



# **Revising the Historic Landscape Character of West Penwith, Cornwall Final report**



## **Revising the Historic Landscape Characterisation of West Penwith, Cornwall**

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The Project Manager was Jacky Nowakowski.

The views and recommendations expressed in this report are those of Historic Environment Projects and are presented in good faith on the basis of professional judgement and on information currently available.

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## **Abbreviations**

AONB	Area of Outstanding Natural Beauty
CC	Cornwall Council
CRO	Cornwall Record Office
CWT	Cornwall Wildlife Trust
EH	English Heritage
ESA	Environmentally Sensitive Area
GIS	Geographic Information System
HBSMR	Historic Buildings Sites and Monuments Record (Cornwall Council)
HER	Historic Environment Record
HES	Historic Environment Service
HLC	Historic Landscape Characterisation
ICS	Institute of Cornish Studies
MCO	Monument Cornwall
MD	Medieval
NIA	Natural Improvement Area
NMP	National Mapping Programme in Cornwall
OD	Ordnance Datum
OS	Ordnance Survey
Rev HLC WP	Revising the HLC of West Penwith (project)
SSSI	Sites of Special Scientific Interest
WPS	West Penwith Survey
WHS	World Heritage Site

## **1 Summary**

This project was funded by English Heritage to undertake 89 sq km of Historic Landscape Characterisation (HLC) refinement work in West Penwith, Cornwall.

The work builds upon the HLC refinement already undertaken by Historic Environment Projects, Cornwall Council, in West Penwith as part of the 'Lowland Cornwall' and 'HLC Revisions in West Penwith' projects.

West Penwith is the westernmost peninsula of Cornwall and is of international importance. It contains one of the largest concentrations of upstanding monuments in the UK, extensive blocks of prehistoric field systems fossilised in the present day landscape and relict landscapes in the form of earthworks which spans prehistory to the post-medieval period.

The methodology for the HLC refinement is based upon that employed during the 'Lowland Cornwall' project with additional elements due to the availability of further supporting datasets, principally from the West Penwith Survey.

All HLC mapping was undertaken on ESRI ArcView 9.2/10 GIS software to produce a shapefile with accompanying attribute tables inputted in Access, and the two datasets joined when the mapping was completed. Mapping was completed for six time-slices; c2011, c1880, c1840, late medieval, later prehistoric and Romano-British period, and early prehistory. Full attributes were inputted for the c2011, c1880, c1840 time-slices, with partial attributes completed for the earlier 'interpretive time-slices'.

Revision provides a more detailed and accurate picture of HLC, and the extent to which the prehistoric field pattern is encapsulated in today's landscape. It provides a key management tool to facilitate a future historic environment strategy for West Penwith, underpin the presentation of the results of the West Penwith Survey Publication, and be used to increase public perception and promote the importance of the historic environment in West Penwith.

## **2 Introduction**

### **2.1 Project background**

This project was funded by English Heritage to undertake 89 sq km of Historic Landscape Characterisation (HLC) refinement work in West Penwith, Cornwall. Mapping was undertaken in two tranches; from February 2012 to early April 2012 and the second from late September to early October 2012.

The first tranche of the project completed revised HLC mapping for 68 sq km of the West Penwith peninsula (the parishes of Madron, Gulval, St Ives, Sennen and St Levan).

The second tranche of the project completed revised HLC mapping for 21.76 sq km of the West Penwith peninsula including the entirety of Sancreed parish and the remaining upland parts of St Buryan and Ludgvan not mapped by the Lowland Cornwall project (Dudley, forthcoming a).

The work builds upon the HLC refinement already undertaken by Historic Environment (HE) Projects, Cornwall Council, in West Penwith as part of the 'Lowland Cornwall' (Dudley, forthcoming a) and 'HLC Revisions in West Penwith' (Dudley, forthcoming b) projects.

The archaeological resource in West Penwith is of international importance, containing one of the largest concentrations of upstanding monuments in the UK. Furthermore, extensive blocks of prehistoric field systems are fossilised in the present day landscape and others survive as relict landscapes in the form of earthworks (Nowakowski 2010, 2011). This unique level of survival and continuity imbues the landscape with its highly distinctive quality; it is essentially a landscape which has retained much of its ancient character in the face of many centuries of change.

Despite this, relatively few archaeological sites in West Penwith are scheduled. There are, however, some Sites of Special Scientific Interest (SSSI) in coastal areas, the cliff tops and moors form an Area of Outstanding Natural Beauty (AONB) and the St Just Mining District is part of the Cornwall and West Devon Mining World Heritage Site (WHS). The most archaeologically sensitive parts of West Penwith (amounting to 9,000ha) were designated an Environmentally Sensitive Area (ESA) in 1987 in recognition of the significance and international importance of the historic environment. The ESA designation has now expired, with many of the existing agreements within it about to come to a close.

### **2.2 Aims**

The main aims of the project were to:

- Undertake a refined HLC mapping for the ecclesiastical parishes of Sancreed, Sennen, St Levan and St Ives, and parts of Madron, Gulval, Lelant, Ludgvan and St Buryan (in order to complete the refined HLC mapping for West Penwith).
- Prepare descriptive texts to accompany the HLC mapping.
- Produce a report outlining the methodology employed and the key results of the project.

It is envisaged that the refined HLC mapping will:

- Provide information and evidence which will further future historic environment strategies and sustainable management of the historic environment of West Penwith.
- Provide key evidence against which the effects of future change can be assessed.



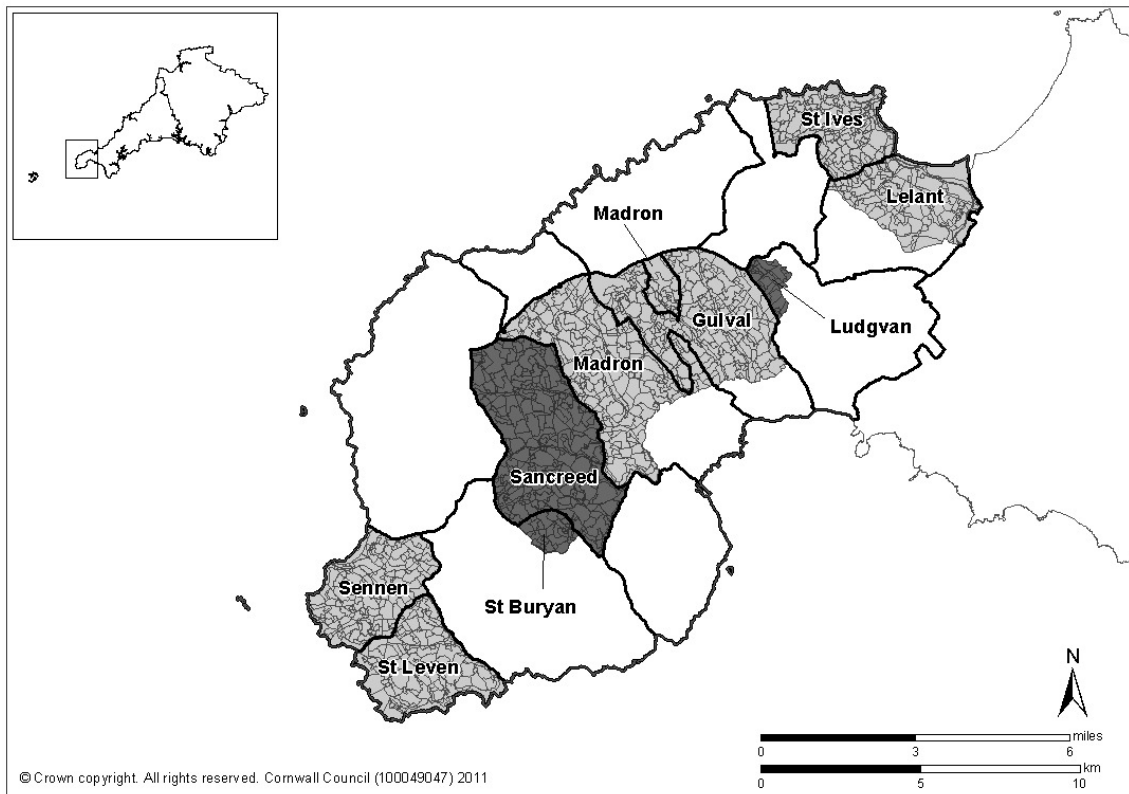
- Help promote the importance of the West Penwith landscape by providing a major contribution to the forthcoming West Penwith Survey (WPS) monograph through informing the thematic and chronological themes in the publication.

## 2.3 Method

The methodology for revision was based on that developed by the Lowland Cornwall project (Dudley forthcoming a). However, further adjustment to that method was required for this particular project. This was due to the complexity of West Penwith's landscape and the intended use of the HLC in the West Penwith Survey (WPS) publication (see Section 3 for further discussion).

### 2.3.1 Project area (Fig 1)

The project area covers 89 sq km, including the entire ecclesiastical parishes of Sancreed, Sennen, St Levan and St Ives, and the northern, upland portions of St Buryan, Lelant, Ludgvan, Gulval and Madron ecclesiastical parishes (which had not been mapped as part of the Lowland Cornwall project - see Dudley forthcoming a).



*Fig 1 Revising the HLC of West Penwith project area. The areas mapped are shown in grey (named with parish) with the boundaries of the ecclesiastical parishes defined (black outline). The parishes in light grey were completed as part of the first tranche of mapping and those in dark grey as part of the second tranche.*

### 2.3.2 HLC Structure

Historic Landscape Characterisation is hierarchical. At the top of the refined HLC sits a 'Broad Type' with increasing levels of complexity beneath it. Broad Type is further sub-divided to form a more specific 'HLC Type'; and within 'Enclosed Land' this can be further sub-divided to a detailed 'Sub-Type' level, defined by a complex set of attribute values. For example:

**Broad Type:** Enclosed Land [simple set of attribute values]

- HLC Type:** Medieval Enclosed Land [moderately complex set of attribute values]
- Sub-Type:** MD derived from Cropping Units [complex set of attribute values].

An important part of the HLC mapping process is the completion of an accompanying database of HLC attributes for each parcel of landscape. The HLC attributes are identified and described for each area mapped and include a range of 'attribute fields' to describe it. Each attribute field is a specific characteristic which is further described using a pre-defined list of 'attribute values' (see Section 5.2.1 for the full list of fields and values).

For example, the Lowland Cornwall method uses a 'Dominant internal boundary' attribute field. This is used to describe the predominant boundary type found in a parcel of HLC. In the Lowland Cornwall method predominance is interpreted in terms of numerical dominance rather than visual dominance. To more accurately describe the complexity of field boundary characteristics there is also a 'Secondary boundary' attribute field where the less numerically dominant boundary characteristics can be described using the values. For both the Dominant and Secondary boundary attribute fields the pre-determined list includes ten options to choose from to describe the field values (for example, 'sinuous', 'straight', etc – for a full list of options see Table 2, Section 5.2.1).

### **2.3.3 Mapping and digitisation**

The revised mapping was undertaken from mid February 2012 to early April 2012 and the second tranche in late September 2012 to early October 2012.

HLC mapping was carried out on ArcView 9.2 GIS software with attributes entered into an accompanying Access database. This was undertaken on a parish by parish basis. With the completion of mapping in each parish, the GIS and Access datasets were joined, and the final dataset exported to GIS.

The following were created:

- HLC (c2011, c1880 and c1840 full 'time-slices' with attribute values)
- HLC 'interpretative time-slices' with no attribute values for the late medieval, late prehistoric and Romano-British period, and early prehistoric)
- Historic Settlement data (place-name and history of settlement development).

As with Lowland Cornwall, the modern 1:10,000 digital map at the scale of 1:5000 was used to produce the c2011 HLC; though for accuracy, polygons were drawn at 1:2500 using the latest version of OS Master Map data.

Tithe map data for Gulval was unfortunately unavailable so the detail for the c1840 time-slice was populated with the c1880 values.

An important part of the Lowland Cornwall derived method is the production of a separate supporting Historic Settlement dataset; mapped separately as a GIS based layer of point data with attribute values. As a continuation of the method, Historic Settlement data was mapped as part of this project.

Its basis was the HE transcription of the Institute of Cornish Studies (ICS) Place-name Index (Historic Environment nd). The dataset was used to better identify to settlement size and character (and therefore understand changes to the surrounding HLC). As with the revised HLC, time-slices were chosen on the availability of GIS-based maps i.e. c2011, c1880 and c1840.

The full metadata of the refined HLC and the Historic Settlement database is listed in Appendix 5.2.2.

### **2.3.4 The development of the Lowland Cornwall method**

The HLC methodology for the project is based on that employed during the Lowland Cornwall project which was in turn based on guidance developed through previous HLC projects (Aldred and Fairclough 2003; Clark *et al* 2004). Lowland Cornwall HLC does, however, differ slightly from conventional HLC as it was developed for the needs of the Lowland Cornwall project (see Dudley forthcoming a).

The HLC mapping undertaken by this project included a number of refinements to the original Lowland Cornwall method.

Firstly, the characterisation includes three additional interpretative time-slices for the late medieval, late prehistoric and Romano-British, and early prehistoric periods. The Lowland Cornwall method included only two: the late medieval and the prehistoric periods.

The completion of the two prehistoric interpretative time-slices required a greater range of supporting datasets than the Lowland Cornwall method; notably the GIS mapping resulting from the National Mapping Programme (NMP) in Cornwall, the West Penwith Survey data (now available as a raster digital dataset) and Cornwall Council's Historic Buildings, Sites and Monuments (HBSMR) data.

Due to the intended use of the HLC mapping to help illustrate the discussion of the chronological development of the landscape in the WPS publication, all the time-slices were fully populated for each of the six time-slices employed. In the Lowland Cornwall project, the prehistoric interpretative time-slice was only completed for areas identified as Prehistoric Enclosed Land.

## **2.4 Critique of the developed Lowland Cornwall HLC method**

### **2.4.1 Introduction**

The following section considers the results of the updated Rev HLC WP method in relation to that used in the Lowland Cornwall project (see Dudley forthcoming a).

This discussion is not intended to introduce or explain HLC methodology in detail but to show the principal differences in the Rev HLC WP method. It illustrates examples of HLC mapping to demonstrate the greater range of supporting data available to this project, and summarises the limitations and potential opportunities to improve future HLC mapping projects in Cornwall.

A principal aim of the Rev HLC WP mapping is to contribute to the WPS publication by providing an illustrative background to help frame the discussion of the development of the landscape which includes the medieval and prehistoric periods. To complete this for the whole of West Penwith will require the amalgamation of the results of this project with the two related HLC mapping projects; Lowland Cornwall (Dudley forthcoming a) and HLC Revisions in West Penwith (Dudley forthcoming b).

This section also highlights the difficulties in distinguishing Prehistoric and Medieval Enclosed Land in terms of present HLC (the c2011 time-slice) based upon the analysis of attribute fields and values alone. This issue is touched upon in further detail in the discussion of the Lowland Cornwall method (Dudley forthcoming a) but it is important to highlight this again. It is also likely that this issue will be raised again with the discussion of the HLC for the whole of West Penwith as part of the WPS publication. Examples and ideas which may be relevant to the broader discussion of the HLC for the entire West Penwith peninsula will be discussed as part of the HLC Chapter in the WPS publication (due for completion in 2014).

The high degree of complexity and great historic time-depth of much of West Penwith's landscape means that identification of HLC is not always simple. The distinction between the Prehistoric and Medieval Enclosed Land is not always sharply defined. The inter-mingling of these two major periods, combined with multiple phases of landscape

alterations over successive periods, makes clear interpretation sometimes difficult, especially in terms of consistency, robustness and confidence.

It is important to note that as a direct development of the Lowland Cornwall method, the Rev HLC WP HLC gives a sequential account of landscape change to the present day. Discussion of the Lowland Cornwall methodology has highlighted the project-specific requirements of its HLC, and the potential positive and negative aspects of the mapping (Dudley forthcoming a).

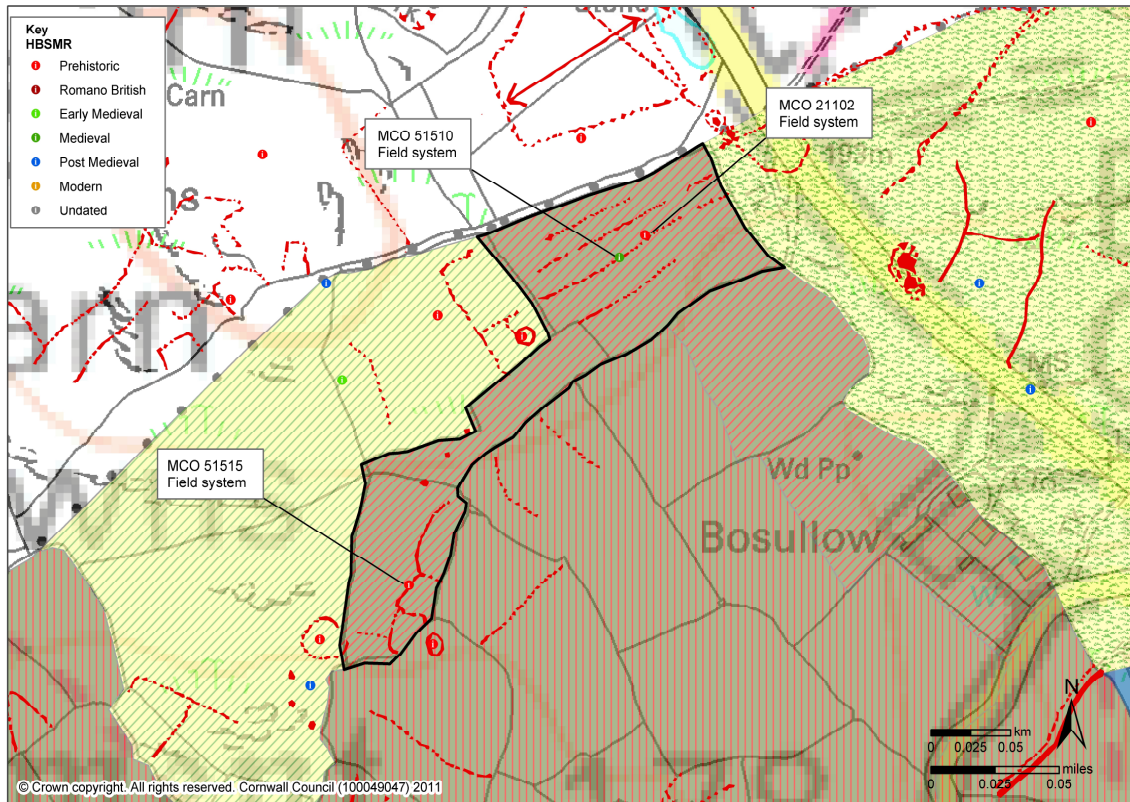
#### **2.4.2 Discussion**

In the original Lowland Cornwall method the amount of supporting data was deliberately restricted, as the aim of the project was to test predictive modelling of the spatial relationship between prehistoric monument types and HLC (in particular Medieval Enclosed Land).

However, the requirement of the Rev HLC WP method was different; the aim being to map the HLC for three time-slices and three interpretive time-slices to the early prehistoric period (interpreted as the mid to late Bronze Age). To do this with a greater degree of confidence, it was necessary to use a greater range of supporting data available from the HER. This was provided by HBSMR monument data and features recorded by the NMP from aerial photographs, and where available, archaeological survey (both measured and sketch) undertaken by the West Penwith Survey (and now available as a digital raster dataset).

To illustrate the further development of the Lowland Cornwall method for this project examples of HLC mapping are discussed.

At Bosullow, Madron, an area containing the remnants of prehistoric field systems was identified as Prehistoric Enclosed Land in the early prehistoric interpretive time-slice (see Fig 2 below). This interpretation was based upon data from the NMP and the HBSMR. Due to an adjoining area in the parish of Morvah containing the remains of a lynched field system (recorded in the HBSMR) the area was interpreted as probably being altered in the Iron Age (and therefore mapped as 'Altered Prehistoric Enclosed Land' in the late prehistoric and Romano-British time-slice). The area is an exposed location situated near to the summit of a ridge of high ground (190m – 200m OD) and therefore it was considered likely that the area had reverted to Upland Rough Ground (unenclosed) in the late medieval interpretive time-slice (although it may have been temporarily cultivated as an outfield strip system). The interpretation as Upland Rough Ground was prescriptive-led (subjective), but partly informed by the c1840 Tithe map, and by the c1880 OS map (adhering to rough ground conventions used by the Ordnance Survey). For both the c1840 and c1880 time-slices, the area was characterised as Upland Rough Ground (croft) enclosed internally by newly created straight boundaries. In the c2011 time-slice, the area was mapped as 'Altered Prehistoric Enclosed Land (Re-arranged)' as it had been improved, but retained two of the three former field boundaries. Following conventional HLC methodology it is likely that the area would be characterised as 'Modern Enclosed Land' HLC Type and 'Modern Intakes' Sub-Type; quite a different result when compared to the sequential method of Lowland Cornwall.

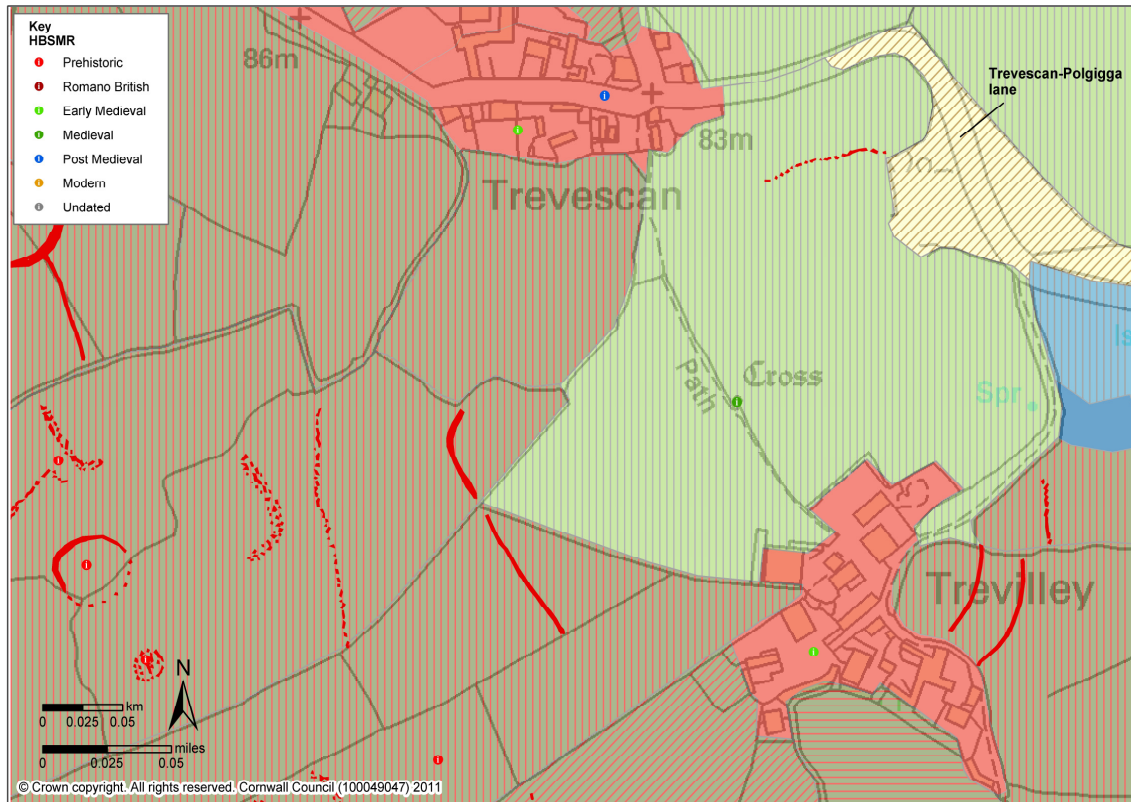


*Fig 2 Bosullow, Madron. An area of 'Altered Prehistoric Enclosed Land' (bold black line) is shown with supporting NMP (in red) and HBSMR data (shown with Monument Cornwall numbers and site type). The area highlighted in bold is discussed in the section above.*

At Trevescan, Sennen, NMP and HBSMR data was used to support the decision making process to further differentiate between Prehistoric and Medieval Enclosed Land (see Fig 3 below).

Surrounding most of the area around the settlement of Trevescan, the Enclosed Land HLC is predominantly irregular and occasionally very irregular in pattern, and mostly dominated by sinuous boundaries with a high percentage of erratic-sinuous boundaries. This area has been interpreted as Prehistoric Enclosed Land. Supporting this interpretation is a high density of prehistoric features recorded by the NMP and HBSMR within the area.

However, immediately to the south east of of Trevescan, and close to the settlement of Trevilly, and adjoining the large block of Prehistoric Enclosed Land, is a small area of different character. Here the character of the enclosures is quite different and the favoured interpretation was for the HLC to be mapped as Medieval Enclosed Land. There could have been a temptation to push the boundary of the Prehistoric Enclosed Land eastwards to the Trevescan-Polgigga lane. But the lack of NMP and HBSMR prehistoric data gave greater confidence to the interpretation of Medieval Enclosed Land.



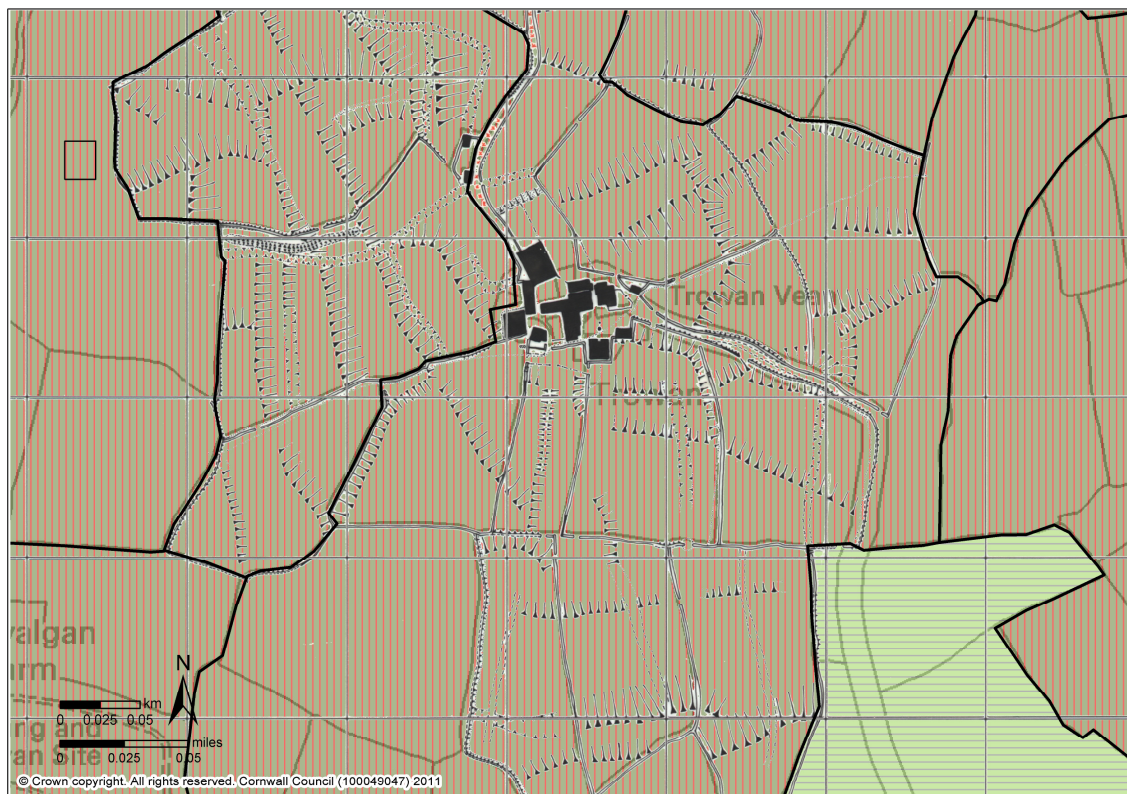
*Fig 3 Trevescan, Sennen. An area of 'Altered Prehistoric Enclosed Land' HLC (brown with red lines) close to the settlements of Trevescan and Trevilley (HLC Type: Hamlet, shown in red). Within these HLC Types is a wealth of prehistoric features recorded by the NMP (in red) and HBSMR data. The small area of 'Altered Medieval Enclosed Land' HLC (green with grey lines) contains no prehistoric features recorded by the NMP or HBSMR supporting the HLC interpretation.*

Further supporting evidence for the mapping of the interpretive time-slices was provided by the results of the West Penwith Survey. The Survey was undertaken over a ten year period, from 1980 to 1990, and included measured and sketched surveys of several of the larger blocks of rough ground, and areas of enclosed land (a majority of which were located in the northern parishes of Penwith) (see Rose 2009 for discussion). As part of completing the project's archive the survey data has recently been digitised (Nowakowski 2011), enabling its use as a supporting dataset for HLC mapping.

This was of great assistance in guiding interpretation, especially in areas where prehistoric field systems had been altered in the medieval period but which still retained relict prehistoric elements in the form of former field boundaries which survived as lynchets and stony banks. These patterns may also be fossilised in the present field boundaries. However, modern OS mapping and historic mapping rarely record these features. In these areas interpretation based upon field boundaries and patterns alone would have led to the characterisation as Medieval Enclosed Land.

However, it can be argued that due to the scale (height and length), form and appearance (marked breaks in slope) that the lynchets strongly influence the perceived character of Enclosed Land. Therefore, these areas were characterised as Prehistoric Enclosed Land, but 'Re-arranged' in the late medieval interpretative time-slice.

For example, in an area of Enclosed Land at Trowan, St Ives, the field boundaries as recorded on modern OS mapping and historic maps would be interpreted as medieval in character. However, data captured by the West Penwith Survey (1:2500) showed a complex arrangement of surviving lynchets, relicts of earlier enclosures, which contribute significantly to the later character of the landscape (see Fig 4 below).



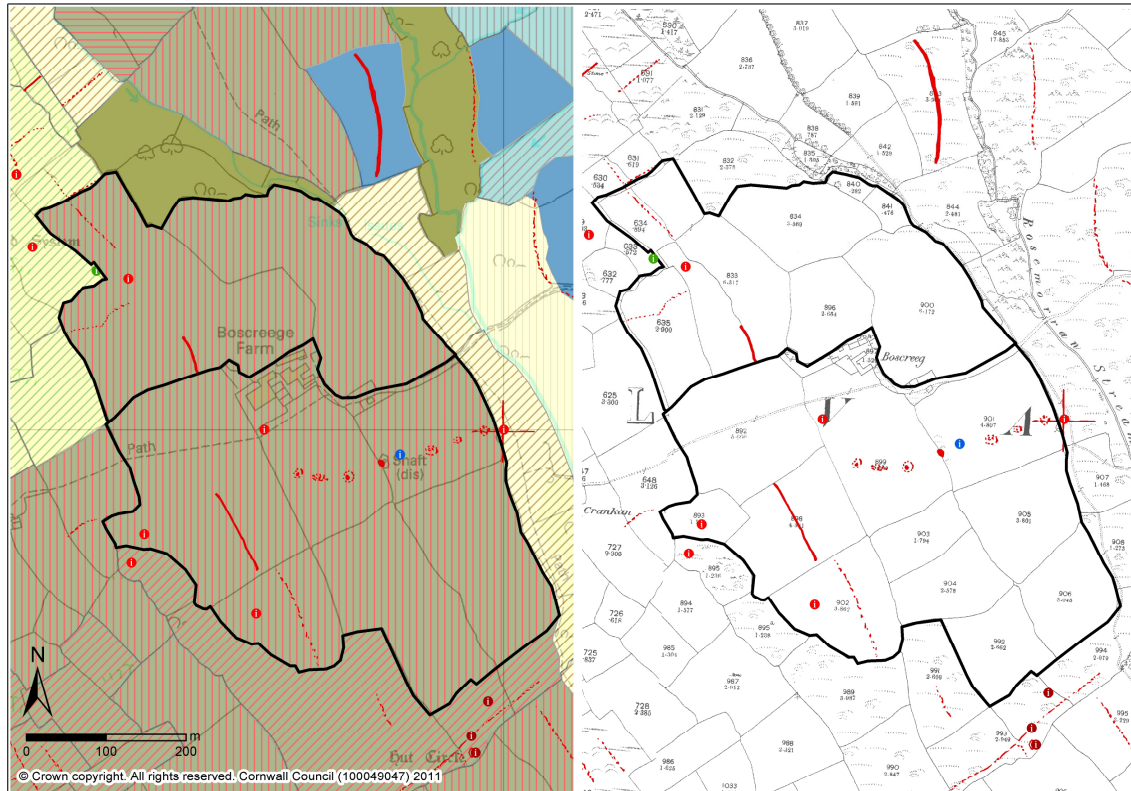
*Fig 4 Trowan, St Ives. An area of 'Altered Prehistoric Enclosed Land' HLC (brown with red lines) surrounding an early medieval settlement. The present fields are medieval in pattern and character. However, data in the West Penwith Survey shows the complex series of lynchets and earthworks that survive in the area (hachures shown in black). These significant physical features make a valuable contribution to the HLC of the area and give clear evidence of considerable time-depth which results in its characterisation as Prehistoric Enclosed Land HLC Type.*

A further refinement used in this HLC revision mapping was the addition of the 'erratic-sinuuous' and 'erratic-angular' characteristics to expand the range of dominant and secondary field boundary values (see Fig 6 and Appendix 5.2.1). This was trialled as a result of the final analysis of the Lowland Cornwall mapping. From a descriptive basis this found that there was often little in the attribute values alone to distinguish between Prehistoric and Medieval Enclosed Land in the c2011 time-slice (Dudley forthcoming a). Whilst analysis of Lowland Cornwall's HLC suggested that there was a higher likelihood of erratic boundaries in Prehistoric Enclosed Land, they could also be occasionally found in areas of Medieval Enclosed Land. Casual observation suggested that erratic boundaries could vary in character and that in areas of amalgamated medieval cropping units erratic boundaries could often be more jagged or angular in their appearance than those located in Prehistoric Enclosed Land.

However, the analysis of the use of these additional boundary values in the Rev HLC WP mapping for the c2011 time-slice shows some improvement to the situation, though perhaps limited.

For example, for the portion of the parish of Gulval mapped during this project, the c2011 time-slice has 75 areas (polygons) identified as Prehistoric Enclosed Land. This included 13 areas (17%) where the dominant boundary is 'erratic-sinuuous' but only a single area where 'erratic-angular' was dominant. Fifty of the 75 areas have a secondary boundary, and analysis shows that nine of these are 'erratic-sinuuous' (18%) and four 'erratic-angular' (8%).

An important point to consider in relation to the interpretation of Prehistoric Enclosed Land is that for both the dominant and secondary boundary fields in Gulval, 'sinuous' boundary values dominate. Of the 75 areas of Prehistoric Enclosed Land, 32 polygons or 43% were characterised as having a dominant sinuous boundary. However, all 32 of the polygons were mapped as 'Altered' with 27 or 84% as altered in the Modern period.



*Fig 5 Boscreege, Gulval. Two areas of 'Altered Prehistoric Enclosed Land' HLC (brown with red lines) are outlined in bold. To the left is the HLC mapping for the c2011 time-slice and to the right is the c1880 OS map. Analysis shows that there has been an amalgamation of fields between c1880 and c2011, so that in the c2011 time-slice a considerable proportion of secondary boundaries are straight in character. However, due to the sequential nature of the Lowland Cornwall HLC method the Enclosed Land retains its 'Prehistoric' HLC Type. It is probable that both areas were significantly altered in the medieval time-slice; the upper area probably by 'amalgamation', and the lower area, by being 're-arranged', but again, due to the method, their Prehistoric Enclosed Land HLC Types were retained.*

The suggested sequence of alteration to many areas of Prehistoric Enclosed Land in the medieval period is based upon a generalised (and perhaps accepted?) assumption that medieval boundaries are more likely to be sinuous in character. But the further analysis of the attributes values suggests that the landscape history of Prehistoric Enclosed Land could be more complex than previously acknowledged by mapping. It suggests that some of the sinuous boundary characteristics have a greater time-depth, perhaps dating to the later prehistoric and Romano-British period.

During the HLC mapping process it was also observed that the Prehistoric and Medieval Enclosed Land could subtly vary in its character between different parishes and areas.

For example, in the parish of St Levan it is possible that the alteration of the Prehistoric Enclosed Land has had a significant impact on HLC. Here 23 polygons were identified as Prehistoric Enclosed Land in the c2011 time-slice, all of them 'Altered', and with 17 polygons (or 74%) altered in the Modern period. However, in contrast to Gulval only a single polygon (4%) of Prehistoric Enclosed Land had an 'erratic-sinuous' dominant



boundary. There was also only a single 'erratic-angular' dominant boundary, but six or 26% of polygons where the dominant boundary was 'sinuous'. Furthermore, for six of the polygons or 23%, the dominant boundary was 'straight'. This is also reflected in the statistics for secondary boundaries of the Prehistoric Enclosed Land in St Levan, where of 20 polygons with secondary boundary characteristics, ten (50%) were 'sinuous' and eight, or 40%, were 'straight'.

This high proportion of 'straight' boundaries in the parish of St Levan could suggest that there had been significantly more alteration to the Prehistoric Enclosed Land when compared to Gulval parish (mapped as part of this project). But again, this could be the result of Lowland Cornwall's sequential method, in that once an area has been recorded as Prehistoric Enclosed Land in an earlier time-slice or interpretative time-slice, all change in Enclosed Land are recorded as alterations (either by amalgamation, subdivision or, if on a significant scale, comprehensive re-arrangement).

This is not necessarily a significant issue but something that users of the mapping should be aware of when they use HLC mapping from the Lowland Cornwall derived method. A GIS-based query on the attributes could be used to select areas of Prehistoric Enclosed Land where the dominant boundary was 'straight' in the c2011 time-slice and these areas then re-mapped accordingly to conventional HLC method.

However, trying to distinguish Prehistoric and Medieval Enclosed Land based upon dominant 'field patterns' and 'dominant' and 'secondary' boundary types in the c2011 time-slice alone does not always deliver a clear-cut distinction, especially due to the amount of alteration. This was noted in the analysis of the Lowland Cornwall HLC method (Dudley forthcoming a). Looking at the HLC mapping for the parish of Lelant for example, there is little to distinguish Prehistoric and Medieval Enclosed Land in terms of regularity/irregularity. For Prehistoric Enclosed Land in the c2011 time-slice 60% of field patterns are 'Regular', 32% of polygons are 'Irregular' and 8% are 'Very Irregular'. Twenty four of the twenty five polygons or 96% have been altered in the Modern period. For Medieval Enclosed Land 56% of polygons are 'Regular' and 44% are 'Irregular'. A majority of Medieval Enclosed Land (87%) has been altered in some way in the Modern period.

Overall, analysis suggests that Prehistoric Enclosed Land in c2011 is more likely to have 'Very Irregular' field patterns but not exclusively. It is also more likely to have 'erratic-sinuous' boundaries (the Medieval Enclosed Land in Lelant contained none).

To aid the consistency of the interpretation of regularity/irregularity and boundary attribute values a rough visual guide was produced for Rev HLC WP mapping (see Fig 6 below). This was developed following a suggestion made in the Lowland Cornwall HLC report (Dudley forthcoming a). During the Lowland Cornwall project it was easy for inconsistency to creep in because of length of time it took to complete the mapping (over a year) and the geographical nature by which mapping was undertaken. This latter point was a result of completing several parishes in one area and then moving on to the next group, which was situated in an area of different geology, topography, farming regimes and historical differences in terms of ownership, tenure and settlement. The visual guide should not be seen as rigid or onerous but more of a brief visual check.

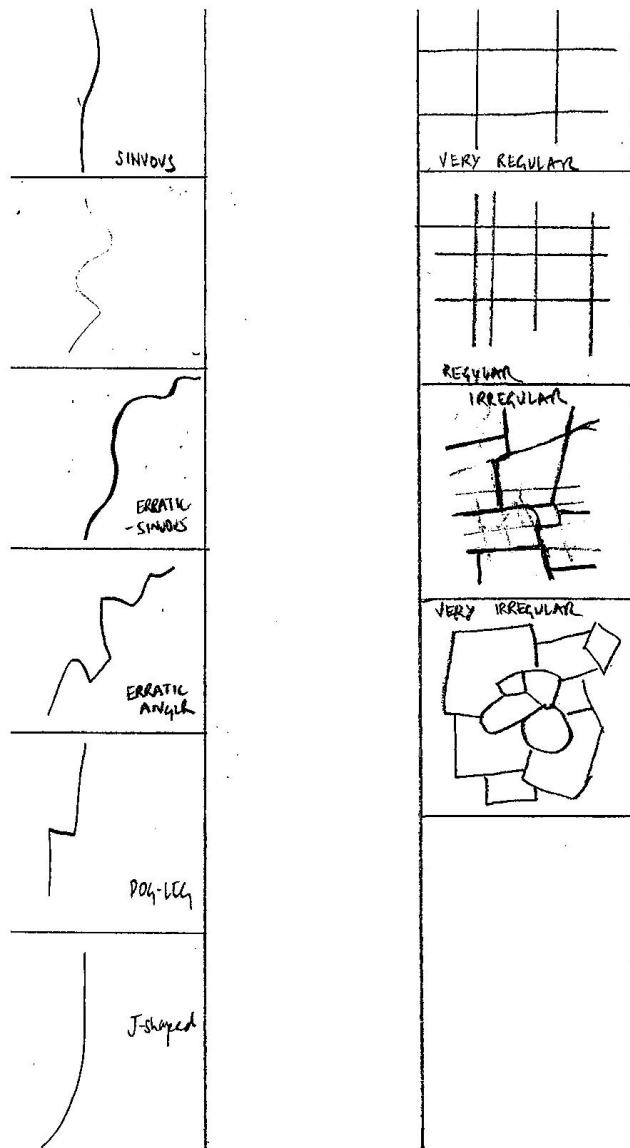


Fig 6 Visual sketch guide for the interpretation of patterns and field boundary attribute values used during the Revising the HLC of West Penwith HLC mapping.

A significant development of the Lowland Cornwall HLC method is the addition of the Rough Ground HLC Sub-Types – Upland Rough Ground (croft), Coastal Rough Ground (croft) and Valley Rough Ground (croft). This refinement was developed by the HLC Revisions in West Penwith project in response to differences noted during Lowland Cornwall mapping when it was felt that Rough Ground (divided) Sub-Types better reflected the annexation of larger pieces or rough ground, rather than smaller enclosures typical of most croft land (Dudley forthcoming a and b). Furthermore, based on the author’s experience gained while studying the rough ground of west Cornwall it was felt that the croft land in West Penwith was often different in character from other areas, as it often fossilises and contains within the boundaries of abandoned prehistoric field systems (Dudley 2011a).

### 2.4.3 Recommendations for future HLC and analysis

In future, it is likely that HLC projects in Cornwall will be undertaken in the HLC module of exeGesIS HBSMR software. In the Rev HLC WP method three interpretative time-slices were created, broadly correspondingly with the late medieval, late prehistoric and Romano-British, and early prehistoric periods. However, these broad periods do not reflect the true complexity of the development of the landscape. Of course, the level of

interpretation is determined by the type and quality of the supporting datasets available. It is likely that the benefits and limitations of the interpretive time-slices will come to the fore in the production of the HLC section of the West Penwith Survey publication.

An example which could help guide future HLC work in Cornwall and the production of interpretive time-slices is the HLC for South Yorkshire, where they were structured upon set dates. However, this was only pushed back to the late medieval period, with interpretative time-slices for AD1400, 1600, 1750, 1850, 1900, 1925, 1950, 1985, and 2000 (see <http://www.sytimescapes.org.uk/home>). In the case of West Penwith this would be extremely time-consuming as the following dates could conceivably be added to the sequence - AD1066, AD800, AD400, AD100, and 1000BC. The usefulness of the interpretative time-slices generated in West Penwith should be considered as part of the HLC chapter in the WPS publication.

Section 2.2.2 of this report outlines the limitations of using the supporting attribute fields and values in distinguishing the differences between Prehistoric and Medieval Enclosed Land. Analysis of the Lowland Cornwall method suggests that average field size could form a useful part of trying to distinguish differences in HLC (Dudley forthcoming a, 53-54). Due to the nature of HLC mapping this is an additional value that has to be generated after the mapping stage is fully completed (as it is based upon calculating the area of the polygon and dividing it by the number of fields within it).

Casual observation during the HLC Revisions in West Penwith mapping suggested that there is a potential difference in the average field size of the Prehistoric and Medieval Enclosed Land in West Penwith. Furthermore, it was casually observed that there could be a difference in the average field size of Prehistoric Enclosed Land located in the northern coastal parishes (Towednack, Zennor, Morvah and St Just) and those located in the southern parishes mapped by the Lowland Cornwall project (Paul and St Buryan).

Due to the limited area of this project a statistical analysis exploring these observations may benefit from the analysis of West Penwith as a whole, and best carried out as part of the production of the HLC chapter in the WPS publication.

## **3 References**

### **3.1 Primary sources**

Ordnance Survey, c2010. 1:10,000 map (digital)

Ordnance Survey, c2010. Master map digital data

Ordnance Survey, c1880. *1:25 Inch 1st Edition map* (surveyed between 18xx and 18xx) Ordnance Survey and Landmark Information Group (digital copy)

Martyn, Thomas, 1748. *Map of Cornwall at One Inch Scale* (facsimile copy at HES)

Tithe Map, c1840. *Parish of Lelant* (digital copy provided by Cornwall Records Office, Truro)

Tithe Map, c1840. *Parish of Madron* (digital copy provided by Cornwall Records Office, Truro)

Tithe Map, c1840. *Parish of Sennen* (digital copy provided by Cornwall Records Office, Truro)

Tithe Map, c1840. *Parish of St Ives* (digital copy provided by Cornwall Records Office, Truro)

Tithe Map, c1840. *Parish of St Leven* (digital copy provided by Cornwall Records Office, Truro)

### 3.2 Publications

- Aldred, O, and Fairclough, G, 2003. *HLC: Historic Landscape Characterisation: Taking stock of the Method - The National HLC Method Review*, English Heritage and Somerset County Council.
- Clark, J, Darlington, J, Fairclough, G, 2004. *Using Historic Landscape Characterisation*, English Heritage and Lancashire County Council.
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- Dudley, P. 2011a. *Goon, Hal, Cliff and Croft; west Cornwall's rough ground*, Cornwall Council and English Heritage.
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- Historic Environment, nd [198?]. *Transcription of Institute of Cornish Studies Place-name Index* (Paper copy stored as part of the Historic Environment Record, Cornwall Council).
- Nowakowski, J. 2010. *West Penwith Survey, Cornwall Project Design for Security Archive and Assessment, English Heritage Project no: 5683, Final version 03.02.2010*, Cornwall Council, Historic Environment Projects.
- Nowakowski, J. 2011. *West Penwith Survey, Cornwall: Analysis and Publication Updated Project Design 2011*, Cornwall Council, Historic Environment Projects.
- Padel, OJ, 1985. Cornish Place-name elements, *English Place-name Society LV/II*.
- Padel, OJ, 1999. Place-names in R Kain and W Ravenhill (eds), *Historical Atlas of the South-West England*, University of Exeter Press.
- Rose, P, 2009. *West Penwith surveys, Cornwall, 1980 to 1990; Archive Summary*, Cornwall Council, Historic Environment Projects, HE report 2009R051.

### 3.3 Websites

- <http://www.heritagegateway.org.uk/gateway/> English Heritage's online database of Sites and Monuments Records, and Listed Buildings
- <http://www.sytimescapes.org.uk/home> South Yorkshire Historic Environment Characterisation

## 4 Project archive

The HE project number is **2011099**

The project's documentary, photographic and drawn archive is housed at the offices of Historic Environment, Cornwall Council, Kennall Building, Old County Hall, Station Road, Truro, TR1 3AY. The contents of this archive are as listed below:

1. A project file containing site records and notes, project correspondence and administration.

2. English Heritage/ADS OASIS online reference: cornwall2- 122585
3. GIS shapefiles and accompanying metadata held in the directory: L:\Historic Environment (Data)\HE\_Projects\Sites\_H\HLC\_Revising\_West\_Penwith\_2011099

This report text is held in digital form as: G:\TWE\Waste & Env\Strat Waste & Land\Historic Environment\Projects\Sites\Sites H\HLC\Revising HLC WP report Final

## 5 Appendices: HLC methodology

The appendix outlines the list of ecclesiastical parishes mapped by the Revising the HLC of West Penwith project, and the metadata for the refined mapping and the supporting Historic Settlement dataset.

### 5.1 Study areas (with ecclesiastical parishes)

Table 1 shows the ecclesiastical parishes relate directly with the c1840 Tithe maps used to map the c1840 HLC time-slice. The maps have been scanned and rectified into a digital format by the Cornwall Records Office. Those underlined were only partially covered by the project area as these had been partially mapped by the Lowland Cornwall project (Dudley forthcoming a).

Parishes (ecclesiastical)
<u>Gulval</u> (no c1840 Tithe Map available as digital data), <u>Lelant</u> , <u>Ludgvan</u> , <u>Madron</u> , Sancreed, Sennen, <u>St Buryan</u> , St Ives, St Leven.

Table 1 List of study areas with relevant ecclesiastical parishes

### 5.2 Metadata: HLC datasets

The following section outlines the components and attributes of the Refined HLC method and Historic Settlement data.

Each is divided in a similar manner to act a GIS metadata statement.

#### 5.2.1 Revising the HLC of West Penwith (refined Lowland Cornwall method)

Software:

ESRI ArcView 9.2/10 (upgraded August 2012) GIS and Microsoft Access 2000.

Date:

February 2012 to October 2012.

Mapper:

Peter Dudley

Scale:

HLC identification at 1:5,000 with polygons drawn at 1:2500 using the latest version of OS Master Map data. Minimum size of 1ha applied to polygons.

Time-slices (with full attributes):

1. c2011 HLC
2. c1880 HLC
3. c1840 HLC

Further interpretative time-slices (only mapped for polygons where interpretation was possible and with limited attributes):

4. Late medieval
5. Late prehistoric and Romano-British
6. Early prehistoric

HLC Sources (all available as digital data):

1. c2011 time-slice – modern 1:10,000 OS map
2. c1880 time-slice - c1880 1:2500 OS map (1st edition)
3. c1840 time-slice – c1840 Tithe maps (rectified)

Further supporting evidence:

1. Historic Settlement data.
2. National Mapping Programme (raster)
3. West Penwith Survey (GRH 68/3 – 1:1000) – scanned
4. West Penwith Survey (GRH 68/4 – 1:2500) – scanned
5. Cornwall HBSMR

Process:

1. Data collection on a parish by parish basis.
2. Historic Settlement data mapped for full parish.
3. HLC mapping undertaken as a GIS shapefile with full suite of attributes entered into an accompanying Access database; the two linked by a Polygon ID number unique to each polygon in that parish.
4. Once the parish was completed, the shapefile and Access database were joined in GIS, and exported out as a final GIS shapefile.
5. The final shapefile was presented with an accompanying symbology file as a visual check to the data. This was carried out for each time-slice.
6. Further fields were added to the final parish shapefiles.
  - Ecclesiastical parish (name)
  - Source (project name and HE projects reference code)
7. Once all parishes completed, the separate parish final shapefiles were merged.

HLC fields and attribute values:

Field	Attribute values
<b>Polygon ID</b>	Unique value for each polygon
<b>Landuse</b> [only in c2011 time-slice]	Core
	Sub-core
	Fluctuating/Tidal
	Marginal
<b>Broad Type</b>	See Table 3 for full breakdown
<b>HLC Type</b>	See Table 3 for full breakdown
<b>Sub-Type</b>	See Table 3 for full breakdown
<b>Period</b>	Modern (c1900-present)
	Early Modern (1750-c1900)
	Post-medieval (1540-1750)
	Medieval (1066-1540)
	Early Medieval (AD410-1066)
	Romano-British (AD43-410)
	Iron Age (800BC-AD43)

<b>Field</b>	<b>Attribute values</b>
	Bronze Age (2500-800BC)
	Mesolithic (10000-4000BC)
	Prehistoric (c4000BC-AD410)
<b>Confidence</b>	Certain
	Probable
	Possible
<b>Active</b> [only used for Industrial Broad Type]	No
	Yes
	N/A
<b>Overall/Pattern shape</b>	Very Irregular
	Irregular
	Regular
	Very Regular
<b>No of fields in polygon</b>	Free text
<b>Dominant internal boundary type</b>	None
	Erratic - Sinuous
	Erratic - Angular
	Erratic [not used]
	Curvilinear
	Sinuous
	S-shaped
	J-shaped
	Dog-leg
	Straight
<b>Secondary boundary</b> [internal]	None
	Erratic [not used]
	Erratic - Sinuous
	Erratic - Angular
	Curvilinear
	Sinuous
	S-shaped
	J-shaped
	Dog-leg
	Straight
<b>% Dominant</b>	51-69%



Field	Attribute values
	70-89%
	(> 90%)
<b>Map Source</b>	1:10,000 OS
	1880 OS 1:2500
	1840 Tithe Map
	GRH68 West Penwith Survey 1:1000
	GRH68 West Penwith Survey 1:2500
	HER transcription of ICS Place-name index
	NMP 1:10,000
	Interpretation

Table 2 List of HLC fields and attribute values

HLC Types:

Table 3 lists the full range of HLC Types employed in the Revising the HLC of West Penwith method. Only a limited number of the available HLC Types and Sub-Types were identified in the area of the refined mapping.

Broad Type	HLC Type	Sub-Type
Communications	Major Roads	
	Railways	
	Airfields	
	Canals	
Industrial	Extractive, metalliferous	
	Extractive, non-metalliferous	
	Processing	
Intertidal and mudflats	Intertidal mudflats	
	Saltmarsh	
	Inshore water	
	Beach	
	Rocky foreshore	
Military	Military airfields	
	Barracks	
	Artillery complexes	
	Military communications	
Ornamental	Pleasure garden	
	Parkland	
	Plantation	
	Deer Park	

Broad Type	HLC Type	Sub-Type
Recreational	Golf course	
	Campsite, chalet park etc	
	Theme park	
Settlement	Highway settlement	
	Farmstead	
	Hamlet	
	Village	
	Town	
	Terrace	
	Row	
Rough Ground	Coastal Rough Ground (undivided)	
	Coastal Rough Ground (divided)	
	Coastal Rough Ground (croft)	
	Bare cliffs	
	Valley Rough Ground (undivided)	
	Valley Rough Ground (divided)	
	Valley Rough Ground (croft)	
	Upland Rough Ground (undivided)	
	Upland Rough Ground (divided)	
	Upland Rough Ground (croft)	
Woodland	Shelterbelt	
	Timber plantation	
	Woodland mixed	
	Deciduous Woodland	
	Ancient woodland Semi-Natural	
Enclosed Land	Prehistoric Enclosed Land	PX field patterns
		PX Altered field patterns (Sub-Divided)
		PX Altered field patterns (Amalgamated)
		PX Altered field patterns (Re-

Broad Type	HLC Type	Sub-Type
		arranged)
Enclosed Land	Medieval Enclosed Land	MD Strips (Unenclosed)
		MD derived from Strip Fields (Enclosed)
		MD derived from Cropping Units
		MD Barton field patterns
		MD Orchard (not commercial horticulture)
		MD Peripheral fields
		MD Altered field patterns (Sub-Divided)
		MD Altered field patterns (Amalgamated)
		MD Altered field patterns (Re-arranged)
Enclosed Land	Post-Medieval Enclosed Land	PM New Farms (>5ha)
		PM New Smallholdings (<5ha)
		PM Barton field patterns
		PM Orchard
		PM Intakes
		PM Altered field patterns (Sub-Divided)
		PM Altered field patterns (Re-arranged)
		PM Altered field patterns (Amalgamated)
Enclosed Land	Early Modern Enclosed Land	Emod New Farms (>5ha)
		Emod New Smallholdings (<5ha)
		Emod Barton field patterns
		Emod Orchard
		Emod Intakes
		Emod Altered field patterns (Sub-Divided)
		Emod Altered field patterns (Re-arranged)
		Emod Altered field patterns (Amalgamated)
Enclosed Land	Modern Enclosed Land	Mod New Farms (>5ha)
		Mod New Smallholdings (<5ha)

Broad Type	HLC Type	Sub-Type
		Mod Intakes
Horticulture	Orchard	
	Market Garden	
Infrastructure	Car Park	
	Water/Sewage works	
	Electricity sub-station	
	Recycling station	
	Refuse tip (public)	
	Refuse tip (commercial)	
Water	Reservoir	
	Fish farm	
	Artificial Lake	
	Natural Lake	
Dunes	Dunes and Towans	

Table 3 List of HLC Types (and subdivisions)

Further background:

Table 2 lists the full attribute values available for the three HLC time-slices mapped, ie, c2011, c1880 and c1840. The three further interpretative time-slices were mapped with a limited number of fields populated due to the lack of historic source material, ie, Broad Type, HLC Type, Sub-Type, Period, Confidence and Source.

The full suite of HLC Types developed by the Lowland Cornwall method is listed in Table 3. The HLC structure differs from other HLC projects as HLC Type has been further subdivided to a Sub-Type level. The Sub-Type classification focused on Enclosed Land; a result of the HLC being derived from the Lowland Cornwall HLC method.

'Landuse' was the only field to be recorded in a single entry per polygon (irrespective of time-slice). The identification of attribute values as either 'Core', 'Sub-core', 'Fluctuating/Tidal' and 'Marginal' aimed to indicate the potential depth of continuous land use in an area. Analysis of the Lowland Cornwall method shows that the idea of 'landuse' as employed by the method was of little use (see Dudley forthcoming a). However, as a continuation of the Lowland Cornwall HLC data structure it was still recorded.

Decision making in this respect was based on evidence from the Historic Settlement dataset. The interpretation and dating of Cornish, and to a lesser extent, English place-name elements was used to give a potential indication of a settlement's earliest date, and the landscape history of the area.

This is easiest to postulate for the Cornish place-name elements *tre*, *bod*, *hendre*, *lann*, *ker* and *lys* which probably date in usage to between the fifth and tenth centuries AD (see Padel 1985). It is suggested that these could be interpreted as 'core' areas: those most likely to have been continuously settled since the Romano-British period. The polygons surrounding these settlements were classified as 'Core'.

Other attribute values for landuse included 'Sub-Core' (possible areas of continuous settlement) and 'Fluctuating/Tidal' (areas where settlement may have been re-organised from earlier periods or later in date). 'Marginal' landuse was identified on the basis of rough ground, altitude, severity of slope and aspect; typically corresponding

with Rough Ground or Woodland, or previous areas of Rough Ground (Post-Medieval, Early Modern and Modern Enclosed Land) and Woodland.

Establishing the extent to which an area extended beyond a settlement was difficult with an understandable limitation to its accuracy. Extent was usually established by subjective judgment influenced by topography (altitude, severity of slope, and aspect) and the way in which the landscape was divided (dominant boundaries). A small number of the c1840 Tithe maps recorded tenement boundaries (for example Paul) and where so, these were used to delineate the areas of enclosed land surrounding a particular settlement.

Table 4 below lists the key place-name elements and dates by which Landuse was classified.

<b>Place-name elements</b>	<b>Landuse</b>	<b>Date</b>
<i>Tre-, bod-, ker-, lann, -lys, hendre</i> (all Cornish language)	Core	5th – 10th centuries AD
Later Cornish element and English <i>tun</i>	Sub-core	9th – 11th centuries AD
English element and <i>tun</i>	Sub-core	9th – 11th centuries AD
Cornish <i>pen, pol</i> , etc and English <i>cote</i> and <i>wordig</i> recorded in 1086	Sub-core	9th – 11th centuries AD
Other Cornish and English place-name elements recorded since 1086	Fluctuating/Tidal	11th century AD onwards

*Table 4 Interpretation of Cornish and English place-name elements and the earliest recorded date of settlements in relation to 'Landuse'*

Location:

L:\Historic Environment  
(Data)\HE\_Projects\Sites\_H\HLC\_Revising\_West\_Penwith\_2011099

### **5.2.2 Historic Settlement**

Software:

ESRI ArcView 9.2/10 (upgraded August 2012) GIS.

Date:

February 2012 to October 2012.

Mapper:

Peter Dudley

Scale:

Mapped at 1:5,000 as a single layer (point data).

Time-slices:

1. c2011
2. c1880
3. c1840
4. 1748 map

Sources (available as digital data except where noted):

1. c2011 time-slice – modern 1:10,000 OS map
2. c1880 time-slice - c1880 1:2500 OS map (1st edition)
3. c1840 time-slice – c1840 Tithe maps for selected parishes (rectified)
4. 1748 time-slice – 1748 Martyn’s Map of Cornwall (paper copy)
5. HES transcription of ICS place-name index (paper copy held as part of CC HBSMR)

Process:

1. Data collection on a parish by parish basis. Added to existing Lowland Cornwall Historic Settlement dataset.
2. Historic Settlement data mapped for full parish.
3. Historic Settlement data used to classify attribute values in ‘Landuse’ field in HLC layer.
4. The final shapefile presented with an accompanying symbology as a visual check.

HLC fields and attribute values:

<b>Field</b>	<b>Attribute Values</b>
<b>ID</b>	To be populated
<b>Place-name</b>	Free text
<b>First recorded as</b>	Free text – earliest reference
<b>Earliest date</b>	Free text
<b>Language</b>	‘C’ – Cornish
	‘E’ – English
	‘CE’ – Cornish/English mix
	‘CL’ – Cornish/Latin mix
	‘U’ - Unknown
<b>Elements</b>	Free text
<b>Settlement type 1748</b>	T – Town (e.g. over 250 dwellings – over appx 100ha in area)
	NV – Nucleated Village (e.g. over 15 dwellings in a concentrated, constrained area)
	DV – Dispersed Village (e.g. over 15 dwellings dispersed over a wide but coherent area)
	LV - Linear Village (e.g. over 15 dwellings in a line along a road or

Field	Attribute Values
	valley)
	NHT – Nucleated Hamlet (e.g. under 15 dwellings – under in size)
	DHT - Dispersed Hamlet (e.g. under 15 dwellings dispersed over a wide but coherent area)
	LHT -Linear Hamlet (e.g. under 15 dwellings in a line along a road or valley)
	TE - Terrace (e.g. line of houses built similar in plan, more formally arranged than row)
	R - Row (e.g. line of houses built in different phases and therefore each house differs in size, and/or steps forwards/backwards from the next).
	SHT – Shrunk Hamlet (hamlet reduced in size/dwellings from former time slice)
	SF – Single Farm (e.g. larger dwelling with several outbuildings)
	C – Cottage (e.g. single isolated dwelling with a small number of small outbuildings)
	H - House (e.g. villa with no outbuildings)
	MH - Mansion House (large grand house with outbuildings)
	M - Mill.
	IN - Industrial e.g. Huel Rose. These are likely to be transitory names.
	N - Not established.
	D - Deserted. Recorded on an earlier map but no longer recorded as a place-name on map.
	NA - Not applicable (as topographical/landscape name)
	U - Unknown (not visible due to error/damage to map or if extant would not have been recorded as within larger settlement)
NS - Not shown but possibly extant	
FB - Farm buildings	
LT – Linear Town	

<b>Field</b>	<b>Attribute Values</b>
	CH – Church
	SCH – School
	CHA – Chapel
	INN – Inn
	LDGE – Lodge
	FC – Fish cellars
<b>Settlement type c1840</b>	For full list, see 1748 above
<b>Settlement type c1880</b>	For full list, see 1748 above
<b>Settlement type modern [c2011]</b>	For full list, see 1748 above
<b>Period</b>	Early Medieval (c410 – 1066)
	Medieval (1066 – 1540)
	Post-medieval (1541 – 1750)
	Early Modern (1751 – 1899)
	Modern (1900 – present)
<b>Date Confidence</b>	Certain
	Probable
	Possible
	Unknown
<b>Type Confidence</b>	Certain
	Probable
	Possible
	Unknown
<b>Notes</b>	Free text

*Table 5 List of Historic Settlement HLC fields and attribute values*

Further background:

The method is the same as used by the Lowland Cornwall project.

The method by which the date or 'period' of a settlement was established is complex.

The earliest documentary date for each settlement was taken from the HES transcription of the ICS place-name index held as part of the Cornwall HER. In the absence of such data a date was established (where possible) using the historic map data; Martyn's 1748 Map of Cornwall, c1840 Tithe, c1880 OS and modern 1:10,000 OS maps. Due to the date range of the historic maps these were only useful for the identification of more recent settlements; from the post medieval period onwards.

To give an idea of the original date of the settlement a date period was given. This followed the existing Cornwall HER classifications and mirrored the HLC;

Early Medieval (c410 – 1066)

Medieval (1066 – 1540)



Post-medieval (1541 – 1750)

Early Modern (1751 – 1899)

Modern (1900 – present)

In some instances it is possible to suggest that a settlement was established in an earlier period before it was first recorded in documentary material. This is easiest to postulate for the Cornish place-name elements *tre*, *bod*, *hendre*, *lann*, *ker* and *lys* which probably date in usage to between the fifth and tenth centuries AD (see Padel 1985).

In parts of east and north Cornwall there are almost as many English place-names as Cornish ones.

It is harder to date the English language elements. All names will post-date the early 9th century AD when the English first settled in Cornwall, and many may have simply replaced the British names of existing settlements, and therefore seriously limit the way in which Lowland Cornwall is trying to use the dataset.

It is likely that the English element *tun*, 'farmstead, estate', pre-dated the Norman Conquest and so sits in the later range of the Early medieval period. In mid and west Cornwall important Cornish estates had *tun* added to their names, representing an English administrative take-over, for example Helston (*henlys – tun*) and date to a similar period. However, in the same area the compound Newton seems to be medieval in date, in use probably between the 12th to 15th centuries AD (Padel in Ravenhill, 1999, 91-2).

The usage of the English elements *cot* and *wordig* (worthy) is different to that of *tun*: they are found mainly in north and east Cornwall and probably date to the medieval period.

Padel suggests that *wordig*, 'farm, enclosure' settlements were found on less attractive land than *tun* settlements, and that many were likely to date mainly to the expansion of farming in the eleventh to thirteenth centuries AD. In Cornwall, a majority of worthy settlements are found to the north of the River Ottery (*ibid* 93-94).

*Cot* was likely to be a low status site (perhaps like the Cornish *bod*?). In Devon a majority of *cot* settlements are found in the north of the county with a complete absence in the south. In Cornwall, as with *wordig*, there is a general absence south of the River Ottery but there is a small cluster around Callington. The dating of the element, in the absence of a 1086 Domesday reference, could be contemporary with *wordig*, though the situation is not clear. The appearance of *cot* in western Cornwall is predominantly in the compound of *ceald-cot*, 'cold cottage' is later when *cot* had stopped being used to form other place-names (Padel in Ravenhill, 1999, 94).

Padel (*ibid*) comments that habitative terms have been concentrated upon in place-name studies but topographical terms were just as likely to have been used to describe settlements. An issue in respect to 'Landuse' is that their dating is more problematic: the elements used over a broad date range, and potentially borrowed from long-standing names of natural features.

Where *pol-*, *pen-*, *wood*, etc elements were recorded in 1086 (in relation to a settlement) a (late) early medieval date is likely.

Location:

L:\Historic Environment (Data)\HE\_Projects\Sites\_L\Lowland\_Cornwall\_2009028\HLC

[the existing shapefile was updated by Revising the HLC of West Penwith]

## 6 Appendices: Descriptive texts

The following descriptive texts were originally developed by the Lowland Cornwall project (Dudley forthcoming a) and have been revised following the completion of Revising the HLC of West Penwith. Due to the nature of West Penwith's landscape and the parishes mapped as part of this project, the changes to the descriptive texts focus upon the Rough Ground and Prehistoric and Medieval Enclosed Land HLC Types.

### 6.1 Introduction

Every parcel of Britain's landscape has, or has been, altered over time by the activity of people. It is an historic landscape of accumulated human action, with nowhere found in its purely natural state (adapted from Herring 2009).

The interaction of past and present is complex. It is constantly evolving as land use changes, but successive phases of past activity can create time-depth in a landscape. Time-depth includes fossilised (still in use) and relict (abandoned) features. These often form an important part of our present landscape, significantly influencing the physical and visual character of an area, and our perception of it. These features are identifiable by commonly occurring attributes, such as the shape of field boundaries. Key attributes will group where the landscape has undergone shared landscape history, created over time by similar processes and similar periods of human activity.

Historic Landscape Characterisation (HLC) has been developed to give a broad, landscape-scale overview of landscape history and the processes that have helped to form it. The visual presentation of information is an important part of the method. It does this by grouping similar blocks of landscape into coherent units, or polygons. Each polygon is ascribed to a certain HLC Type; a predetermined classification which encapsulates the main landscape history and processes that have affected Cornwall's landscape.

HLC data is presented as an overlay to map data, with each Type and further subdivision(s) also presented. Each has its own symbology (colour and conventions) to make interpretation easier.

Underlying the HLC is a two to three-tier hierarchical system that increases in complexity with each tier. At the top, and most general, is the Broad Type; e.g. Rough Ground or Enclosed Land. Beneath, at the second-tier level the complexity of attributes increases to further divide the Broad Type into HLC Type; e.g. Upland Rough Ground (undivided) or Medieval Enclosed Land. The third-tier has the most complex arrangement of attributes that can be identified from map-based evidence alone. In the Lowland Cornwall project third-tier HLC has been sub-divided into different Sub-Types, and has only been undertaken for Enclosed Land (as this was the focus of the project), for example:

Broad Type:	Enclosed Land
HLC Type:	Medieval Enclosed Land
HLC Sub-Type:	MD derived from Strip Fields (enclosed).

The following texts are descriptive and outline the details by which each HLC Type was identified and mapped in the c2011 time-slice as part of the Lowland Cornwall project. It aims to be succinct and concise with the text targeted to a general audience. Therefore the way in which the descriptive texts are written is substantially different to the explanatory texts for the 1994 mapping (Cornwall Council and the Countryside Commission 1994), and the 1998 and 2009 revisions of the texts (Herring 1998; 2009).

The texts focus instead on simply describing the Broad Types, HLC Type and where appropriate, its Sub-Types, and the key attributes identifiable from the modern 1:10,000 OS map alone. No reference is made to the value of each, nor the typical archaeological and historical components, as the project area is geographically limited in extent.

## 6.2 Rough Ground

### Summary

Rough Ground is defined by its rough vegetation and is predominantly found in agriculturally marginal locations (areas open to wind exposure, with poor soil fertility and drainage). Formed and maintained by human interference Rough Ground is 'semi-natural' and often demonstrates the longest continuous history of human utilisation; in part the product of early prehistoric farming, but maintained by continued use from late prehistory to the mid-nineteenth century through the seasonal grazing of livestock. Once a crucial part of the agricultural economy, many areas of Rough Ground are now neglected, with vegetation levels at their highest since prehistory. The different HLC Types of Rough Ground are distinguished by their location and the level of enclosure or sub-division.

### Broad Type: Introduction

Rough Ground is defined by rough vegetation (typically variations of heath, coarse grassland, furze/gorse, and osiers/willow) and predominantly found in agriculturally marginal locations (areas open to wind exposure, with poor soil fertility and drainage). It can include areas where exposed rock surfaces and rock debris also dominates.

It is sub-divided into the following HLC Types based on differences in location and land division; the differences also reflected in historic land use and ownership:

1. Upland Rough Ground (undivided)
2. Upland Rough Ground (divided)
3. Upland Rough Ground (croft)
4. Valley Rough Ground (undivided)
5. Valley Rough Ground (divided)
6. Valley Rough Ground (croft)
7. Coastal Rough Ground (undivided)
8. Coastal Rough Ground (divided)
9. Coastal Rough Ground (croft)
10. Bare cliffs

### Principal historical processes

Rough Ground is regularly regarded as largely 'natural' or 'wild' when it is in fact often 'semi-natural' in origin, largely formed and maintained by human interference. Areas of Rough Ground often demonstrate the longest continuous history of human utilisation; in part the product of early prehistoric settlement and farming, but maintained by continued use from late prehistory to the mid-nineteenth century through the grazing of livestock. Grazing has interrupted the normal natural succession or development of vegetation communities through to woodland (adapted from Herring, 2009).

Environmental analysis suggests that woodland cover in many parts of Cornwall was removed by early farmers in the Neolithic and Early Bronze Age (c4000-1500 BC). By c1500BC this farming activity, together with natural climatic deterioration, had led to a widespread reduction in soil fertility.

Place-name evidence suggests that by the early medieval period (AD410 – 800) rough ground was an integral part of the agricultural economy through transhumance, or the movement of livestock to seasonal grazing grounds. In the medieval period, areas of rough ground were organised into large open areas of common land shared by several local farming settlements. It seems likely, however, that the shared use of rough ground for the seasonal grazing of livestock has its origins into late prehistory, and perhaps as far back as c1500BC. Reminders of these commons are often found in the Upland Rough Ground (undivided), Valley Rough Ground (undivided), and Coastal Rough Ground (undivided) HLC Types.

From the fourteenth century onwards changes in land ownership and rights enabled individual farms and farmers to divide off smaller areas of rough ground from the commons. These are identified as Upland Rough Ground (divided), Valley Rough Ground (divided), and Coastal Rough Ground (divided) HLC Types.

Additionally, from the seventeenth century onwards parcels of rough ground were often sub-divided by boundaries into 'crofts' or smaller enclosures of rough ground. Crofts were mostly taken in by individual farmers and households, to be used as fuel grounds, rough pasture and temporary cultivation. In West Penwith this often included areas of relict prehistoric fields, improved and reused as croft land but with irregular or very irregular field patterns, dominated by sinuous and erratic-sinuous boundaries. Where these types of enclosures survive as Rough Ground they are identified as Upland Rough Ground (croft), Valley Rough Ground (croft), and Coastal Rough Ground (croft) HLC Types.

Until the Agricultural Revolution in the late 18th century rough ground was an integral part of a mixed farming economy, covering approximately 40% of Cornwall. Most areas of rough ground were principally used for grazing but rights also allowed the collection of domestic fuel (furze/gorse and turf/peat). Additionally, when permitted by the owner, rough ground was where stone was quarried, a majority of ore mined, and areas streamed for tin. Bare cliffs were often the focus for quarrying and mining activity due to the accessibility of its rock faces and debris. Each Type of Rough Ground typically demonstrates a variation in its past and present activity due to differences in location e.g. maritime-based activity in Coastal Rough Ground HLC Types.

By 1800, however, a rapidly rising population led to large areas of rough ground being enclosed as new farms and small-holdings. More people ensured growing markets for farmers' produce so existing farms could afford to intake and improve blocks of rough ground, the process aided by advances in machinery and agricultural thinking. By the late nineteenth century the area of Cornwall's rough ground had shrunk further. It had also become a marginal part of the farming economy as farmers specialised, for example, in dairy alone.

Throughout the twentieth century the process continued, with further improvements in mechanisation, the wide availability of artificial fertiliser and Government grants for improvement. Bodmin Moor is the last remaining area in Cornwall where rough grazing continued to be practised on a large scale. Other, smaller areas of rough ground became unmanaged; with the level of human intervention and management reduced to practically nil.

The larger, more accessible areas of rough ground are now often used for recreation by the urban-based population. They are often highly valued for their beauty, ecological value and the wide range of archaeological features that survive within them. In more recent years, largely through environmental initiatives, rough grazing has started to be reintroduced, principally on the Lizard and coastal areas to help improve ecological value, and to keep archaeological features visible and free from encroaching scrub.

### **Further reading**

Dudley, P, *et al*, 2011. *Goon, hal, cliff and croft: west Cornwall's Rough Ground*, Cornwall Council and English Heritage.

Dudley, P, 2008. *The Archaeology of west Cornwall's moors, downs and heaths*, Cornwall Council (available as a downloadable pdf).

Herring, P, and Rose, P, 2001. *Bodmin Moor's Archaeological Heritage*, Cornwall Council.

## **HLC Types: Typical mapped attributes**

(Based on recurring features found on modern OS 1:10,000 map data)

- Common to all Rough Ground Types: rough vegetation mapped using standardised OS conventions.
- Upland Rough Ground (undivided): hilltop and upland plateau location, open and not sub-divided.
- Upland Rough Ground (divided): hilltop and upland plateau location, sub-divided by boundaries into smaller parcels of land.
- Upland Rough Ground (croft): upper hill slope, hilltop and upland plateau location, sub-divided by boundaries, into small parcels of land often as extensions to existing enclosed land.
- Valley Rough Ground (undivided): valley bottom and valley side location, open and not sub-divided.
- Valley Rough Ground (divided): valley bottom and valley side location, sub-divided by boundaries into smaller parcels of land.
- Valley Rough Ground (croft): valley bottom and valley side location, sub-divided by boundaries, into small parcels of land often as extensions to existing enclosed land.
- Coastal Rough Ground (undivided): coastal location, open and not sub-divided.
- Coastal Rough Ground (divided): coastal location, sub-divided by boundaries into smaller parcels of land.
- Coastal Rough Ground (croft): coastal location, sub-divided by boundaries, into small parcels of land often as extensions to existing enclosed land.
- Bare cliffs: coastal location, large areas of exposed rock faces and rock debris, occasionally with areas of rough ground vegetation.

## **6.3 Enclosed Land**

### **Summary**

Enclosed Land is divided into field enclosures and sub-divided by field boundaries; improved and maintained by farmers as productive farmland. It has an extremely complex landscape history, with great differences in time-depth, often with periods of continuous use (and change) over hundreds, and sometimes thousands, of years, and in this respect Cornwall's Enclosed Land is unusual. It has been sub-divided on the basis of date, with supporting evidence provided by the Historic Settlement dataset. Due to its complexity it is classified to Sub-Type level, based on differences in field shape, field patterns, field boundaries, probable tenure and enclosure process, and subsequent alteration.

### **Broad Type: Introduction**

Enclosed Land is divided into field enclosures and sub-divided by field boundaries. It has been improved and maintained by farmers as productive farmland, dominated by a changing mixture of grassland (pasture) and cultivated crops (arable, root and green crops).

Map sources typically show Enclosed Land as 'clean-land' without the conventions for rough ground vegetation although small areas of coarser vegetation and rock outcrops can be included within fields.

The character of Enclosed Land varies enormously with great differences in time-depth. It has an extremely complex landscape history, often with periods of continuous use (and change) over hundreds, and sometimes thousands, of years, and in this respect the time-depth of Cornwall's Enclosed Land is unusual.

To reflect this time-depth the Broad Types has been sub-divided into the following HLC Types distinguished by differences in field pattern, field shape, and the line of internal

field boundaries. Further supporting interpretative evidence was provided by the dating analysis of historic settlements.

1. Prehistoric Enclosed Land
2. Medieval Enclosed Land
3. Post-Medieval Enclosed Land
4. Early Modern Enclosed Land
5. Modern Enclosed Land

Each HLC Type has then been further sub-divided on the basis of tenure, land use and change identifiable in the attribute sets. Historic maps (c1840 Tithe and c1880 OS) were used to aid interpretation and to help quantify landscape change in the past 170 years. Further supporting data from the HER was used to inform characterisation, with particular focus on extant physical features that contribute to the complexity of the visual interpretation of historic character. This included HBSMR, NMP and West Penwith Survey data.

## **Principal historical processes**

### ***Prehistoric Enclosed Land (c1500BC – 410AD)***

Land enclosed and farmed since late prehistory (probably Middle Bronze Age onwards, c1500 BC -). It often survives in marginal locations where surface rock is a problem, so that later improvement was too laborious and uneconomic. There are differences in attributes which probably reflect differences in date and later prehistoric and Romano-British reuse.

Areas of very small field size, with very irregular and irregular field patterns, dominated by curvilinear and erratic-sinuuous boundaries probably originally date to the Mid to Late Bronze Age (c1500- c700 BC). They are often associated with Bronze Age and Iron Age round houses (sometimes mapped on OS maps), located on the edge of upland and coastal areas, in more windswept and exposed locations.

On more sheltered, less marginal ground (but probably still within areas of poorer than average fertility) HLC mapping in West Penwith has distinguished two different character types of prehistoric enclosed land:

Areas of possible Mid to Late Bronze Age field systems that have potentially been amalgamated in later prehistoric periods. These areas have enclosures of small to medium size, often irregularly-shaped, arranged in broadly irregular or very irregular patterns, often with a high proportion of erratic-sinuuous and sinuous boundaries. These areas often found in marginal locations in West Penwith, located on the higher hill slopes and/or rockier ground and in a large concentration along the northern coastal strip from St Ives to Sennen. It is in these areas of enclosed land that there has been a high survival of relict prehistoric field boundaries surviving in the form of stony banks, stone and earth banks and sizeable lynchets (breaks in slope produced by cultivation).

On the more sheltered southern parts of West Penwith are blocks of medium sized, square and rectangular enclosures, arranged in regular patterns, and dominated by gently curvilinear and sinuous, and occasionally erratic-sinuuous boundaries. These areas are potentially the wholesale re-arrangement of Late Bronze Age enclosures, associated with later prehistoric and Romano-British farming hamlets, where field patterns and holdings had to be arranged in a more formal manner. The areas often have dominant linear boundaries, which often parallel the main orientation of local topography. These areas appear to be located on the more sheltered hill slopes and plateau and are often harder to visually distinguish from surrounding Medieval Enclosed Land. This is in part probably due to their more favourable location, and therefore potentially more intensive land use stretching back into late prehistory. It is also

possible that some of the areas represent new enclosure dating from late prehistory due to the increase in population pressure and expansion of farming.

In many areas, especially parts of West Penwith, the Lizard, the Carnmenellis granite and the upland fringes of Bodmin Moor it can be readily seen that Prehistoric Enclosed Land was altered by the amalgamation of fields in the medieval period. The character in these areas, however, is still prehistoric. It is only where there has been substantial re-arrangement in the medieval period that earlier character has been completely lost (see below).

### **Medieval Enclosed Land (410AD – c1540AD)**

The agricultural heartland of Cornwall, it is associated with historic settlements documented before the sixteenth century AD, when a majority of the population still farmed the land. For the most part it is generally located on the best land, on the gentler slopes and in the most sheltered areas (Herring 2009).

For some areas of Cornwall, particularly West Penwith and parts of the Lizard, the Carnmenellis granite and the upland fringes of Bodmin Moor, it is plausible to suggest that much of the Medieval Enclosed Land potentially derives from heavily altered prehistoric land (see above); with the main land divisions and defining boundaries essentially late prehistoric in pattern but a majority of the Enclosed Land medieval in character. However, it is difficult to distinguish this from pattern and boundary evidence alone.

Elsewhere the results of archaeological excavation suggest that underlying much of the Medieval Enclosed Land are former field patterns originally enclosed in the prehistoric period. In these areas there was wholesale re-arrangement, probably in the early medieval and medieval periods, though the exact date is often unknown, with variation probable from area to area.

New enclosure would also have been undertaken in the medieval period. This is often hard to distinguish in HLC terms (based on map evidence alone), except in areas where ring-fences survive in the landscape, and a relative chronology can be established.

Originally, a majority of Medieval Enclosed Land was organised as open 'strip' field systems. The strips were groups of parallel, often sinuous, narrow, long, rectangular fields, open to each other, and divided from the next only by a low bank. Several similar-sized strips were arranged in a group or bundle; often termed a 'cropping unit' by landscape historians in Cornwall. Several cropping units were open to one and another but grouped within a large 'open' field; the field enclosed by a substantial stock-proof boundary. The systems were associated with farming hamlets where several tenant farming families lived; each tenant holding a certain amount of land, intermixed with other tenants within the system. There was a degree of communalism as the land was shared out equally amongst the tenants and the open fields grazed in common in the ley period.

The extent of fields derived from cropping units has diminished drastically over time. The loss up to c1840 was due mainly to sub-division (and to a lesser extent, re-arrangement) and since then to amalgamation, especially in the twentieth century. Peripheral fields and fields derived from strip fields are now very rare.

#### Medieval Strips (Unenclosed)

Open strip field systems are now rare; and the Sub-Type MD Strips (Unenclosed) correspondingly so. Cornwall is fortunate to have one of the last survivals at Forrabury, Boscastle.

#### Medieval derived from Strip Fields (Enclosed)

Evidence in Cornwall suggests that 'open' strip fields were enclosed from the fourteenth to seventeenth centuries. This was linked to broad changes in land tenure and economy whereby a tenant's land holdings were grouped together. The open strip systems

appear to have been enclosed in two main ways, depending on the settlement history of a particular location.

Where hamlets of farming families continued the open strip systems could be enclosed as strips, more often as a small group of strips amalgamated together, and farmed by a single tenant. Instead of a low bank dividing these, a stock-proof boundary would be built; usually an earthen bank or Cornish hedge; the boundary fossilising the earlier low bank that once divided the strips. This process resulted in the HLC Sub-Type, MD derived from Strip Fields (Enclosed).

#### Medieval derived from Cropping Units

Where farming settlements had changed from several families to a smaller group, or even individual families, strip systems would be enclosed on a larger scale, usually on a cropping unit by cropping unit basis. Each cropping unit would be enclosed to form an individual field, enclosed by a boundary such as an earthen bank or Cornish hedge, and farmed by a single tenant. Groups of enclosed cropping units arranged close to one another could then be farmed as a single holding rather than in an intermixed manner, though this did continue. This process resulted in the HLC Sub-Type, MD derived from Cropping Units.

#### Medieval peripheral fields

In the damper, heavier soils of the valley bottoms MD peripheral fields were often used as hay meadows, to produce valuable winter feed for livestock. Once the hay was cut in late summer, livestock would graze the remaining grass into the autumn. Due to their location, peripheral fields might also contain areas of coarser vegetation within them, for example, patches of rushes.

Due to a combination of its long history and its coverage of the best agricultural ground, Medieval Enclosed Land has undergone many successive phases of alteration due to changes in agriculture, economy and settlement. This is recorded in the Sub-Types MD Altered field patterns (Sub-Divided or Amalgamated or Re-arranged). The scale, speed and date of changes varied from parish by parish, and often a farm by farm basis.

#### Medieval Altered field patterns (Sub-Divided)

Sub-division often occurs near to settlements that have grown substantially; from single farms (including small-holdings) to hamlets and in particular, surrounding villages that grew rapidly in the nineteenth century, for example, St Newlyn East. Changes in land use will also affect the level of subdivision; where market gardening has developed and more in recent times, where horse paddocks have been established.

#### Medieval Altered field patterns (Amalgamated)

Amalgamation of field enclosures is not purely a modern phenomenon. Barton farms or head manorial farms were an early focus, due to differences in tenure, land use, and capital available to invest in labour and technology. In the parish of Probus, the Amalgamation of cropping units into larger fields appears to date to the late medieval period onwards. Elsewhere, Amalgamation is later in date, probably dating to the eighteenth and nineteenth centuries, but primarily focussed again on larger holdings and more wealthy land owners. Modern farming methods have resulted in large-scale Amalgamation being more widespread. Typically, the smaller, later boundaries that sub-divided the fields were removed first but in certain areas, for example, parts of Penwith, large areas of many small fields have been amalgamated into single large enclosures.

#### Medieval Altered field patterns (Re-arranged)

Re-arrangement is areas where there has been the comprehensive, wholesale realignment of field boundaries, or where there has been both considerable amalgamation of field enclosures and the realignment of certain field boundaries. This



can occur where a large estate has been split up into several holdings, for example, the small farms created from the Trerice Estate, St Enoder following the First World War.

### ***Post-Medieval Enclosed Land (c1540 AD – 1750AD)***

Land enclosed from the late sixteenth century through to the mid-eighteenth, typically from Rough Ground. The fields are generally medium to small in size, enclosed and divided by straight boundaries; the land enclosed principally in three ways.

#### Post-Medieval Intakes

Intakes were often extensions to blocks of Prehistoric and Medieval Enclosed Land enclosing more marginal land (rough ground) in the valley bottoms and the upland areas. They are generally medium sized fields, mostly regular in field pattern, though occasionally irregular where fitted into the topography. Early maps often show small patches of coarse vegetation within them, the full improvement process sometimes taking generations of work to complete.

On occasion they can contain a sinuous boundary, perhaps the remnant of a later medieval outfield (a temporary field enclosed and cultivated on marginal ground for a short time when economic conditions allowed).

In West Penwith, the occasional area can contain elements of relict boundaries of abandoned prehistoric field systems, evidenced by the occasional erratic-sinuous boundary.

In this period new farms and new small-holdings were enclosed on a piecemeal basis; the two distinguished from each other in terms of field size and settlement patterns. Further supporting evidence provided by Historic Settlement data helps to distinguish post medieval settlements from those founded in the early modern period.

#### Post-Medieval New Farms

New farms have been defined as holdings over 5ha in size. They are often located in upland areas, on former Upland Rough Ground, typically shown on historic maps with a single dwelling and surrounding group of small farm buildings. Most often they have English place-names but in west Cornwall earlier examples continued to have Cornish place-names. Field size tends to be medium in area, but noticeably larger than small holdings, as they were enclosed by full time farmers.

#### Post-Medieval New Smallholdings

New small holdings were single cottage dwellings, with few or no small farm buildings. They are located in upland areas, on former Upland Rough Ground, and also on the edges of valley bottoms, on areas of Valley Rough Ground, and more occasionally, Woodland. Worked by a single family, on a part-time, subsistence basis, the fields are small in size, square or rectangular in shape, and often regular or very regular in pattern.

#### Post-Medieval Altered fields

Due to successive changes in technology, economy and settlement pattern, a majority of Post-Medieval Enclosed Land has undergone extensive phases of alteration, recorded in the Sub-Types as PM Altered field patterns (Sub-Divided or Amalgamated or Re-arranged). Alteration to Post-Medieval Enclosed Land has occurred due to the similar processes to those highlighted in Medieval Enclosed Land.

### ***Early Modern Enclosed Land (1750AD – 1900AD)***

Land enclosed in the late eighteenth and nineteenth centuries, usually from Rough Ground or Valley Rough Ground. The character is similar to Post-Medieval Enclosed Land; dominated by straight boundaries, regular or very regular field patterns, and dispersed settlement of single dwellings and holdings. However, the process was undertaken more rapidly, on a larger, more organised scale, due to the massive increase in population following the Agricultural and Industrial Revolutions.

### Early Modern New Farms and Smallholdings

Both new farms and new small holdings are similar in character to those in the post medieval period, though field size on New Farms might tend to be larger due to changes in farming technology (for example the use of draught horses). Sinuous field boundary elements could still be included where medieval outfield boundaries, or former pasture boundaries, have been incorporated into the field patterns.

### Early Modern Intakes

Intakes varied in size but could be larger in field size than those in the preceding period. This is due to advances in farming machinery, changes in agricultural thinking and practice, and the continued growth in markets for produce. They were often extensions from existing medieval and post-medieval farms.

### Early Modern Altered fields

Due to modern changes in technology, economy and settlement pattern, a majority of Early Modern Enclosed Land has undergone extensive phases of alteration, recorded in the Sub-Types as EMod Altered field patterns (Sub-Divided or Amalgamated or Re-arranged). In many areas, especially coastal and those surrounding large towns and villages, parcels of Early Modern Enclosed Land have now been built on, and recorded under the Settlement Broad Type. Alteration to Early Modern Enclosed Land has occurred due to the similar processes to those highlighted in Medieval Enclosed Land.

### **Modern Enclosed Land (1900AD - )**

Land enclosed in the twentieth century, usually from Upland Rough Ground or more occasionally, Valley Rough Ground. The character is similar to Post-Medieval Enclosed Land and Early Modern Enclosed Land; dominated by straight boundaries, regular or very regular field patterns, and dispersed settlement of single dwellings and holdings; often with large farm sheds and buildings.

### Modern Intakes

A majority of Modern Enclosed Land is classified as Intakes; often at some distance from the farming settlement, enclosed from large tracts of former Upland Rough Ground. Field size is very large, and occasionally a large field barn or shed is built to store livestock, silage or haylage. Due to the widespread use of modern vehicle based machinery the fields are interconnected by straight trackways.

### Modern New Farms and Smallholdings

Modern smallholdings and new farms are fewer in number and area than in the preceding post medieval and early modern periods

### **Further reading**

Dudley, P, 2008. *The Archaeology of west Cornwall's moors, downs and heaths*, Cornwall Council (available as a downloadable pdf).

Herring, P, and Giles, C, 2008. *Agriculture in Herring, P, Sharpe, A, Smith, JR, and Giles, C, Bodmin Moor: An Archaeological Survey: Volume 2; The Industrial and Post-Medieval Landscapes*, English Heritage.

Herring, P, and Rose, P, 2001. *Bodmin Moor's Archaeological Heritage*, Cornwall Council.

Website: *Flying Past* - <http://www.historic-cornwall.org.uk/flyingpast/farms>

### **HLC Types: Typical mapped attributes**

(Based on recurring features found on modern OS 1:10,000 map data)

- Common to all Enclosed Land HLC Types: enclosed and sub-divided by field boundaries.
- Prehistoric Enclosed Land: generally irregular or very irregular field patterns, in some instances regular field patterns; erratic, curvilinear and sinuous internal boundaries; often small fields, except where altered; typically located in more marginal locations in the areas where there is an abundance of rock, e.g.. granitic uplands and coastal locations.
- Medieval Enclosed Land: generally regular or irregular field patterns; dominated by sinuous internal boundaries, but sometimes dog-leg and J-shaped, erratic where amalgamation has taken place, and occasionally S-shaped and curvilinear boundaries; fields can vary in size and shape, especially where there has been large scale alteration; typically located on the best agricultural land, on valley sides and sheltered locations, although can extend on to valley bottoms and edge of high ground; associated with older settlements, often former farming hamlets with Cornish place-names (less so in the east of Cornwall); settlements connected by networks of irregular lanes and roads.
- Post-Medieval Enclosed Land: generally regular field patterns; dominated by straight internal boundaries; rectangular or square fields, medium to small in size; typically located in upland areas and valley bottoms; associated with more recent settlements, often individual farms and small cottages with English place-names, occasionally Cornish; or next to important and large existing farms; settlements often connected with fields by straight tracks and roads. Occasional sinuous boundary suggesting former medieval land use but as a marginal part of the landscape. On marginal land, especially in West Penwith, the occasional erratic-sinuous boundary suggests former prehistoric land use.
- Early Modern Enclosed Land: generally regular field patterns; dominated by straight internal boundaries; rectangular or square fields, large to small in size; typically located in upland areas and valley bottoms; associated with more recent settlements, often individual farms and small cottages with English place-names; settlements often connected with fields by straight tracks and roads. Occasional sinuous boundary suggesting former medieval land use but as a marginal part of the landscape.
- Modern Enclosed Land: generally regular field patterns; dominated by straight internal boundaries; rectangular or square fields, large or very large in size; typically located in upland areas; associated with more recent settlements, often individual farms with a mixture of Cornish and English place-names; fields connected by straight tracks and roads.

## **6.4 Woodland**

### **Summary**

Woodland is dominated by deciduous or coniferous trees, or a variation of the two. Following the end of the last glacial period deciduous trees once covered most parts of Cornwall. However, by the medieval period woodland cover had been reduced to the marginal steep-sided valleys. Traditionally woodland was managed to maximise economic return. Non-native coniferous trees were introduced on a large scale from the late eighteenth century onwards, not only to improve profitability, but also for ornamental purposes, especially in the estates surrounding large houses. Further deciduous species were also introduced and by the nineteenth century Cornwall's woodlands were more varied in character than ever before. Woodland products were once economically important but many areas of Woodland now receive negligible management, however, tree cover is at its greatest since the medieval period. The different HLC Types of Woodland are distinguished by tree species, land use and possible time-depth.

## **Broad Type: Introduction**

Woodland is where deciduous or coniferous tree cover dominates, or a combination of the two.

The character of the Type can be sub-divided into the following HLC Types distinguished by differences in species, time-depth, location, and the size and shape of the areas under tree cover.

1. Shelterbelt
2. Timber plantation
3. Woodland mixed
4. Deciduous Woodland
5. Ancient Semi-Natural Woodland

Historic maps (c1840 Tithe and c1880 OS) are used as further source material to better establish the original date of the woodland cover.

## **Principal historical processes**

From c8,000BC to c4000BC woodland covered a majority of Cornwall's land surface except the most exposed and waterlogged parts of the uplands and coastal margins. The species and density of tree cover varied with location, exposure and drainage; the most sheltered areas dominated by oak with an understory of hazel and holly while in damper areas willow and alder prevailed.

Large areas of the woodland cover had been removed by the Neolithic period (c4000BC to c2500BC) by early farmers grazing increasingly large herds of livestock. Grazing, cultivation and population pressure all continued through later prehistory, so that by the early medieval period woodland distribution was probably restricted to the steeper valleys of Cornwall. Woodland was further encroached upon, with the least marginal areas (south-facing and less steep slopes) cleared first.

Despite the ever continuing reduction in area, woodland was carefully managed to maximise its resources. In the medieval period it was exploited as pasture grounds (underwood), sources of fuel, coppice wood (including barking of oak for the tanning industry) and timber. In Cornwall, the needs of the mining industry added further pressure on woodland management, with trees needed for timber (for structures and props) and charcoal (for smelting).

The Domesday Book of 1086, however, recorded that Cornwall had little woodland area proportionally. With the reduction in the grazing of the Rough Ground, in particular Valley Rough Ground, many areas are, through natural succession, returning to Deciduous Woodland; with figures suggesting that Cornwall has more woodland cover in c2011 than for the past 1000 years at least.

Many of the areas of Deciduous Woodland could have their origin in the medieval period, but it is likely that they have gone through several phases of clearance, replanting and/or natural succession. From the late eighteenth century onwards, as part of the changes in land management methods associated with the Agricultural Revolution, new species of tree were introduced to Cornwall including sycamore, beech and chestnut; their original introduction often associated with large estates.

Timber Plantations of coniferous trees also began to be planted at a similar time, often infilling the gaps between areas of deciduous woodland, or entirely replacing them. Commonly, they have names ending in 'plantation' or 'copse'. Early plantations were often planted by landowners of large estates keen to maximise economic gain from marginal land. They also provided additional benefits of providing wind breaks, closing off estate land from general view and adding ground cover for hunting.

Twentieth century Timber Plantations are generally on a much larger scale, often covering several hundred hectares or more, and are found away from steep sided valleys and estates, with a focus on former areas of Upland Rough Ground.

Mixed Woodland does not naturally occur, being a mixture of deciduous and non-native coniferous species. It can occur where Timber Plantations have merged with blocks of deciduous woodland. In several instances Timber Plantations have rapidly become unmanaged and neglected, and with time a new flush of deciduous woodland has grown within the plantation. In other areas, Mixed Woodland is the deliberate result of purposeful landscape design, usually associated with the creation of a picturesque view from particular parts of a large estate. It can often survive as a remnant when the surrounding ornamental landscape has been removed or altered.

Shelterbelts are typically quite small in area, and are usually linear belts of trees running parallel to existing field boundaries, within large blocks of Enclosed Land. They can be planted by individual farmers or sometimes as part of a program of improvement on estates and tenanted farms. Intended to reduce the damaging effects of the wind to crops and settlements they tend to be planted in upland areas where wind exposure is a problem.

### **Further reading**

There is currently no general historical synthesis of Cornwall's woodland.

Herring, P, 2008. Other uses and activities in Herring, P, Sharpe, A, Smith, JR, and Giles, C, *Bodmin Moor: An Archaeological Survey: Volume 2; The Industrial and Post-Medieval Landscapes*. English Heritage.

Rackham, O, 1986. *The History of the Countryside*. J M Dent, London.

### **HLC Types: Typical mapped attributes**

(Based on recurring features found on modern OS 1:10,000 map data)

- Shelterbelt: narrow, linear alignment of trees; usually dominated by coniferous trees; located in exposed areas to protect certain fields or settlements from the wind - within areas of Enclosed Land; predominantly Post-Medieval, Early Modern and Modern, due to their exposed location.
- Timber plantation: dominated by coniferous trees; if older then generally medium in size favouring valley sides and bottoms; if modern, often very large in size, dissected by tracks, the largest found in upland locations.
- Woodland Mixed: medium to large areas of woodland; mixed coniferous and deciduous, with varied history often incorporating smaller plantations that have been abandoned; found on valley sides or bottoms.
- Deciduous Woodland: small to large areas of woodland, varied history often incorporating recent regeneration of woodland on areas of former Rough Ground, especially Valley Rough Ground.

## **6.5 Industrial**

### **Summary**

Industrial HLC is where industrial land is extensive and dominant in character. Its defining attributes vary but can include a huge range of built and cut features which, when taken as a whole, are often significant in scale, both physically and visually. Cornwall has a notable industrial legacy. Its origin stretches back into late prehistory, reaching a heyday in the late nineteenth century when a rapid decline led to many industrial complexes to be abandoned. The Type also records active industry and in certain areas this has continued on a significant scale; for example, the china clay industry on the Hensbarrow granite. Located anywhere where resources and infrastructure allows it is sub-divided into HLC Types by differences in the resource exploited, and the methods employed to do so.

## **Broad Type: Introduction**

Only extensive areas of industrialised land are mapped under the Industrial Type.

Where a relict industrial landscape has reverted to Woodland or Rough Ground, or in urban areas, incorporated within larger blocks of Settlement, the HLC will use the dominant Broad Type. This significantly reduces the extent of Industrial HLC in the c2011 time-slice. Modern, light industrial units are included in the Settlement Broad Type.

It can be distinguished into those areas that are still in active use, and those that are non-active, or disused. It is sub-divided into HLC Types on the dominant industrial processes that were undertaken in the area; though in many areas there have been successive phases of metalliferous, non-metalliferous and processing industries creating a complex set of landscape features.

1. Extractive, metalliferous
2. Extractive, non-metalliferous
3. Processing

Historic maps (c1840 Tithe and c1880 OS) are used as further source material to better establish the former extent of industrial areas.

## **Principal historical processes**

Industrial activity has been an important part of Cornwall's economy since late prehistory. Greenstone, for hand axes, was quarried in the Neolithic period and it is probable that both tin and copper were first streamed and mined (respectively) from the Bronze Age onwards. As yet, the archaeological evidence for early mining and extractive industry is indirect, largely because later workings have tended to obliterate earlier examples (adapted from Herring 2009).

As time progressed industry became larger in scale, more complex, and linked to more extensive transport networks. The height of Cornwall's metalliferous and extractive industries (together with its associated processing) was the late nineteenth century; hence a majority of Industrial Type is classed as 'non-active'. However, in the twentieth century certain industries continued, expanding in importance and scale; for example, china clay on the Hensbarrow granite.

Cornwall is famous for its metalliferous mining industry, principally for tin, copper and arsenic.

Tin was originally exploited by streamworking and this developed into a major industry in Cornwall in the later medieval period. As the surface deposits of tin became exhausted, the tanners began, mainly from the fifteenth and sixteenth centuries, to turn more of their attention to the seams, or lodes, themselves and venture further under ground.

Early mining was shallow, taking the form of short shafts interconnected with areas of underground excavation limited in scale and depth. But as rock-breaking and pumping technologies improved engine houses became commonplace, allowing the mines to become deeper and more extensive than before. Copper mining continued to develop alongside the expansion of the tin industry, but both industries suffered from the boom and bust fluctuations of ore prices.

While mining developed further underground, processing complexes on the surface increased in complexity, size and extent. Different ores required different stages of processing resulting in various types of buildings and features; e.g. calciners for arsenic. A majority of these structures were temporary in nature, built of timber and from the later nineteenth century onwards, corrugated iron, although some were more permanent and of stone construction.

Ancillary processing industries developed alongside mining, including smelting works, gunpowder works, fuse and rock-drill factories. Consecutive complexes of tailings works were constructed along the major river valleys to try and recover tin ore suspended in the water pumped out of mine workings.

Cheaper foreign imports and the gradual exhaustion of the more easily worked lodes led to a rapid decline in both industries by the end of the nineteenth century. Tin mining struggled through the twentieth century but no mines are now currently in active use.

Cornwall is also famous for its non-metalliferous extractive industry based on the exploitation of its varied rock types.

Until the early nineteenth century granite quarrying was largely confined to the exploitation of surface rock. By the eighteenth century increasingly large quarries were developed. This was associated with the increase in civic and infrastructure construction, the opening of new national and international markets, and the development of new drilling and cutting technology. The production of precision-dressed granite flourished, particularly on Bodmin Moor and the Carnmenellis granite. Few of these quarries now remain in active use.

Other quarries, located usually on outcrops of granite, gabbro and elvan were opened to produce roadstone/ballast.

Slate was an important export from north Cornwall from the later medieval period, especially in the area around Delabole; famous for its blue grey slate used for roofing, flagstones and grave stones.

China clay (kaolin), a form of decayed granite, has been worked since the mid eighteenth century, principally on the Hensbarrow granite (the China Clay Area), but also in the western half of Bodmin Moor, and on the Tregonning and West Penwith granite. It is in these outlying areas that early remains survive best. The industry continues to work on a massive scale on the Hensbarrow granite with associated docks and processing works at Fowey.

### **Further reading**

Bryan, E, 1994. *Cornish Mining: The Techniques of Metal Mining in the West of England, Past and Present*. Cornish Hillside Publications, St Austell.

Buckley, A, 2007. *The Story of Mining in Cornwall*. Cornwall Editions Limited, Fowey.

Gerrard, S, 2000. *The Early British Tin Industry*. Tempus.

Herring, P, Sharpe, A, Smith, JR, and Giles, C, 2008. *Bodmin Moor: An Archaeological Survey: Volume 2; The Industrial and Post-Medieval Landscapes*. English Heritage.

Smith, JR, 1992. *Cornwall's China Clay Heritage*. Twelveheads Press, Truro.

Stanier, P. 1999. *South West granite: a history of the granite industry in Cornwall and Devon*. Cornish Hillside Publications, St Austell.

Website: Cornish Mining World Heritage Site - <http://www.cornish-mining.org.uk/delving-deeper>.

### **HLC Types: Typical mapped attributes**

(Based on recurring features found on modern OS 1:10,000 map data)

Active

- Extractive, metalliferous: none (c2011).
- Extractive, non-metalliferous: non-shaft based; large scale, open extraction; quarried rock faces; bare and scrubby over waste heaps, with variable amounts of large stone waste; access roads; reservoirs and settling ponds; small ancillary buildings.

- Processing: often large buildings; chimneys; small to medium sized ancillary buildings; settling ponds, leats and sluices; railways; docks, quays, wharves, storage bins, cranes.

#### Non-active

- Extractive, metalliferous: shafts; shaft safety walls; bare and scrubbed over waste heaps; platforms; revetment walls; reservoirs; engine houses (often unroofed); headframe; storage bins; chimneys; flues; calciners; buddles; settling ponds; ancillary buildings, stamps, leats; OS maps sometimes preserve old mine names, typically 'Wheal', and more occasionally 'Consols' or 'Mine'.
- Extractive, non-metalliferous: large scale, open extraction pits and quarries; rock faces; roofless buildings/ruins; bare and grassed over waste heaps; scrubby vegetation; former roads and paths; cuttings and embankments of disused rail and tramways; empty settling ponds; OS maps sometimes preserve old mine names, typically 'Quarry', and more occasionally 'Pit', especially in the china clay areas.
- Processing: abandoned buildings and ruins often on the edge of settlements; chimneys; ruined, roofless ancillary buildings and offices; empty settling ponds; railway and tramway embankments, cuttings and bridges; abandoned docks, quays, wharves, and storage bins; OS maps sometimes preserve old names, typically 'Harbour' and 'Dock(s)'.

## **6.6 Military**

### **Summary**

Military complexes built or maintained in the twentieth century that are large in area. Those mapped as HLC are mostly still in active use, with only a few sites decommissioned. Individual sites can show considerable time-depth, used as defensive sites over successive periods, especially near important harbours. Cornwall's strategic location at the edge of the Atlantic has resulted in a wealth of military sites since the sixteenth century, with a marked peak in the Second World War. The vast majority of military complexes are now abandoned, and are not mapped in the c2011 HLC; their principal impact is to add local time-depth in specific locations to other HLC Broad Types. Military activity can vary and the HLC is sub-divided upon the basis of the type of built features, scale and location.

### **Broad Type: Introduction**

The Broad Type covers military complexes used in the twentieth century that are extensive in area. Individual sites can show considerable time-depth, used as defensive sites over successive periods, especially near important harbours.

Many complexes are too limited in area to be mapped in this Broad Type; others have been considered to be secondary to more dominant HLC Broad Types, especially where they have been significantly altered following abandonment.

The Military HLC Broad Type has been sub-divided into HLC Types based on differences in military activity, built features and scale:

1. Military airfields
2. Barracks
3. Artillery complexes
4. Military communications



## Principal historical processes

In Cornwall, a majority of Military HLC is located on or near to the coast, with a notable concentration in the south east corner of Cornwall, surrounding the naval centre of Plymouth.

Earlier defensive sites, such as prehistoric hillforts, medieval castles, later blockhouses, and Civil War forts have merged into their immediate landscape. It is only where military use has continued into the twentieth century that a significant impact is made in HLC terms.

Traditionally, military sites focussed on prominent locations in the landscape, concentrating to defend important harbours, settlements and resources. From the sixteenth century onwards, as the early British state developed, Cornwall became important strategically. This was due to its far-flung location, jutting out into the Atlantic, and therefore a staging post to protect maritime and international interests but also a place susceptible to enemy attack, and occasionally internal unrest.

By the mid-twentieth century military infrastructure had increased dramatically in its variety and scale; fuelled principally by the demands of two World Wars and significant leaps in technology.

Airfields were first developed in the First World War to protect shipping in the Western Approaches, with a proliferation of them in Second World War. They required a coastal location to aid a quick response and large areas of level ground, and so were often situated on the level coastal plateau and in former areas of Rough Ground.

The demands of Second World War also required many military communication sites to be developed. These were constructed to help defend airfields, and due to Cornwall's location, to communicate with shipping and to listen for and identify enemy activity in the Atlantic. These sites were often developed on areas of Coastal and Upland Rough Ground, usually in prominent locations to send and intercept radio signals.

Artillery bases also protected strategic features, both military and economic. These were often smaller sites, less prominent in scale, and once abandoned were generally lost to other Broad Types in terms of HLC. In some instances the artillery complexes are situated within larger military bases.

As D-Day approached Cornwall's strategic position again came to the fore, resulting in a large number of military barracks developed as part of the war effort. Many of these, however, were temporary in nature, and as with artillery complexes left little long-term HLC impact.

A majority of the First and Second World War military sites have been altered to Enclosed Land or reverted back to Rough Ground. Cudrose and Predannack airfields are still in active military use, and Cleave has been altered to GCHQ early listening post. St Mawgan airfield has recently been decommissioned and is now used as a civil airfield.

## Further reading

Ashworth, C, 1990. *Action Stations: 5. Military airfields of the South-West*. Patrick Stephens Limited.

Herring, P, 2008. Other uses and activities in Herring, P, Sharpe, A, Smith, JR, and Giles, C, *Bodmin Moor: An Archaeological Survey: Volume 2; The Industrial and Post-Medieval Landscapes*. English Heritage.

Pye, A, and Woodward, F, 1996. *Historic Defences of Plymouth*. Cornwall County Council.

Website: Flying Past - <http://www.historic-cornwall.org.uk/flyingpast>.

## **HLC Types: Typical mapped attributes**

(Based on recurring features found on modern OS 1:10,000 map data)

- Military airfields: large, open area; if active, enclosed by a significant perimeter boundary; runways; dispersals/pens; observation towers; hangers; sheds; ancillary buildings; radar stations.
- Barracks: large, open area; if active, enclosed by a significant perimeter boundary; buildings, often arranged in formal rows; parade ground.
- Artillery complexes: small to medium sized open area, if active enclosed by a significant perimeter boundary; gun emplacements; small buildings.
- Military communications: small to medium sized open area; if active, enclosed by a significant perimeter boundary; radar beacons; masts; buildings; often in coastal and upland locations.

## **6.7 Ornamental**

### **Summary**

Ornamental HLC is land that has been carefully designed, manipulated, and managed to create an idealised landscape, associated with mansion houses and accompanying estates. A majority of Ornamental HLC in Cornwall was established in the eighteenth, nineteenth and very early twentieth centuries, often by individuals made wealthy by profits from copper and tin mines. The vestiges of medieval design landscapes survive in the form of deer parks, but most only survive as components of time-depth within areas of other HLC. In the later twentieth century many areas of Ornamental HLC were converted back to Enclosed Land as the estates upon which they were founded collapsed.

### **Broad Type: Introduction**

Ornamental HLC has been carefully designed, manipulated, and managed to create an idealised landscape, associated with mansion houses and accompanying estates.

They were (and occasionally can still be) private landscapes of recreation for the landowners who commissioned them, but away from the house and garden the deer parks, parkland and plantations often had (have) an economic role within the estate.

The Ornamental Broad Type can be sub-divided into HLC Types based on differences in location, size and shape, planting, tree cover, and the type of built features found within them:

1. Pleasure garden
2. Parkland
3. Plantation
4. Deer Park

### **Principal historical processes**

Ornamental gardens surrounding larger houses have been part of Cornwall's landscape since the medieval period at least. Large areas of tenanted Enclosed Land, and sometimes Rough Ground were converted into private ground for pleasure and recreation.

Early gardens were limited in scale, their size and grandeur, as today, dependent on the wealth of the families who commissioned them. The more important later medieval Cornish estates developed deer parks; large open areas with scattered trees where deer were kept within a park pale to be hunted by the Lord to provide sport, and game for the table.

A majority of deer parks were disparked or had decayed by the mid-sixteenth century when most were reorganised as Enclosed Land. The estate at Boconnoc has a remnant medieval deer park; the area recorded under the Deer Park HLC.

The majority of Ornamental HLC was created in the eighteenth, nineteenth and very early twentieth centuries, often by individuals made wealthy by profits from copper and tin mines.

In the mid to late eighteenth century large landscape-scale Parkland became fashionable, the ethos was to enhance the 'natural' aspects of the landscape; a movement in landscape design for which Britain is famous. Parkland HLC has carefully positioned clumps of trees, with open vistas uninterrupted by hedges, framed by the sinuous lines of plantations. Larger scale Plantations framed the parkland, controlling the views into/from the mansion house and points within the estate.

With the nineteenth century expansion in exploratory travel, and growth in botanical science, the emphasis shifted towards laying out gardens with specimen trees and shrubs, camellias, rhododendrons and more delicate exotic plants, many of which could not survive far from the benign influence of the Gulf Stream.

These later gardens are often in valleys, making the most of natural topography to aid shelter and growing conditions. They were smaller, darker and more intricately planned, being enclosed by planted shelter belts to enhance the micro-climate (adapted from Herring 2009).

Many gardens declined in the mid-twentieth century as the maintenance of large teams of gardeners became increasingly difficult. Much ornamental landscape has disappeared or been reduced in impact and importance, however, several important landscapes do survive, and these are mapped in the c2011 time-slice. Following abandonment Ornamental HLC often reverted to Enclosed Land, but close to the major towns it can often be incorporated into Settlement in later HLC time-slices.

### **Further reading**

Pett, DE, 1998. *The Parks and Gardens of Cornwall: A Companion Guide*. Alison Hodge, Penzance.

### **HLC Types: Typical mapped attributes**

(Based on recurring features found on modern OS 1:10,000 map data)

- Pleasure garden: small to medium sized in area; enclosed and often sub-divided; situated close to a mansion house; shrubs and trees; beds, terraces and walkways; ponds; lawns; summerhouses; glasshouses; pavilions.
- Parkland: large in area; often open but can be sub-divided into large fields; framed by plantations and occasionally ponds; sinuous and curving boundaries, occasionally straight; tree clumps and copses; drives and carriageways; seats; isolated buildings.
- Plantation: small to large in area; often surrounding a mansion house and/or to frame parkland, or control views into/from parkland; planted mixed coniferous and deciduous species; often recorded as 'Plantation' on OS maps.
- Deer Park: large in area; open; scattered isolated trees; framed by plantations; sinuous and curving boundaries, occasionally straight; tree clumps and copses; drives and carriageways; isolated buildings; recorded as Deer Park on OS map.

## **6.8 Recreational**

### **Summary**

Recreational HLC covers large areas of land given over to recreation, predominantly in the late twentieth century. It is found in greatest concentration close to the main

tourist resorts on the coast, but can be found inland also. Subdivision is based on differences in activity, and often distinguished on map evidence by symbology alone.

### **Broad Type: Introduction**

This Broad Type covers large areas of land given over to recreation, predominantly in the late twentieth century; and therefore only recorded in the c2011 HLC time-slice. Golf courses, however, were the earliest to be developed, with a handful founded at the close of the nineteenth century.

Groups of early twentieth century summer houses were established close to many of the larger beaches, especially on the north coast, but most are now permanent settlements, and recorded as Settlement HLC. Other, smaller areas of recreational facilities are absorbed into other Broad Types, again, often as Settlement.

Recreational HLC is predominantly found in close proximity to the coast, and in particular, close to settlements where the tourist industry forms a major part of the economy. Access by car now forms an important part of recreation.

Subdivision is based upon differences in the density of buildings; the areas of Recreational HLC often distinguished on OS maps by map symbology alone.

1. Golf course
2. Campsite, chalet park, etc
3. Theme Park

### **Principal historical processes**

Cornwall's nascent tourism industry started to develop in the early nineteenth century. At first, it was the wealthy who travelled to Cornwall to visit dramatic natural locations, for example, Land's End and the Logan rock at Treen.

It was not until 1859 and the connection of Cornwall to the main rail network that tourism become an industry. Visitor numbers dramatically increased as Cornwall was marketed as a summer destination for families living in the urban centres. Tourism had a largely seaside bias focussing on, and greatly expanding, many existing fishing villages and towns. On the north coast, several settlements expanded from a few houses to small towns bustling with summer visitors staying in purpose-built guest houses and hotels. Wooden chalets for summer visits were also built in the Dunes and Coastal Rough Ground; creating small temporary settlements (many of which are now permanent).

The Campsite, chalet, etc HLC Type developed in late twentieth century with the increase in car transport hence they both have networks of tarmac and concrete drives. The car has also enabled campsites to be located inland from the beaches. They are often located in areas of Enclosed Land concentrating around the major resorts; the result of farmers and small holders diversifying their income.

With changes to employment law to allow for a shorter working week, and the increase in people's wealth, recreation itself became a growing industry with a growth in sport as a leisure pursuit. Golf courses were established predominantly in coastal locations, or near to major settlements; often altering areas of Enclosed Land or further utilising the natural undulations of dunes.

Theme Parks were developed as visitors wanted a more than a traditional 'bucket and spade' experience, the car allowing them to drive to venues where they could be entertained.

Due to the modern relationship between the car and recreation all Recreational HLC Types have extensive car parks and networks of roads.

## Further reading

There is currently no general historical synthesis of Cornwall's recreational landscapes.

### HLC Types: Typical mapped attributes

(Based on recurring features found on modern OS 1:10,000 map data)

- Golf course: large, open area; small to medium sized buildings close to a car park; driving range; often found in coastal locations or the edge of major towns; mapped on OS maps with a symbol.
- Campsite, chalet park, etc: high density of small rectangular buildings; complex network of small roads; medium sized ancillary buildings; sub-divided with straight boundaries; often in valley and coastal locations.
- Theme Park: irregular scatter of small to large sized buildings; large car park(s); mapped on OS map with name.

## 6.9 Settlement

### Summary

Settlement HLC is where buildings dominate, the areas in Cornwall varying in size from a single farmstead through to a large town or small city. The buildings found within them are mostly permanent dwellings (where people live), but generally as a settlement increases in size and importance, so does the number of buildings associated with economic, industrial and recreational activity. Many of Cornwall's settlements were established in the early medieval and medieval periods but others have a more recent history, especially in the mining districts. Due to the massive rise in population and successive changes to the economy many show considerable time-depth. Differences in settlement size and layout are basis by which Settlement HLC has been sub-divided.

### Broad Type: Introduction

Settlement HLC is defined as areas dominated by buildings. Predominantly these are permanent dwellings (where people live), but as the size of a settlement increases the range and number of non-dwellings rises as well. Thus, there is a corresponding rise in complexity with larger settlements offering a range of economic, industrial and recreational functions that smaller settlements cannot sustain.

Difference in settlement size is the main basis by which Settlement HLC has been sub-divided.

The HLC-Types Highway settlement, Terrace and Row differ slightly in their identification process. These were mapped to further demonstrate the complexity of rural settlement; to enable Lowland Cornwall to better understand landscape change. Their classification is based upon layout; Highway settlement on location and Terrace and Row upon the differing arrangement of buildings. However, these were only recorded when settlement size was comparatively small (usually the c1840 and c1880 time-slices), many are now part of larger settlements where the Village or Town HLC Type can be used instead.

The following HLC Types were used;

1. Farmstead
2. Hamlet
3. Village
4. Town
5. Highway settlement
6. Terrace
7. Row

## **Principal historical processes**

Most settlements in Cornwall started as rural farming communities in the early medieval or medieval period. Usually located in the most favourable locations (based upon shelter, access to water and soil fertility), in many instances these are found close to, or probably overlies, later prehistoric and Romano-British ones. Certain settlements would have been larger and/or more important than others, also being centres for administrative and ceremonial activity.

In the medieval period most settlements were farming hamlets of several dwellings nucleated in a group. Individual, isolated dwellings also occurred, reflecting differences in agricultural potential, and/or land tenure and status.

Following the Norman Conquest, planned towns were created systematically with markets held on specified days to control economic activity. Towns were evenly spaced (10-15 miles apart) to ensure a sufficient agricultural hinterland to supply the market, and were the focus for industrial, financial and administrative activity. Medieval towns were small in size compared to the settlements of today and typically contained three or four main streets, usually with one of these either widened or splayed to form a market place. Most have a larger than average medieval church, often placed at one end of the market place, and some have surviving medieval castles (most famously Launceston), or the known sites of them (Truro, Liskeard, Tregony, Week St Mary). Most in Cornwall have now developed into major towns, though some never expanded, and are only villages (adapted from Herring 2009).

In the later medieval period, following the Black Death, certain hamlets were subdivided into separate individual farms, while others stayed as farming hamlets. The rural population steadily rose in the seventeenth and early eighteenth centuries and new farming settlements were established, often as single farms and smallholdings. New towns were also founded, often to exploit new services and needs, for example, Falmouth as a victualling centre for ships. The old towns continued to grow slowly until the mid-eighteenth century, often by people leaving the countryside.

With the Agricultural and Industrial Revolutions in the late eighteenth and early nineteenth centuries leading to a massive rise in population, settlements exponentially increased in size and number over a short period of time.

Existing medieval towns located close to mining, quarrying and other industrial activity expanded in size and commercial activity. Medieval hamlets in the mining districts did the same, sometimes becoming bustling villages and towns (Camborne for example). Again, near to the mining districts new farms and small holdings were enclosed in areas of former Rough Ground as the population rocketed in size.

Several new towns were developed to serve industry, often as ports to handle the export and import trade primarily for industry. Hayle was developed by the Cornish Copper Company, exporting Cornish copper to South Wales for smelting and the import of Welsh coal.

The pattern of rural settlement also changed, especially where large commercial centres were distant. A particular feature of eastern Cornwall was the number of small settlements developed along highways or at river crossings, serving travellers and acting as local service centres (having smithies, carpenters' shops etc). Near to industrial areas, often close to the more remote quarries and mines, on former areas of Rough Ground, rows and terraces were developed by landlords keen to increase revenue.

In the twentieth century the population living in larger settlements increased dramatically. Virtually all the villages and towns in the c2011 time-slice include a high proportion of later twentieth century housing and light industry; their original cores now dwarfed by modern development.

The services and function of almost all the larger settlements have also changed. Most are largely residential, their original industrial, harbour and commercial functions having died. Others are now dominated by the provision of residential and recreational facilities for tourists. Similarly, while many of the smaller rural hamlets have changed little in their number of dwellings, a majority have also become residential settlements with little or no farming activity.

### **Further reading**

Website: Cornwall Industrial Settlements Initiative – <http://www.historic-cornwall.org.uk/cisi>

Website: Cornwall and Scilly Urban Survey – <http://www.historic-cornwall.org.uk/csus>

### **HLC Types: Typical mapped attributes**

(Based on recurring features found on modern OS 1:10,000 map data)

- Farmstead: single dwelling; farm yard; surrounding farm buildings; nucleated settlement.
- Hamlet: multiple dwellings (15 or under); townplace; scatter of farm buildings; occasional church and/or chapel; nucleated, linear, or dispersed settlement.
- Village: multiple dwellings (15 – 250 approx); occasional farm included on settlement edge; service buildings e.g. church and chapels, school, library, village hall, sports club, pub; small car park; occasional small industrial estate; nucleated, linear, or dispersed settlement.
- Town: multiple dwellings (approx 250 and over); multiple service buildings and zones e.g. churches and chapels, schools and colleges, leisure centres, sports clubs, pubs, commercial streets, fire stations; car parks; industrial estates.
- Highway settlement: linear or dispersed arrangement of dwellings along road; small in size (hamlet or village level); often located close to prominent cross roads on A and B roads.
- Terrace: linear arrangement of conjoined dwellings; shared alignment of frontage; only recorded when in isolation.
- Row: linear arrangement of conjoined dwellings; staggered alignment of frontage; only recorded when in isolation.

## **6.10 Horticulture**

### **Summary**

Horticulture HLC is dominated by the crops of flowers, fruit, nuts, vegetables, and ornamental garden plants grown on a commercial basis as a cash crop. These are areas of intensive land use, where infrastructure has also been built to maximise yield. Cornwall benefits from an early growing season due to the influence of the Gulf Stream. Commercial scale horticulture is largely a recent phenomenon, except in the Tamar Valley where the industry was already important by the late eighteenth century. The development of the railway network in the late nineteenth century allowed horticulture to further develop in parts of Cornwall, especially close to the main line. Since the end of the Second World War, however, foreign imports have ensured its decline.

### **Broad Type: Introduction**

Areas identified as Horticulture HLC are where the landscape is dominated by the crops of flowers, fruit, nuts, vegetables, and ornamental garden plants grown on a commercial basis as a cash crop. These are often areas of intensive land use, where infrastructure has also been built to maximise yield i.e. glasshouses and buildings where crops are started and buildings where the crops are processed.

Vegetable crops of swede/turnip (Swedish turnip) and potatoes are also grown by many farmers, particularly in west Cornwall but the crops can be grown within Enclosed Land without the permanent infrastructure of glasshouses and nursery beds.

Horticulture Broad Type is located in areas of Enclosed Land, often Medieval Enclosed Land, close to the temperate influence of the ocean or large tidal rivers, on south and east facing slopes sheltered from the south west and northwest winds. The land is usually sub-divided to aid the management of crops.

The Broad Type can be sub-divided on the basis of the dominant cash crops grown, and the corresponding differences in infrastructure to do so.

1. Orchard
2. Market Garden

In the past market garden crops were not recorded by Tithe surveyors and the OS using a map convention. A majority of this land would have been classified by HLC as Enclosed Land, most probably the Sub-Type, MD Altered (Sub-Divided). This is because Medieval Enclosed Land was often the most fertile ground and because market gardening often results in the intense subdivision of pre-existing fields. The HLC Type can be recorded in the c2011 time-slice because of the accompanying infrastructure of glasshouses and buildings (these being a late twentieth century development).

### **Principal historical processes**

Horticulture has been undertaken since the medieval period at least. Its scale depended on the wealth of the household, the plants grown to provide extra foodstuffs for the immediate household.

Small garden plots would be cultivated to provide vegetables and fruit. Most farming settlements and probably all larger houses had orchards situated close to dwelling houses, mainly for cider production but also to provide fruit for food; both grown for domestic consumption rather than on a commercial basis. Orchards for domestic use continued to be a feature of Enclosed Land until the early to mid twentieth century, when most apple trees were 'grubbed' out and the enclosures amalgamated into larger fields for cultivation or pasture.

Commercial-scale horticulture did not start until the eighteenth century with the growth of towns and an urban-based population. New crops were also introduced and by the late eighteenth century west Cornwall was already exporting potatoes by ship for sale in London.

Markets close by also developed. Southeast Cornwall benefitted from the growth of Plymouth as an important naval town, with market gardening and orchards a prominent feature of the Tamar Valley by the close of the eighteenth century. Here, the industry was so important to the economy that paper mills were built to supply the demand for wrapping produce.

As the railway networks grew in reach so did the market for fruit, vegetables and flowers. Cornwall was in a prime location; the benign influence of the Gulf Stream ensured an early growing season, giving Cornish producers a guaranteed market for their produce. As the wealth of the general population increased the market in flowers also developed and again Cornwall was an important producer due to its temperate climate.

In the late nineteenth century market gardening was growing in importance especially around the edge of the south coast close to Penzance. Here, people enclosed parcels of Coastal Rough Ground with tiny enclosures divided by drystone walls and terraced revetments. Hedges of tamarisk and privet were grown as wind breaks, the fields interconnected by meandering footpaths and networks of trackways. None are now in cultivation, and almost all have reverted to the coarse vegetation of Rough Ground.



The importance of commercial fruit growing in Cornwall has declined since the Second World War as it has become cheaper to import from abroad. Commercially run orchards are limited to the few businesses specialising in cider production but market gardening is still carried out in the Tamar valley, particularly around the settlement of Bohetherick.

### **Further reading**

There is currently no general synthesis of Cornwall's horticultural past.

### **HLC Types: Typical mapped components**

(Based on recurring features found on modern OS 1:10,000 map data)

- Orchard: regular arrangement of trees (there is an OS map convention for an orchard); small to medium sized, square or rectangular fields often created by the subdivision of existing Enclosed Land; predominantly straight boundaries for subdivision; small buildings to edge of fields; located in sheltered locations away from high ground; often close to a dwelling; occasional shelter belts of woodland.
- Market Garden: small to medium sized, square or rectangular fields often created by the subdivision of existing Enclosed Land; predominantly straight boundaries for subdivision; glasshouses and/or polytunnels; small buildings to edge of fields; often located in sheltered locations away from high ground; occasional large buildings for processing; occasional shelter belts of woodland.

## **6.11 Communications**

### **Summary**

Mass transportation links that are significant enough in scale to impact on HLC. The history and archaeology of the type is varied, but communications infrastructure, both large in scale and significant in visual and physical impact, developed largely in the twentieth century. Certain roads, however, date to the late medieval period at least, while airfields are the most recent development. Disused routes and areas which continue to have a significant impact on the landscape are also included. Due to its association with the movement of people and resources Communications HLC is found across all the study areas but in total forms a very small part of Cornwall.

### **Broad Type: Introduction**

Mass transportation links that are significant in scale to impact on HLC. This Broad Type has been divided into the following HLC types:

1. Major roads
2. Railways
3. Airfields (non-military: commercial and private)
4. Canals

### **Principal historical processes**

The communication infrastructure of Cornwall is largely needs driven, determined by a complex of factors including topography, settlement, industry, agriculture, economics, government policy, community pressure, the entrepreneurial action of landowners, individuals and businesses, and the need to reduce journey time and cost (adapted from Herring 2009).

In terms of HLC, mass transportation, large in scale and significant both in visual and physical impact, is largely a recent phenomenon, starting to a lesser degree in the eighteenth and nineteenth centuries, but increasing substantially in the late twentieth.

Roads have developed over centuries, with most of the main thoroughfares of Cornwall established by the late medieval period (the spinal A30, the A38 and A39). It is only since the 1950s that existing roads have undergone extensive enlargement and alteration, with the addition of by-passes and upgrading around most major towns and congestion-spots.

Numerous local railways were developed in the early nineteenth century to serve the needs of industry. It was not until 1859 and the opening of Brunel's Royal Albert Bridge over the Tamar that Cornwall was connected to the larger rail network. This linked large urban markets to Cornish industry and agriculture, changing the farming economy and greatly expanding the tourist industry. Further lines continued to be developed in to the early twentieth century but since the mid-twentieth century many have been closed.

Canals in Cornwall were developed from the mid-eighteenth century onwards to expand the distribution of resources for agricultural improvement. When compared to roads and railways they were often shorter in length and more limited in scale. By the mid-nineteenth century canals had been superseded by the rail transportation.

Small civilian airfields were first established in Cornwall prior to the Second World War (e.g. St Just and St Merryn in 1937). Many military airfields were created during or immediately after the War and one of these, St Mawgan developed into a significant joint military and civil airport, the latter now known as Newquay Airport (Herring 2009). Other civilian fields are simple landing strips, often grass. Airfields are often found on upland and coastal plateau where a level gradient over a large area can accommodate the need for a runway. The airfields originally developed for the military in Second World War, but are now civilian, favoured coastal locations, and often incorporated large areas of former rough ground (e.g. Perranporth).

### **Further reading**

Stengelhofen, JP, 1988. *Cornwall's Railway Heritage*. Twelveheads Press, Truro.

### **HLC Types: Typical mapped attributes**

(Based on recurring features found on modern OS 1:10,000 map data)

- Major roads: roadway; cuttings; embankments; roundabouts; fly-overs; underpasses; tunnels; slip roads; lay-bys; services.
- Railways: railway track; stations; large, medium and small buildings; cuttings; embankments; bridges, viaducts, tunnels; sidings; goods yards.
- Airfields: runway; taxi strips; hangars; large car parks; observation towers; terminal and ancillary buildings.
- Canals: channels; embankments; cuttings; inclines; tow paths.

## **6.12 Dunes**

### **Summary**

Dunes consist of successive ridges of blown sand and shell deposits with differing levels of vegetation cover. Near to their seaward side the dunes are often dominated by marram grass but further inland the dune systems change, giving way to mixed plant communities of grassland and trees. There is a long history of human interference, with successive phases of land use and abandonment. The date and history of dune development varies; available evidence suggests that the dune systems on the south Cornish coast are more recent than those on the north coast, although even these continued to develop well into post medieval times.

### **Broad Type: Introduction**

Dunes consist of successive ridges of blown sand and shell deposits. The HLC Broad Type covers large parts of the Cornish coast, and can extend inland a considerable way.

Vegetation is an important component of the HLC: marram grass, a specially adapted coarse grass, thrives on the seaward sides of dune complexes where other plants cannot. Further inland the dune systems change, giving way to mixed plant communities of permanent grassland and trees; and it is here the ground was once exploited as pasture for the grazing of livestock and occasionally rabbits. There is a long history of human interference, and in many areas, the relief and vegetation has been affected by past activity.

### **Principal historical processes**

(Adapted from Herring 2009)

There is still uncertainty concerning the date and rate of development but it is known that not all the dunes in Cornwall were created at the same time. Available evidence suggests that the dune systems on the south coast are more recent than many of the major systems on the north coast, although even these continued to develop well into post medieval times. For example, the medieval church of St Piran, Perranporth was swamped by encroaching sand in the nineteenth century.

An important historical feature of dune development is the succession of sand movement and stabilisation; a stabilised land surface may be used for pasture, cultivation and settlement before being sealed by a further sand blow, the surface of which may in due course become stabilised and again used. At Gwithian, archaeological excavation revealed successive buried land surfaces and human activity dating from the Early Bronze Age through to the medieval period.

In the medieval period many of dune systems were used as seasonal pasture grounds. In west Cornwall dunes are often called by their Cornish name, towans; prefixed with the settlement to which common rights were originally attached e.g. Gwithian towans. In the later periods, many were also used as rabbit warrens; the vegetation communities upon which they fed greatly affected by human activity and regarded as 'semi-natural'. Marram grass itself has been deliberately planted to aid stability in places, particularly where sand movement threatened property.

Many areas defined as Dunes Broad Type show further time-depth of human interference. Some contain ruined mines (especially on the vast Perran Sands) and others now abandoned industrial complexes, the most dramatic and extensive being the explosive works at Upton Towans, near Hayle. These have altered the natural landforms by providing stable and more permanent relief in an inherently mobile landscape.

In the twentieth century recreational caravan and chalet parks and golf courses have also spread on to the Dunes, considerably altering their character but not always dominating it (as at Hayle and Bude). At Penhale, Perranporth the dunes are used by the military and are out-of-bounds to the public.

### **Further reading**

There is currently no general historical synthesis of Cornwall's dunes.

### **HLC Types: Typical mapped components**

(Based on recurring features found on modern OS 1:10,000 map data)

- Dunes: large, open areas dominated by areas of bare sand and rough grassland; located on coastal margins.

## **6.13 Infrastructure**

### **Summary**

Twentieth century large-scale 'sub-urban' infrastructure located separately from settlements. It is associated with the management, dispersal and collection of power, waste and transportation at a large scale; the result of the increased size, needs and demands of the modern population. It is sub-divided on the basis of land use, the

differences often identified by annotation on modern 1:10,000 OS maps. The scale of each area can vary, and more recently, landscaping to reduce the visual impact of a development has become increasingly important.

### **Broad Type: Introduction**

This Broad Type was developed for the Lowland Cornwall project with the aim to better understand more recent landscape change; in particular the development of twentieth century large-scale 'sub-urban' infrastructure located separately from settlements. It is associated with the management, dispersal and collection of power, waste and transportation at a large-scale; the result of the size, needs and demands of the modern population.

Reservoirs are mapped in the Water Broad Type, and have earlier origins with a few developed in the late nineteenth century.

The Infrastructure Broad Type is sub-divided on the basis of land use, the differences identified by annotation on modern 1:10,000 OS maps. The scale of each area can vary, and in more recent development landscaping to reduce the visual impact has become increasingly important.

It has been sub-divided into the following HLC Types;

1. Car Park (out of town schemes)
2. Water/Sewage works
3. Electricity sub-station
4. Recycling station
5. Refuse tip (public and commercial)

### **Principal historical processes**

From the late twentieth century large-scale infrastructure has become a common feature of the landscape. The rise in its landscape prominence is linked to the increased use of technology, the rise in consumerism, and the continued trend in population growth (and pressure), all of which have required the better management of resources.

Refuse tips have the earliest history with many small scale tips operated in the past by individual town authorities. As the twentieth century progressed the amount of waste produced by people increased dramatically, due to the considerable rise in population, increase in consumption and product packaging. The management of rubbish has become centralised with large tips servicing whole districts, covering several large towns and a substantial population.

The same changes, linked with advances in technology, and combined with the need for centralised points of collection and redistribution, have created large scale water/sewage works and electricity sub-stations. Water/sewage works tend to have a more restricted location, most often positioned on, or the edge of, valley bottoms near to streams and rivers.

Recycling stations and car parks (out of town car parks) are a very recent landscape phenomenon in Cornwall. These have developed in the past twenty years with an increase in the awareness of environmental impact. Purpose built out of town car parks (park and ride schemes) focus on the main shopping centres and Truro has the only large scheme in Cornwall, though a new one is planned on the edge of the city, and others likely elsewhere.

Recycling centres, once rare, are now being built across Cornwall and with the reduction in land-fill capacity, are increasing in size and so can be mapped as part of c2011 HLC.

### **Further reading**

No general synthesis is currently available.

## **HLC Types: Typical mapped attributes**

(Based on recurring features found on modern OS 1:10,000 map data)

- Car Park: large open area; network of access roads; embankments and terraces; located on the edge of major towns near to A roads (as park and ride).
- Water/Sewage works: series of large circular and rectangular tanks; small ancillary buildings; trackways; occasional enclosing bank as part of landscaping works; enclosed by a single boundary, often straight; modern OS 1:10,000 map notes 'sewage works'.
- Electricity sub-station: square or rectangular in area; enclosed by a single boundary, often straight; modern OS 1:10,000 map notes 'El Sub Sta' and the line of several pylons converging on site.
- Recycling Station: open area; access and exit points; modern OS 1:10,000 map notes 'Recycling Centre'.
- Refuse tip (both public and commercial): large unenclosed area; trackways; access road; landscaping – embankments, shelter belts of woodland.

## **6.14 Water**

### **Summary**

Water HLC is where bodies of inland fresh water dominate in scale. In Cornwall, most are man-made features dating to the later twentieth century, with the HLC Types distinguished by their history and intended use. Those naturally formed also occur. These are most commonly located close to the coast, where bars have cut off former intertidal creeks from the sea. Dozmary Pool is the only large naturally-formed inland water body in Cornwall.

### **Broad Type: Introduction**

Water HLC is where bodies of inland fresh water dominate in scale. In Cornwall, most are man-made features dating to the later twentieth century, but those that were naturally formed also occur and are distinguished as a separate HLC Type. The date of the natural features varies; some were formed after the glacial period, but a majority of natural lakes next to the coast were formed by the separation from the sea in later periods, but at various times. The man-made are sub-divided based on size and use.

1. Reservoirs
2. Fish farm
3. Artificial Lake
4. Natural Lake

### **Principal historical processes**

Most water-bodies in Cornwall large enough to be recorded as Water HLC are man-made and date to the mid to late twentieth century.

Naturally formed features do occur but their date of origin varies. This is because most occur next to the coast, where a bar of shingle and sand has blocked a former creek from the sea; often after a storm event. The largest and only inland natural body of water is Dozmary Pool, the origin of which is thought to date to the early post-glacial period.

Large scale reservoirs were first developed in the early twentieth century as the urban population grew (College reservoir, Penryn) but a majority of the larger ones were developed in the late twentieth century, the most recent, Colliford on Bodmin Moor.

Fish farms and Artificial Lakes are far smaller in size with less of a visual impact on HLC than the reservoirs. They have a recent history, often developed by individual farmers or landowners either as part of business diversification (coarse fishing) or through agri-

environment schemes, which financially support the creation of small lakes to benefit wildlife.

Many of the larger Artificial Lakes are flooded extractive pits, abandoned from the late nineteenth century onwards. Several lakes near to large china clay pits that are still active in use are used temporary reservoirs to store water, which is pumped to processing works when required.

### **Further reading**

No general synthesis has been undertaken.

### **HLC Types: Typical mapped attributes**

(Based on recurring features found on modern OS 1:10,000 map data)

- Reservoirs: large, open areas of water (not closed reservoirs); dam; small ancillary buildings; often in upland locations.
- Fish farm: series of small ponds; ponds vary in size but usually regular in shape; valley bottom location.
- Artificial Lake: small to large in size; often irregular in shape; most frequently in valley bottom location; larger lakes associated with abandoned extraction pits.
- Natural Lake: medium to large in size, variable in shape; named on modern and historic maps, predominantly coastal locations.

## **6.15 Intertidal and mudflats**

### **Summary**

Intertidal and mudflats cover the area between Mean Low Water and Mean High Water, but can extend above and beyond them for a limited distance. Differences in water cover, vegetation, sediment type and the exposure of bedrock is the basis upon which the Broad Type can be sub-divided. It is created by the natural processes of marine inundation, erosion and deposition with a varied history dependent on location. Rates of erosion and deposition, however, have been altered by man's activities, leading to large areas of intertidal mudflats and salt marshes that have a more recent history. The HLC Types have been utilised for communication, extraction of raw materials (e.g. sand) and food production; a role in which some areas continue today.

### **Broad Type: Introduction**

The Intertidal and mudflats Broad Type covers the area between Mean Low Water and Mean High Water, and extends into those areas slightly above and beneath them.

This includes areas frequently inundated with seawater above mean high water due to the action of spring tides and/or exposure to swell, and the creeks of water (permanently below mean low water) that extend inland.

Differences in water cover, vegetation, sediment type and the exposure of bedrock is the basis upon which the following HLC Types are determined;

1. Intertidal mudflats
2. Salt marsh
3. Inshore water
4. Beach
5. Rocky foreshore

### **Principal historical processes**

The Intertidal and mudflats Broad Type has been created by the natural processes of marine inundation, erosion and deposition. Rates of erosion and deposition, however, have been increased and altered by man's activities, leading to large areas of intertidal mudflats and salt marshes that are recent in formation.

In the post-glacial period a rise in sea levels flooded the unglaciated steep valleys to form rias or inland coastal inlets of creeks and estuaries; for example, the Camel, Fal, Fowey and Tamar.

Further periods of sea-level change have occurred with many areas of low-lying land inundated further; probably in the Bronze Age and Iron Age periods. Areas of 'submerged forest' or former woodland and peat deposits survive in the intertidal zone in several areas of the Cornish coast, for example at Marazion and Long Rock.

Many of the beaches, and possibly many of the present sea-cliffs in areas of softer rock, perhaps date to the last major phase of sea level rise. In areas of hard rock, the cliffs could be older. In these areas the sea has cut large wave-cut platforms to leave areas of rocky foreshore and sections of foreshore dominated by looser rock debris/boulders (this has been mapped as part of Rocky foreshore HLC).

Beaches are formed where erosion and deposition has combined to deposit large volumes of small particles of sand, silt and small pebbles. The character of beaches can vary dramatically. Many in Cornwall are rich in the fragments of calcareous shells and have been used for hundreds of years to improve soil fertility. At Carlyon Bay, St Austell, however, the beach was artificially formed using quartz waste from china clay production.

There were once many more creeks, especially along the southern coast where several have now silted up completely, as at Seaton, Pentewan, Porthluney. The Cober was trapped as Loe Pool when the Bar was thrown up by storms in the medieval period (see Water HLC Broad Type).

The networks of creeks and inlets (Inshore water) offer naturally-sheltered harbours and transport networks that extended far inland. They were often the main thoroughfares for trade and movement of people from prehistory up until the late nineteenth century. The strategic importance of estuaries continues and many are still key harbours and ports; in the Second World War several formed main points of departure for the D-Day landings.

Inshore water once extended further inland, and settlements that were once important medieval, and probably late prehistoric, ports were left stranded by the silting up of the shallower creek heads. The River Fowey at Lostwithiel had silted up by the fourteenth century limiting trade considerably, the result of sediment washed down from tin-streaming activity on Bodmin Moor.