Managing Change on Historic Battlefields

A guide for planning and heritage professionals

October 2023

Version History

Version Date	Author	Ratified	Version	Amendments
January 2023	Simon Marsh	Draft	v0.1	
June 2023	Simon Marsh	Draft	v0.2	Comments from Durham County Council, Battlefield Panel and Historic England incorporated.
Oct 2023	Simon Marsh	Board of Trustees	v1.0	

Foreword

During a training event for heritage professionals run by the Battlefields Trust in April 2022, participants identified a need for specific guidance on managing change on England's historic battlefields, particularly in providing advice on desk-based assessments and fieldwork that may be necessary in the planning process. The Battlefields Trust, as the leading national organisation aiming to preserve, research and present battlefields as educational and historical resources, undertook to produce such guidance and this document is the result of that work.

This document sets out the Battlefields Trust's guidance for heritage professionals on managing change on battlefield and includes what it considers to be best practice approaches for investigating battlefields. It draws heavily on existing national planning policy and Historic England guidance and has benefitted from comments from Historic England and other practitioners.

Simon Marsh

Battlefields Trust Research and Battlefields Threats Coordinator

October 2023

Contents

Managing change on historic battlefields

1. Introduction

1.1. This document provides advice for planning authorities, public bodies and others involved in planning and land management activities affecting historic battlefields in England. It should be used when considering the impact of proposed development on battlefield sites and their setting, including those that have been Registered by Historic England. Elements of this guidance are also likely to be relevant to other parts of the United Kingdom.

1.2. This document sets out:

- the status of battlefields as heritage assets of the highest significance.
- an approach to preparing and assessing development plans and other land-use proposals affecting battlefields.
- the criteria which should be applied when making decisions relating to planning applications and other land-use planning proposals.
- guidance on how best to investigate battlefields for planning and land management purposes.

2. The significance of historic battlefields

2.1. Although of often short duration, the engagements that took place on our historic battlefields saw key moments which changed the course of British history: thousands of people came together and risked their lives, some for a cause they believed in, others because they were made to fight. They are, as Winston Churchill famously observed, ‘the punctuation marks of history’. The value of battlefields today is both tangible and intangible. The topography of a battlefield, often with landscape features which were there at the time of the battle, provides a vital resource for understanding how the battle evolved and was fought. Archaeology from the battle, for example the lead shot that was fired or the grave-pits of the dead, can be combined with an understanding of the landscape and documentary evidence to develop our knowledge of what took place there. But there are other, less tangible, benefits which battlefields provide. They encourage increased tourism and with it economic benefits to the surrounding area. They also provide a teaching environment where the past can be brought to life and offer a sense of identity and place for those living in locations where, perhaps, very little of major significance has otherwise happened.

3. Registered battlefields

3.1. In 1995, Historic England established a Register of Historic Battlefields which now includes 47 of the most important English battlefields. Historic Environment Scotland implemented an Inventory of historic battlefields in Scotland in 2011 and this now covers 40 different sites. In 2016, the Welsh Government took a different approach by identifying over 700 sites of conflict in an inventory whilst allowing for their designation

as scheduled ancient monuments, where this was deemed appropriate. As part of the initial work for the Welsh inventory, Cadw undertook detailed work on 47 battle and siege sites. No listing of battlefields exists yet in Northern Ireland.

3.2. Historic England only registers battles which were 'fought on land involving wholly or largely formed bodies of armed men, deployed and engaged on the field under formal command'. Its selection criteria requires a battlefield that is designated to be historically significant, to have a secure location, and have sufficient topographic integrity for it to be understood as a battlefield. Other factors used by Historic England in determining whether a battlefield should be Registered include the potential for archaeological finds relating to the battle to be made, the existence of sufficient documentary evidence, evidence of military innovation, biographic associations with important figures, and commemorative. All Registered battlefields have an entry on the National Heritage List for England which contains details about the battle, including its historical significance and topography, and a map showing the designated area of the battlefield.

4. Policy context

4.1. Historic England's battlefield register was established under the Historic Buildings and Ancient Monuments Act (1953).

4.2. The inclusion of a battlefield on the Register of Historic Battlefields does not give it statutory protection, but it does make its status a material consideration when planning decisions that affect it are made. Planning authorities should consult Historic England on proposed developments that might affect the significance of a Registered battlefield, including its setting. They should take any advice from Historic England into account when deciding whether permission should be granted for development.

4.3. In England planning decisions about development on Registered battlefields are primarily governed by national planning policy currently set out in the National Planning Policy Framework (NPPF). This says that when a heritage asset, including battlefields, will be affected by a proposal, developers need to provide a statement of the significance of the heritage asset so that the planning authority can make a judgement about the harm the development will have on that significance. A heritage impact assessment provided by the developer is the usual vehicle for this statement of significance. Local plans can also inform planning decisions about battlefields (see section 6 below).

4.4. If the harm to the significance of a Registered battlefield from development is substantial, then only in 'wholly exceptional circumstances' should the development be agreed. For development causing less than substantial harm to the significance, the planning authority is required to weigh-up the public benefit of development against the harm to the significance of the heritage asset, determining which is the greater, to decide whether to agree or refuse planning permission. For non-designated heritage assets, the scale of harm to significance should also be considered against the benefits of development.

4.5. Planning policy guidance makes clear that whether a proposal causes substantial harm to the significance of a heritage asset will be a judgment for the decision-maker, having regard to the circumstances of the case and the policy in the NPPF. 'Substantial' harm is generally seen as a high test, so it may not arise in many cases. The guidance also says that it is the degree of harm to the asset's significance rather than the scale of the development that is to be assessed. The harm may arise from works to the asset or from development within its setting.

5. Roles and responsibilities

5.1. Certain public bodies have specific roles and responsibilities for historic battlefields at national or local level. At the highest level, the government sets the national policy for planning and the historic environment, which is then a consideration for national and local planning bodies.

5.2. Historic England maintains the Register of Historic Battlefields and gives advice to local authorities on managing change to Registered battlefields. Organisations that make decisions on planning applications are legally required to consult Historic England if changes could affect a Registered battlefield.

5.3. Planning authorities have an important role in protecting historic battlefields as they both prepare their respective local plans (in which a Registered or non-Registered battlefield can be identified as a heritage asset) and in determining planning applications.

5.4. Public bodies who have a responsibility for land management should consider Registered battlefields when they develop plans, policies and guidance. This will allow them to manage change on battlefield sites appropriately.

5.5. The Battlefields Trust, a national charity dedicated to preserving, researching and presenting battlefields as historical and educational resource, can provide advice on managing battlefield heritage.

6. Local Plans

6.1. Local plans should set out policies and criteria that apply to the protection, conservation and management of battlefields, both registered and those listed locally. Such plans should be consistent with, but not duplicate national planning policy on battlefields. When developing local plans, planning authorities should consider potential impacts and the capacity of Registered and non–registered battlefields to accommodate development without damage to their significance, key landscape characteristics and special qualities. This process should follow similar principles to those outlined in the section on the battlefield development management process in Section 7

7. Managing Development on Battlefields

7.1. Battlefield registration is not intended to be a barrier to development. Its purpose is to ensure that any development proposals affecting battlefields take into consideration the special character and qualities of that landscape, the significance of the battlefield, and any impact on physical remains from the battle or the landscape of the battlefield are mitigated as far as possible.

7.2. Early and meaningful engagement by developers with the local planning authority and Historic England can be helpful in shaping development proposals to minimise their impact on the significance of a particular battlefield, its special characteristics, and can help identify unacceptable proposals before significant costs have been incurred.

7.3. Historic England provides guidance on the sustainable management of the historic environment in its Conservation Principles, Policies and Guidance (historicengland.org.uk) document. This establishes a model for understanding the significance of a heritage asset, assessing the impact of any change, and then seeking appropriate mitigation. This framework can then be applied to the requirements set out in paragraph 197 of the NPPF which says that in determining applications local planning authorities should take account of:

a) the desirability of sustaining and enhancing the significance of heritage assets, and putting them to viable uses consistent with their conservation;

b) the wider social, cultural, economic and environmental benefits that conservation of the historic environment can bring;

c) the desirability of new development making a positive contribution to local character and distinctiveness

The following sections provides further amplification which is specific to battlefields.

Understand

7.4. The National Planning Policy Framework says that development proposals affecting heritage assets (including Registered and non-Registered battlefields recognised as heritage assets) should describe their significance, including the contribution made by setting to that significance, and, as all battlefields have the potential for archaeological remains to be present, include a suitable desk-based assessment and field evaluation. Developers normally provide this in the form of a Heritage Impact Assessment which details the battle and battlefield and explains what impact the development would have on the significance of the site if it was approved. If no Heritage Impact Assessment has been made, the application fails to meet the aim and objectives of the NPPF (para 194) and the developer should be asked to provide one.

7.5. A qualified and experienced professional should carry out a heritage impact assessment, using methodologies that are proportionate and appropriate for assessing battlefield sites:

7.6. The assessment should identify important features of the battlefield including, topography, extent, potential or known physical remains, key sight lines (including those from outside the battlefield area), and earlier development on the site. Any other heritage assets on the battlefield or in the surrounding area should also be considered. Finally, the nature of the development and the possible impacts it will have on the battlefield's significance should be reviewed.

7.7. The starting point for understanding any Registered battlefield should be the entry of the Register of Historic Battlefields which can be found via the National Heritage List for England. This can be supplemented with further reading, including the Battlefields Trust Battlefield Hub which contains detailed information about English and Scottish battlefields. The Historic Environment Record should also be consulted as this provides a baseline view of the battle and battlefield (both Registered and non-Registered ones), and provides details on finds and other designations within the battlefield area. Unfortunately, these can be of variable quality and the Battlefields Trust may be able to provide more detailed information from the UK Fields of Conflict Database it has established. Heritage professionals undertaking such assessments should have accessed these resources as a minimum. Map regression can be a further helpful tool in understanding the landscape of the battlefield as it can indicate where there has been continuity and change over time. Further detail on this is provided in the section 8.3. Field evaluation work will often involve a metal detecting survey of the battlefield. Methodology for this is covered in section 8.4 and 8.5 of this guidance.

Assess

7.8. Whilst change has occurred on many English battlefields since the battle was fought, topographic integrity remains for all Registered battlefields (otherwise they would not have been registered) and may also exist for non-Registered battlefields. This presents itself in the rise and fall of the land, which is unlikely to have changed substantially since the battle was fought, as well as in enclosure, banks, ditches, and ridge and furrow – if they were there at the time of the battle. Water courses, although they may have meandered over time, and marshland would, like other landscape features, have created terrain obstacles, shaping the tactical environment. Thoroughfares, which now might only be tracks or paths, may also be important in providing an understanding of the approaches to the battlefield and therefore how the armies deployed. These features should be assessed as part of any management of change on a battlefield.

7.9. It is also important to consider views of this terrain from outside any designated battlefield area, particularly those where opposing army commanders approached the

battlefield as this would have conditioned their tactical and operational decision making.

7.10 Development outside the designated battlefield area which affects its setting should additionally be considered. Any that detracts from a battlefield's general pastoral quality or distracts from the views that opposing army commanders would have experienced on the day of battle and therefore on the heritage significance of the site are of particular importance and should be assessed carefully. Further Historic England advice on managing change within the setting of heritage assets can be found at The Setting of Heritage Assets (historicengland.org.uk).

7.11. The contribution a battlefield provides to local character and distinctiveness often derives from the fact that the battle was probably one of the most significant historical events to have occurred in that location and is a key element in developing local identity and providing a sense of place. Battlefields also provide a focus for commemoration and can be used as an educational tool in explaining the events that took place there. Finally, a battlefield might also be a tourist destination which benefits local retailers and hospitality providers. These reflect the wider social, cultural and economic benefits that conservation of battlefields can bring.

Mitigation

7.12. Ideally, proposed changes will not cause harm to the significance of a battlefield. In practice, however, harm may occur, and therefore the options for reducing or minimising harm need to be explored.

7.13. The preferred option will always be one which avoids impacts on the battlefield altogether. Where this is not possible, developers should aim to reduce impacts through design. Proposals should also identify opportunities to enhance the battlefield where possible, though these are likely to be considered as compensatory and the least preferred option. They should only be considered as mitigation when opportunities for avoidance and reduction have already been explored.

7.14. Enhancement schemes can increase understanding of a battlefield. The funding of historical, archaeological or local community research is one way this can be achieved. By revealing key terrain and/or opening-up important views and sight lines, they can help preserve the integrity of battlefield landscapes. Interpretive and commemorative schemes or others that increase battlefield access can also help enhance battlefields by creating community and visitor benefits.

8. Permitted Development

8.1. The General Permitted Development Order[1] allows certain types of development to take place, including on registered battlefields, without planning

[1] The Town and Country Planning (General Permitted Development) (England) Order 2015 (legislation.gov.uk)

permission. This is allowed because the works are deemed to be of a scale or type that is generally not likely to have an unacceptable impact. However, such works can result in detrimental change on battlefields and impact on any extant archaeology there without a requirement for its investigation in advance of development.

8.2. Planning authorities can remove permitted development rights by implementing an Article 4 Direction[2] on an area of land within its jurisdiction. Planning authorities may therefore wish to consider whether such a course of action for certain categories of permitted development is appropriate for registered battlefields within their area. The Battlefields Trust can advise on the categories likely to have a detrimental impact.

[2] See Planning for the Historic Environment: Restricting Permitted Development and Article 4 Directions | Historic England for Historic England advice on the use of Article 4 Directions.

9. Battlefield Investigation Methodology

9.1. Recreating the historical landscape

9.1.1. The purpose of recreating the historical landscape of a battlefield is to better understand the key elements of terrain and the extent to which they survive today. Reconstructing such landscapes allows terrain clues found within the primary accounts of a battle to be better understood and for the action described to be placed within that recreated landscape. Such landscape can then be overlaid on modern mapping using GIS tools to identify important topographic features within a proposed development area on a battlefield.

9.1.2. Where primary sources are sparing in identifying important terrain features, historically sensitive KOCOA (**k**ey terrain, **o**bservation and fields of fire, **c**over and concealment, **o**bstacles, **a**venues of approach and withdrawal) analysis can be used to augment such sources where a battlefield's location is generally secure. KOCOA is a methodology developed by the US military for analysing battlefield terrain and its application is detailed at 8.3.

9.2. Historical landscape reconstruction methodology

9.2.1. The key features sought when reconstructing the landscape of a battlefield are those that affect the logistics - the long distance movement of men and materials (the strategic landscape) - and the terrain that effects the more immediate tactics of warfare, and are principally: roads; rivers with the position and nature of crossing points, whether ford, bridge or embankment; marsh or boggy land; wood and woodland; the extent and nature of unenclosed land, whether arable open field or common pasture; enclosed land; and settlement whether nucleated or dispersed (tactical terrain). All these features can assist or hinder in the movement of an army, the deployment of troops, and the engagement and action of the battle. But the landscape is not static and all these features may have been altered, to a greater or lesser extent, over time. Roads might be realigned, upgraded to turnpikes and later major modern thoroughfares, or downgraded or even deserted entirely. Similarly, rivers can be straightened, scoured or diverted, but will also meander and create new channels by natural processes. Marshes can be drained, woods grubbed up and evidence of early agricultural practices, such as ridge and furrow, destroyed by modern agricultural practices or development. Landscape evolution can result in many early features being obscured or obliterated and the earlier the landscape that needs to be understood, the more complex and challenging is the task. The earlier character of the landscape and the chronology and mechanism of its change, as well as the nature of land tenure, the production of records of it, and survival of archives can all lead to very different potential for reconstructing terrain at the time of a battle.

9.2.2. The primary sources for landscape analysis are the various types of historic map: county, enclosure, tithe, and estate. All have particular advantages and

limitations as all were made for a specific purpose.[3] County maps being of smaller scale than the others omit much detail but are particularly useful for placing features in a wider landscape context and are especially useful for road networks.

9.2.3. Enclosure maps document the process of enclosure and, as they are legal documents, are highly accurate. They largely date from the eighteenth and nineteenth centuries, the parliamentary period of enclosure, and very few pre-eighteenth century enclosure maps have been found nationally. Their function was to plot the new allotment boundaries and roads. They often also map ancient enclosures, and pre-existing roads and buildings. But within the newly enclosed land former features are not shown so the landscape being replaced cannot be discovered from enclosure maps. Draft enclosure maps do plot both the existing and new landscape but these rarely survive.

9.2.4. Tithe maps, like enclosure maps, were legal documents and, in addition to being highly accurately plotted, also all record the same information, although not always presented in the same way.[4] The purpose of the tithe map and apportionment was to record the new tithe tax, or rent charge, payable on every titheable parcel of land in England and Wales. In many parts of the country they are extraordinarily detailed giving data field-by-field: name, description, state of cultivation (arable, pasture, meadow etc.), measurement (acres, roods, perches), rent charge, owner and occupier. Field names can be especially useful as they can describe soil conditions, identify lost features such as warrens and parks, and indicate former land use, e.g. stocking, dibbing and sart indicate former woodland.[5] Tithe maps are also particularly valuable for delineating township boundaries. However, their date range 1836-1850 means they post-date enclosure for most places and any features they show, including some township boundaries, may be enclosure or later impositions.

9.2.5. Estate maps can be the most useful as they are not confined to a particular process, function or period. Estate owners could be institutions: the Crown, colleges, charities, monasteries; aristocratic families; or owners of single farms. Estate maps could be made for any number of reasons: as working documents for management; as a means of calculation rents and dues, typically when the estate changed hands through inheritance or sale; when alterations were made, either large scale re-planning or minor modifications; to settle disputes; or as a display of wealth and status. It is this diversity of function that makes them the most useful group of maps to study, but with a significant caveat: they are limited to the land belonging to the estate, often wholly ignoring other property and as such should be treated with caution. But despite their fragmentary and subjective nature, estate maps can

[3] T Partida, 'Drawing the Lines: A GIS Study of Enclosure in Northamptonshire', PhD, Huddersfield (2014) pp.37-66
[4] For a full discussion of the Tithe Commutation Act and tithe apportionments and maps see, Roger J. P. Kain & R.R. Oliver, The Tithe Maps of England and Wales: A Cartographic Analysis and County by County Catalogue, Cambridge, (1995)
[5] Partida, 2014. p.49

provide invaluable evidence of the condition of the landscape and, if there are a series of them, how it evolved.

9.2.6. Other documentary sources such as county histories, estate and parish records, deeds and sale catalogues should also be consulted for evidence of landscape history and management. All of these can provide information about how agricultural systems were organised and managed and the types of crops being grown and stock being reared. Manor court rolls can provide the most useful non-map information as they record detail of the organisation and management of the landscape, including rights of way.[6] Archaeological features are also of great importance to understanding past landscapes, particularly so for those as early as the medieval period. Aerial photography and lidar data should also be examined and as they can prove especially useful in identifying features such as ridge and furrow and former river channels and roads, and for generating contour data.

9.2.7. Geographic Information System (GIS) is an important tool for reconstructing historical landscapes. It allows the integration and systematic analysis of multiple data sets as well the ability to overlay multiple data sets to analyse the interaction between them. It also allows historical maps to be geo-rectified against a modern base-map, permitting an understanding of where those historical landscape features would have been located within today's terrain.

9.3. KOCOA Analysis

9.3.1. The starting point for any KOCOA analysis should be in determining the tactical **objectives** of opposing commanders in fighting the battle. These should be found in or deduced from the primary sources. Once these end states have been identified an analysis should be undertaken of the **key terrain**, defined by the US military as 'any locality or area the seizure, retention, or control of which affords a marked advantage to either combatant'. Key terrain should be that which was vital for achieving a commander's military objectives in fighting a battle. Key terrain is not always high ground and it may be the case that a specific area of high ground may be important; for example, the 'military crest' which allows observation down to lower ground is likely to be more important than the 'topographic crest' if such observation is obscured from the latter. Potential key terrain can be assessed by considering its control by either force on the outcome of the battle. Control may result from seizing ground (ie capturing it) or securing it (ie dominating it from another position). Key terrain will also depend on whether a force is attacking or defending. Major obstacles are seldom key terrain, but ground which allows defenders to cover an obstacle with fire may be. Key terrain might also permit or deny movement.

9.3.2. Areas around key terrain, such as avenues of approach, and obstacles should be analysed to determine if they provide clear **observation and fields of fire** for

[6] They are in fact court 'orders' but are called 'rolls' as they were originally recorded on a roll of parchment. Many are also found in book form or on separate leaves. They also record such items as admittances to, and deaths within the manor, and fines for transgressions of local ordinances.

opposing forces. This may differ in different periods, particularly given the obscuring effects of smoke from black powder weapons. Use of telescopes in later periods by senior officers and use of man-made structures, such as windmills or church towers may also be variables in understanding what can and cannot be seen. Areas of good observation and fields of fire create engagement zones which can support defensive operations. **Cover and concealment** is the opposite of observation and fields of fire and involves analysis to show areas where combatants are protected from direct or indirect fire (cover) or observation (concealment). Some obstacles and 'dead' ground – a dip in the landscape, for example - may provide this. The identification of cover and concealment can also help locate defensible terrain, possible approach routes, and areas where troops assemble. Observation, fields of fire, cover and concealment can all be analysed via digital elevation models in Geographic Information Systems (GIS) using line of sight analysis.

9.3.3. **Obstacles** are natural or man-made features which prevent, impede or divert military movement. They can include buildings, hedgerows, walls, rivers, streams or gullies. Their importance depends on how they affect an attacking or defending force. Obstacles can 'disrupt' a force's movement and/or cohesion, 'turn' it away from a desired axis of advance, which may expose its flank to direct fire, 'fix' it so it cannot move for a period of time – a fordable river is one example, or 'block' it entirely from moving in a particular way. **Avenues of approach** support the movement of forces and are often vital in understanding how the opposing sides arrived on the battlefield and therefore their likely deployment orientation. For attacking forces avenues of approach are generally those that give the best cover and concealment from enemy fire and observation. Line of sight analysis and an assessment of obstacles should help determine the most likely approaches or axis of advance. Unit frontage is also a factor in determining likely approach avenues as generally, but not always, they will need to accommodate the size of force that is using them.

9.3.4. By considering all these factors from the perspective of the doctrine, training, practice and experience of the combatants at the time of the battle, an assessment of the likely battlefield area can be made. But this is only possible if the historical landscape in which opposing commanders had to deploy their forces has been reconstructed.

9.4. Battlefield survey methodology

9.4.1. Battlefields tend to cover large areas of land and their archaeology is, unstratified in nature. Most, but not all, battlefield artefacts are made from metal, so the most effective way of investigating them is through a metal detecting survey. Archaeological evidence on battlefields differs from that found on other sites in that the vast majority of artefacts are not contained within sealed contexts but are unstratified within the topsoil and/or subsoil. This form of evidence is almost uniquely fragile in that any interference with the topsoil/subsoil has the potential to completely remove and thus destroy any archaeological information. This factor should be given

particular consideration when assessing planning applications affecting battlefields which only appear to involve minor groundworks, come under the definition of permitted development or in such situations where there would be no tangible impact on sealed archaeological deposits or features of non-battlefield type.

While a trial trench evaluation may be appropriate first phase for investigating the potential presence of buried archaeological remains associated with a battle, such as grave pits or field defences (as well as archaeological remains of any other period), it is not an appropriate technique for investigating unstratified battlefield evidence, even if accompanied by metal detecting of excavated spoil. With a standard evaluation sampling approach of say 4% trenching across a site, detecting of machined topsoil is unlikely to be able to fully scan all of this upcast due to the way it is often mounded-up during machining and the reach of a detector being on average, around 0.3m deep. If therefore half of the upcast topsoil comes within reach of the detector this perhaps therefore results in 2% of the site being covered by metal detecting. This is simply not a sufficient coverage to determine the presence or absence of unstratified battlefield archaeology, which can only be achieved through a systematic metal detecting survey.

9.4.2. The purpose of surveying a battlefield is to produce a representative sample of battlefield related finds rather than to recover all the surviving artefacts. A range of factors can distort sampling, including concentrating detector surveying in particular areas of the battlefield above others, the experience of the detectorist, the sophistication of the metal detector used, and ground conditions. In the case of a small area of impact, 100% recovery can be attempted, especially if it is possible to combine systematic metal detecting with machine removal of topsoil and subsoil deposits in 0.1m spits under archaeological supervision, until the natural substrate is reached.

9.4.3 Long grass on a pasture field can create poor detecting conditions and surveys should be conducted where possible in the late autumn to early spring timeframe when the grass is at its shortest or after it has been cut/grazed back if there is a need to investigate a site at other times of year. Ideally arable land will have been shallow ploughed before a metal detecting survey takes place as this will improve rates of recovery of battle related artefacts.

9.4.4. To ensure representative sampling is achieved by a metal detector survey, two different approaches are possible. One is using a survey grid (eg. 20m x 20m) with detectorists detecting in each grid square in a single orientation to give full surface coverage. Finds are bagged and pin flagged for later recording via GPS. If required, the area can be redetected at 90 degrees to the original survey orientation. This approach is slow, takes a lot of time to cover large areas and there is often no information as to how complete the coverage was or how much time was spent in each square. If a grid is already set up on part of a site, for example where geophysical survey or fieldwalking is also taking place then it may be appropriate to use this approach with care.

9.4.5. The alternative approach is for detectorists to detect along a transect laid out across the ground. The transect width can be varied to create different levels of sampling. The sweep of a detector is around 2m so across a 10m transect this would produce a sample of about 15-20% of the surface area. Conversely a 5m transect would give 30-40% coverage and 2.5m spacing, approximately 80%. Detecting at less than 2.5m begins to risk the transects overlapping which may result in people working too closely to one another or finds distribution plots become distorted due to some areas effectively being detected twice and others only once. This also makes comparison with wider spaced transect results on the same or other battlefields - a vital component of the methodology - less straightforward. Transects should be laid out along two baselines created using cross-sight ranging poles or pre-established GPS coordinates. Once the ranging poles are aligned transect widths are established between the ranging poles using a tape measure or a pre-measured rope with transect widths marked on it. Coloured flags are used to mark each transect at the desired interval in an alternating pattern (the Battlefields Trust uses red-yellow-red-yellow-green to avoid confusion between transects) which is then repeated. The transects can then be extended beyond the baselines to the field boundaries or over undulating terrain by aligning by sight new coloured flags of the same colour with the two that have already been positioned along the baselines to mark a single transect line (see Figure 1). The flags can be made using short lengths of bamboo cane and waterproof ripstop fabric cut to size and stuck onto the canes using gaffer tape. A typical transect layout is shown schematically in Figure 1 below. An example of a baseline with transect flags is shown in Figure 2. Should the equipment be available, transects of the desired spacing can also be pre-created in GIS and the data then transferred onto a sub-metre accuracy GPS and subsequently staked out on the ground using the internal GPS ‘stake out’ function.

9.4.6. Once the transects are laid out, each detectorist moves along a transect from flag to flag of the same colour whilst detecting, ensuring that the flags stay in a consistent line directly in front of them and therefore being confident they are not deviating into other transects Unless specifically trying to locate iron objects, detectorists should use a setting on the detector which seeks to discriminate out iron. If iron objects are being sought, the setting should be ‘all metal’. Although the volume of iron objects across most land may introduce a significant time addition to any survey. Advice on sensitivity settings should be taken from experienced detectorists on the survey. Generally, where such advice is not forthcoming, average setting levels of sensitivity should be used initially and then modified up or down depending on the results; too many ephemeral signals may indicate the sensitivity should be reduced, whilst few signals may suggest it needs to be increased (or the ground has no finds).

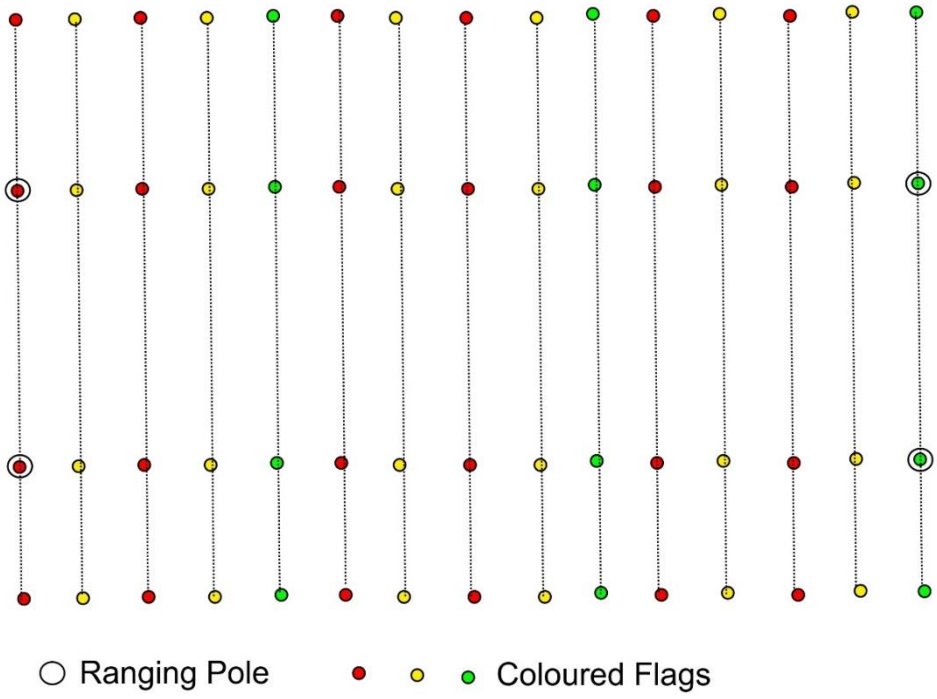

Figure 1: Layout of transects showing ranging poles and coloured flags
N.B. individual transects shown as straight lines

9.4.7. The spacing of transects should be determined by the research objectives of the project. If a large area needs to be covered then a reconnaissance survey with 10m transects may be used. This should, at least for the early modern period, be sufficient to identify areas where some battle activity took place and help to target future re-survey work using 5m or 2.5m transects. Until the completion of the Battlefields Trust Mortimer's Cross survey in 2022, the search for medieval battlefields was judged to be best undertaken using 2.5m transects as this increased the chances of locating relevant finds because experience at Bosworth suggested that, for such early battlefields, these were very limited. However, the Mortimer's Cross survey[7] demonstrated that surveying at 2.5m transects was still no guarantee of success and that, if large areas of ground need to be surveyed, an initial 10m transect approach might still be best, particularly if time and resources are limited. More research using both 2.5 and 10m transects in searches for medieval battlefields is required to determine whether the conclusions for the Mortimer's Cross project are valid.

[7] See Mortimer's Cross Survey Report 2022 (The Investigation of Mortimers Cross Battlefield (battlefieldstrust.com)), p.91 for this discussion.

Figure 2: 5m transects baseline laid out at Stow (1646) battlefield

9.4.8. Whilst metal objects make up the most common material culture on battlefields, some non-metallic items might also be located. Gun flints (See. Figure 3) may be identified by detectorists as they scan the surface, particularly in ploughed soil, or as they dig, and these should be treated as finds of significance.

Figure 3: Probable gunflint recovered from the battlefield on Stow on the Wold (1646)

Recovery, analysis and storage of finds

9.4.9. Battlefield related finds and any other finds of possible archaeological significance should be individually bagged with a unique identifying number and their location recorded using sub metre accuracy GPS. In addition to recording the location of individual battlefield related find, GPS must be used to record the area of survey by taking a location reading of at least the four corners of the transect area but ideally the ends of each transect, to show the area covered. Finds and survey area data should be plotted to GIS. Finds of obviously modern date or no archaeological significance do not need to be individually recorded and can be collected by transect or survey area (whichever is appropriate), assessed in case anything of significance has been inadvertently missed, quantified and then discarded.

9.4.10. All finds worth recording must be cleaned carefully using standard archaeological approaches[8] and then measured where necessary. It is essential that lead bullets are gently brushed and cleaned using water (which may not be considered typical practice), as only after the removal of any soil is it possible to fully analyse the surface of the bullet for firing evidence of any other information. Lead (and iron) shot must be weighed using micro scales and the diameter of the shot measured using sub millimetre electronic callipers to help determine the type of weapon used to fire the shot. Bullet analysis should also be undertaken to determine whether and how the shot was fired, bearing in mind that a bullet having no markings does not mean that is has not been fired. Measurement and analysis must be recorded, preferably on a spreadsheet, and photographs of any finds of note taken using a vertical camera stand and with a millimetre scale to show the dimensions of the object. Detailed information and guidance on bullet analysis can be found in publications by Foard[9], Harding[10] and Sivilich[11].

9.5. Impact of ground conditions on battlefield surveys

Object survivability

9.5.1. The nature of the ground can have an impact on the survivability of objects and how easy it is to recover them through a metal detecting survey.

9.5.2. Susceptibility of metal to corrosion can be categorised into three groups. Corrosion resistant metals such as gold and silver (or where gold and silver plating has protected the metal lying beneath); metals, such as copper and lead, which corrode quickly initially and then build-up a protective layer; and, finally, metals, most notably iron, which do not form a protective layer and therefore corrode rapidly. Smaller and more complex shaped objects in the latter category will decay more quickly than larger objects, therefore, an iron arrowhead may not survive at all whilst iron round shot may be preserved to some extent.

---

[8] See Watkinson, D and Neal V, *First Aid for Finds* (London: Rescue/UKICAS, 2001)
[9] Foard, G. (2012). *Battlefield Archaeology of the English Civil War*. BAR British Series 570
[10] Harding, D. F. (2012). *Lead Shot of the English Civil War. A Radical Study.* Foresight Books
[11] Sivilich, D. (2016), *Musket Balls and Small Shot Identification: A Guide*. University of Oklahoma Press

9.5.3. Land use affects the survivability of objects. If the land has been used for arable farming, the ploughing may have damaged objects in the soil and increased aeration, both of which increase rates of decay. In contrast, pasture fields may see better preservation as objects may have passed down to the bottom of the soil column due to worm action to where the soil is less aeriated. Where pasture has been converted to arable, it is possible that such arable stratification has been undisturbed, particularly if deep ploughing has not been used. Secondary stratification may also occur in limited areas, including within remnant furrows of former ridge and furrow. This process can also occur through colluviation at the base of a hill slope and alluviation on flood plains.

9.5.4. Soil drainage also has an impact on survivability of objects, as well drained soils tend to be better aeriated. Finally soil chemistry will separately have an impact on survivability. Broadly speaking acidic (low pH) soils aid corrosion whilst alkaline (high pH) soils generally support more stable conditions, though not always for lead, which is important given the prevalence of lead shot on UK battlefields.

Impact on detecting

9.5.5. Land use can also impact on rates of metal detector recovery. Generally speaking, and assuming soil chemistry conditions are consistent, fewer finds are likely to be made on long term/permanent pasture than on arable land or pasture land which has been cultivated in recent decades. In part, this is due to objects having passed down toward the bottom of the soil column due to worm action, making detection more difficult. In extreme cases this can place objects out of the range of modern metal detectors.

9.5.6. Deep ploughing of pasture or on land where there is a possibility that secondary stratification has occurred, can bring objects closer to the surface and therefore locatable with a metal detector. The arrow heads found at Towton (1461) may have been located due to this process. This can, however, have a negative impact as deep ploughing can damage the objects and lifting them from a stratified and more corrosion stable position in the ground can increase rates of decay.

Figure 4: Waterloo Uncovered - metal detecting during machining in 0.1m spits at Hougoumont Farm on the 1815 Waterloo battlefield (photo © Sam Wilson)

9.5.7. In a planning and development archaeology context, stripping back the ground surface in 10cm spits with the spoil and then detecting the new surface level should be considered if there are concerns that earlier pasture land use, alluviation[12] or colluviation[13] may have caused battlefield finds to sink below the range of a modern metal detector. Stripping back the soil in spits allows a secondary metal detector check on the surface layer removed and deeper penetration of the remaining ground, which can be repeated if necessary until the natural substrate is reached. This approach was used by Waterloo Uncovered (see Figure 4) to increase the recovery of lead shot around the farm of Hougoumont. It was also used at Worcester (1651) during archaeological investigations for the dualling of the southern relief road as the 17th century layer was found to be around 58cm below the surface due to alluviation from the rivers Teme and Severn.[14]

9.5.8. Contamination of battlefields, which occurs through the depositing of metal 'rubbish' on battlefield land may also need to be considered by archaeologists involved in planning work, both when setting archaeological conditions on planning approvals and when advising on planning applications for activities which may result in battlefield contamination.

9.5.9. Contamination of battlefields can be caused by holding festivals, re-enactments and other events on battlefields, as has occurred at Cropredy Bridge

[12] Defined as the deposit of sediment by a body of moving water.
[13] Defined as loose, unconsolidated sediments that have been deposited at the base of hillslopes by either rainwash, sheetwash, slow continuous downslope creep, or a combination of such processes
[14] Richard Bradley (Wessex Archaeology), presentation on *Recent investigations at Worcester – sampling a seventeenth century battlefield in an alluvial environment*, 11th Fields of Conflict Conference, 7-8 May 2022

(1644), Tewksbury (1471), and Hastings (1066) where ring pulls, coins, and in the case of Hastings, discarded sparklers from Bonfire Night events, made subsequent metal detecting surveys very difficult to conduct given the high volume of signals created by such detritus. ‘Green’ waste disposal, which, in theory, involves spreading biodegradable waste over a land, but in practice often includes metal objects, as experienced at Barnet (1471), similarly prevents effective metal detecting surveys taking place. Stripping back topsoil can help address this problem and should be considered as part of an archaeological condition attached to commercial development.

Further Reading

Brown, Craig (2021), *Critical applications of KOCOA in Western Europe c.26 BC – 1745 AD*, PhD Thesis, University of Edinburgh (https://era.ed.ac.uk/bitstream/handle/1842/38576/Brown2021.pdf?sequence=1&isAllowed=y)

Department of Levelling-Up, Housing, and Communities (2021), *National Planning Policy Framework*, (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf)

Department of Levelling-Up, Housing, and Communities (2019), *Historic Environment – Guidance* (https://www.gov.uk/guidance/conserving-and-enhancing-the-historic-environment)

Foard, Glenn and Morris, Richard (2012)*, The Archaeology of English Battlefields,* CBA Research Report 168, Oxford

Foard, Glenn (2012), *Battlefield Archaeology of the English Civil War*, Archaeopress, Oxford

Foard, Glenn and Curry, Anne (2013), *Bosworth 1485 – A Battlefield Rediscovered*, Oxbow Books, Oxford

Foard, Glenn, Wilson, Sam and Partida, Tracey (2020). *Barnet Battlefield Project 2015-2018*. University of Huddersfield (https://archaeologydataservice.ac.uk/library/browse/issue.xhtml?recordId=1184473&recordType=GreyLitSeries)

Foard, Glenn and Partida, Tracey (2022) *The 2018-2022 Investigation of the 1461 Battle of Mortimer's Cross*, Battlefields Trust (https://battlefieldstrust.com/media/820.pdf)

Harding, D.F (2012), *Lead Shot of the English Civil War – A Radical Study*, Foresight Books, London

Historic England (2008), *Conservation Principles, Policies and Guidance* (https://historicengland.org.uk/images-books/publications/conservation-principles-sustainable-management-historic-environment/conservationprinciplespoliciesandguidanceapril08web/)

Historic England (2012), *Battlefield Selection Guidance*, (https://historicengland.org.uk/images-books/publications/dsg-battlefields/heag072-battlefields-rsg/)

Historic England (2017), *The Setting of Heritage Assets*, (https://historicengland.org.uk/images-books/publications/gpa3-setting-of-heritage-assets/heag180-gpa3-setting-heritage-assets/)

Historic Environment Scotland (2016), *Managing Change in the Historic Environment – Historic Battlefields*, Historic Environment Scotland, Edinburgh (https://www.historicenvironment.scot/archives-and-research/publications/publication/?publicationid=b7a05b45-f2a9-4c71-8450-a60b0094c62e)

ROTC (Reserve Officer Training Corps – U.S. Army). (2002). Section 3: *Introduction to terrain analysis*, Washington, D.C (8420011_CH05_03_p244-265:8420011_CH05_03_p240-261-7 (citizenmilitem.com))

Sivilich, D. (2016), *Musket Balls and Small Shot Identification: A Guide*. University of Oklahoma Press, Norman

Watkinson, D and Neal V, (2001). *First Aid for Finds,* Rescue/UKICAS, London