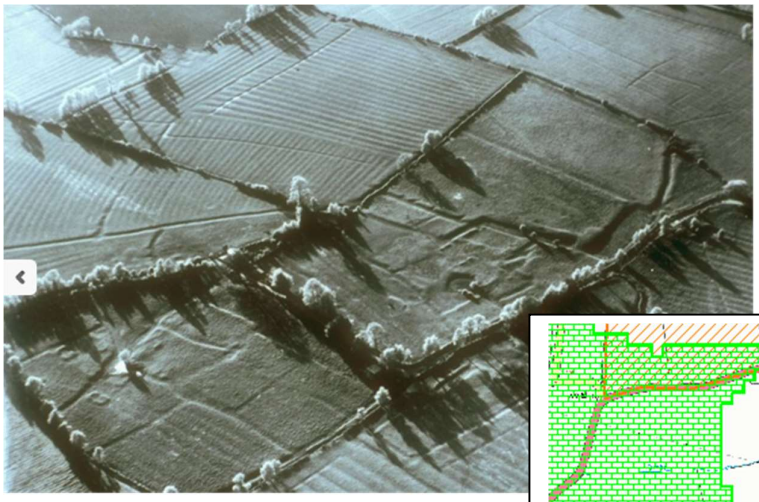
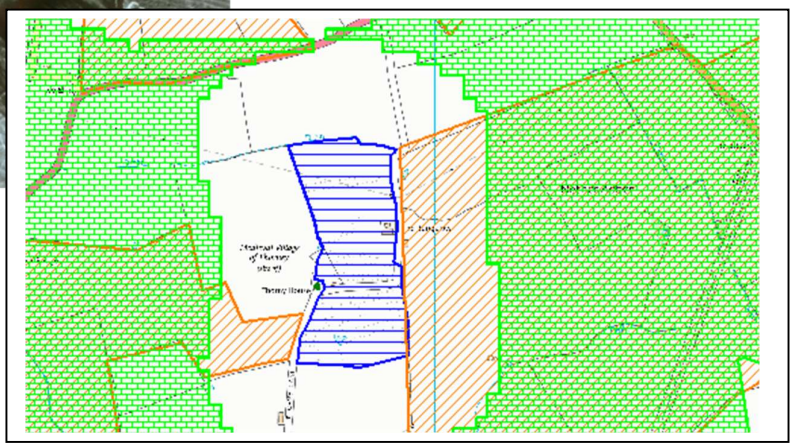
Forestry Commission Project E

Enhancing SHINE datasets for Woodland Creation

for Somerset and Bath & North-East Somerset





April 2023

J Grove South-West Heritage Trust

Contents

1. Background

Under *The England Trees Action Plan* action 4.6 (UK Government 2021, 33), the Forestry Commission has secured funding from the Nature for Climate Fund to deliver the three- year 'National historic environment datasets for woodland creation' project. This project will make historic environment data available to woodland proposers at the earliest stages of woodland creation.

Although SHINE is currently used to inform woodland management funded by Countryside Stewardship, it has long been recognised that, in its current form, SHINE is not suitable for use in woodland creation proposals (e.g., Lloyd-Regan et al. 2022, 38-44 & 61). Working with the 'National historic environment datasets for woodland creation' SHINE-enhancement group, the Association of Local Government Archaeological Officers (ALGAO), Natural England and Historic England, the Forestry Commission wants to explore and potentially implement updates to the SHINE methodology, workflow guidelines, selection criteria, record fields, polygon standards and online portal, to build on previous investment and find out how SHINE could evolve to inform woodland creation, in addition to its existing use for agri-environment schemes. If updates are implemented, they could also support SHINE working more effectively for agri-environment applicants.

Project E was designed to explore how SHINE could evolve to inform woodland creation: Insights from local historic environment services creating SHINE records.

2. Somerset & BANES Study area

Within the time frame it was felt that a selection of the low-risk woodland area could be processed for the project. The study area comprised South Somerset and BANES. South Somerset was chosen because it has the most HER monuments. BANES (Bath & North East Somerset) was chosen because it has the highest ratio of SHINE polygons to HER monuments. Together those two areas will cover over half the HER Monuments identified in the Forestry Commission's Low Risk Areas for woodland creation in Somerset and BANES.

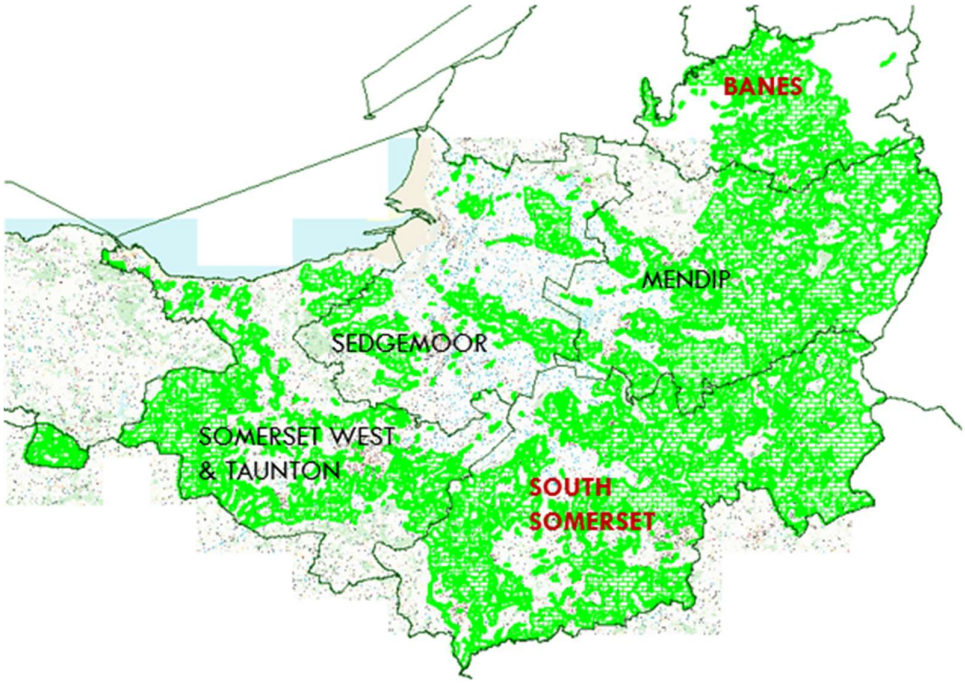
3. Blanks in the data

One significant issue for the use for SHINE data for the woodland creation process is how to treat applications that fall in the 'blank' areas between known archaeological sites. These obviously do not represent an absence of significant archaeological remains but merely an absence of knowledge about where such sites do and do not exist. While UKFS currently deals only with known heritage assets, an appreciation of potential would be useful to the forestry sector.

To assess the implications of this inherent knowledge gap for woodland creation a rapid survey of archaeological geophysical surveys has evaluated surveys within Somerset for the additional significant sites they located.

This report is presented as a separate document in Appendix 1

4. SHINE report



Within South Somerset, 4023 HER sites were checked/assessed for inclusion within SHINE. A further 551 'Events' on the HER were also scanned for potential additions. 143 SHINE polygons were added (some were also deleted to enable merging of polygons). 30 HER sites were amended/updated.

Within BANES, 1146 HER sites were checked/assessed for inclusion within SHINE. 57 SHINE polygons were added. 29 HER sites were amended/updated.

All existing SHINE polygons were checked, with approximately half meriting amendments or updating. The sites that were thought to have potential for inclusion were subject to the current SHINE methodology, which in Somerset includes consultation of historic maps, aerial photos (including Google Earth), lidar, and digital HER sources.

Before the update within South Somerset there was an average of one SHINE site for every 7.3 sites on the HER in Forestry Commission's Low Risk Areas. This ratio was improved to one site for every 5.8, and for BANES there was a comparative improvement of 9.2 to 6.3.

Both new datasets were uploaded and merged to the national SHINE dataset through the SHINE web portal; this data was also transferred to the Forestry Commission as part of the project.

District	No of Monuments on the HER in low risk areas	No of SHINE polygons in low risk areas	Added during project	Ratio before project	Ratio after project
South Somerset	**4023**	**552**	**143**	**7.3**	**5.8**
Mendip	2875	403		7.1	7.1
Somerset West & Taunton	2110	315		6.7	6.7
Sedgemoor	875	151		5.8	5.8
BANES	**1146**	**124**	**57**	**9.2**	**6.3**
	10154	**1545**	**200**	**6.5**	**5.8**

Table 1 - Number of SHINE polygons and HER sites within the low-risk woodland areas

The data was processed at a rate of 25-30 sites per hour, which is based on reviewing all the sources listed above – there are currently no specified standards for which sources must be checked to create SHINE records. This average figure encompasses the seconds it takes to assess a listed barn, to a field of ridge and furrow, the extent of which is seen to be much larger when lidar and aerial photos are consulted, and which also intersects with existing SHINE polygons, and could take up to an hour to sort out. Any day rate for SHINE enhancement needs to factor in the proportion of easy to difficult sites.

	No. SHINE polygons	**Area of SHINE polygons**	**Area**
South Somerset low risk pre update	552	-	473.5 sq km
South Somerset low risk now	678	56.8 sq km	473.5 sq km
South Somerset	976	67.8 sq km	959 sq km
BANES low risk pre update	124	-	117.2sq km
BANES low risk now	179	11 sq km	117.2sq km
BANES	333	19 sq km	351 sq km

Table 2 - Area of SHINE polygons in the low-risk areas in the study areas

5. Conclusions

The study asked for insights and recommendations on how the current SHINE methodology, workflow guidelines, selection criteria, record fields, polygon standards and online portal should be updated to inform woodland creation proposals -

Methodology

- Methodology of use - the fact that woodland creation could be damaging to the historic environment means that consultation of the HER **prior** to the consultation going live on the portal is necessary to ensure that the consultation is concluded within the 20-day time frame. There is no flexibility within the SHINE portal for conversation about change – once a response is submitted it is seen as 'complete'. If an issue is raised during the window it could potentially derail the entire application.
- Methodology of SHINE creation should remain constant i.e. created by the local historic environment service and uploaded to the portal. There are issues with the detail of polygons and other elements which need to be addressed (see below).

Workflow guidelines

- Section 5 of the guidelines - *The SHINE dataset is a live dataset, which will require regular maintenance through time to ensure it remains fit for purpose.* Resourcing is an important factor to

consider. Without additional funding it would be difficult for the Somerset and BANES HERs to devote additional time to SHINE enhancement work.

- *Significance* – relates to the significance of achieving protection through Countryside Stewardship – not to the significance of the site. There is a need for clarity for both the users and creators.
- Impractical advice - not all of the guidelines can be followed, for example the advice for boundaries is *Historic boundaries, where these survive as extant features, should be identified in the SHINE dataset.* In Somerset and BANES, these features are rarely entered into the SHINE dataset.
- Grade II Listed Buildings are mapped on SHINE as listed structures but need to have a separate SHINE polygon created for Countryside Stewardship comment, for example, most milestones are grade II, are not commented on by Historic England, so would need a SHINE entry for comment to be made during a Historic Environment Farm Environment Record (HEFER) consultation.

Selection criteria

- This has evolved since the inception of SHINE – the ad hoc nature of the consultation and updating process since the initial exercise means that certain features do not have the coverage of others, e.g. ridge and furrow, parkland.
- There will be differences in site-significance between counties based on factors such as rarity and preservation.
- The addition of woodland as a factor in the equation may influence the relevance of some sites for inclusion – field names are not included as a SHINE element, but would a field named 'Chesters' or 'Blacklands' be the best site for woodland? It would not be substantive, verified, of known character or mappable, but such placename are indicative of Roman or early settlement.

Polygon standards There are numerous issues with SHINE polygons, both creation and use. Examples of these are -

- multiple sites can be included within one polygon, and adding sites can change the significance of the whole polygon, with knock-on effects for adjacent landholdings and potentially for agreement holders.
- Some polygons can be added to the dataset, but rejected as being too small, but once increased in size, or entered as a circle that can be buffered, this buffer could be too close to an adjoining polygon and again rejected, resulting in another amendment/upload.
- The management polygons (called Heritage Management Advice Areas or HMAAs) that are added via the portal are of limited use without recent knowledge of the site, conditions and current management – however, with pre-application consultation for woodland, this might be a practical way of ensuring that any mitigation agreements are reiterated and visible on the agreement documentation.
- The cross-border advice within the workflow guidelines for SHINE is impractical. *Where a SHINE record crosses a Local Authority or Administrative boundary the HER should liaise with the Local Authority or Administrative body in question, to define a single SHINE polygon that reflects the entire site requiring management. This may involve sharing HER records and maps to make sure the site is accurately represented. The SHINE record will therefore be maintained by one organisation, usually the one with the largest share of the site in question, who will also be responsible for providing management advice.*

The on-line portal and woodland creation

- It is uncertain at the current time as to how woodland creation will be dealt with in E.L.M. in terms of a data portal. The following comments are based on the continued use of the current HEFER portal used for agri-environment schemes.
- There would need to be clear notification that a woodland creation proposal is included within the SHINE consultation. It is unclear at this point whether these would be stand-alone applications or could be included with the current options.
- Once an application appears on the SHINE portal, there is only a 20-day consultation window for a Historic Environment response. There is no leeway here for conversation about alternative areas or

mitigation. It is clear therefore that there needs to be a pre-application consultation prior to the proposal reaching the SHINE portal.

The suitability of SHINE for use in woodland creation.

The crucial difference

- SHINE was created to assess beneficial management for known historic environment sites within agri-environment schemes.
- Woodland is a potential risk to the historic environment, with some exceptions (landscape, erosion control).

The challenges

- SHINE is not a comprehensive dataset. Not all HER records have been subject to SHINE assessment.
- The SHINE data alone, without advice or reference to other datasets, cannot be used as an assessment of potential as there are sites that could be used as indicators of potential that would not be included in SHINE e.g. an excavated Roman settlement would not be included in SHINE but could be adjacent to an area of proposed woodland.

Can SHINE be used at all?

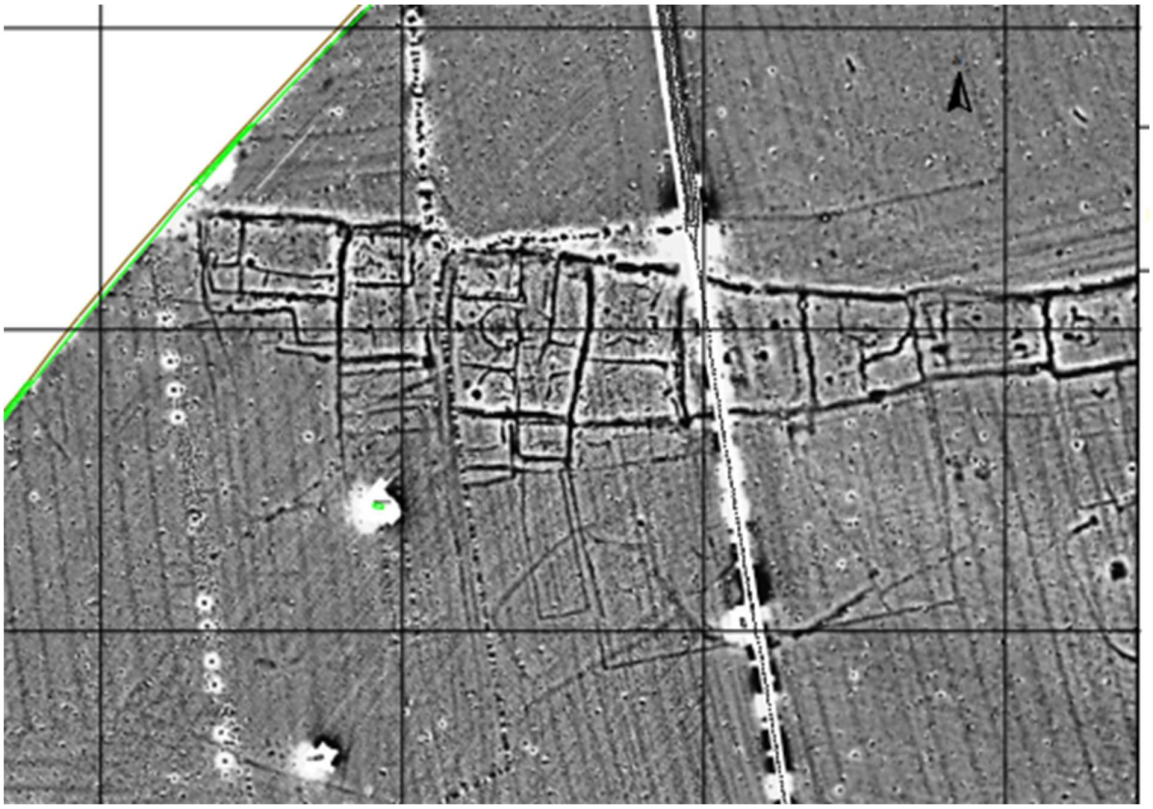
- As a hands-off process – No, there are too many factors that need to be considered outside of the SHINE parameters.
- As part of a consultation process it could contribute to initial assessment.
- The final proposal via the on-line portal should be a rubber-stamp at the end of the consultation process, to enable the online consultancy to function. The window of consultation does not have the flexibility to allow change, conversations or mitigation to be concluded within the time frame.

Appendix 1

Geophysics Assessment Project

Part of Forestry Commission Project E for Somerset

April 2023



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1. Project Aim

To assess the archaeological potential of woodland creation areas a variety of factors come into play. A key element of mitigation is to establish the presence or otherwise of significant archaeological sites. The frequency of sites within the landscape is an unknown factor, but one that could be better understood through an analysis of data that is held within the HER of a local historic environment service.

Geophysical survey is an established method of mitigation. This study looks at geophysical surveys within Somerset to try to understand the relationship of 'blank' areas, or areas without significant archaeology, in the HER prior to and post-survey to enable a comparison to be made of the number of sites known before and after geophysical survey in relation to the area/size of survey and to estimate the frequency of sites within the landscape.

2. Methodology

A list of 369 geophysical surveys in Somerset of over 2ha was extracted from the HER. Although woodland creation areas are frequently below 2ha, it was felt that surveys below this size would not contribute sufficient data for their inclusion in the analysis to be justified within the allowed time frame e.g. to look at ten surveys totalling 12ha would have less to contribute than ten surveys totalling 150ha.

To sample this data-set parameters were set of 2-10ha, 10-30ha and 30+ha.

The reason for the survey was itemised for each survey and divided into categories. For the analysis to be as objective as possible, the categories of research, unknown, woodland & pre-2000 were omitted from further analysis. Research surveys are obviously targeted at areas with high potential and would skew any attempt at objectivity; surveys after 2000 are of a comparable standard – earlier surveys provided inconsistent results and interpretation; the woodland and unknown categories were too small to be statistically valuable.

Type	**2-9.99ha**	**10-29.99ha**	**30-125ha**	**Total**	**comment**
Development	**143**	**33**	**14**	**190**	Includes quarries
Research	*66*	*9*	*3*	*78*	*targeted*
Solar	**14**	**27**	**4**	**45**	And wind farms
Linear	**12**	**4**	**4**	**20**	Roads & pipelines
Woodland	*1*		*1*	*2*	*See case study*
unknown	*2*	*3*		*5*	*Prob development*
Pre 2000	*27*	*2*		*29*	*?quality/source*
TOTAL	***265***	***78***	***26***	***369***	
Sample categories total	**167**	**64**	**22**	**255**	
No. analysed within sample	**36 (14% of total, 21% of sample cat)**	**12 (15% of total, 19% of sample cat)**	**12 (46% of total, 54% of sample cat)**	**60 (16% of total, 23 % of sample)**	

Table 1 Somerset Geophysics 2ha-125ha

Rationale

The sample concentrated on three categories. Development is normally concentrated around settlement areas e.g. housing; solar developments often target south facing slopes or flatter landscapes whereas

linear surveys (pipelines, roads) cut a more arbitrary swathe across a landscape, and are therefore the most objective survey type.

All of the linear developments were subject to a deeper analysis. Similarly, the larger areas would provide the best basis for area: site ratio, so four (as being the maximum for two categories) from each of the largest size survey were looked at; with equal numbers for the mid (4) and small (12) included. (The surveys for solar and development categories were chosen by an equal spread through the data and were not cherry-picked.) One of the larger linear surveys was found to have no report and was probably an initial pre-survey assessment and is voided in the subsequent data.

All sizes of site are given in hectares and rounded up/down as appropriate. All percentages/ratios are similarly rounded up/down.

What constitutes a site?

Within this analysis, a 'site' was counted as something worthy of archaeological excavation, so settlement areas or ritual monuments were most definitely included, but find spots, flint scatters, field systems and agricultural elements were discounted unless there was an overriding factor. In this way, areas of, for example, ridge and furrow, could not skew the data. As such, a 'blank' survey may have contained sites of lesser significance, but not pertinent to the analysis. All of the sites counted within the analysis would have been eligible for SHINE – but many went on to be excavated and subject to development.

3. Results

- The surveys totalled just over 11 square km, the majority within the larger surveys, but a comparative amount in the two smaller sizes.

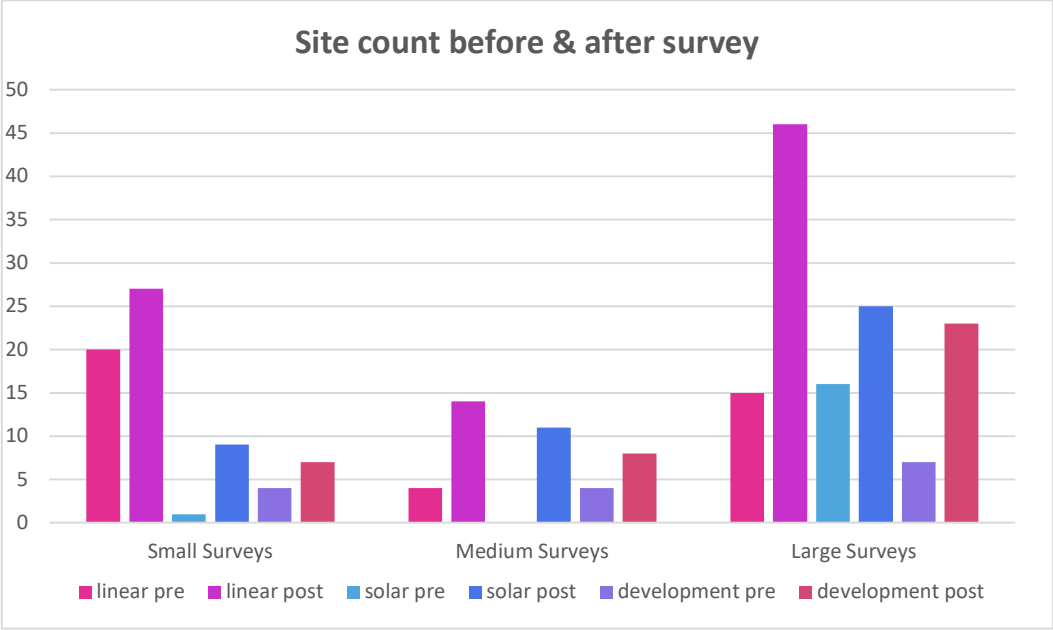
	small	medium	large	Total
Linear(19 surveys)	64ha (12 surveys)	79ha (4 surveys)	223ha (3 surveys)	**366ha**
Solar (20 surveys)	60ha (12 surveys)	70ha (4 surveys)	225ha (4 surveys)	**355ha**
Development (20)	60ha (12 surveys)	71ha (4 surveys)	252ha (4 surveys)	**383ha**
	184ha	**220ha**	**700ha**	**1104ha**

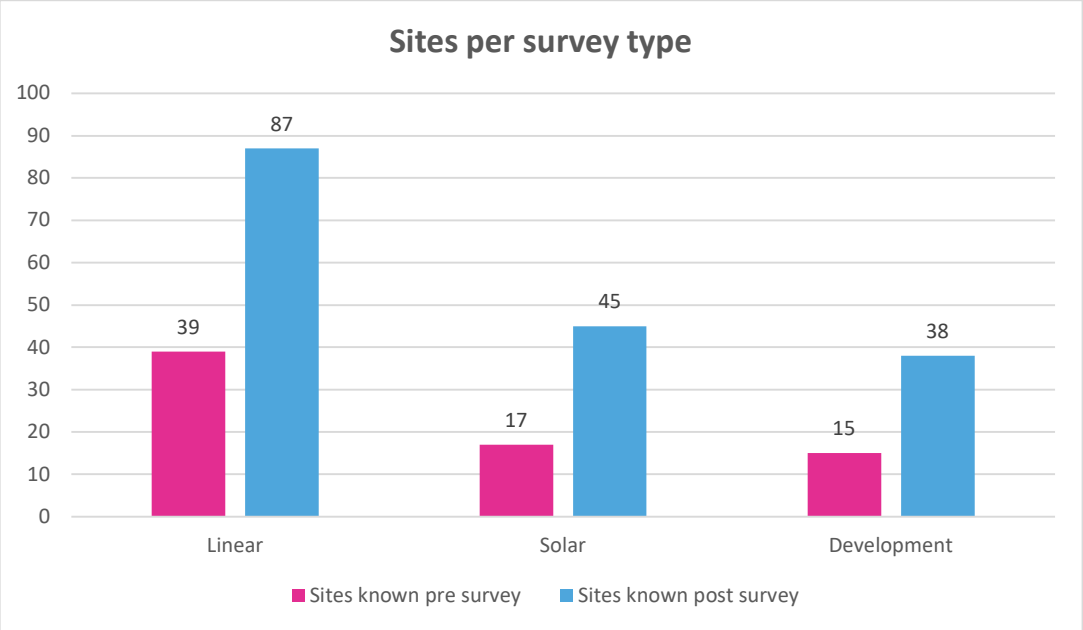
Table 2 Area surveyed in each category

- Prior to survey, 10% of the survey area was covered by known archaeological sites. After survey, this rose to 16.8%.
- Unsurprisingly they all show an increase - e.g. the linears, from having 1 known site per 9ha, increases to one site every 4ha.

	Sites known pre survey & ratio sites /hectarage	Area covered by known sites	Sites added by survey	Area covered by added sites	Total no. of sites & sites/ hectarage	Total hectarage of sites post survey
Linear (366h)	39 1:9ha	32ha 8.7%	48	32ha	87 1:4ha	**64ha** **17%**
Solar (355h)	17 1:21ha	38ha 10.7%	28	15ha	45 1:8ha	**53ha** **15%**
Development (383h)	15 1:23ha	33ha 8.6%	23	36ha	38 1:10ha	**69ha** **18%**
	71 **1:15.5**	**103h** **(10%)**	**99**	**83ha**	**170ha** **1:6.5ha**	**186ha** **(16.8%)**

Table 3 Site data





	small	medium	large	Totals
Linear surveys	12	4	3	**19**
Hectarage	64ha	79ha	223ha	**366ha**
No of sites pre survey	20	4	15	**39**
No of sites post survey	27 (ie 7 new sites)	14	46	**87**
Blank pre survey	4	2	0	**6**
Blank post survey	2	1	0	**3**
Solar surveys	12	4	4	**20**
Hectarage	60ha	70ha	225ha	**355ha**
No of sites pre survey	1	0	16	**17**
No of sites post survey	9	11	25	**45**
Blank pre survey	11	4	1	**16**
Blank post survey	6	1	1	**8**
Development surveys	12	4	4	**20**
Hectarage	60ha	71ha	252ha	**383ha**
No of sites pre survey	4	4	7	**15**
No of sites post survey	7	8	23	**38**
Blank pre survey	9	2	1	**12**
Blank post survey	6	1	0	**7**

Table 4 Site data for the surveys divided by size.

	Small	Medium	Large	Totals
No of surveys	36	12	11	**59**
Hectarage	184ha	220ha	700ha	**1104ha**
No of sites pre survey	25	8	38	**71**

No of sites post survey	43	33	94	**170**
Hectarage of sites	26ha	28ha	131ha	**185ha**
Average size of site	0.6ha	0.85ha	1.4ha	**1.09ha**
Site coverage %	14%	12.7%	18.7%	**16.75%**
Blank pre survey	24 (66%)	8 (66%)	2 (18%)	**34 (58%)**
Blank post survey	14 (39%)	3 (25%)	1 (9%)	**18 (30%)**
% of double blank	58%	37%	50%	**53%**

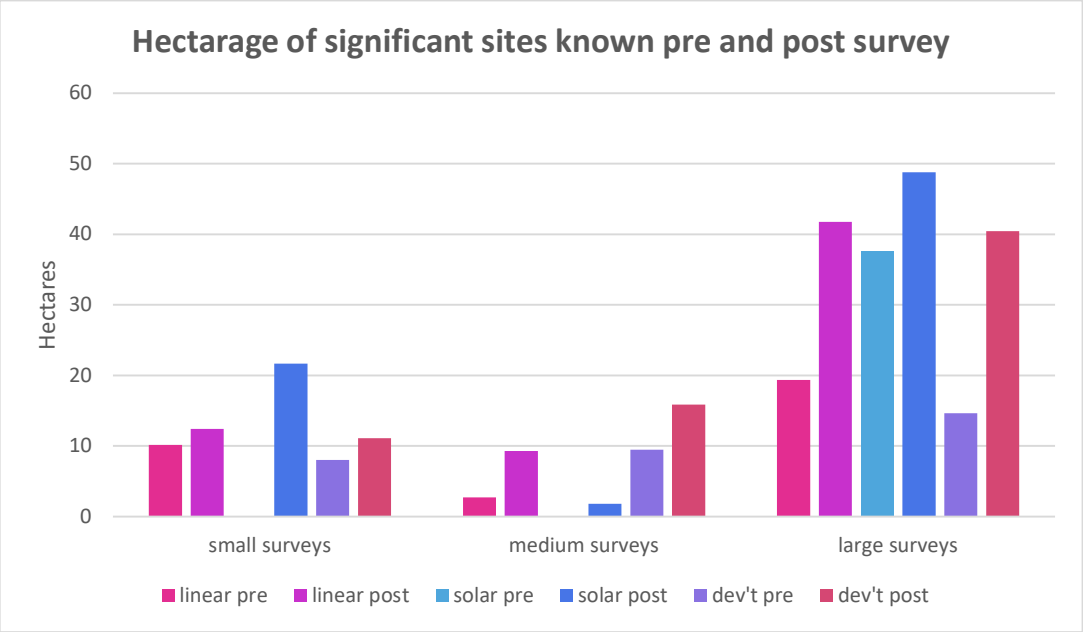
Table 5 concordance

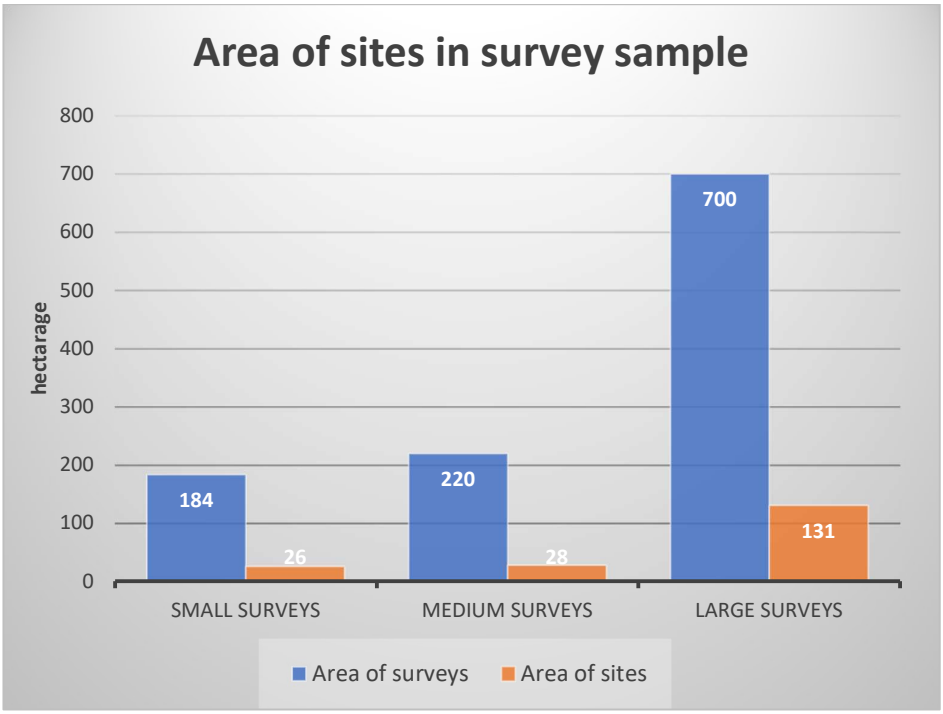
- New sites found during survey – the hectarage of additional sites is lowest for the smaller survey areas, only 4% of the survey area was covered by new sites, whereas the larger surveys resulted in almost double this (7% and 8.5%).

	36 Small surveys (184 ha)				**12 Medium surveys (220ha)**				**11 Large surveys (700ha)**			
	sites	**ha**	**+sites**	**ha**	**sites**	**ha**	**+sites**	**ha**	**sites**	**ha**	**+sites**	**ha**
Linear (366h)	20	10.13	7	2.4	4	2.7	10	7.59	15	19.34	31	22.42
Solar (355h)	1	-	8	2.17	0		11	1.8	16	37.7	9	11.1
Dev (383h)	4	8	3	3.1	4	9.5	4	6.35	7	14.65	16	25.8
	25	**18.13**	**18**	**7.67**	**8**	**12.2**	**25**	**15.74**	**38**	**71.69**	**56**	**59.32**

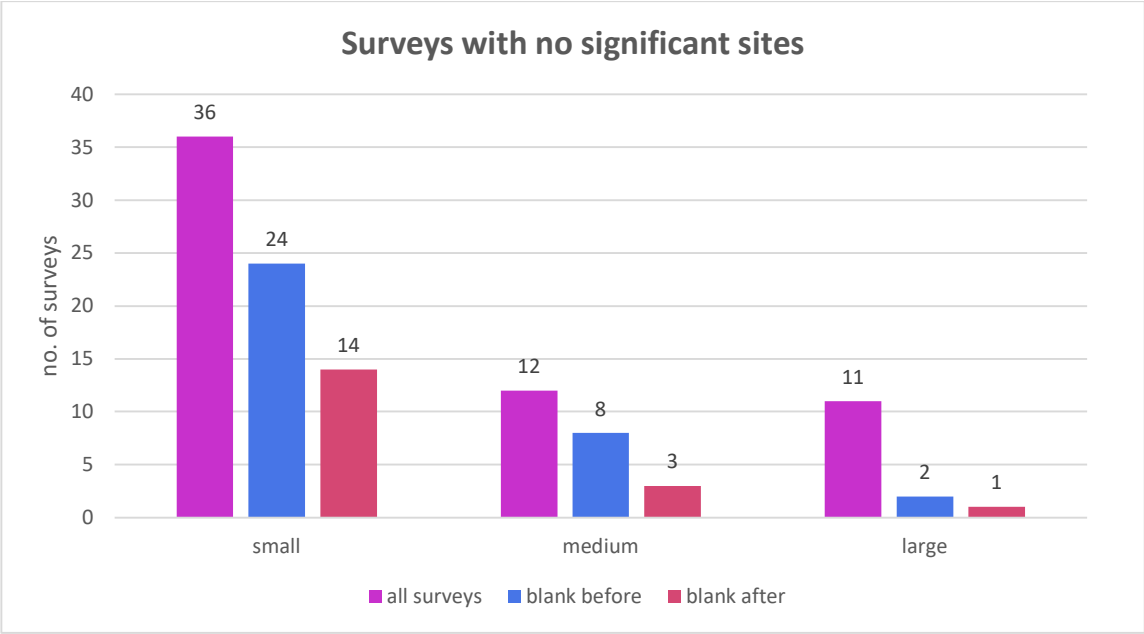
Table 6 Area of each category, with the area of the additional sites in relation to the number of sites known pre and post survey.

- The area of sites within the medium surveys more than doubled after survey, 56%, whereas the small and large categories only increased by 29% and 45%.





- 18.7% of the large survey area was covered by significant archaeological sites.
- The other survey areas contained relatively less - 14% of the small and 12.7% of the medium.



- With just over 50% of the sample having no significant sites both before and after survey, contributing factors, such as slope, geology, locale, need to be considered prior to geophysical survey being proposed. These will probably have already been factored in prior to some of the surveys within the sample being undertaken.

4. Previous Research

A report in 2001 (Hey and Lacey) analysed the various methods for archaeological evaluation, including a specific study of geophysical surveys. Some 22 years later, it would be interesting to revisit the report in greater detail. A number of quotes and charts are particularly pertinent -

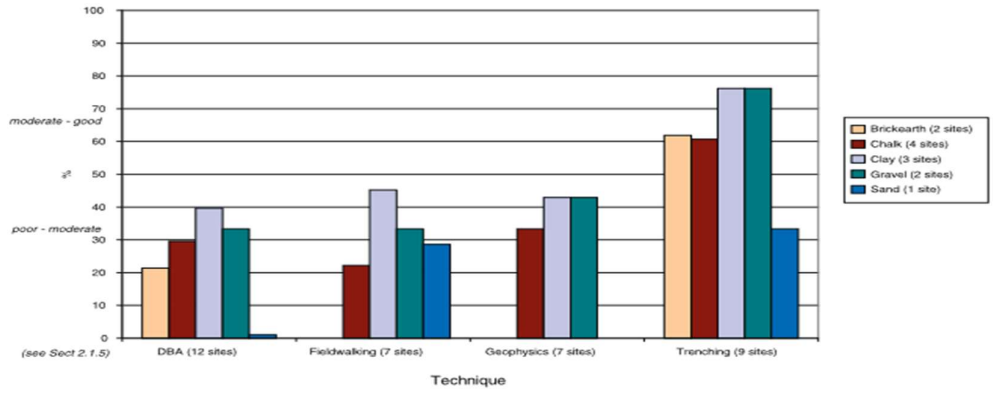


Figure 6 Success of techniques in relation to geology

…geophysical data can and does overlook very important remains. These results confirm a significant limitation of geophysical survey that must not be dismissed, and they emphasise the need for appropriate specification of methodology and the exercise of considerable caution in any dismissal of significance where no anomalies are evident

…the resounding endorsement of the fact that, in the right conditions, and correctly applied, geophysical methods are indeed highly effective at locating archaeological features

Whilst geophysical survey is so clearly a valuable approach in field evaluations, this analysis has emphasised the continuing need to be alert to the fact that many types of small-scale or subtle features are undetectable. This deficiency may again be of less significance if other related features are detectable, but it must remain a cardinal rule that absence of anomalies does not necessarily imply an absence of significant features

Evaluation of archaeological decision-making processes and sampling strategies (Hey & Lacey; Oxford: Oxford Archaeology 2001) Appendix 2 Study of geophysical surveys, by Neil Linford and Andrew David.

5. Case Studies

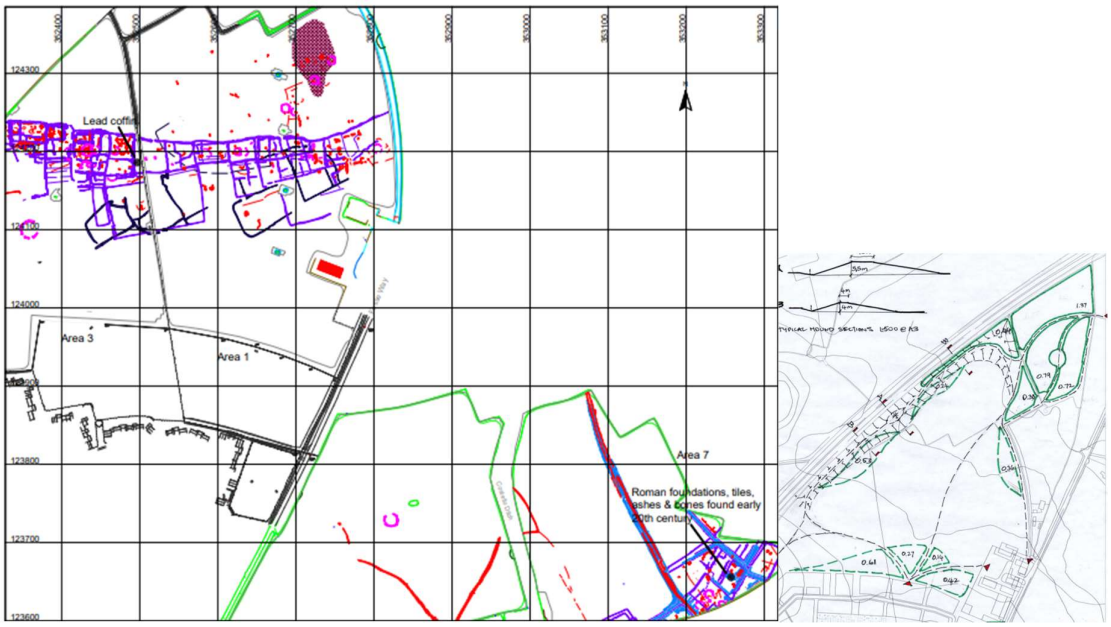
Neither of the following case studies was included within the project dataset but are focussed on here to demonstrate that archaeological potential is an issue to consider during woodland planting, that cannot be covered easily by data, hence the need for the continued input of professional advice to accompany any data used in woodland creation.

Case Study 1

Hainbury Farm

In March 2020 (during lockdown!) a planting proposal was received for an area of land in South Somerset. The area contained one identified site on the HER of a Roman coffin burial. It was located close to a Roman road and just over 1km north of a Roman town and oppidum. An adjacent area of land had had a negative housing evaluation. Following discussions with the applicant and the Forestry Commission, and supported by Historic Environment planning colleagues, it was agreed that a geophysical survey should be undertaken. Eventually taking place in March 2021 this showed the plan of a Roman ladder settlement, together with a number of enclosures. Additional areas were surveyed on the applicant's initiative, showing up the plan of a suspected villa to the south-east. The surveys eventually informed the layout of a proposed development master plan involving a country park, creation of bunds and new planting areas – with information boards proposed for a restored barn/shelter, while identifying areas that would be acceptable for development.

With SHINE data alone (none was present for the area in question) the planting scheme may have gone ahead. The coffin was a recent (2013) metal detector location – it is questionable whether the same significance would have been attached to an antiquarian location. However, the location close to Roman roads, town and Iron Age oppidum may have triggered a requirement for more research and information levied by the Forestry Commission on the applicant.



Case Study 2

Hinkley Point

Two areas totalling 145ha were surveyed in advance of the Hinkley Point power station expansion. Prior to the survey, the HER had records for one cropmark enclosure, cropmark field boundaries, a deserted farm site, water meadows and a scatter of Roman pottery.

Now, following geophysical survey/evaluation/excavation, we know that the cropmark enclosure was Bronze Age, with five further Iron Age/Roman settlement areas, a prehistoric field system, a Bronze Age midden and cremation, 7th to 9th century iron working area, and the deserted farm had medieval origins. Just under half of the area contained archaeological features.

The evaluation identified a 7th century cemetery, which was noted on the geophysics as an area of magnetic disturbance, and not thought to be of much interest (pink area on the inset plan). Complete excavation of this unique site recorded over 300 well preserved skeletons.

If simple buffering of known sites was taken in a hypothetical woodland creation situation, then the outcome would not have been as positive. Increasing the understanding of an area's potential can only be of benefit to both foresters and the historic environment.

6. Conclusions

It is easy to think of 1ha as a small area, but 2ha, the smallest size in this study, is four football pitches – a development of this size would trigger mitigation in many cases. The likelihood of an archaeological site being present is something that is judged on a daily basis by development management archaeologists – and much goes into this judgement – geology, slope, orientation, elevation, agriculture, locale, scale, appropriateness of technique, - as well as HER information. However, the South West Heritage Trust's senior planning archaeologist notes that geophysics results on small development sites can be limited and trial trenching can provide better information. Under UKFS some upfront survey and mitigation can be justified and carried out.

Clearly there is a relationship between the size of survey and the frequency of sites recorded. Of the smaller survey areas 66% (24 out of 36) recorded no significant sites before survey, 39% (14 out of 36) remained blank. If the survey area was blank before survey, there was a fairly even likelihood that it remained blank (small, 14 out of 24, 58%; mid-size, 3 out of 8, 37%; large 1 out of 2, 50%; total 18 out of 34, 53%).

The results for the small and medium size surveys are relatively similar. The introduction of the larger surveys radically increases the site count and the average size of a site.

Overall, before survey within the sampled areas, there was an average of one known site per 15.5ha; after survey, this increased to one significant site every 6.5ha. Linear surveys, probably the most objective survey type, showed a result of one significant site every 4ha, which is possibly more realistic, but may still be an underestimate.

The average site size from the data in this exercise, as recorded by the HER, was just over 1ha; but that is all it is, an average – the Hinkley excavations are a case in point, settlements spread, change, develop and not everything shows on geophysics.

The Shapwick parish survey in Somerset would be a useful example to look at for the spread of sites over a large area, utilising many survey methods, including field walking, metal detecting, map regression as well as geophysical survey - but a Roman hoard and an unknown associated villa was found soon after the 20 years of survey had finished!

The use of geophysical survey to identify sites and prevent damage is an imperfect solution. Some damage to the archaeological resource is inevitable with planting, so the challenge is to devise a mechanism where affordable mitigation can prevent the most harm.