More extensive trench complexes were established on the large military training areas such as Salisbury Plain and Cannock Chase from 1915 onwards. Examples at Larkhill (Brown and Thompson 2018) and Perham Down (Wessex Archaeology 2017) on Salisbury Plain, and Sherbrook valley on Cannock Chase (Carpenter et al. 2018, 81-83) all had replica battlefields with opposing frontlines and support trenches separated by 'no-man's-lands'. Evidence from the excavated trench complex at Larkhill suggests that the trenches were dug, back-filled, re-dug and modified over a three-year period from 1915 to 1918 (Brown and Thompson 2018, 9-10).

When and by who were the Browndown trenches created?

It has proved difficult to establish exactly when, and by which troops, the Browndown practice trenches were dug and used. Given the presence of similar structures in pre-war military manuals it is plausible, but unlikely, that elements of the Browndown trenches could predate 1914. Equally military manuals in the late 1930s continue to include instructions for trench systems (Anon 1937), making it possible that some trenches post-date 1918. Brown (2004, 58) cautions against assuming that all trenches date from the First World War. However, given their morphological similarity to both other independently dated examples elsewhere in the UK, and plans in contemporary military manuals (e.g. Solano 1916; Anon 1916a, 1916b, 1917 and 1918), and the presence of some of the features on 1923 aerial photography, it is considered likely that most, if not all, of the more substantial trenches at Browndown were created during the First World War.

Royal Marines

The only documentary evidence of trench digging at Browndown comes from very shortly after the outbreak of the War. Writing in his diary on Monday 10th August 1914 James

Thompson (Plymouth Battalion of the Royal Marines Light Infantry - then part of the newly formed Royal Naval Division) states “*At Portsmouth. Fell in at 8 o’clock and marched to Browdown for trench digging.*” (Thompson 1914).

It is quite possible that the Royal Marines were responsible for subsequent episodes of trench digging at Browdown. Shortly after Thompson’s diary entry the Royal Naval Division was briefly deployed to Belgium before returning to Britain in October 1914 (Sparrow and MacBean Ross 1918, 13; Jerrold 1923). On their return the Portsmouth Battalion of the Royal Marines was temporarily stationed at Browdown before moving to a new purpose-built base at Blandford Forum (Jerrold 1923, 46). The presence of Royal Marines at Browdown during 1915 and early 1916 remains uncertain. During this time the Royal Naval Division was deployed in Gallipoli and then the Western Front (Jerrold 1923). In July 1916 the Royal Marines School of Musketry, later the Small Arms School of the Royal Marines, was founded at Browdown Camp (Friends of Stokes Bay 2023).

Volunteer Training Corps

In 1915 the Portsmouth Evening News refers to a series of training exercises taking place at Browdown (Anon 1915a, 1915b and 1915c). The exercises involved local voluntary home defence militia, the Gosport and District, and the Portsmouth, Volunteer Training Corps. Training appears to have taken place both within, and in the wider area surrounding, the current study area. Reference is made to “*the defences prepared*” (Anon 1915a, 3), and to “*trenches*” (Anon 1915c). However, it remains unclear whether this refers to the trenches recorded in the study area. The fact that trenches are only mentioned in passing, and that the training took place over a wider area apparently unrestricted by extensive fieldworks suggests that the trench complex seen today was not yet fully developed.

Hampshire Regiment

A further possible connection is with the Hampshire Regiment. The 14th (1st Portsmouth), 15th (2nd Portsmouth), and 16th (Service) Battalions of the Hampshire Regiment were recruited between 1914 and 1915 from volunteers in Portsmouth and surrounding towns, including Gosport (Long Long Trail 2023). These ‘Pals’ battalions were based in Portsmouth between September 1914 and January 1916 before moving elsewhere in the country and then being deployed to the continent. The 3rd Reserve Battalion of the Hampshire Regiment was based in Gosport from January 1915 until the end of the war and served as a local centre for recruitment and training (Atkinson 1952, 51). As yet there is no documentary evidence linking the Hampshire Regiment to the Browdown trenches, however, this must remain a strong possibility.

Other Regiments

Beyond locally based regiments, Sadden (1990, 49-50) notes that both Fort Brockhurst and Fort Rowner in Gosport were used as transit camps in which units were kitted up and prepared before embarkation for the Western Front at Southampton. As both forts are on the western edge of Gosport it is possible that these troops may have also trained at Browdown.

Summary

It is likely that at least two phases of trench digging and training took place at Browdown Ranges (north) during the First World War. The first, during the initial weeks of the war in late summer 1914, and possibly again in autumn 1914, involved the Royal Marines Light Infantry, and is likely to have focused on practicing digging trenches and maintaining troop fitness. It is possible that some of the straighter lengths of trench are from this phase.

A second, more intensive and protracted phase of activity occurred later in the war once the need for training in trench warfare became apparent. This involved training in a replica segment of a battlefield comprising two opposing frontlines, separated by a no-man's-land, and probably also the irregular trench complex to its west in earthwork survey area 1. It is not certain precisely when this activity occurred, or which regiments were involved. The lack of mention of extensive trenching in newspaper reports from late 1915 suggest that it occurred later, between 1916 and 1918. Again, it is uncertain which regiments trained at Browdown during this phase of activity, but it is most likely to have been the Hampshire Regiment, the Royal Marines/Royal Naval Division, or other units in transit to embarkation at Southampton. The complexity of features present at Browdown suggest that the configuration of training was far from static. Particularly towards the eastern side of the site more formal 'text book' trench layouts appear to have been augmented, extended and overwritten over time (see figs 33 and 36).

Conclusions

This project has investigated a series of archaeological features on Browdown Ranges (north) including a previously known extant round barrow of probable early Bronze Age date (with possible reuse as a medieval windmill mound), and a series of twentieth century military earthworks. Dominating these features is a significant complex of First World War practice trenches. Numerous examples of First World War practice trenches have been identified throughout England (Historic England 2017). Amongst these those at Browdown Ranges (north) stand out as one of the best preserved, and most complex examples with good surviving earthworks. Other examples of complex, extant trench systems exist at Cannock Chase, Staffordshire (Carpenter et al. 2018, 23 and 81); Penally, Pembrokeshire (Pyper et al. 2021); Redmires, South Yorkshire (Ullathorne 2006); Sherwood Pines, Nottinghamshire (Caswell 2023). However, these sites tend to extend over much wider areas. The configuration of trenches at Browdown is likely to reflect at least two phases of activity, the first at the outset of the War in August 1914 (Thompson 1914), and a second more extensive and intensive phase probably between 1916 and 1918. There is evidence of both 'text book' training environments utilising opposing frontlines and irregular trench networks, alongside practicing digging trenches resulting in isolated shorter lengths of crenelated, elongated crenelated and straight trench.

The practice fieldworks recorded at Browdown are unusual in that a wide range of different features including opposing frontline trenches, irregular trench systems, and other scrapes are combined in a much more restricted space. Some indicate later infantry training including slit trenches, or foxholes, possible mortar positions, and grenade throwing practice, while vehicle tracks point to Second World War and later training. Evidence from dropped cartridge cases suggests training in this area has continued into the 21st century. The survival of extensive earthworks also indicates the potential for the presence of buried archaeological evidence of trench construction techniques and artefacts, such as, buttons, badges and cartridges to identify who trained here and when.

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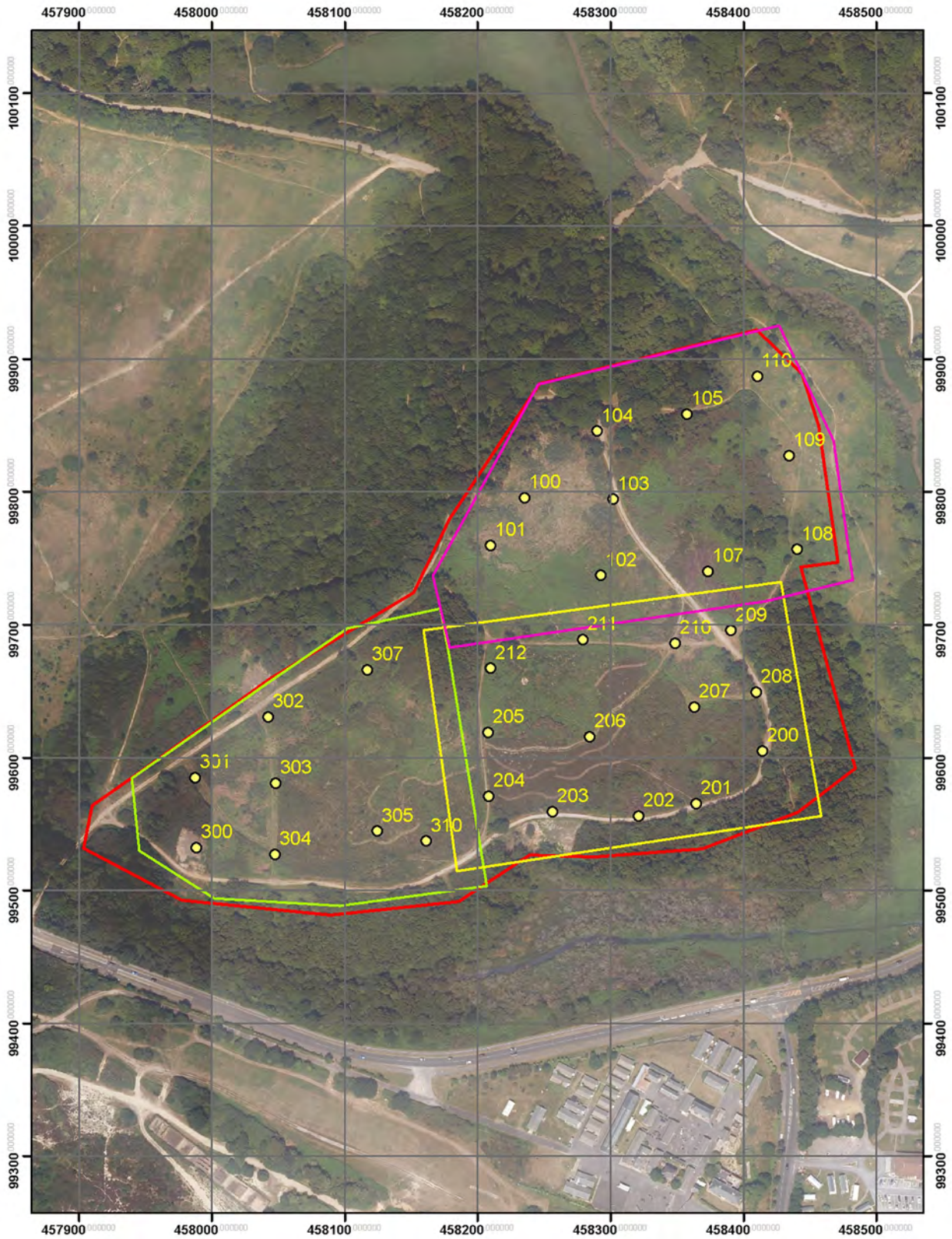


Figure 60: Browndown trenches, Gosport: the three overlapping drone flight areas (yellow, purple and green) covering the overall study area (red) and the positions of the ground control targets listed in Table 1. UAS survey targets December 2019. [© Historic England. Photography ©Airbus Defence and Space Ltd; Bluesky International Ltd; Getmapping PLC]

Appendix 1: Methodologies

UAS Survey

Drone-captured photogrammetry

Drone photography was acquired using a DJI Mavic 'Platinum Pro' quadcopter, owned and operated by Historic England. Photo-mapping over the Browdown trenches took place in bright, low sunlight conditions between 12:00 and 14:30 on 3 December 2019. DroneDeploy software was used to capture 778 overlapping 5 megapixel JPEG images in three pre-programmed flights (1: 222, 2: 296, 3: 260) all at 45m above ground level, covering a total area of 14.12 ha (see fig 60).

The images were processed using Agisoft Metashape 1.5 to form high-quality orthomosaic photographs at 2cm and 5cm ground sample distance (GSD). From these images a number of rendered surface models were created using the Relief Visualisation Toolbox (RVT 1.3). The positional accuracy of the orthophotograph GeoTiffs (and subsequent models) was improved in Metashape by reference to 31 ground targets (0.5m black and white chequerboard panels) visible on the aerial photographs. Precise coordinates for each target (see Table 1) were recorded in the field using the GNSS equipment outlined in the analytical earthwork survey method statement below. The principle RVT visualisations, adjusted to provide the clearest indications of the trenches, were as follows:

- Digital Surface Model 11cm GSD with 16-direction hill-shading and a vertical exaggeration factor of 3 (fig 68).
- Digital Surface Model, open negative, 11cm GSD with 16-direction hill-shading and a vertical exaggeration factor of 3.
- Digital Surface Model, open positive, 11cm GSD with 16-direction hill-shading and a vertical exaggeration factor of 3.
- Digital Surface Model, simple local relief, 11cm GSD and a vertical exaggeration factor of 3 (fig 69).

The UAS was also used to record a number of 4K fly-through videos of the study area and various still photographs. The flights were undertaken in accordance with the procedures in Historic England's 'Small Unmanned Aircraft Operations Manual' (2019), which underpins the organisation's Permission for Commercial Operations accreditation with the UK Civil Aviation Authority (Registration No. 09325413). Processing and visualisation was carried out in accordance with our published guidelines (Historic England 2017c).

Point id	Easting	Northing	Height
100	458235.30131	99795.66061	6.07947
101	458209.69465	99759.67927	6.19642
102	458292.50032	99737.07772	5.82041
103	458301.78064	99794.33626	5.62982
104	458289.93540	99845.60446	4.90680
105	458357.43053	99858.54932	3.59978
107	458373.08266	99740.02947	5.03717
108	458440.20996	99756.65808	3.79779
109	458434.08716	99827.17543	3.64366
110	458410.23701	99886.84182	2.83740
200	458414.34732	99605.00226	4.18457
201	458364.15719	99565.38778	4.16468
202	458320.92424	99555.84097	4.49822
203	458256.31692	99559.17667	4.55769
204	458208.31185	99571.06067	4.01768
205	458207.91704	99618.86047	5.24227
206	458284.27984	99615.53945	4.92298
207	458363.00617	99638.05685	4.58466
208	458409.53706	99649.20307	4.33853
209	458390.37760	99695.57765	4.74405
210	458348.66786	99686.04398	5.04716
211	458279.13771	99688.81417	5.86519
212	458209.59493	99667.14225	5.96787
300	457988.39129	99532.24170	5.18423
301	457987.50840	99584.81252	4.89483
302	458042.38167	99630.40434	5.58169
303	458047.79857	99580.85775	5.63121
304	458047.25831	99527.32058	5.28417
305	458124.46083	99544.59885	5.34203
307	458116.65323	99666.05800	5.86003
310	458161.00611	99537.12818	4.90454

Table 1: Control points used for improving the accuracy of the orthophotograph and digital surface model (see fig 60)

Analytical Earthwork Survey

The survey was conducted using survey grade Global Satellite Navigation Survey System (GNSS) receivers (Historic England 2016a) and a robotic Total Station Theodolite (TST) (Historic England 2016b). GNSS data was collected using 2 Trimble R8 survey-grade GNSS receivers working in Real Time Kinematic (RTK) mode. All survey points were related to an R8 receiver configured as an on-site base station. The position of the base station had previously been adjusted to the National Grid Transformation OSTN15 using the Trimble VRS Now Network RTK delivery service. This uses the Ordnance Survey's GNSS correction network (OSNet) and gives a stated accuracy of 0.01–0.015m (1–1.5 cm) per point. A Trimble S7 TST was also used. Its position was established using a series of control points previously located with an R8 GNSS receiver.

Digital survey data were adjusted, and field codes processed, in Trimble Business Center software before being exported to ArcGIS 10.8.1, and output at scale. The survey drawing for this report was completed at a scale of 1:500 using digital drawing techniques in Adobe Illustrator software. Figures 65-69 show all earthworks features recorded in earthwork survey areas 1 and 2 reduced to a scale of 1:500.

The round barrow, which is under very dense undergrowth and woodland, was investigated briefly in March 2020 immediately prior to the first COVID19 lockdown. Horizontal measurements were taken by tape and vertical measurements were taken using a pocket level.

Aerial Investigation and Mapping

All available aerial photographs held by the Historic England Archive, Swindon were reviewed as prints or born-digital files. This included oblique and vertical aerial photographs taken by the RAF and commercial companies for non-archaeological purposes at intervals from the 1940s to the 1990s. Specialist archaeological oblique aerial photographs taken at intervals from the 1930s to present 2019.

Georeferenced digital vertical photographs were supplied to Historic England through the Aerial Photography for Great Britain (APGB) agreement by Next Perspectives.

Other online sources of vertical aerial photographs, Google Earth (taken at intervals from 2000 to 2019) and Bing Maps (2018) were also consulted.

The Cambridge University Collection of Aerial Photography (CUCAP) online catalogue lists a number of photographs which cover the area, but this collection is currently closed and only a small number of images that are held as duplicate prints in the Historic England Archive could be consulted.

Other Sources

Historic England Archive GIS (Historic England Archive Monument data, historic maps and Ordnance Survey Mastermap)

BGS (British Geological Survey) <http://mapapps.bgs.ac.uk/geologyofbritain/home.html>

The National Library of Scotland maps <https://maps.nls.uk/index.html>

Hampshire HER records, Historic England research records (National Record of the Historic Environment Record), published and unpublished excavation reports and a range of on-line and published sources and historic maps were used to aid interpretation of the archaeological remains.

Assessment and mapping

All available aerial photographs were viewed under magnification and in stereo where possible. Digital photographs were viewed on screen.

Georeferenced and rectified digital images were produced of key photographs using the University of Bradford AERIAL 5.36 rectification programme. Ordnance Survey Mastermap and the APGB orthophotos were used as control to correlate the aerial photographs to the base map. Height data at 2m resolution was used to improve the accuracy of rectifications. Where good control information is available on the photography and source used for control, the accuracy of rectifications is commonly within $\pm 1\text{m}$ of true ground position. In areas with poor control and/or high topographic variation this error may be larger (Evans 2019, 44–5).

Lidar data were processed using the Relief Visualization Toolbox 2.2.1 (Kokalj and Somrak 2019; Zakšek, Oštir and Kokalj 2011) to produce 2D visualisations as GeoTIFF images. The visualisations were viewed in the GIS. Lidar data were also viewed in 3D in Quick Terrain Reader and Modeler.

All archaeological features from the Neolithic to twentieth-century military remains visible as cropmarks and earthworks on aerial photographs and lidar were mapped across the entire study area. This included sites previously recorded by earlier aerial surveys, which were re-mapped to achieve the best fit with newly mapped features, benefitting from more modern and accurate georeferencing. Features were recorded according to morphology using Historic England mapping conventions.

Archaeological features were mapped as line and polygon data within a geodatabase using ArcMap 10.7.1 in accordance with Historic England's 'Standards for Aerial Investigation and Mapping Projects' and Aerial Investigation and Mapping Technical Specification. See Table 2.

Textual data were recorded in an attribute table. Monument polygons were created to outline the extent of a single monument.

Monument recording was undertaken in the Historic England Research Records database (Warden). The records are available via Heritage Gateway (www.heritagegateway.org.uk).

Data will be supplied to the HERs. Mapping will be available via the HERs, the Aerial Archaeology Mapping Explorer (<https://historicengland.org.uk/research/results/aerial-archaeology-mapping-explorer/>), and the project-specific GIS portal.


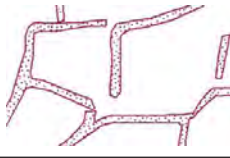

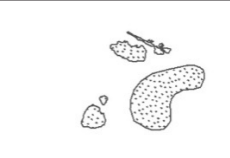




Layer name	Layer content	Layer colour	Feature type	
MONUMENT_POLYGON	Polygon encompassing features within a single NRHE record	Black	Polygon	
BANK	Polygon for features such as banks, platforms, mounds and spoil heaps	Red	Polygon	
DITCH	Polygon for features such as ditches, hollows, pits or hollow ways	Green	Polygon	
EXTENT_OF_FEATURE	Polygon outlining a feature or group of features such as industrial complexes	Grey	Polygon	
RIDGE_AND_FURROW_EXTANT	Polyline depicting outline and arrow indicating the direction of a field of ridge and furrow	cyan	Polygon and polyline	
RIDGE_AND_FURROW_LEVELLED	Polyline depicting outline and arrow indicating the direction of a field of ridge and furrow	magenta	Polygon and polyline	
STRUCTURE	Polygon for built features including stone, concrete, metal and wood	Grey	Polygon	
SCARP_SLOPE_EDGE	Polylines in form of a schematic T-hachure depicting break of slope	Blue	Polyline	

Table 2: Aerial mapping layer content and drawing conventions, based on AIM standards

Appendix 2: Scaled Survey Drawings

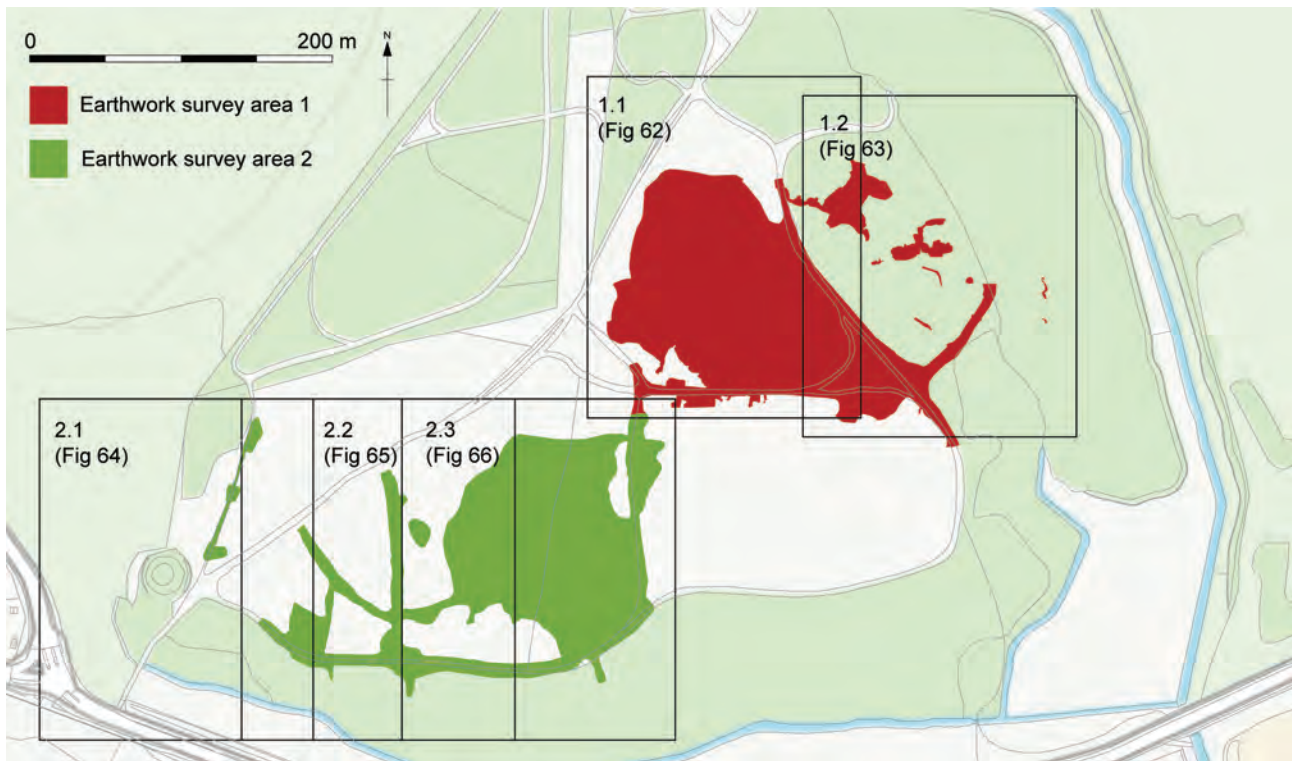


Figure 61: Location of earthwork survey drawings (figs 62-66), scale 1:5000. [© Historic England. Base mapping derived from OS open data © Crown copyright and database right 2023 and OS Master Map © Crown Copyright and database right 2023. All rights reserved. Ordnance Survey Licence number 100024900]

Figures 62-66 Analytical earthwork survey drawings, scale 1:500

Figures 67-70 UAS survey outputs, scale 1:2000



Figure 62: Brown-down trenches, Gosport. Analytical earthwork survey area 1.1, scale 1:500. [© Historic England Archive. AF00452/D001]



Figure 63: Brown-down trenches, Gosport. Analytical earthwork survey area 1.2, scale 1:500. [© Historic England Archive. AF00452/D002]

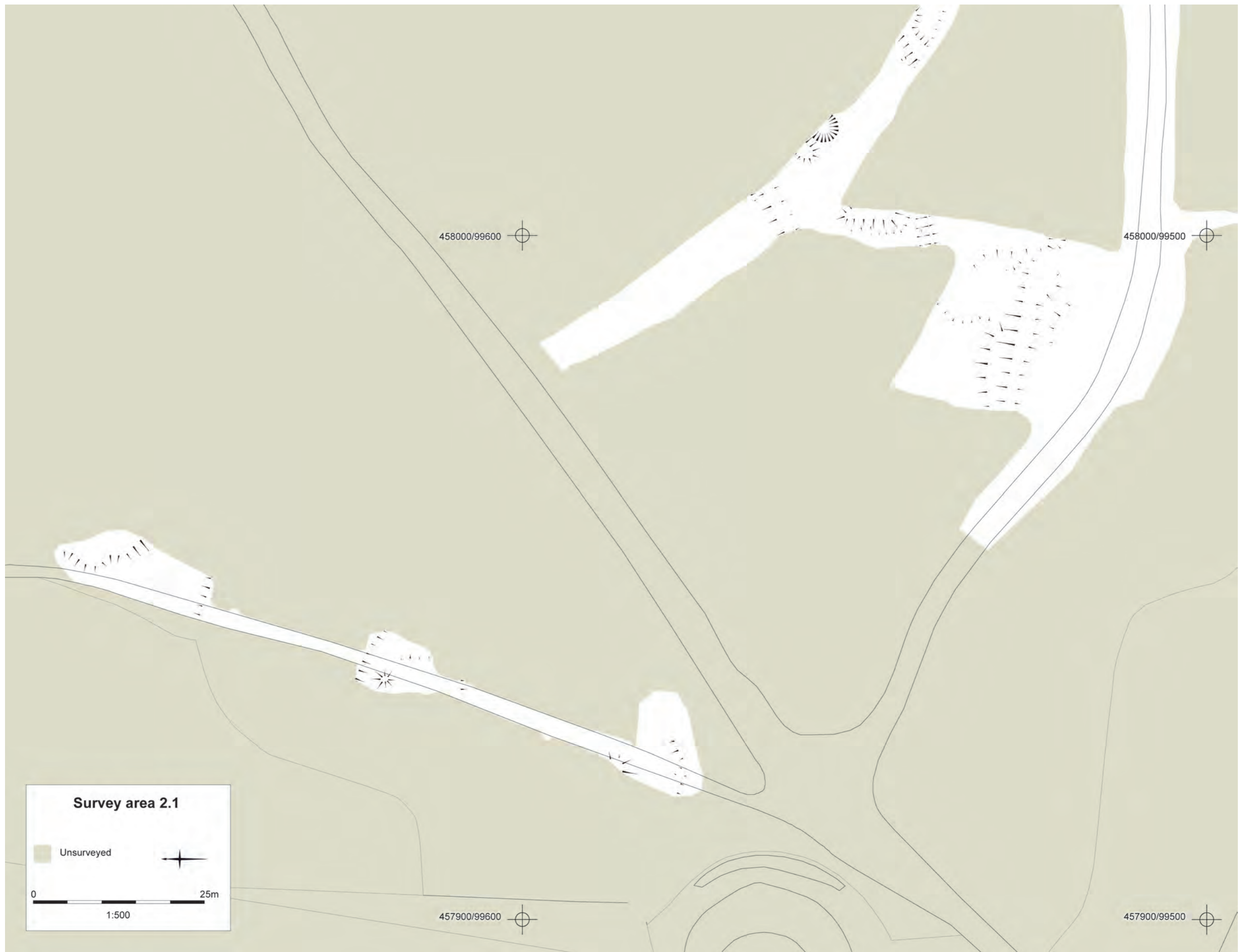


Figure 64: Browndown trenches, Gosport. Analytical earthwork survey area 2.1, scale 1:500. [© Historic England Archive. AF00452/D003]



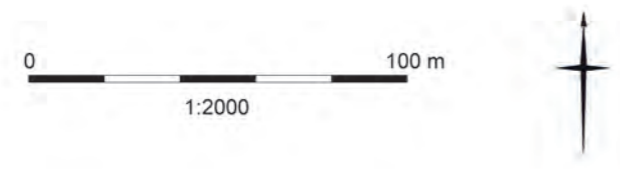
Figure 65: Browndown trenches, Gosport. Analytical earthwork survey area 2.2, scale 1:500. [© Historic England Archive. AF00452/D004]



Figure 66: Browndown trenches, Gosport. Analytical earthwork survey area 2.3, scale 1:500. [© Historic England Archive. AF00452/D005]

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458500/99900



457900/99500

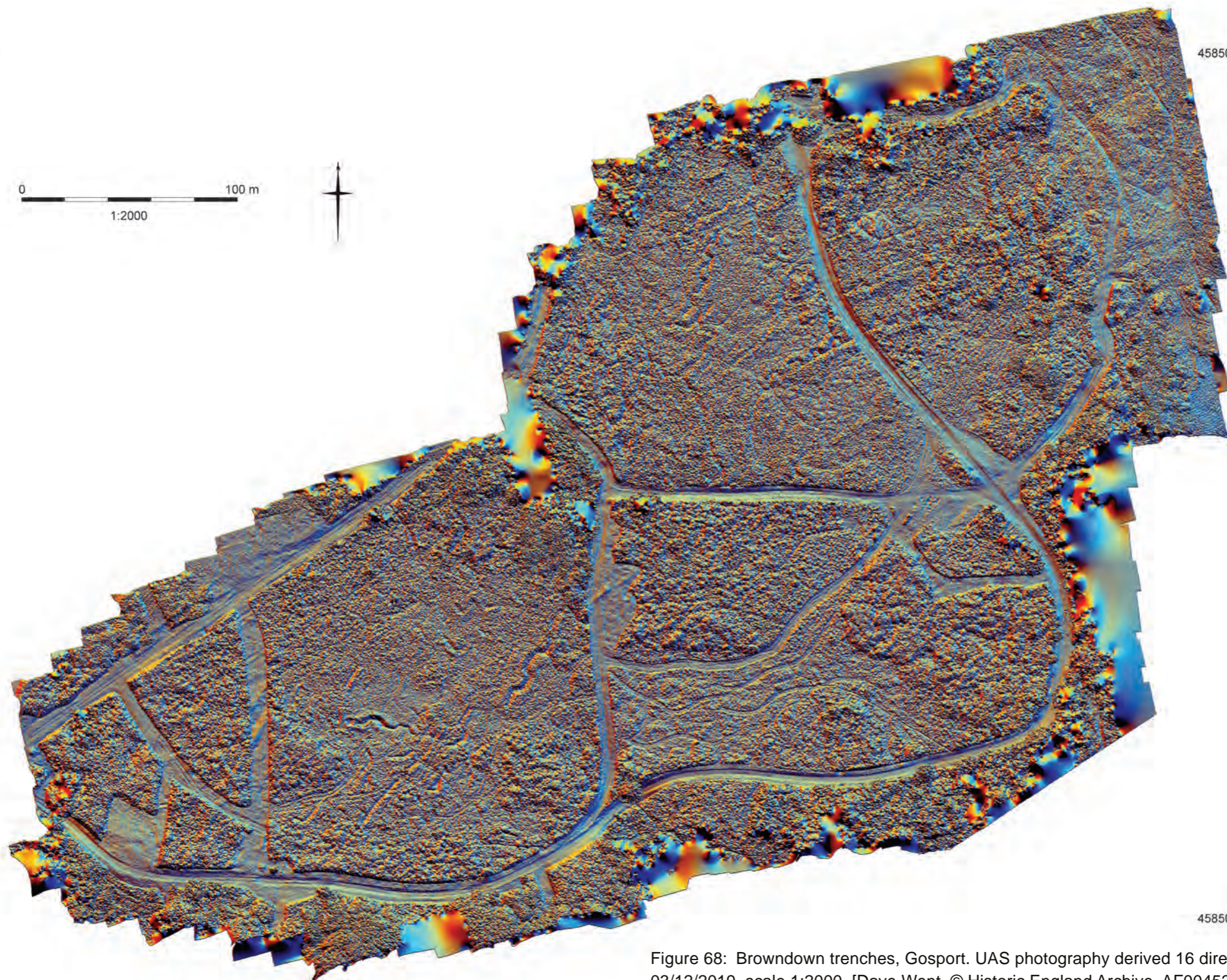
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Figure 67: Browndown trenches, Gosport. UAS photography derived orthophoto, 03/12/2019, scale 1:2000. [Dave Went. © Historic England Archive. AF00452/D0006]

457900/99900

458500/99900

0 100 m
1:2000



457900/99500

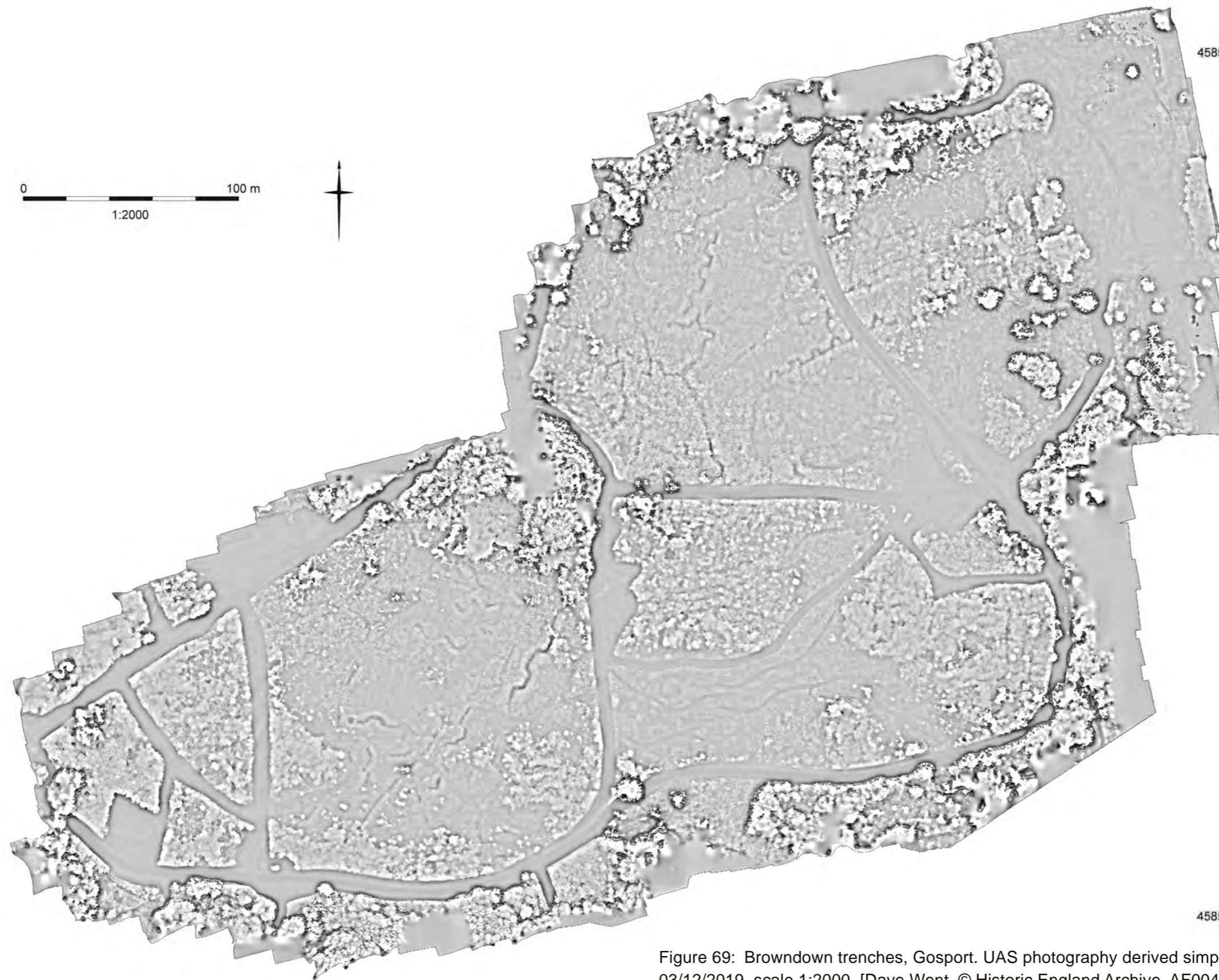
458500/99500

Figure 68: Browndown trenches, Gosport. UAS photography derived 16 direction hillshade model, 03/12/2019, scale 1:2000. [Dave Went. © Historic England Archive. AF00452/D0007]

457900/99900

458500/99900

0 100 m
1:2000



457900/99500

458500/99500

Figure 69: Browndown trenches, Gosport. UAS photography derived simple local relief model, 03/12/2019, scale 1:2000. [Dave Went. © Historic England Archive. AF00452/D0008]

457900/99900

458500/99900

0 100 m
1:2000



457900/99500

458500/99500

Figure 70: Browndown trenches, Gosport. UAS photography derived orthophoto, 08/04/2022, scale 1:2000. [Olaf Bayer. © Historic England Archive. AF00452/D0009]



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