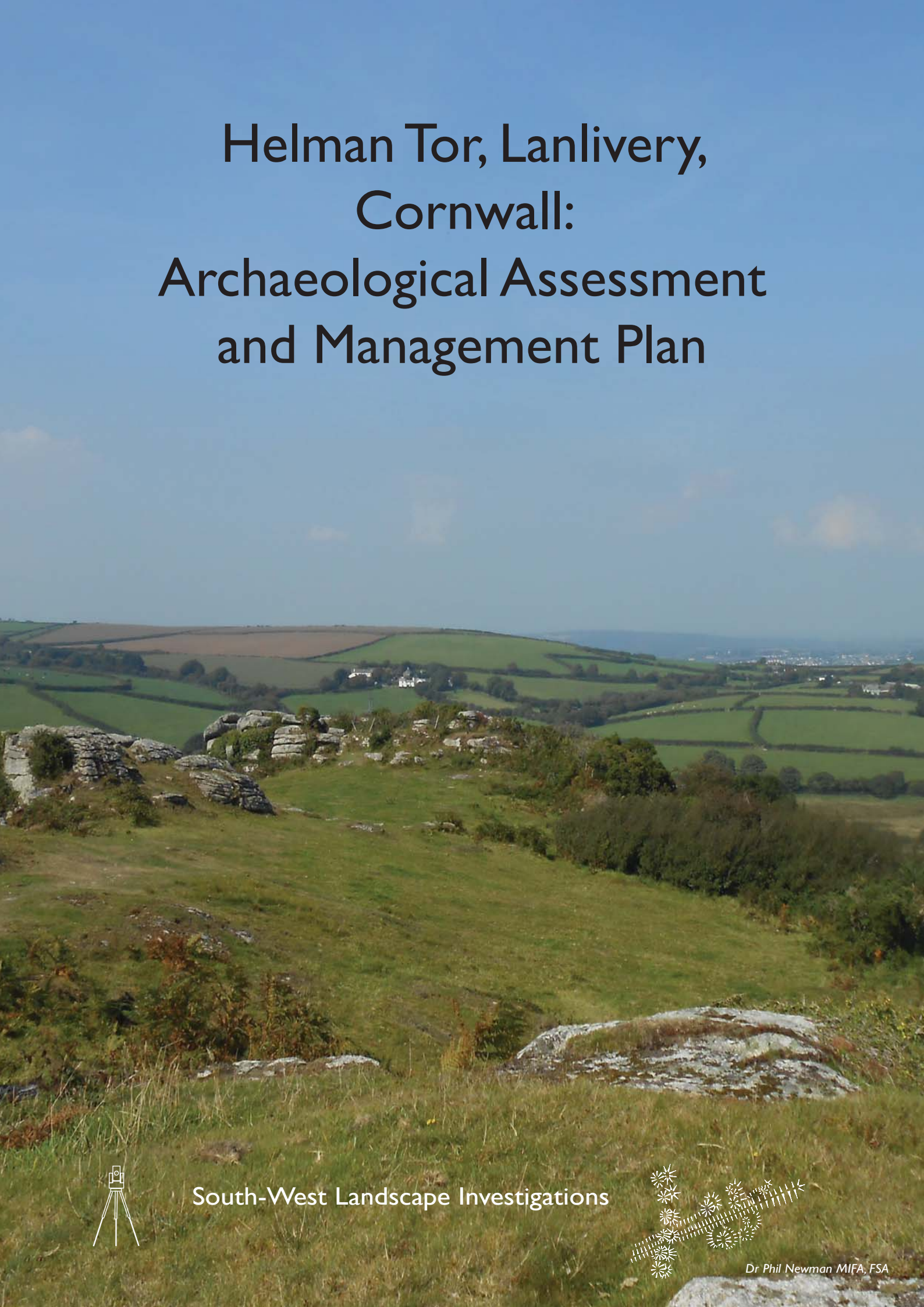
Helman Tor, Lanlivery, Cornwall: Archaeological Assessment and Management Plan



South-West Landscape Investigations

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Helman Tor, Lanlivery, Cornwall: Archaeological Assessment and Management Plan

Report Produced for:

Cornwall Wildlife Trust

By
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SW LANDSCAPE INVESTIGATIONS

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Acknowledgements

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Summary

An archaeological assessment of Helman Tor (centred SX 06185 61662) in Lanlivery parish, Cornwall was requested by Cornwall Wildlife Trust (CWT), who currently manage the land as part of the Helman Tor Nature Reserve. The purpose of this assessment is to provide information concerning the character, extent, significance and condition of archaeological remains, within an area now being managed under a Higher Level Stewardship (HLS) agreement; also, to provide archaeological advice and prioritized recommendations to inform future management of the heritage assets and access to them by the public.

The 13.7 hectares of the stewardship agreement which form the focus for this assessment, contains significant prehistoric archaeological remains, including a tor enclosure of Neolithic origins. There are also various remains surviving from the 2nd to first millennium BC in the form of a hut circle, cairns, hut platforms and linear boundaries.

Fieldwork was undertaken in September 2014. Following a walkover survey, the location and status of all archaeological remains within the assessment area has been established and an inventory assembled. A statement of significance for the scheduled monuments has been prepared and a record of condition, current vegetation cover, and any problems was compiled.

Recommendations are offered for future management priorities concerning the archaeology, along with suggestions as to how public access may be enhanced. Required actions are itemized, with suggested methods and a schedule. Areas affected by these recommendations are delineated an a series of aerial photo overlays.

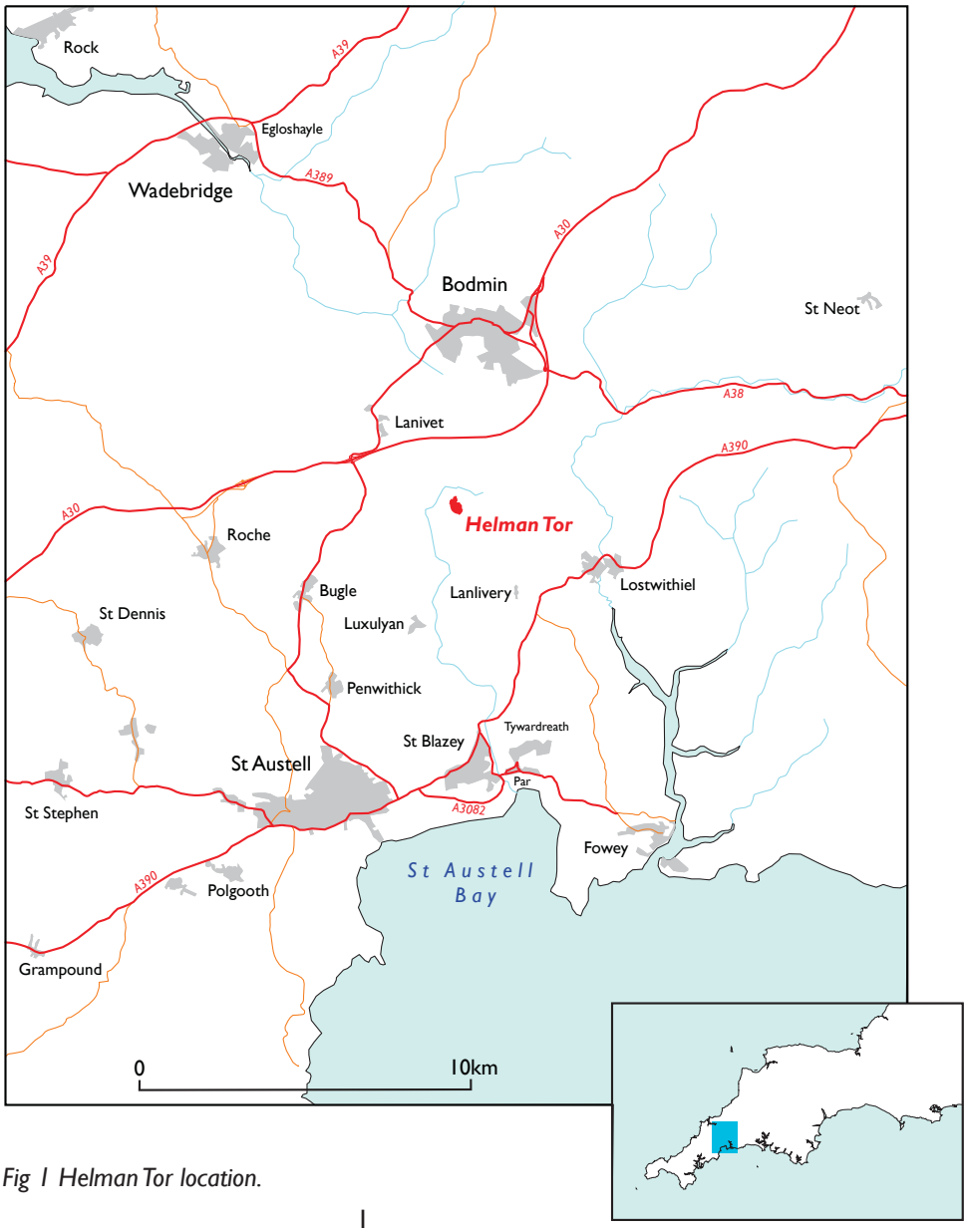

Fig 1 Helman Tor location.

1.0 INTRODUCTION

1.1 Site context

Helman Tor is an isolated exposure of the Hensbarrow granite boss, in Lanlivery parish, Cornwall, located approximately midway between Bodmin and St Austell. The granite of the tor protrudes through an elongated plateau at the summit of the hill and comprises a series of exposed, weathered outcrops and detached boulders; many rock basins are present. An OS trig pillar sits on the southern outcrop at a height of 209m AOD.

Although this area forms part of the Helman Tor Nature Reserve (along with Higher Trevilmick, Red Moor, Breney Common, Lowerton Moor and Crift), which covers a total area of 245ha, this archaeological assessment is concerned only with the 13.7ha of the tor and its flanks (Fig 3).

The tor contains a number of archaeological sites, including a Neolithic tor enclosure on its summit, of national significance; vestiges of a Bronze Age field system, including boundary banks and lynchets, have been recorded on the western slopes. One large hut circle, also of Bronze Age date, is extant within the field system, and at least two platforms, which are potential house sites, have been recorded. All of these features are included in the schedule (Scheduled Monument List No. 1007306). Discrete evidence of post medieval or modern stone cutting is visible on the outcrops of the tor and various moorstone boulders within the enclosure and on the slopes of the hillside. These suggest sporadic use of the area as a source of stone, although this probably never developed much beyond local use.

Helman Tor is located in a deeply rural and sparsely populated part of central Cornwall. Access to the site is restricted to small vehicles, cyclists or pedestrians, by passing along a narrow lane from the north, which, for cars terminates at the foot of the tor. Walkers may continue south along the Saint's Way public footpath to Crift, or they may use one of the two stiles that provide a route accross the tor, waymarked as part of the CWT Wilderness Trail[1]. However, no through route across the tor to Higher Trevilmick or Red Moor exists for public use. The ring fence and wicket gates currently prevent entry to the scheduled area by riders.

The countryside immediately surrounding the tor is essentially pasture, including improved and semi-improved land, contained within a patchwork of small fields. Extensive disused tin streamworks, now wooded, cover much of the valley ground of Breney Common to the west.

The tor possesses impressive views over much of the mid-Cornish hinterland, as well as Bodmin Moor to the north west and the St Austell clay country to the south west. The western slopes of Dartmoor may be seen in the distance and both the north and south Cornish coasts are visible.

1.2 Statutory and non-statutory designations

All of the land included in this assessment (Fig 3) is designated as a Scheduled Monument (SM) and Helman Tor is a Regionally Important Geological Site (RIGS). The area also has county designations as an area of Great Historic and Scientific Value and an Area of Great Landscape Value. The entire area is Access Land, as designated under the CROW Act of 2000. The Tor forms part of the Helman Tor Nature Reserve, and a long-distance footpath between Padstow and Fowey, The Saint's Way, skirts the western base of the tor. This is not an ancient route but was created in 1986, with the support of Cornwall County Council.

1.3 Context of the survey

Helman Tor and Higher Trevilmick have been entered into a 10-year Higher Level Stewardship (HLS) agreement (AG00421030), commencing November 1st 2013. An archaeological investigation is required to assess the condition of all known heritage assets contained within the designated area, and to formulate proposals for future management of each asset and the area as a whole. The following proposals are based on the results of the survey and include a range of sensitive measures to control vegetation and manage the sites in an appropriate manner.

1.4 Methodology

The main brief of the fieldwork was to re-assess past site surveys and condition assessments, check for accuracy in location and description, and update the comments on condition and current threats. An evaluation of historic descriptions of the site, documentary and cartographic evidence, as well as a summary of past research, has been well covered by Dudley (2005) and does not form part of the brief for this report.

Fieldwork

Fieldwork was undertaken in mid-September 2014. This late in the season, dense bracken growth had overwhelmed most of the features on the lower western slope, although the interior of the tor enclosure was generally clear. Furze was also obscuring some features on the ground and very few of the archaeological sites and linear archaeological features were fully visible for close field inspection.

The location and extent of the heritage assets (Fig 3), has been established from previous surveys (Dudley 2005; Riley 1995), or plotted from an ortho-rectified aerial photograph. Where not obscured, the extent of the rampart was established in the field using mapping grade GPS. This combination of data has served as the basis for mapping and illustrations in this report (Fig 3-6).

Brief field notes for each asset were recorded, including site type, character (i.e. earthwork, structure, etc), condition, including current vegetation cover (see site inventory).

Where possible, if vegetation cover permitted, colour digital photographs to record condition were taken. General views, to illustrate certain points, have also been included.

Fig 2 The upper plateau of the tor and the interior of the Neolithic enclosure. An area that is well grazed in parts by a small herd of cattle.

1.5 Management issues and current threats

Gorse (furze) and other scrub species, including bramble, blackthorn and hawthorn, are impenetrable in places, and are among the major concerns for the management of the heritage assets on the tor. Recent (2010) inroads into reducing the scrub at three locations have been successful: to the north of the car park; within the tor enclosure on the north-western side; on the western slopes, including the hut circle and footpath. However, much more work is required to free all the archaeological sites from this cover, particularly the elements of a Bronze Age field system on the western slope, and on the rampart on the eastern side of the tor.

The other major problem, covering nearly all of Helman Tor, is the blanket of particularly tall bracken. The invasive and rapid spread of these ferns has filled the gaps left by the 2010 scrub clearance, so the archaeological features affected are still completely invisible to the public throughout the summer and autumn months, when very little of Helman Tor's archaeology can be explored freely or safely.

Although cattle are currently grazing the tor and its slopes, their access to much of the ground is restricted by the furze and bracken, limiting their ability to wander over the ground and reducing the impact of their activity in helping control vegetation. The eastern slopes (Zone 2) are particularly dense and there is currently little evidence for the cattle visiting this area in September 2014. This limited access is also causing pinch points where cattle are over-using certain routes, causing poaching in some sensitive areas.

The risk of wildfires is very real while the vegetation is in this state, especially in the early spring when the previous year's bracken die-back can become dry and combustible.

The ring fence around the scheduled area has been breached at one point along the north-east corner of the tor enclosure, allowing cattle to move between it and the pasture field and causing damage to the hedge bank.

1.6 Recent management history

Attempts to manage the monument and its surroundings over the past three decades have had varying degrees of success. The site was first entered into the DoE schedule in 1977; the whole of the tor and its slopes were affected, including some archaeologically barren areas. An attempt by a previous owner to improve grazing by clearing an area of stone from the NW slope within the SM in 1982, met with local outcry (*WMN* 13-Sept-1982) and was short-lived. Damage, caused by cattle movement in winter was a problem reported in 1987, in which year also, consent was granted to upgrade parking facilities for visitors to the tor. A management agreement for the SM was negotiated (under the terms of Section 17 of the Ancient Monuments and Archaeological Areas Act (1979) with the then owner, commencing in 1991. Countryside Stewardship Schemes then followed from 1992 onwards, renewed in 1997.

In 2002, Cornwall Wildlife Trust purchased much of the land of Higher Trevilmick farm, which included the flanks of the Tor. The land was then leased back to the vendor on a ten-year Farm Business Tenancy and it was again entered into a Countryside Stewardship Agreement held by the tenant, who retained responsibility for managing and grazing the Tor, although the Trust now had some involvement. The tenant grazed the tor with Exmoor ponies in the winter months until 2013 when the tenancy ended and the Trust took the management of the tor and surrounding land in hand, at which point the ponies were no longer available for grazing. The eastern part of the tor, including the tor enclosure itself is owned by Lanhydrock Estate Company, although the Trust hold the grazing rights to it

Attempts to control bracken on the tor by spraying, including using aircraft and manual (backpack) spraying methods, have been occurring intermittently since the early 1990s. As the intensity of grazing has reduced since the 1980s, scrub has developed gradually and now covers the slopes of the tor to a considerable degree. Aerial photos of the late 1990s show the gorse to have reached a critical level since then, especially on the western side of the tor. Historic satellite imagery also charts the gradual increase in scrub since 2001 (Google Earth 2001, 2002, 2005, 2009, 2014). Previous campaigns to reduce this scrub have had some impact, but only in discrete

areas, such as around the hut circle cleared by volunteers in 2010, and parts of the tor enclosure's interior.

Currently, a herd of up to 30 cattle have access to the area on a year round basis (Fig 2). They are contained by a ring-fence surrounding the property. This is due to be upgraded soon, though repairs will be required immediately at one point on the hilltop enclosure (Fig 12). Watering points are in place, but at least one is currently unavailable for use by the cattle.

2.0 SITE INVENTORY (see Table 2 p.14)

The following inventory is based loosely on that compiled for the 2005 report by Peter Dudley. Portable finds are not included in the brief for this report and are omitted from these data. For the sake of continuity and consistency, the site numbering system follows that used by Dudley. These numbers are unique to Helman Tor and do not correspond to those of the Cornwall HER, however, HER numbers are included if previously allocated. The entire tor and its slopes are included in the schedule (Fig 3); all heritage assets therefore should be seen as protected under that designation. (*Nb for more detailed descriptions of individual sites on Helman Tor, Peter Dudley's 2005 report should be referred to; available from Cornwall HER*).

3.0 STATEMENT OF SIGNIFICANCE

The enclosure on Helman Tor is one of only two of this type in Cornwall reliably dated to the early Neolithic period. The other is located at Carn Brea and both were excavated by Roger Mercer in the 1980s (Mercer 1981; 1986). The findings from these two sites, contributed to the recognition that the tor enclosures constructed in the south-west's igneous geology, are of similar date (Neolithic, c.3500BC to 2200BC), and served similar functions, to the causewayed enclosures installed into areas of England where geology was more conducive to digging ditches. This makes the Helman Tor enclosure among the earliest group of monuments in Cornwall and indeed in Britain, and one of the rarest. There are less than 90 Neolithic enclosure monuments in the UK, but within that group Helman Tor is one of only 19 recorded tor enclosures (Oswald *et al* 2001). Of the others known, most are in the Westcountry, including Trencrom in west Cornwall and Dewerstone in Devon, which are both believed to be Neolithic, but only Helman Tor and Carn Brea have provided reliably excavated dateable material.

Stone hut circles of the type found on the western slope of the tor are relatively common in Cornwall and Devon, especially on moorland districts such as Bodmin Moor and Dartmoor, but less so elsewhere in Britain. Excavated hut circles have demonstrated their date range to extend from the Middle Bronze Age to the Iron Age. Their survival depends on later land uses; unimproved stony ground such as found on the uplands and on outliers like Helman Tor, are where these features survive best. The presence of a single hut suggests that others once existed in the locale and two recorded possible hut platforms nearby also imply a greater domestic presence here than the single hut.

Other, probably contemporary, features associated with the hut, including boundary walls, a lynchet, an enclosure, cairns and a droveway/hollow way, suggest this area was an area of settlement and farming in the 2nd and 1st millennium BC; these fragments provide important indicators of the nature of early human activity in the broader landscape of this district.

On the whole, the upstanding prehistoric archaeology on Helman Tor is not visually striking and easily overlooked, but all of these features, especially the tor enclosure interior, the hut circle and hut platforms, will contain sub-surface archaeological deposits, including artefacts, residues and environmental data that hold crucial evidence about the past.

Of local significance is the evidence of stone cutting found on the outcrops of the tor and detached stone of the enclosure interior and the hillslope. This activity was on a very small scale, with only limited evidence, but it does indicate perhaps the use of granite on a local scale. The use of wedge and groove techniques and later plug and feather, suggests a date range extending potentially from the 18th to 20th centuries.

Sensitive management measures at this scheduled monument need to be commensurate with the immense cultural significance of the place, and should include maintaining appropriate levels of vegetation, conservation of the archaeological features above and below ground, and sustaining or improving public access and levels of interpretation.

4.0 THE HERITAGE MANAGEMENT PLAN

4.1 Guiding principles

The aim of the HLS program for the scheduled areas of Helman Tor is to restore species-rich, semi-natural grassland (HLS land management option HK7) over the majority of the tor, including areas of known archaeological significance. The specific stated aim under this option is to:

> *'..provide more open conditions to restore BAP lowland and acid grassland habitat and to improve the visibility of the archaeological features, through a combination of scrub removal and controlled grazing'*

In certain zones (Zones 8 and parts of zone 7), successional scrub (HLS option HC15) will be maintained, but will also, initially, require a significant reduction of gorse. Although contained within the scheduled area, less archaeology has been recorded within these zones. However, a reduction of scrub within them is essential to assist in the control of adjacent archaeologically rich areas, particularly Zones 2 and 6, by preventing the spread of vegetation. It is also likely that unrecorded archaeology lies within zones 7 and 8 and scrub removal may assist with further discoveries.

The objective with regard to the welfare of the archaeological assets in Zones 1-6, will be to eradicate, or significantly reduce, invasive species covering the archaeology, while encouraging the desired grassland species to recover. An initial programme of scrub clearance and bracken spraying (if applicable) must be carried out in a non-destructive manner, ensuring no damage to the monuments occurs. No heavy machinery should be used for example and all work should be done with light, manually operated equipment, such as chain saws and brush cutters. Stumps should be treated with an appropriate herbicide and left in the ground to decay. The recommended months for scrub clearance are December to February[2]. This should be followed by a suitable regime of grazing, monitoring and remedial interventions such as further cutting or spraying when necessary, to restore the desired grassland habitat on the hill. Grazing infrastructure, including a ring fence, gateways and watering points are already set into the periphery of the scheduled area. The ring fence is due to be upgraded, when care should be taken not to impinge on the archaeology, especially in the vicinity of the tor enclosure.

Public access to the archaeological sites should be maintained and encouraged. Footpaths should be kept clear and signage kept up to date. New means of access would enhance the experience for those visiting the tor, and electronic media, such as mobile phone apps, could be used to better distribute information and interpretation for visitors to the monument.

4.2 Priorities

Unusually for an HLS agreement, the whole of Helman Tor is scheduled, including sectors where no archaeology is extant or known. Therefore, this management plan needs to include recommendations for all the land within the boundary of the schedule. It has not been possible to make close inspections of many individual monuments, due to vegetation cover, so priorities are suggested based on the archaeological significance of areas within the SAM, known to contain archaeological features. The recommendations therefore cover zones, rather than individual sites, so the less archaeologically rich zones (Zones 7 & 8) need to be considered of secondary importance within the works timetable.

The tor enclosure, its associated assets, immediate environs and access routes should be seen as a main priority due to the comparative scarcity of the site type and its national significance. However, although of regional significance, the Bronze Age hut circle and associated field system, hut platforms, lynchets and other features on the western slope, will require equal consideration in terms of management resources. All of these assets require immediate attention in the plan described below.

4.3 Aims

Within these proposals:

- The final appearance of the archaeologically significant areas (Zones 1-6) will be acid grassland, containing wildflowers within the sward. Scrub species, namely gorse, blackthorn and bramble should cover less than 5% of the area.
- Individual archaeological sites (e.g. the hut circle, ramparts, boundary banks) should be free of all scrub.
- Mature hawthorns and holly can remain in these zones, except where directly causing root-damage to archaeology, but saplings should be controlled by grazing, or by cutting; stumps should be treated with an appropriate herbicide.
- Bracken should be significantly reduced, or preferably eradicated, on the tor and its western and eastern slopes. However, the presence of some bracken is considered valuable for biodiversity purposes in this reserve, and limited coverage will continue, restricted to the southern slopes of the tor in Zone 8 where archaeological features are less numerous and those that do survive are more robust. The spread of this bracken will require continuous monitoring to keep it contained.
- In areas where successional scrub is allowed to continue, a mosaic of interconnecting clearings can be created by initial cutting in the early stages, and maintained through grazing.
- Grazing livestock will be free to wander on any part of the tor and maintained in sufficient numbers to control regrowth of scrub and bracken. However, they will be prevented from causing erosion and their activity will be monitored to prevent this, especially in winter and spring when the ground is soft.

4.4 Actions, with levels of priority (*see* Fig 5 and TABLE 1)

4.4.1 The hilltop enclosure (Zone 1 [1ha] Priority 1)

The interior of the hilltop enclosure contains the hilltop plateau and several of the granite outcrops, amounting to about 1ha. It is defined on the west by the built boundary wall, on the east by the slope of the rampart and a further section of boundary wall, and on the north and south by granite outcrops. Detached granite is present but the terrain has the appearance of having been cleared in places, perhaps for the siting of structures in antiquity. For that reason, and the shallow nature of the soil, this area should be considered extremely sensitive to erosion by people and cattle, and by root damage caused by trees, scrub and bracken.

A large stand of gorse was removed from the NW corner in 2010 and, currently, the majority of the hilltop is covered by close cropped grass, providing an area favored by cattle. However, the sward is interrupted by some large stands of gorse, smaller isolated gorse bushes, and a large spread of blackthorn (*see* Zone 3 below and Fig 12). Brambles are a problem along the NE corner of the enclosure. Removal of all this scrub should take place during the first winter season of action. Hawthorns will become a problem if left unchecked; mature examples can remain but saplings should be removed.

Although the present level of bracken is tolerable, this zone should be included in the programme of bracken reduction in year 1, to prevent it spreading (*see* **4.5** below).

4.4.2 The eastern rampart (Zone 2 [0.6ha] Priority 1)

This strip of ground includes the slope and stony banks of the rampart on the eastern side. Although comprising a very subtle combination of earthworks and stony features, this is among the key surviving elements of the Neolithic enclosure. However, much of it is currently obscured by gorse and blackthorn; bracken has also become

invasive within the gaps where it has managed to get a hold. All of this scrub needs to be removed in season one (winter 2014-15), plus a buffer zone of approximately 10m east from the base of the rampart needs to be cleared and maintained.

4.4.3 The eastern rampart - NE end (Zone 3 [0.11ha] Priority 1)

Zone 3 abuts the field wall that adjoins the rampart on the edge of the plateau and extends west into the interior of the tor enclosure. Currently this area contains a dense patch of tall scrub, mostly blackthorn but also some gorse, approximately 70m by 35m. In the past this area was maintained as a wide grass sward with open access down to a field gateway. This sward needs to be reinstated to rid the rampart of invasive scrub and to give free movement to grazing animals on the eastern slope of the tor, an area they are currently avoiding, due to the density of the scrub. The cleared area should extend from the boundary wall, to at least the southern corner of the central granite outcrop and needs to include the ground occupied by the clearance cairns recorded by Dudley (2005)(*see* Fig 3, & 4).

4.4.4 The outer enclosure (Zone 4 [0.75ha] Priority 1)

An outer enclosure on the western side of the tor was constructed to take advantage of a natural shelf running along the contour of the hillside, and utilizing several small outcrops by linking them. Additional stone was incorporated into the top of this feature to form a boundary, which encloses a further 0.8ha outside of the main hilltop monument.

The scrub currently covering this feature varies in density, but is at its worst near the northern section, where gorse, blackthorn and bramble are impenetrable in places. Smaller stands of gorse and individual bushes exist in several other places along the enclosure's interior and its boundary banks. All of this scrub should be cut, both inside the enclosure and along the boundary.

The area also has a covering of bracken which should be eradicated, or significantly reduced, as part of the main programme of bracken reduction (*see* **4.5** below).

4.4.5 The southern (?)entrance (Zone 5 [0.55ha] Priority 1)

The entrance and approach to the hilltop enclosure on the southern end (Zone 5), contains some scrub, though is clear where the footpath passes through it. As the main approach to the tor monument this needs also to be cleared of scrub.

4.4.6 Lower western hillslope (Zone 6 [2.73ha] Priority 1)

A large hut circle exists here, currently overwhelmed by bracken, and comprises the main feature of interest in this area. Other features have been recorded here, some from aerial photo interpretation, but vegetation has hampered ground verification by Dudley in 2005 and for the current assessment. The true character and extent of these remains is yet to be established for certain, but currently two hut platforms, a sub-rectangular enclosure, and various linear features make up the recorded archaeology. Most are likely to be of similar date to the hut circle and possibly associated with it.

A large area within this zone was cleared of scrub in 2010, including the ground surrounding the hut circle and the area to both sides of the footpath. Unfortunately, bracken has taken advantage of this open space and now dominates it. This should be eradicated as part of the main programme of bracken clearance (*see* **4.5** below). Gorse is persisting in the areas not yet reduced and will require thorough removal.

4.4.7 Northern slopes (Zones 7 [2.05ha] Priority 2)

Little significant archaeology has been recorded in Zone 7, and it is the intention to maintain some successional areas of vegetation within it. However, the current level of scrub will need to be reduced over a large portion of

this area, especially the over-matured gorse, and maintained at a lower density in order to allow access by cattle. It is currently difficult for cattle to move freely within this zone and a mosaic of inter-connecting clearings would be a suitable objective to ease that problem.

4.4.8 Southern and south-eastern slopes (Zone 8 [4.42ha] Priority 2)

Within this zone the archaeology comprises only a group of undated clearance cairns and the 19th-century overhanging quarryman's shelter. The latter in particular will not be affected by vegetation growth. Although the future management of parts of this zone includes the maintenance of successional scrub, the denser areas, and the large stands of over-matured gorse should be reduced and maintained at a lower mass in order to allow access by cattle. A mosaic of inter-connecting clearings would be a suitable long-term objective for this area, through which public access to the quarryman's shelter would also be easier, and the cairns can be clear and accessible.

4.4.9 Northern slopes (Zone 9 [1.63ha])

The vegetation in Zone 9 includes a good balance of tree and shrub species, and is well frequented by cattle who benefit from the shelter it provides. Although included in the scheduled area, no sensitive heritage assets are contained within it and no intervention to specifically manage archaeology is required in this zone.

4.4.10 Charting progress

Progress of scrub reduction and grazing effectiveness can be monitored by recording each area as it is cleared using a simple hand-held GPS device, or by accurate sketch plotting on a geo-referenced aerial photo overlay. This dated information can be stored in a GIS system and referred to in future years as a means of documenting and evaluating the success of the work, and used to determine any modifications required.

4.5 Bracken control (Year 1, Summer 2015; Priority 1)

Bracken should be eliminated, or significantly reduced, in Zones 1 to 7 (Figs 4 & 6), amounting to 9.8ha in total. It may also be reduced in Zone 8 but with some retained within the mosaic of scrub on the lower southern slope. If resources are limited, then the priority areas for control should be those containing archaeology (Figs 4 & 6). However, if any zones are left untreated, future control will be more difficult, so a programme covering the whole site is to be preferred. Several methods of treatment are available and it will be for the HLS agreement holder to select the method used. The following discussion identifies the issues associated with each in terms of their effect on archaeological remains.

The most effective treatment would be spraying with the selective herbicide Asulam. This chemical is currently under emergency authorization, permitting its use between July 1st and October 31st 2014. The situation for 2015 is yet to be announced (as of Oct 2014) but it can only be used if the authorization is renewed.

Assuming its use is permitted, and given the size of the area to be treated, aerial spraying, mounted on a fixed-wing aircraft or helicopter would be a feasible method to use and should be considered a preferred option However, expert opinion should be consulted as to its effectiveness and safety on this sloping, rocky terrain. The fact that the site is within a nature reserve and is used for grazing and public access, are also points requiring careful consideration before this course is followed. A great advantage of this method would be that the whole of the area designated for bracken reduction could be covered in one operation and it would avoid the need to disturb the archaeology. However, selective use of the herbicide, avoiding the area to the south-east, where bracken is to be preserved in Zone 8, may be difficult.

Hand spraying, using backpack sprayers, would be equally effective and is also an appropriate method for use on archaeologically sensitive areas. The ULVA (ultra low volume applicator) would also be a suitable alternative though currently is not authorised for the application of Asulam. An advantage of manual sprayers is that smaller

4.6 Action timetable (*see also* general guidance notes below and Figs 5 and 6)

TABLE 1

Schedule	Zone	Action	Task	Priority
Year one Dec 2014 - Feb 2015	1 to 6 [5.75ha]	4.4.1 4.4.2 4.4.3 4.4.4 4.4.5 4.4.6 4.7	Remove scrub (gorse, bramble, blackthorn and small hawthorns) as described above, using brush cutters, chainsaws and other manual methods. Treat stumps with an appropriate herbicide to prevent regrowth. Arisings should be chipped and removed or burned away from extant archaeology (*see* note 2). Alternatively, small, discrete stacks of brashings may be left to decay naturally. Mature trees may remain in place, unless growing directly on an archaeological feature, in which case they should be removed. Saplings of hawthorn and holly should be considered as scrub and likewise reduced to retard the spread of these species. Repair fencing on NE corner of enclosure and restore the breach in the wall (point A, Fig 4)	1
Mid-Jul - Aug 2015	1 to 6	4.5	Begin a programme of bracken reduction/elimination.	1
Mid-Jul - Aug 2015	7 & 8	4.5	Begin a programme of bracken reduction in conjunction with zones 1-6. (nb: Not all of zone 8 will be subject to bracken reduction - *see* **4.5** below and Fig 6)	2
Year 2 Dec 2015 - Feb 2016	1 to 6		Remove any persistent scrub by cutting and further stump treatment.	1
Dec 2015 - Feb 2016	7 & 8 [6.47ha]	4.4.7 4.4.8	Reduce areas of over-matured gorse and other densely packed scrub species to create a mosaic of inter-connecting clearings. Use brush cutters, chainsaws and other manual methods to achieve this. Treat stumps with an appropriate herbicide to prevent regrowth. Arisings may be stacked into small discrete piles to decay naturally. Alternatively, they should be chipped *in situ* or burned on small bonfires (*see* note 2).	2
Mid-Jul - Aug 2016	1 to 8	All	Continue any follow-up treatment of bracken that might be necessary.	1
Year 3 Nov 2016 - Oct 2017	1 to 6	4.4.1 - 6	Evaluate progress, especially the effectiveness, or otherwise, of grazing in helping create the aimed-for HK-7 vegetation cover. Continue to monitor scrub growth. Use volunteers or contractors to remove any persistent scrub regrowth, where still not reduced by grazing.	1
Nov 2016 - Oct 2017	7 & 8	4.4.7 - 8	Evaluate progress, especially the effectiveness, or otherwise, of grazing in helping create the aimed-for HC-15 vegetation cover. Continue to monitor scrub growth. Use volunteers or contractors to remove any persistent scrub regrowth, where still not reduced by grazing.	2

areas can be prioritized if necessary (*see* Fig 6). Small boom sprayers may be available for use on quad bikes or mini tractors, but the rocky terrain would make their use problematic. The recommended months for spraying bracken are mid-July to the end of August.[3]

Various non-chemical methods of reduction might be suitable alternatives, including cutting or rolling using manual or horse-powered methods, and stomping by livestock. All require repeat action over several seasons and are far less effective than chemical control. Heavy machinery, such as tractors, should not be used in Zones 1-6. The use of cut bracken for biomass fuel is a potentially useful system but the harvesters needed could not operate on this terrain, especially the archaeologically sensitive areas. However, this system may be viable if a method to bring in the 'crop' without damaging the ground is available.

4.6 Action timetable (*see* above TABLE 1, p. 10)

4.7 Infrastructure improvements (Year 1, Priority 1)

At only one location is it necessary to undertake infrastructure improvements. This concerns a breach in the fence along the NE corner of the Tor enclosure, which has allowed cattle to enter from, and exit into, the neighboring field, causing erosion of the wall bank that runs along the same line. The fence needs to be reinstated to prevent this, without disturbing the Neolithic rampart that the boundary wall sits on in the field. Posts should be driven into the boundary wall, either vertically or, possibly, horizontally to support the wires. The damaged section should be repaired sympathetically using the stone facing technique originally used on both faces.

4.8 Future research potential

Because Neolithic tor enclosures are an extremely limited resource, and all are scheduled monuments, research objectives need to be very tightly defined and aimed at answering major questions before consent would be granted for any intervention at Helman Tor, such as excavation, test pitting, auger sampling etc. Non-invasive techniques such as geophysics may have a role to play here if the problem of the shallow soil and underlying granite bedrock can be overcome, especially in exploring the potential of the 'cleared' areas to contain evidence of structures. However, the Neolithic credentials of Helman Tor have already been established through excavation, and any resources aimed at this category of monument in the South West, would be better directed at sites yet to be verified, such as Trencrom, Rough Tor, Dewerstone etc.

On the western slopes of the tor (Zone 6), management recommendations have been hampered for this and previous investigations (e.g. Dudley 2005), because vegetation has been so dense in recent years. A proportion of the recorded archaeology has been derived from aerial photo transcription but not properly ground verified, so uncertainty remains over the authenticity and interpretation of some features. It is highly recommended that a new earthwork (GPS) survey at a scale of 1:500 or 1:1000 is undertaken soon after the scrub reduction of 2014-15, preferably in late winter. This would provide accurate locations and extent for each feature within the group. The survey needs to be accurately geo-referenced and suitable for transfer into a GIS. Such a survey, combined with previous surveys of the tor enclosure, would also play an important role in preparing interpretation material (below) and informing future management.

4.9 Interpretation and public access

The current interpretation board is adequate as a brief summary of the place for visitors, combining information on both the natural and historic environments. However, when it nears the end of its life and a replacement is considered, more information about what to look for at Helman Tor would be useful, especially the Neolithic enclosure, and the addition of information concerning the Bronze Age landscape on the western side should be included. A plan, or air photo overlay, showing the layout of the remains, would assist people in recognising them. Currently, a layperson would have difficulty identifying the ramparts for example, without first knowing where to look. The present location of the board is ideal, but a duplicate, could be considered just inside the fence beside

the stile entrance in the lane at SX 0598 6161. This, if visible from the lane, might encourage people to divert to the tor using the Wilderness Trail footpath from the Saint's Way, enabling them to explore the remains then return to the Saint's Way via the car park exit, as depicted on the current information board.

Smartphone technology could add much to a visit to Helman Tor, if included in a future interpretation scheme. Simply by displaying the web link to the Cornwall Historic Environment Service's Access to Monuments (A2M) Website[2] on the interpretation board, the visitor would instantly have access to authoritative information, which they can study while at the site, or read later.

Although the Wilderness Trail enables walkers to explore the tor, there is currently no footpath that traverses the tor on route to other parts of the reserve, or to other footpaths, apart from the Saint's Way. A through route across the tor, then down to the Red Moor section of the reserve, would increase visitors to the eastern side of the tor providing them with more options. Maintenance of a well-used, wide footpath on the eastern side of the tor could be beneficial in encourage cattle movement into that area.

General guidance notes

1. No tree, sapling or shrub should be grubbed out as part of the reduction. Scrub should be cut at ground-level then treated with an appropriate herbicide. Roots should be left in place to rot. This is a necessary precaution to prevent further damage to sub-surface archaeological features.

2. All bonfires are to be held away from known extant archaeologically features, preferably within known sterile areas. Tin sheeting may be used to protect the ground if needed.

3. Cutting should be avoided during bird nesting seasons.

4. Tractors or any heavy machinery should not be used in any part of the scheduled monument containing archaeological remains, i.e. Zones 1-6.

5. In recommending the above actions it is assumed that appropriate stocking levels of grazing animals will be maintained at all times to assist with controlling regrowth of invasive species. Agreement will need to be gained from Natural England on appropriate numbers for this task.

6. Grazing animals could very usefully include rare breed ponies, such as Dartmoor or Exmoor, which will devour a wider range of plant growth than cattle, including gorse and brambles. Alternatively, sheep have less impact on the land than larger animals, in terms of erosion. There is, however, a problem of dogs at Helman Tor.

7. Controlled burning, although permissible as a management technique, should be avoided within areas of known archaeological remains, in favour of cutting; in particular where stony monuments protrude through loamy soils. or where the density of vegetation is likely to cause an intense or sustained blaze. This technique should only be considered in consultation with an English Heritage Field Advisor.

Notes

[1] http://www.cornwallwildlifetrust.org.uk/Resources/Cornwall%20Wildlife%20Trust/PDF%20Documents/Cornwall_Wildlife_Trust_Wilderness_Trail_leaflet.pdf

[2] Natural England 2011 Scrub management Handbook Appendix 8, 39

[3] RSPB - Bracken management in the Uplands http://www.rspb.org.uk/forprofessionals/farming/advice/details.aspx?id=204253

[4] Access to monuments. http://www.historic-cornwall.org.uk/a2m/neolithic/tor_enclosure/helman%20tor/helman_tor.htm

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TABLE 2 Site Inventory

Gaz No. From Dudley 2005	Type Period	HER (PRN) Eastings Northings	Description	Condition	Priority	Action
20	Enclosure Bronze Age	70968 E: 206095 N: 61447	A sub-rectangular enclosure of 30m by 15m on the SW slope of Helman Tor. Although first recorded from aerial photographs by the NMP, previous attempts to ground-verify the remains (e.g. Dudley 2005) have not been possible due to vegetation cover. Fieldwork was not possible for the present survey for the same reason.	Declining due to coverage of dense bracken and scrub.	1	Reduce scrub Eliminate bracken Ground verification and/or survey required **Zone 6** Action 4.4.6
21	Ditch Not known	71010 E: 206025 N: 61504	A linear cut feature, interpreted as a ditch, was plotted from APs by the NMP. The earthwork follows a sinuous course near the roadside on the lower western slope of Helman Tor. Although first recorded from aerial photographs by the NMP, previous attempts to ground-verify the remains (e.g. Dudley 2005) have not been possible due to vegetation cover. Field inspection was not possible for the present survey for the same reason.	Declining due to coverage of dense bracken and scrub.	1	Reduce scrub Eliminate bracken Ground verification and/or survey required **Zone 6** Action 4.4.6
22	Quarry Post-medieval	/ E: 206058 N: 61438	A probable quarry, adjacent to the hedge beside the lane on the lower western slope of Helman Tor.	Stable. Inaccessible	/	None
23	Field system Bronze Age	/ E: 206050 N: 61512	A field system and associated features (*see* Nos 24-6; 28) on the lower, western slopes of Helman Tor, comprising low fragmentary, stony banks . Although recorded in part on the ground in 1983 some of the features were recorded from APs by the NMP and have not been ground verified. Vegetation prevented Dudley inspecting the remains (2005) and dense bracken covered the site at the time of the present survey.	Declining due to coverage of dense bracken and scrub.	1	Reduce scrub Eliminate bracken Survey required **Zone 6** Action 4.4.6
24	Hut circle Bronze Age/ Iron Age	21396.5 E: 206042 N: 61583	A large, 18m-diameter hut circle on the lower western slope of Helman Tor. It comprises a circular earthen bank incorporating some upright granite slabs. The interior is approximately level . The entrance was not visible when visited due to dense cover of bracken. The site was cleared of scrub in 2010.	Declining due to coverage of dense bracken.	1	Eliminate bracken Survey required **Zone 6** Action 4.4.6
25	Hut platform Bronze Age/ Iron Age	21396.5 E: 206073 N: 61507	One of two likely earthwork hut platforms associated with the field system (23) on the lower western slopes of Helman Tor. Field investigation was not possible due to vegetation cover.	Declining due to coverage of dense bracken and scrub.	1	Reduce scrub Eliminate bracken Survey required **Zone 6** Action 4.4.6

26	Hut platform Bronze Age/ Iron Age	21396.5 E: 206098 N: 61527	One of two likely earthwork hut platforms associated with the field system (23) on the lower western slopes of Helman Tor. Field investigation was not possible due to vegetation cover.	Declining due to coverage of dense bracken and scrub.	1	Reduce scrub Eliminate bracken Survey required **Zone 6** Action 4.4.6
27	Hollow way Bronze Age/ Iron Age	70950 E: 206030 N: 61635	Two stony earthwork banks run approximately NW to SE across the lower western slope of Helman Tor. The features are recorded as a the sides of a hollow way, but are more likely to be part of a Bronze Age field system or perhaps a droveway. Although covered by dense scrub and bracken, the banks are visible in places and an animal path runs along the interior.	Declining due to coverage of dense bracken and scrub.	1	Reduce scrub and eliminate bracken. **Zone 6** Action 4.4.6
28	Clearance cairns Bronze Age	21396.5 E: Various N: Various	A group of four clearance cairns on the lower western slope of Helman Tor, comprising random heaps of loose stone. A dense covering of bracken prevented field investigation.	Declining due to coverage of dense bracken and scrub.	1	Reduce scrub and eliminate bracken **Zone 6** Action 4.4.6
29	Tor enclosure Neolithic	21396 E:206190 N: 61622	A Neolithic tor enclosure which occupies 1.1ha of the flattish plateau on the summit of Helman Tor, incorporating several of the granite outcrops. The rampart is clearest on the eastern side where a combination of subtle artificial earthwork slopes, turf-covered stony banks, and a very few orthostats, define the edge of the plateau. The southern end of the enclosure incorporates a large outcrop, but traces of the stony bank can be traced on the southern foot of the rocks, where a breach in the bank may represent an entrance. The western rampart is less clear, but probably ran along the same course as a more recent stone-faced bank which exists today. This is likely to be medieval or later, but utilised the route and materials of the Neolithic rampart. A pair of closely spaced upright granite pillars, near this bank on the interior, have been suggested as an alternative position for the entrance. The vertical rockface of an outcrop serves as an enclosure wall on the northern end of the tor, linking together the two built ramparts, which run south on the eastern and western sides of the plateau. The interior, undulates considerably, especially around the outcrops, and much earthfast detached rock exists within it. Many stone-free areas have been identified in this area, and are believed by some researchers to represent clearance. To the west of the tor, at a slightly lower altitude, a natural shelf which runs approximately along the contour, appears to have been reinforced with additional boulders to form an outer boundary, or 0.8ha annex, to the main tor enclosure. Test excavations in the 1980s (Mercer 1981; 1986) provided conclusive ceramic and radiocarbon dating evidence, placing the origins of the tor enclosure firmly in the Neolithic period (3500BC to 2200BC).	Mostly stable and in places clear of vegetation. Some scrub and bracken needs attention. The outer enclosure requires scrub removal.	1	Reduce scrub and eliminate bracken. **Zones 1-5** Actions 4.4.1 – 4.4.5

30	Quarryman's Shelter Post-medieval/ modern	/ E: 206234 N: 61452	On the southern slope of Helman Tor, a naturally sited granite slab, rests on a large block to form a wide overhang. The ground beneath has been hollowed and embanked to form an effective shelter, allegedly used to accommodate quarrymen, though this is unverified.	Stable. Bracken surrounds, but does not currently affect, this site.	2	No specific action **Zone 8** Action 4.4.8
31	Field system Bronze Age/ Iron Age	70970 E: 206210 N: 61546	Features recorded by NMP on the summit and eastern slope of Helman Tor. (for summit see 29). The eastern slope is currently covered by dense vegetation and investigation was not possible.	Not known	2	No specific action. General measures to control scrub on the tor. **Zones 1 & 4** Action 4.4.6
32	Clearance heaps Not known	/ E: Vaarious N: Various	Clearance heaps were recorded by in 1983 (CCRA 1983) at two locations on the eastern slopes of Helman Tor and at a separate location to the south. It is possible the heaps have prehistoric origins, clearing ground for settlement or cultivation. Investigation was not possible due to dense vegetation.	Not known – probably stable	1/2	General measures to control scrub on the tor. Survey required **Zones 2, 3 & 8** Action 4.4.2-3, 4.4.8
33	Stone splitting Post medieval/ modern	/ E: Various N: Various	Stone splitting is evident on and around the outcrops of Helman Tor. Lines of semi-circular holes, drilled using a jumper, indicate much post 1800 extraction of granite using plug and feather, but potentially earlier wedge technique is also present. Large pieces have been removed from the southern outcrop and there is some evidence of moorstone cutting on the interior of the Hilltop enclosure.	Stable	/	**Zones 1 & 4** No specific action
35	Clearance	/	A granite heap recorded by Dudley (2005), probably the result of the recorded attempt at land 'improvement' in 1982. Non archaeological	Not known	/	No action
36	Clearance Not known	/	A granite heap recorded by Dudley (2005), probably the result of the recorded attempt at land 'improvement' in 1982. Non archaeological	Not known	/	No action
38	Boundary Med/ post-med	/ E: 206091 N: 61785	A field boundary of medieval or post-medieval date, comprising a stone-faced earthen bank runs NW from the northernmost outcrop of the tor, dividing the northern slope.	Stable	/	**Zone 9** No action. Scrub clearance on western side.
45	Incised cross Modern	/ E: 206213 N: 61570	An incised cross cut into the granite on the southern outcrop of the tor, close by the trig point. The incision has sharp, un-weathered edges and is undoubtedly very recent. Non archaeological	/	/	**Zone 1** No specific action
46	Propped stone Not known	/ 206212 61623	A stone on the tor reported by Dudley (2005) to have been deliberately propped with smaller stones beneath. Not found.	(?) Stable	/	**Zone 1** No specific action

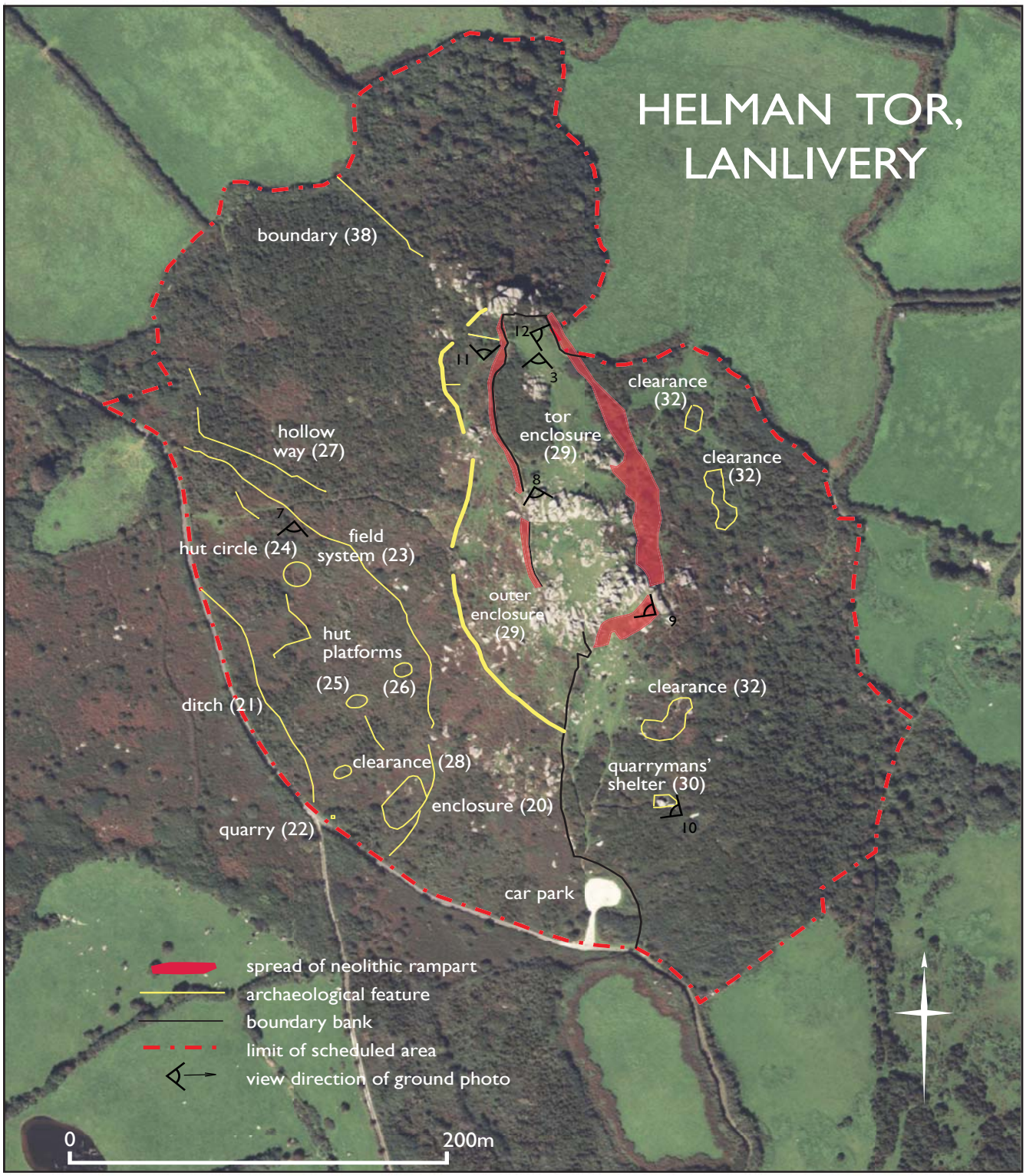

Fig 3 Aerial photograph with overlay showing main archaeological features within the scheduled area. Licensed to Natural England for the PGA through Next Perspectives™. Permitted use: Natural England core business.

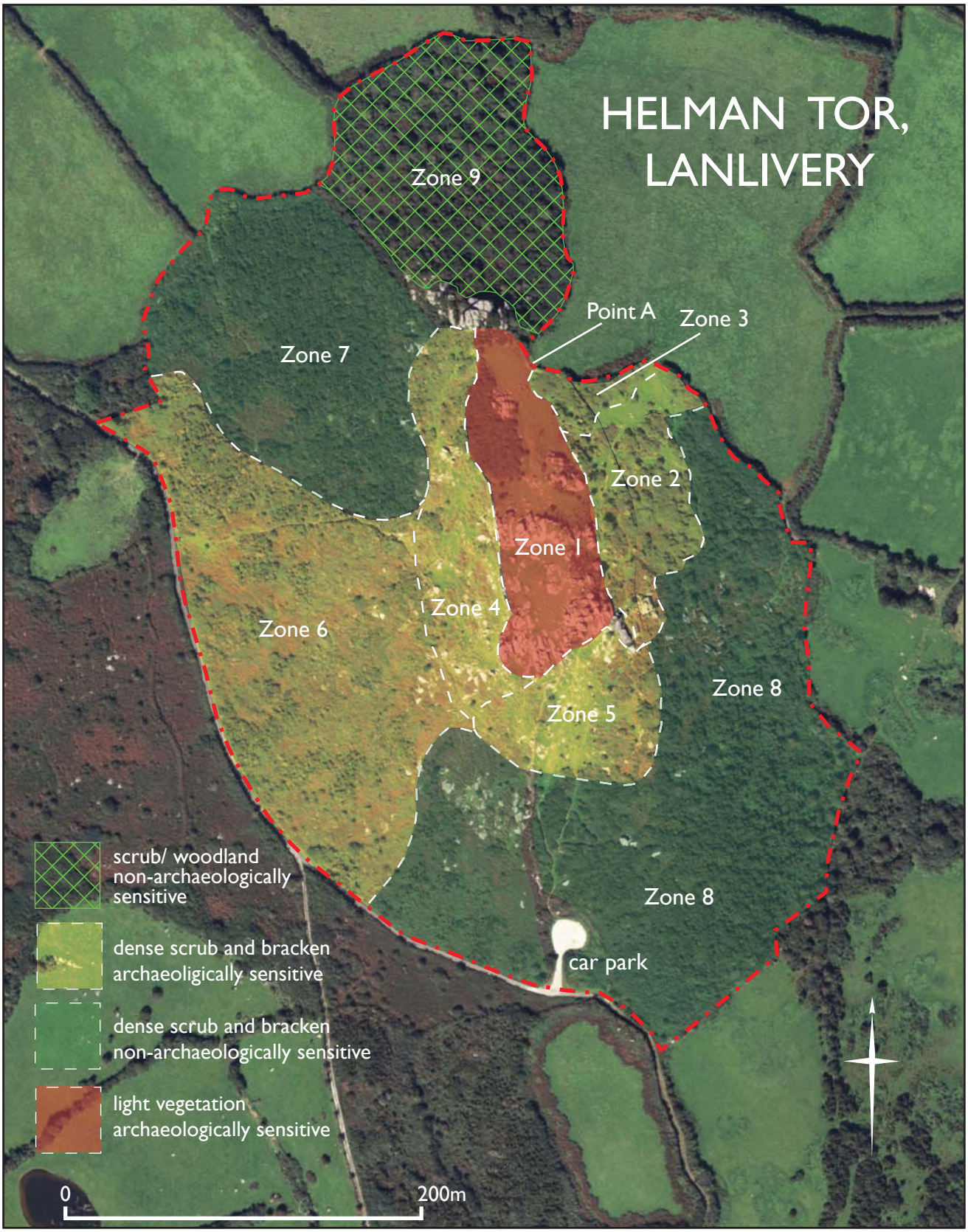

Fig 4 Aerial photograph showing management action zones described in section 4. Data licensed to Natural England for the PGA through Next Perspectives™. Permitted use: Natural England core business.

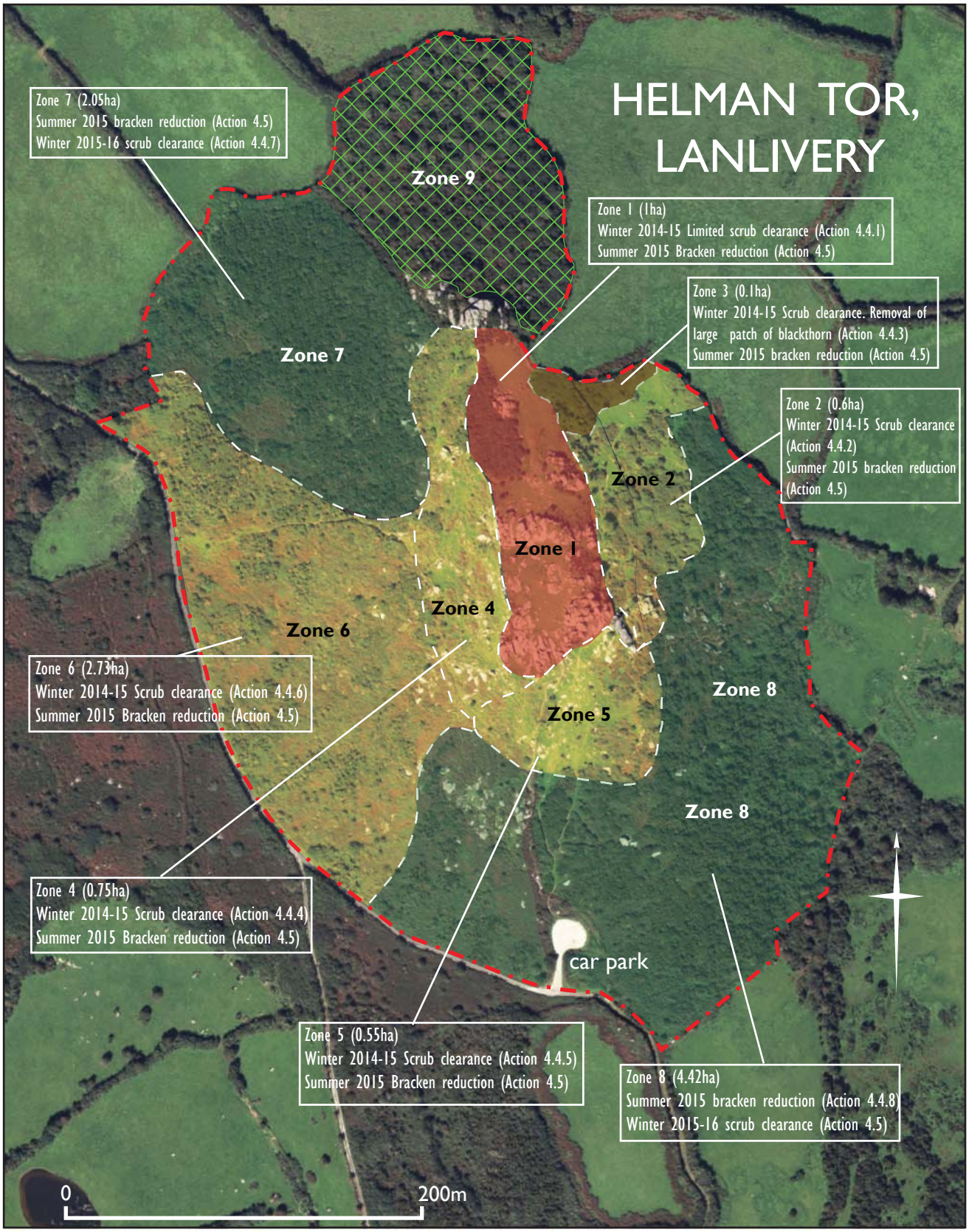

Fig 5 *Aerial photograph showing management action zones described in section 4. with timetable details (see Table 1). Data licensed to Natural England for the PGA through Next Perspectives™. Permitted use: Natural England core business.*

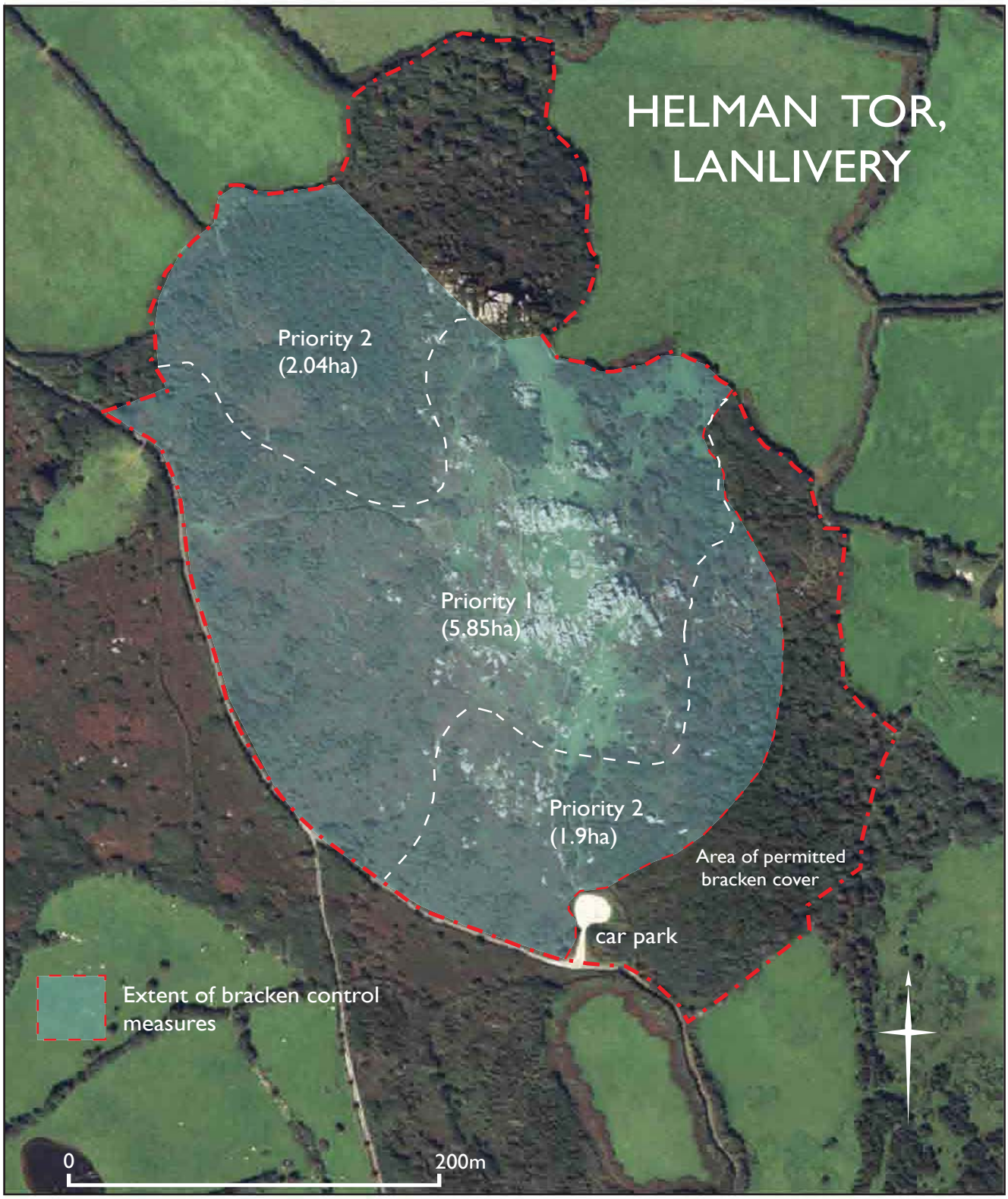

Fig 6 Aerial photo with overlay showing the total area where bracken control is required and priority zones. Data Licensed to Natural England for the PGA through Next Perspectives™. Permitted use: Natural England core business.

Fig 7 The dense covering of bracken is currently obscuring all archaeological features on the west side of the tor.

Fig 8 The western interior of the tor enclosure and the southern outcrop.

Fig 9 Drill split holes on the southern granite outcrop; evidence of stone cutting.

Fig 10 Alleged quarryman's shelter adapted from a natural overhanging rock on the south slopes of the tor.

Fig 11 The enclosure wall, adapted from the Neolithic rampart where it meets the northern tor outcrop. Scrub is spreading over these features.

Fig 12 Boundary wall on the eastern edge of the tor enclosure, showing damage by cattle.

Note also the patch of blackthorn (Zone 3) spreading into the interior of the enclosure.