Historic Landscape Assessment: The East of England Experience Paper Product to GIS Delivery

Journal of GIS in Archaeology, Volume I

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Lynn Dyson–Bruce, B.A.Hons., MSc., FSAS
Historic Landscapes Project Officer, East of England: Essex County Council

"One of the most challenging problems for both the experimental ecologist and the theorist is the interaction of biological populations with the time dimension."

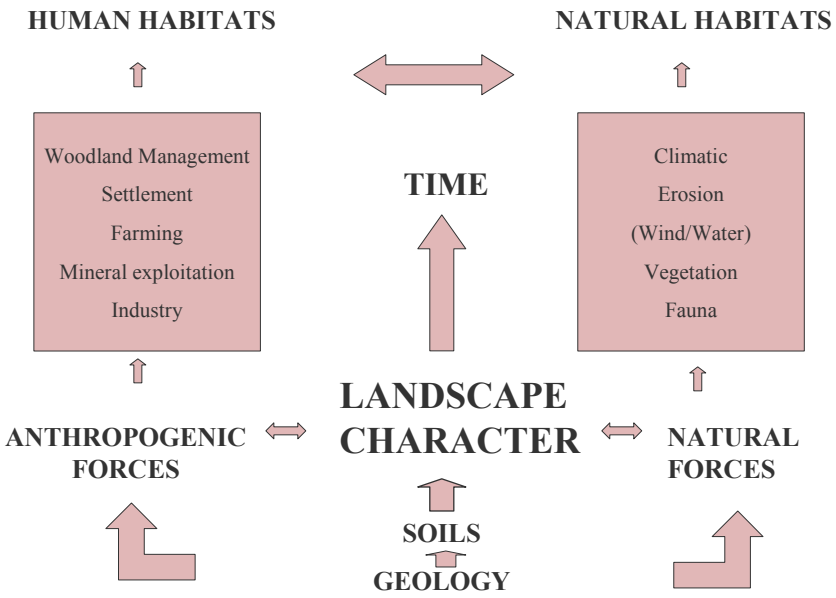
Introduction

Historic Landscape Assessment (HLA) has been developed to assess the historic "time depth" of the landscape, which will enable its characterization into broad historic landscape character types. The development of this methodology was partially in response to the application of Landscape Character Assessment (LCA) across the United Kingdom with an increasing need for the identification and assessment of our heritage of cultural landscapes. The HLA approach was originally developed from LCA methodology.

LCA has a proven methodology but has been unable to adequately identify and assess the historic dimension of our landscape. This is partially the fault of historians and archaeologists, as they have not produced the necessary information in an appropriate format for the assimilation of our cultural heritage by other specialists and nonspecialists in their work. Traditionally, archaeologists and historians have adopted the "spot-site" approach with specialist definitions, which are not easily understood by other specialists or laymen. This has not lent itself to a landscape approach. HLA seeks to redress this balance by providing a background within which these sites can nest. One can then determine if these sites are contemporaneous within their surrounding landscape.

We are aware of the variety of landscapes around us, but few of us realize the time depth of these landscapes, the speed in which they are now being changed, or how they have changed in the past and with what frequency. HLA has shown that the landscape has been in a constant state of flux due to a combination of natural and anthropogenic forces (see Figure 1). HLA seeks to chart the surviving, visible historic components within our landscape that inform the process of landscape development. This may also enable the development of models of past landscape change to inform the decision making process and management of our landscapes in the future.

Figure 1
Landscape Character in Relation to Natural and Anthropogenic Factors



HLA has proven to be a valuable tool and has facilitated the identification of various issues:

- Local, regional, and historic landscape patterns
- Chronological patterns—landscape time depth and palimpsests
- Identification of landscape change
- Landscape management
- Management of archaeological and historical resources
- Informing of research objectives
- Development and control in planning matters
- Informing of archaeological survey
- Informing of LCA
- Regional planning
- Local planning

This information has proven to be of use to a large audience including landscape architects and managers, archaeologists, historians, geographers, planners, and more. This information provides managers and planners with the appropriate knowledge to proactively and positively respond to future development pressures, which has been shown to enable the holistic management of our landscapes for a sustainable future.

Methodology/ Approach

The HLA methodology has developed from the seminal work carried out in Cornwall (Herring 1998), which mapped the landscapes according to "Historic Character Types," a paper-based exercise. Work in Scotland further developed the approach by mapping "Historic Landuse" using a geographic information system (GIS) (Dyson–Bruce, 1998; Dyson–Bruce, et al, 1999). Wales defined a "Register of Landscapes" of specific or outstanding interest (Cadw, 1998). English Heritage (EH) has used a wide variety of paper or increasingly GIS-based methodologies to determine "Historic Landscape Character" in different counties (Fairclough, 1999).

Therefore, it is a new dynamic approach still under development, especially as a GIS application. It is the advent of GIS that has facilitated this approach, as the nature of the information is spatial and complex in three dimensions (time, horizontal space, and vertical depth) that is ideally suited to the GIS platform. This has enabled and facilitated HLA to become a powerful tool; as a consequence, the methodology had to be adapted and changed in response to GIS technology.

Earlier approaches were based on established LCA techniques and methodology. These were paper-based, which led, by their inherent limitations, to the creation of a single map or series of simplistic maps achieved by the aggregation of data to create thematic historic landscape types. This is difficult to be reliably and consistently replicated due to the nontransparent nature of the approach. In addition, this renders any detailed analysis or any changes in the representation or update of the data very difficult to achieve.

However, GIS has been used in the past but has been an enhanced version of the original paper-based approach (i.e., digital maps). This may solve some of the problems of replication and representation of data, but the maps are lacking in inherent intelligence and, more important, metadata. These issues are now being addressed within various county methodologies. It is important to remember that GIS is not an end use in itself but a tool that facilitates input, representation, access, analysis, and output of data. The revised GIS-based methodology enables a transparency of approach with detailed metadata creating a series of attributes that may then be aggregated as required for different objectives, remits, and end users (Dyson–Bruce, et al, 1999; Fairclough, 1999). Thus, the HLA as a methodology has necessitated a fluid and dynamic approach to respond and record not only the subtleties and dynamics within the landscape in a suitably sensitive manner but as a rigorous analytical tool relating to academia, data analysis/entry, and metadata.

In response to these issues, the methodology used in the East of England Project is now GIS-based on an ArcView platform, with the following three interactive aspects:

1. HLA: Creates types by assessing the attributes that make up the landscape types, which may be aggregated to form historic character areas—*the academic, archaeological, and historical aspect.*

2. GIS: Handles the data capture process and input—*the practical aspect.*

3. Metadata: This is the data concerning both of the above. It informs the process of how the data has been collated and used to create the map. This could be regarded as

the *fulcrum* between academic research and the mechanical process of that spatial data's rendition.

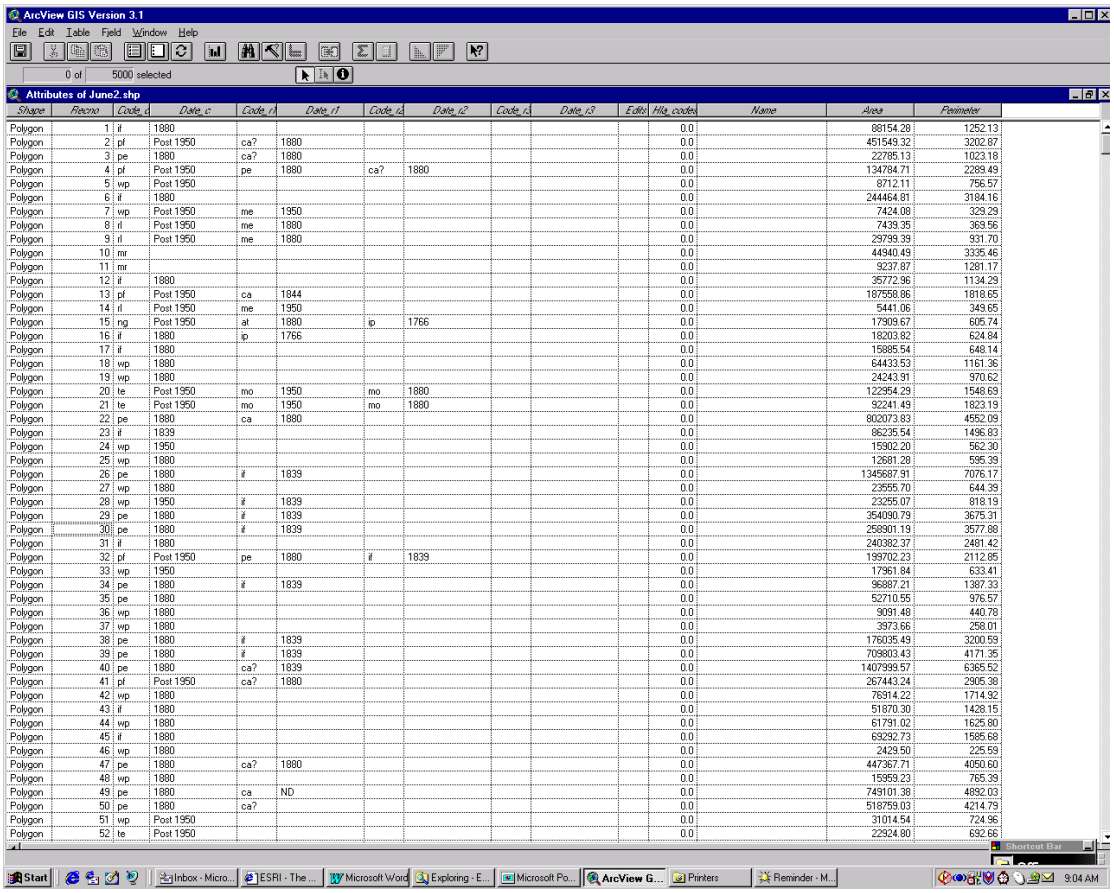
The HLA methodology is a broad-brush and desktop-based approach, primarily assessing historical information, maps (current and historic), aerial photographs, documentary sources, and so forth. The criteria used must be robust, definitive, replicable, and meaningful not only to the data creator but to a variety of end users and objectives. However, the landscape types must be sufficiently sensitive to reflect landscape composition, diversity, variability, continuity, and discontinuity, which enables the complex concept of time-depth and palimpsests within the landscape to be assessed.

The data is collated at 1:25,000 (data capture) and digitized at 1:10,000 (data accuracy), using a defined series of landscape types (attributes). These range from a variety of identifiable field systems, woodlands, parklands, grazing, urban, industrial, extractive, military, and so forth, both current and relict but still visible within the landscape. These landscape types are linked to their source with linked databases. These may then be aggregated, as desired, to form broad areas of Historic Landscape Character according to varied remits and objectives. This broad-brush approach is meant to rapidly assess the landscape as to its historic origin and landscape character.

The metadata will be incorporated directly within the database with appropriate fields (see Figure 2). These will primarily relate to

- Historic landscape type (e.g., code_c, relict_1, or Hla_code)
- Data source: The maps from which the data derived, whether current or relict (e.g., date_c, date_r1)
- Creator: The person responsible for digitizing the polygons and assessing and assigning data
- Date of creation: Date data digitised
- Data owner
- Scale of data accuracy: Scale of digitising
- Scale of data capture
- Glossary of terms (e.g., code_c, code_r2)

Figure 2
Sample of HLA Database—Work in Progress



Shape	Recno	Code_c	Date_c	Code_r1	Date_r1	Code_r2	Date_r2	Code_r3	Date_r3	Edits	Hla_codes	Name	Area	Perimeter
Polygon	1	if	1880								0.0		88154.28	1252.13
Polygon	2	pf	Post 1950	ca?	1880						0.0		451549.32	3202.87
Polygon	3	pe	1880	ca?	1880						0.0		22785.13	1023.18
Polygon	4	pf	Post 1950	pe	1880	ca?	1880				0.0		134784.71	2289.49
Polygon	5	wp	Post 1950								0.0		8712.11	756.57
Polygon	6	if	1880								0.0		244464.81	3184.16
Polygon	7	wp	Post 1950	me	1950						0.0		7424.08	329.29
Polygon	8	rl	Post 1950	me	1880						0.0		7439.35	369.56
Polygon	9	rl	Post 1950	me	1880						0.0		29799.39	931.70
Polygon	10	mr									0.0		44940.49	3335.46
Polygon	11	mr									0.0		9237.87	1281.17
Polygon	12	if	1880								0.0		35772.96	1134.29
Polygon	13	pf	Post 1950	ca	1844						0.0		187558.86	1818.65
Polygon	14	rl	Post 1950	me	1950						0.0		5441.06	349.65
Polygon	15	ng	Post 1950	at	1880	ip	1766				0.0		17909.67	605.74
Polygon	16	if	1880	ip	1766						0.0		18203.82	624.84
Polygon	17	if	1880								0.0		15885.54	648.14
Polygon	18	wp	1880								0.0		64433.53	1161.36
Polygon	19	wp	1880								0.0		24243.91	970.62
Polygon	20	te	Post 1950	mo	1950	mo	1880				0.0		122954.29	1548.69
Polygon	21	te	Post 1950	mo	1950	mo	1880				0.0		92241.49	1823.19
Polygon	22	pe	1880	ca	1880						0.0		802073.83	4552.09
Polygon	23	if	1839								0.0		86235.54	1496.83
Polygon	24	wp	1950								0.0		15902.20	562.30
Polygon	25	wp	1880								0.0		12681.28	595.39
Polygon	26	pe	1880	if	1839						0.0		1345687.91	7076.17
Polygon	27	wp	1880								0.0		23555.70	644.39
Polygon	28	wp	1950	if	1839						0.0		23255.07	818.19
Polygon	29	pe	1880	if	1839						0.0		354090.79	3675.31
Polygon	30	pe	1880	if	1839						0.0		256901.19	3577.88
Polygon	31	if	1880								0.0		240382.37	2481.42
Polygon	32	pf	Post 1950	pe	1880	if	1839				0.0		199702.23	2112.85
Polygon	33	wp	1950								0.0		17961.84	633.41
Polygon	34	pe	1880	if	1839						0.0		96887.21	1387.33
Polygon	35	pe	1880								0.0		52710.55	976.57
Polygon	36	wp	1880								0.0		9091.48	440.78
Polygon	37	wp	1880								0.0		3973.66	258.01
Polygon	38	pe	1880	if	1839						0.0		176035.49	3200.59
Polygon	39	pe	1880	if	1839						0.0		709803.43	4171.35
Polygon	40	pe	1880	ca?	1839						0.0		1407999.57	6365.52
Polygon	41	pf	Post 1950	ca?	1880						0.0		267443.24	2905.38
Polygon	42	wp	1880								0.0		76914.22	1714.92
Polygon	43	if	1880								0.0		51870.30	1428.15
Polygon	44	wp	1880								0.0		61791.02	1625.80
Polygon	45	if	1880								0.0		69292.73	1585.68
Polygon	46	wp	1880								0.0		2429.50	225.59
Polygon	47	pe	1880	ca?	1880						0.0		447367.71	4050.60
Polygon	48	wp	1880								0.0		15959.23	765.39
Polygon	49	pe	1880	ca	ND						0.0		749101.38	4892.03
Polygon	50	pe	1880	ca?							0.0		518759.03	4214.79
Polygon	51	wp	Post 1950								0.0		31014.54	724.96
Polygon	52	te	Post 1950								0.0		22924.80	692.66

There are linked databases to correlate data, especially to the data sources (e.g., maps used to create the HLA data set). This is to address the problem that some data sets are

- Consistent across counties (e.g., Ordnance Survey Landline 2000, 1st Edition)
- Consistent within a county and historic county maps (e.g., Dury 1760 map for Hertfordshire)
- Inconsistent within counties (e.g., historic tithe maps, enclosure maps [parish-based] or estate maps [landowner maps, 16th century and later])

Therefore one can link back to the data that informed that polygon's creation. In addition, there will be links to tables of

- Definitions of the codes used in the data capture process

- A full glossary of attribute types
- Counties with different methodologies
- Hyperlinks to photographs, scanned images, documents, texts, videos, and so forth

Therefore, it will render the methodology transparent.

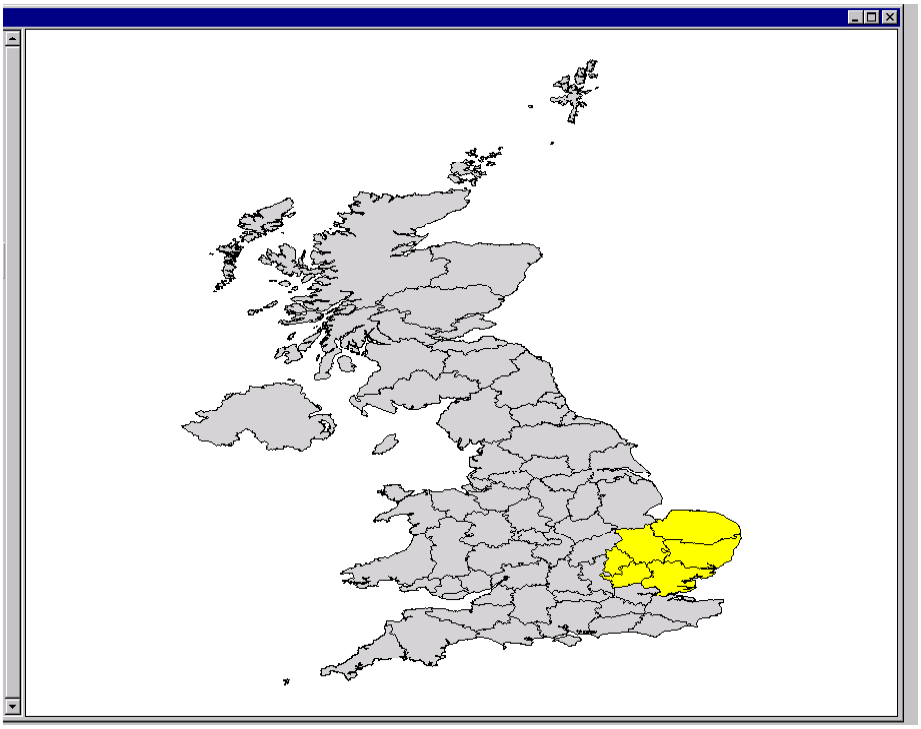
GIS, in addition, has many useful utilities and functions that facilitate the display and analysis of this complex spatial data. In practical terms, this enables a flexibility of approach. This data may then be easily analyzed, statistically and spatially, within its own data set and with others within the GIS platform. Varied outputs are easily possible (e.g., maps, graphs, tables, histograms, presentations, etc.). In addition, the data may be "static," giving time horizons or "organic," allowing constant revision.

Application

The East of England Project is a coordinated approach between English Heritage (EH) and the relevant regional authorities. It is the only project of its kind, as other counties within England are being, or have been, assessed independently. The work on this project area is in progress and includes (see Figure 3).

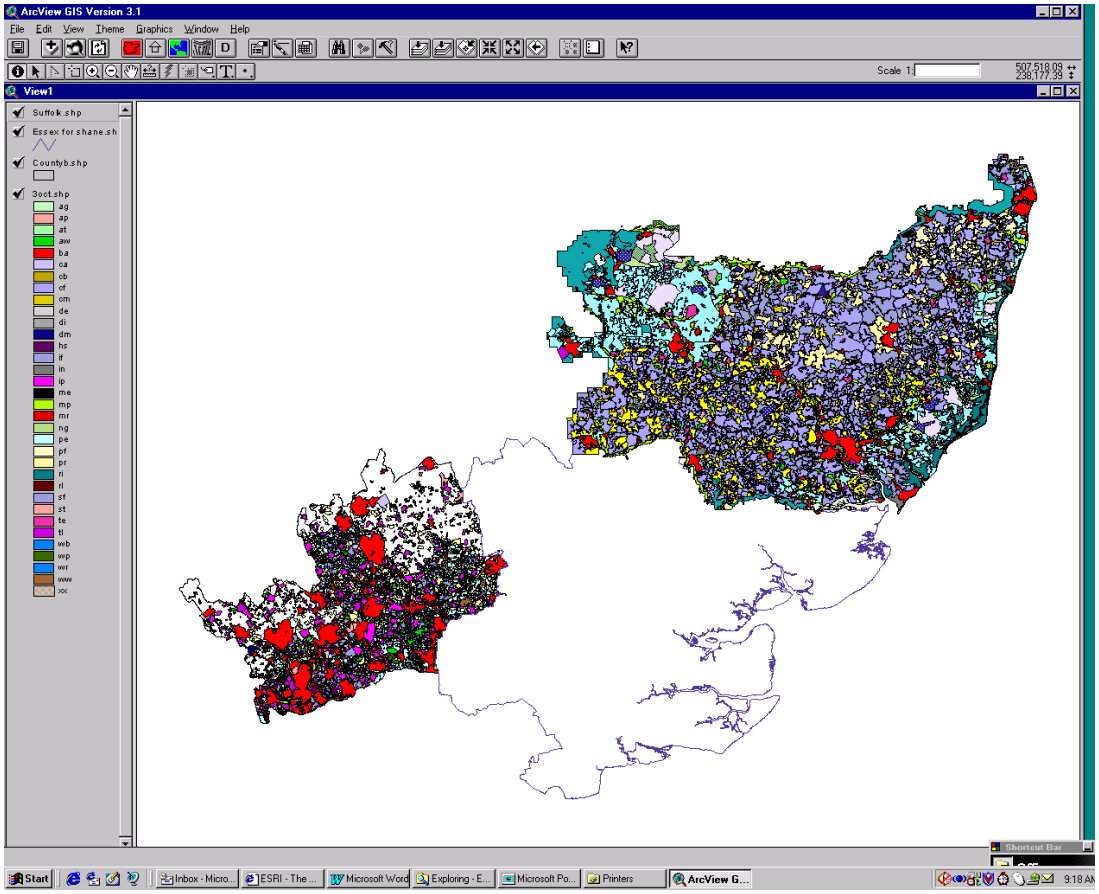
- Suffolk (completed)
- Hertfordshire (near completion)
- Essex (in progress)
- Cambridgeshire, Norfolk, and Bedfordshire (to be done)

Figure 3
Southeast of England Project Area, Shaded Yellow



There are distinct advantages to a series of counties being assessed as a single topographic region. Initial assessment and results have shown that each county has its distinctive historic landscape character and historic development with subtle variations within. Broad historic landscape patterns have been identified that run from one county into the other. However, there is also diversity from one geographic/topographic region to another and within regions. It is a very diverse, complex, and incredibly dynamic landscape (see Figure 4).

Figure 4
Suffolk, Hertfordshire, and Essex—HLA Work in Progress



By geospatial analysis and research it is hoped to identify why in some areas there is diversity and in others a contiguity of landscape character. Initial research indicates a diversity of factors including historic tradition; social, economic, political, agri-environmental, and geological conditions; soils; slope; aspect; height; and so forth, which all have a part to play in landscape development. It has yet to be established in what proportion, why, and how these various factors influence the historic development of the landscape.

HLA does not attempt to place any value on the landscape as values change in response to varied sociopolitical objectives. HLA seeks purely to assess landscape within its historical context. However, HLA has contributed to different forms of landscape assessment and management, and it is hoped that with wider dissemination of the methodology, greater use will be made of HLA in the management decision making process in a variety of remits.

It is hoped that this project area will contribute to a production of a national historic landscape character map comparable to the National Character Map already produced by the Countryside Commission for England. This would be an invaluable resource not only within individual counties and across the country but also for a wide range of different remits and for use by various agencies and individuals for pragmatic, practical research and various management objectives.

Conclusion

The HLA methodology has necessitated a fluid and dynamic approach to respond to and record the subtleties within the landscape in a suitably sensitive manner. In addition, an analytical approach was required to take into account issues relating to data source/synthesis/entry/analysis (i.e., metadata) to ensure a transparency of approach. Experience is proving that appropriate GIS software and a robust methodology are essential for the success of any GIS project. Realistic objectives and timescales with appropriate resources also need to be established to enable the successful completion of any project.

The change of methodology from that of paper-based to GIS has not been without difficulties, but it is constantly under improvement and being refined with experience. This is leading to a more transparent and flexible methodology that will enable more accurate and reliable analysis not only within but, more important, between different counties. Thus, results obtained will reflect real and meaningful historical landscape patterns within the landscape rather than differences in the process of assessment, data capture, synthesis, and analysis. Therefore, the incorporation of metadata is fundamentally important in ensuring a transparent methodology to maintain this consistency in approach.

There is no doubt that in the future the representation of spatial data lies within the GIS platform, as GIS is a powerful tool able to handle vast amounts of complex data. Experience is proving that appropriate GIS software and a robust methodology are essential for the success of any GIS project if it is to be objective, transparent, and replicable. It requires crystal-clear thinking and application, as a GIS map/theme/layer/coverage is only as intelligent as the database and metadata supporting it.

Acknowledgements

English Heritage has been the funding body for the project. I should like to thank Graham Fairclough (English Heritage), Stewart Bryant (Hertfordshire County Council), Paul Gilman (Essex County Council), and Edward Martin (Suffolk County Council) for their assistance and support in this project.

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