

Kent LiDAR Portal

Guide for Desk-Based Study



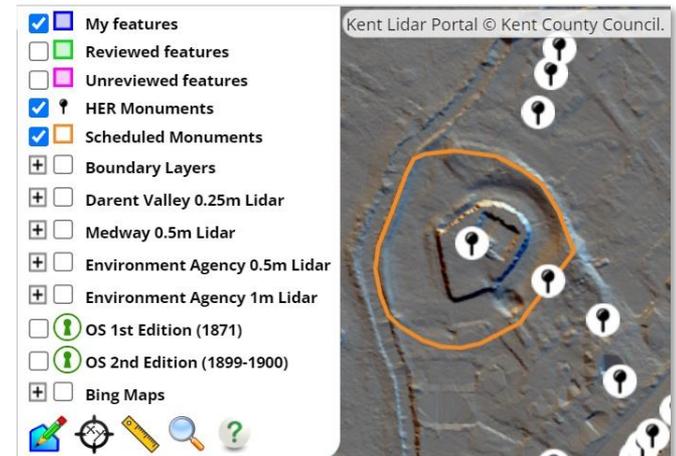
How to use this guide

This **Guide for Desk-Based Study** is intended to be used alongside both the **Gazetteer of Monument Types** and **How to Read LiDAR** guides in order to make well-informed and researched interpretations of possible features spotted in the online LiDAR data on the **Kent LiDAR Portal**. It is not a definitive resource in how to undertake desk-based study, and links to further material and resources are recommended.

Additional, more detailed tutorial guides are provided which instruct on how to interpret features noted in the visualisations, including the **Guide to Groundtruthing**.

The **Kent LiDAR Portal** has been set-up to allow as much supplemental information as possible to be viewed along with the various LiDAR visualisations, including:

- The Historic Environment (HER) records
- Historic maps
- Modern maps, including aerial, OS and street maps



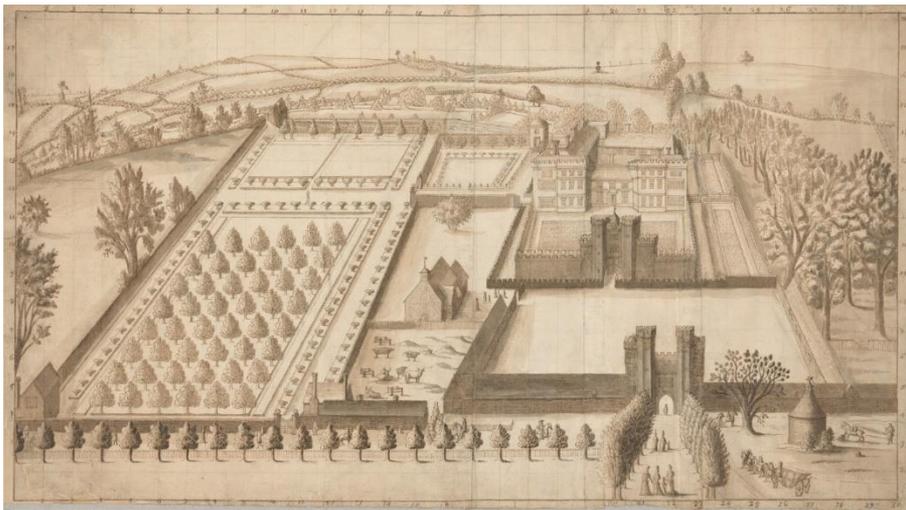
In order for any records recorded on the Portal to be as accurate as possible (and avoid misinterpretations), it is essential that a certain level of desk-based research is carried out in advance. The following short guide will provide some tips for using the available resources on the website, as well as suggestions for where to look further afield for more answers.

Generally, all sources used for undertaking historical research are classified into two types: primary and secondary. Your investigations are likely to incorporate both, particularly as your work progresses and you begin more detailed investigations.

Primary sources:

Primary sources are those which provide direct or first-hand evidence about an event and comprise an original document, account or other form of 'raw' data, including:

- Written documents such as deeds, wills, registers, census records and other archives
- Oral accounts
- Photographs
- Maps
- Artefacts
- Artwork (sketches, paintings, etc)
- Fieldwork and surveys (e.g. excavation records, geophysics, LiDAR, etc)

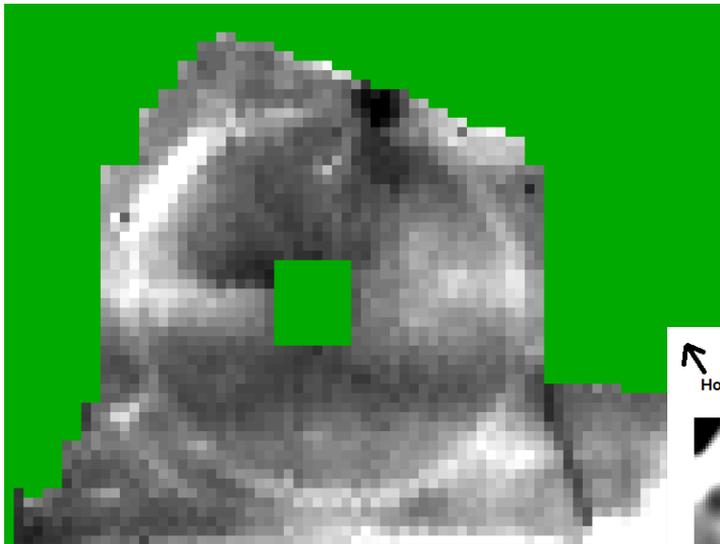


Remember, just because a source is primary, it does not necessarily mean it is accurate!

Pen and brown ink drawing of Lullingstone Castle c. 1670 (Yale Centre for British Art, Paul Mellon Collection)

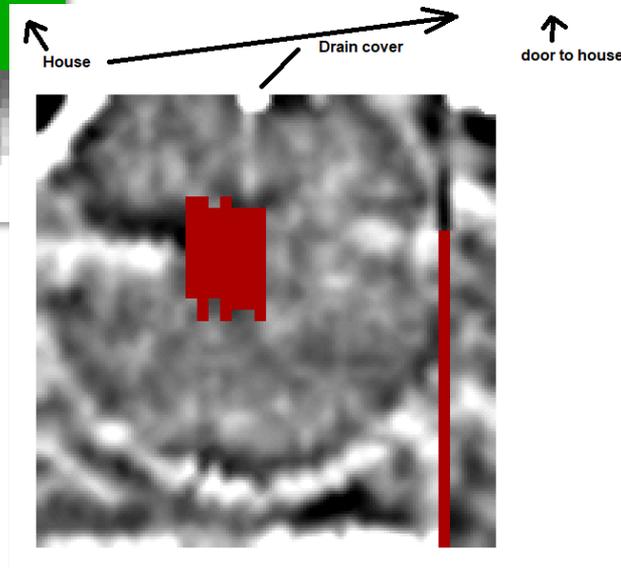
Secondary sources:

Secondary sources, though original research, are those which describe and interpret the primary data, as well as other secondary source material (e.g. academic articles) which have likewise used primary sources in their analysis. A resource such as LiDAR is a primary source in its data and imagery, but it becomes secondary once it is interpreted.



Geophysics at Lullingstone Castle, demonstrating raw primary data (right), and with processing and interpretation (left), making it a secondary source (Interpretation by John Townsend)

Although you should strive to incorporate as many primary sources as possible, good quality (secondary) research which has already been carried out should always be considered as well.



Any decent research report or account will contain all of its original source references, in order for others to find where the material originated and make their own interpretation of the evidence.

Using the HER

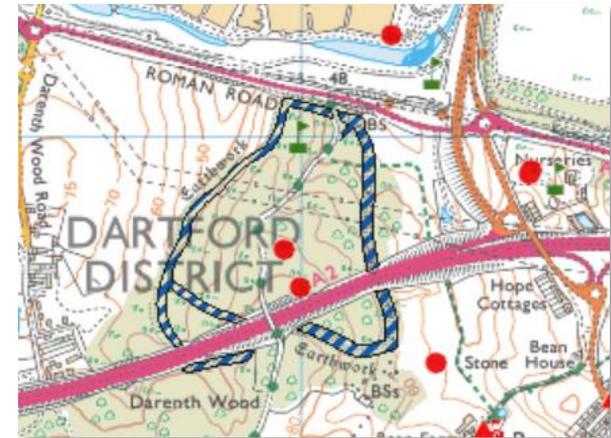
The Historic Environment Record (HER) should be the first port of call for any desk-based research, and fortunately Kent's (**Exploring Kent's Past** www.kent.gov.uk/her) has one of the most interactive and detailed online databases of any county.

One of the most useful aspects it contains is the HBSMR (Historic Buildings, Sites and Monuments Record) data, which includes detailed records on the various monuments, listed buildings, findspots, etc. These data records not only contain a grid reference and plotted point on the map for each, but include the various sources which contributed to the record. The website also contains useful chronological summaries and a glossary of terms.

Although individual images and reports are not available on the online database, they may be accessible from the Heritage Team (heritage@kent.gov.uk), if the request is for research and not commercial purposes.

The HER is ever-evolving and new records are being added all the time, thus what is currently on the online database may not necessarily be up-to-date.

It should also be noted that not all records (in particular survey and excavation reports from local volunteer groups) have been submitted to be logged.



Various layers on Exploring Kent's Past (©Kent County Council)

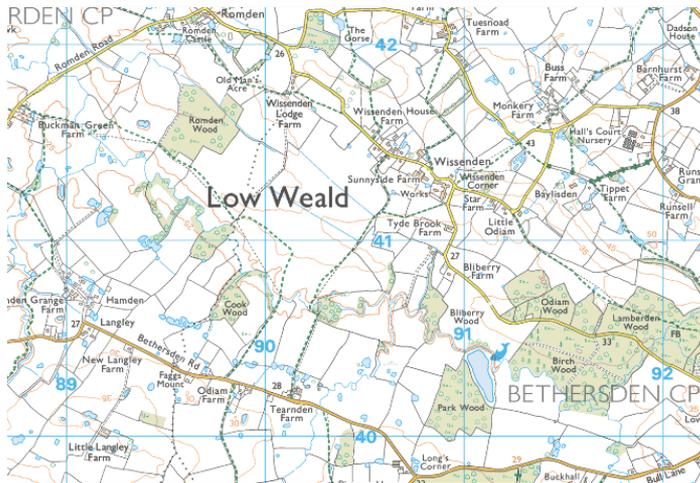
How to use maps

Just as an object's provenance is essential to its context, one of the most important things to know about any site is its location on a map.

For most maps, the location will be given in relation to the national grid reference (NGR) system. For Kent the 100km² grid squares which the county is divided into are split between TQ and TR. These are then further split into squares of 10km², numbered from the SW corner of the grid and increasing in an easterly (left to right) and northerly (upwards) direction. The grid reference is usually given with the letters first, followed by the eastings, and then northings (so in the example TQ63). Most grid references are more specific and given as many as ten figures (e.g. TQ 65734 34509), which involves further grid division, in this case down to 10cm accuracy.

SP	TL	TM
SU	TQ	TR
SZ	TV	

Northings (up the stairs) >	9	09	19	29	39	49	59	69	79	89	99	
	8	08	18	28	38	48	58	68	78	88	98	
	7	07	17	27	37	47	57	67	77	87	97	
	6	06	16	26	36	46	56	66	76	86	96	
	5	05	15	25	35	45	55	65	75	85	95	
	4	04	14	24	34	44	54	64	74	84	94	
	3	03	13	23	33	43	53	63	73	83	93	
	2	02	12	22	32	42	52	62	72	82	92	
	1	01	11	21	31	41	51	61	71	81	91	
	0	00	10	20	30	40	50	60	70	80	90	
		Eastings (along the corridor) >										



Sometimes, the NGR needs to be converted to eastings and northings, which simply means replacing letters with numbers and evenly splitting the numbers into two halves (however many figures there are).

TQ corresponds with 51 (thus the easting of the example would be 565734 and the northing 134509). TR corresponds with 61 and would be calculated equally.

The Portal has a Compass tool which provides the grid reference, but it may be necessary to cross-reference with other OS maps from time to time, which requires you to be able to read and understand the [OS grid system](#). This is also a useful skill as the Portal does not have a 'location finder', meaning you must move the map around or 'zoom in' to find a location. If you have a grid reference already, and want to try and locate the spot on the Portal or elsewhere on another map, you will need to cross-reference it. A useful tool to do this is with the [UK Grid Reference Finder](#), which allows you to feed in any grid reference (to whatever accuracy) and the location will appear. By using landmarks, particularly in the aerial photography layers, you can then relate this location to your own map.

When providing a site's grid reference, it should relate to the centre-most point of an area.

If you need to make a request with the HER for information, you will normally need to provide a grid reference, as well as the radius from that point (anywhere between 250m to 2km) you would like to be covered by the 'data pull' (if you request one).

Do remember though that the location of many HER records, particularly findspots, may only be broadly accurate, and shouldn't be taken as a precise point on the map!



Historic maps

In addition to areas of historic landscape characterisations (HLC) and scheduled monuments (SAM), layers available on **Exploring Kent's Past (EKP)** include various historic maps.

The earliest maps on both the **Kent LiDAR Portal** and **EKP** are the 1st edition Ordnance Survey maps, dating to c. 1871, followed by 2nd ed. (c. 1897). **EKP** also has 3rd (c. 1907) and 4th (c. 1929) editions available as basemap layers to view.

Each survey is unique in its own way, and it is always useful to look at multiple editions to see how details have changed over time, or been omitted.



1st, 3rd and 4th edition (left to right) OS maps of Dartford Gunpowder Works (©Kent County Council)

The National Library of Scotland currently holds the most comprehensive collection of free, publicly available digitised maps and indexes (www.visionofbritain.org.uk/maps/), including topographic maps of different periods and scales.

Earlier tithe maps, which date to the 1830s and 1840s, are also available to be viewed on a hard-drive in the searchroom at the Kent History and Library Centre in Maidstone. A list of accompanying tithe apportionments is available thru the Kent Archaeological Society (www.kentarchaeology.org.uk/research/tithes).

Although tithe maps lack the level of detail, such as building layouts, seen on OS maps, they contain useful information on tenancy and land ownership, as well as land use at that time.



(© Kent County Council)

It is also useful, particularly with tithe maps, to know the extent of parish boundaries and where a certain site falls. As many parishes were amalgamated over the years, the boundaries used for the tithe award schedules should be referenced when selecting the correct tithe map to use (a [parish boundary guide](#) has been provided by the Kent Archaeological Society).

For more on how to read tithe maps, see the [guide](#) put together by the Kent History and Library Centre.

Historic maps

Many other earlier maps are available, from smaller-scale hand-drawn estate maps to larger topographic surveys which cover the entire county. Although most are not available to view online, the searchable catalogues are and include what is held by the [National Archives](#) and the [British Library](#).

The catalogue for the [Kent Archives](#), located in the Kent History and Library Centre, is also searchable.

Some additional historic maps which are available to view at Kent Archives and photograph include:

- Christopher Saxton's *Map of Kent*, 1575
- Philip Symonson's *Map of Kent*, 1596
- Samuel Parker's *A Map of the County of Kent*, 1719
- Edward Hasted's *History and Topographical Survey of the County of Kent*, 1778
- Ordnance Surveyors field surveyors' drawing for West Kent, c. 1797
- Christopher Greenwood's printed *Map of the County of Kent*, made from a survey taken in 1819 & 1820



Any historic map can be incredibly useful, but bear in mind that the surveyors made errors too, so they are not to be entirely relied upon!

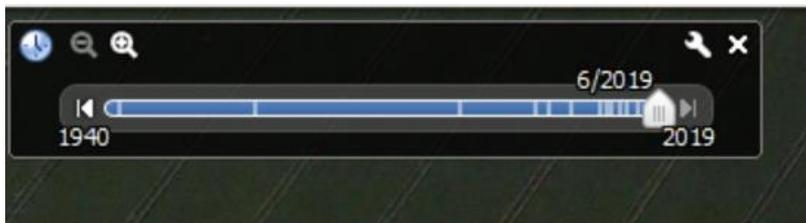
Exploring Kent's Past has three versions of aerial map which are available as base layers: the 1946 RAF aerial, 1990 and 2008.

Again, it is useful to reference all available versions, as certain details can be picked out from each one. Despite best attempts however – partially due to the slightly varied angles of the images – the various tiles from the earlier aerial images in particular are not entirely accurate in how they have been geo-referenced, and a certain margin of error should be expected.

Another useful source for aerial photos is the freely available Google Earth (and [Google Earth Pro](#) in particular). This allows you to view multiple aerial images from different years, particularly so for the last decade when you can see how the land use, crops and other changes in the landscape varied annually.



1990 aerial of Lullingstone Villa on EKP (© Kent County Council)



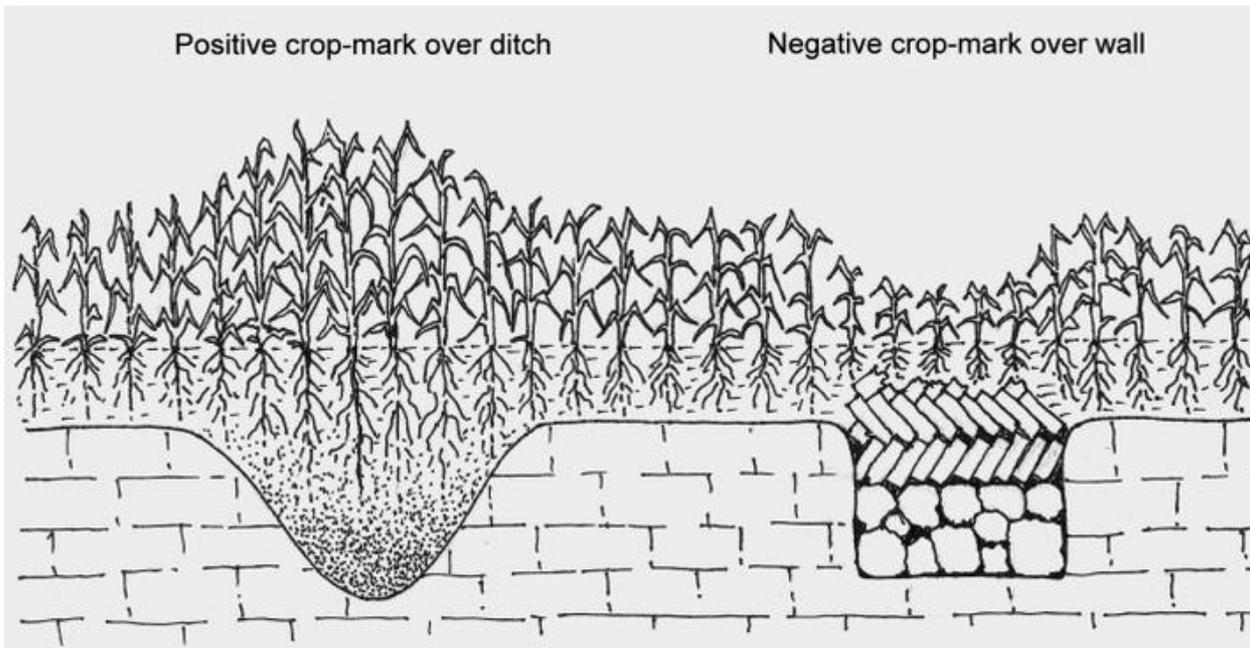
Time slider from Google Earth Pro

Google Earth is also very useful for obtaining an approximate elevation (height above sea level) for a feature or site, although there is of course some margin of error to be expected.

Aerial photos and cropmarks

Assessing aerial photographs can be particularly useful in desk-based study, as in certain years the cropmarks – the visible effects of vegetation as it responds to the differences in moisture and nutrients available in soil – show signs of sub-surface archaeological features.

Cropmarks are split into ‘positive’ and ‘negative’ effects on the vegetation. Negative cropmarks – also known as parch-marks – are when the vegetation’s root development is impeded or undergoes more stress, in many cases when over a buried feature such as a stone wall, as the soil is more shallow. Ditches with deeper soils are more resilient to dry conditions and often have higher nutrient levels, allowing the vegetation to thrive comparatively, creating positive cropmarks.



Cropmarks show up better in certain years over others, depending on seasonal changes, and it is important to assess imagery from different years to see what may be spotted.

Cross-section of how cropmarks form over features (Drawing by Chris Blair-Meyers)

Aerial photos and cropmarks

Many factors affect how well cropmarks may show up in addition to weather conditions.

Soil accumulation, as in valley bottoms, may bury sub-surface archaeology too deeply to affect vegetation, whilst frequent ploughing or erosion can remove all except the substantial features.

Surface geology also plays a factor if there is not enough contrast between a feature's soil composition and the surrounding natural to create a differential effect, which accounts for few cropmarks in wetlands or on Wealden Clay.

The type of vegetation can also be significant, as some, such as chalk grasslands, are already suited to dry sites and produce few parch-marks (for more on local cropmarks see [Kent Aerial Photography](#)).

Beware though, as not all crop- or parch-marks are archaeology. Natural and geological variances can also create suggestive 'features', as well as modern wear-marks and compressions.



Cropmarks of promontory on North Downs scarp near Peene (Google Earth 2017)



Parch-marks in Shoreham, site of annual 'Heavy Horse Show' (Google Earth 2013)

It is always useful to undertake further background reading, either period-specific or on a particular area, in order to supplement any research you might be doing on a site.

The [South East Research Framework](#) (SERF) was undertaken on behalf of Historic England and various sectors of the archaeology community in Surrey, Sussex and Kent to produce a research agenda and strategy for future study. Most of the research chapters were recently updated and contain detailed overviews of different periods and themes worth looking at.

Kent-specific [thematic overviews](#) can also be found on **Exploring Kent's Past**.

Museums outside the county hold nationally important pieces relevant to Kent, including the [Ashmolean](#) and [British Museum](#), with excellent local collections and archives held at museums in [Canterbury](#), [Dover](#), [Maidstone](#), [Rochester](#), [Sevenoaks](#) and [Thanet](#).

[Dartford Museum](#) and heritage centres along the Darent Valley including Otford and Eynsford are also available to access local records, and many of the local history societies have their own databases of records.



Dartford Museum

Remember to always do research at a local level if you can, as chances are that somebody has either an oral or written account which has not been disseminated further.

The [Kent Archaeological Society](#) was established in 1857 to promote the study and publication of archaeology and history within the ancient County of Kent, including historic buildings, genealogy, industrial archaeology and local history.



In addition to various fieldwork projects and a regular lecture and conference programme, the Society undertakes a number of high-quality research initiatives, often published as excavation and specialist reports, articles in the newsletter and annual journal *Archaeologia Cantiana* (which can be accessed from the [website](#) up until 2018) and various other records.



Maidstone Museum, home to the KAS Library

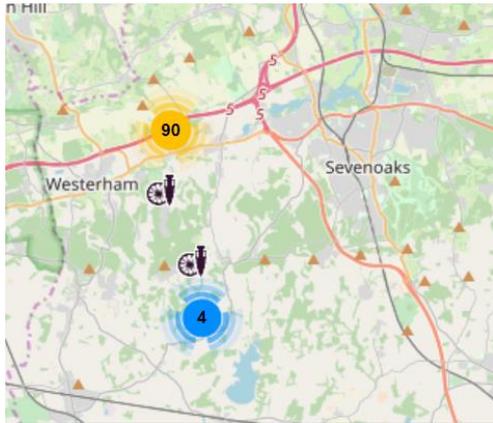
The Society has a room at Maidstone Museum which houses its extensive library for members' use, including a large collection of old pictures and photographs. The Society's archive material is deposited with [Kent Archives](#), where it is available for public inspection.

It is always worth checking with KAS when undertaking local studies or fieldwork, as there are often records of surveys and other work which have been undertaken by volunteer groups and local historians, but have not yet been accessioned with the HER.

Another useful source which can help give indications on former activity and settlement is the **Portable Antiquities Scheme** (PAS) website (finds.org.uk).

This freely available web resource is essentially a database of finds which have been reported to – and often are recorded by – the local Finds Liaison Officer (FLO). Rather than finds uncovered from excavations, these are often stray finds found in the area by members of the public, the majority of whom are metal detectorists.

Finding a concentration of artefacts from a certain period or type can give possible indications of the function or age of features, whether a Roman road or Bronze Age settlement. Although the data must be interpreted with caution, it can also be quite useful.



*Findspot concentrations
on PAS database at most
basic level of access*

The PAS data is not generally available on the publicly-accessible version of the HER database (Exploring Kent's Past), even if they have access to the records, so it is often worth looking at the PAS website as well, as an extra resource.

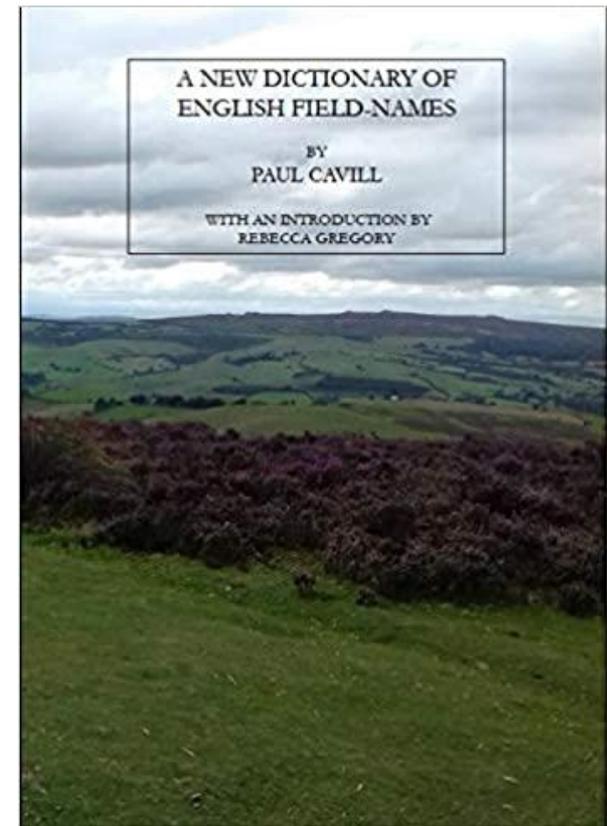
You do not need to register for an account to view the basic PAS database, but just remember that for most users, the find spots have been 'masked' considerably and are only accurate to the nearest 1km. Unmasked coordinates require a 'Researcher' level of access, which most users will not be able to have.

Place-names can also provide much information about a site and the local landscape, as they are a record of how a place was viewed. Field names in particular can give insight into several aspects about a parcel of land, including vegetation and crops grown there, associated animals, land management, how the land was administered, personal names, its position in the landscape, metaphors and allusions tied to it, and other facets of contemporary society.

Two excellent online resources which can be utilised include the [Key to English Place-Names](#) and the [Digital Survey of English Place-Names](#). The newly published *A New Dictionary of English Place-Names* is also recommended.

For Kent-specific place-names, the **Kent Survey of English Place-Names**, undertaken by the English Place-Name Society, is currently still being worked on by Dr Paul Cullen.

However, older volumes include *The Danes in Kent: A survey of Kentish Place-Names of Scandinavian origin* (1927), *Kentish Place Names* (1931) and *The Place names of Kent* (1934), which are available at the Kent History and Library Centre and Kent Archaeological Society library in Maidstone, as well as other KCC libraries.



[Heritage Gateway](#) is a useful all-encompassing search which cross-references over 60 records, including the majority of HERs, the [National Heritage List for England](#) and [Pastscape](#) (English Heritage's National Monument Record which provides information on archaeological, architectural and maritime sites).

[The Historic England Archive](#) has over one million photographs, drawings, reports and publications from the 1850s to the present day that can be searched online, as well as over 90,000 aerial photographs from [Britain From Above](#).

[British History Online](#) has various historic maps and records relevant to Kent, including the second volume of the [Victoria History of the County of Kent](#).

The ADS ([Archaeology Data Service](#)) is also a useful repository of open access grey literature reports and publications.

Some local woodland archaeology projects have already put together toolkits and helpful guides on undertaking research, including desk-based, such as the [Weald Forest Ridge Landscape Partnership](#) and [Clowes Wood Archaeology Project](#). A very useful overview, as well as a specific section on the Kent Downs AONB, is also provided by Dr Nicola Bannister in [The Cultural Heritage of Woodland in the South East](#).

Non-heritage sources can also be consulted for environmental information to supplement research, such as the underlying geology of an area from the [British Geological Society Viewer](#), or maps of ancient woodland in Kent as on [Magic Defra](#).

This **Guide for Desk-Based Study** was produced by the Darent Valley Landscape Partnership Scheme for interpretation of the LiDAR data on the **Kent LiDAR Portal**

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Area of Outstanding Natural Beauty

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