# CORNWALL, TAMAR VALLEY AND ISLES OF SCILLY

# AONB LANDSCAPE MONITORING PROJECT

# PHASE 1: PROJECT REPORT

For:
The Cornwall, Tamar Valley and Isles of Scilly AONB Partnerships

Prepared by:
Land Use Consultants

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## Acknowledgements

This study was led by Sally Parker and Lyndis Cole of Land Use Consultants. Much of the GIS data analysis undertaken for the baseline was undertaken by Faye Davey as part of her PhD at the University of Plymouth.

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In addition, we are grateful for the attendance by local stakeholders and community representatives at the workshops held to inform this study.

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# 1. INTRODUCTION

## AIMS AND OBJECTIVES OF THE PROJECT

1.1. Land Use Consultants (LUC) was commissioned in July 2007 by the Cornwall, Tamar Valley and Isles of Scilly AONB teams to undertake a study to enable an accurate assessment to be made of landscape change in the Areas of Outstanding Natural Beauty (AONBs). This study has three key objectives:

1. Develop a definitive set of indicators and condition criteria for each area of the three AONBs.
2. Put forward a method of data gathering and future monitoring.
3. Establish a firm baseline of information upon which future assessments of change can be made.

And ensure that the approach adopted is as cost effective as possible, recognising that the resources available to AONBs for monitoring will always be limited.

1.2. Fulfilling these objectives will contribute towards Cornwall AONB's Management Plan policy VL4, which aims to:

*'Monitor the state of the Cornwall AONB to identify where the erosion and enhancement of the quality of the AONB is taking place'*

1.3. This policy reflects the national desire for AONBs to select indicators to monitor change in landscape condition, as detailed in the Countryside Agency's 2001 guide to AONB Management Plans[1]. Further, the project links back to the Government's own commitment, outlined in the 2000 Rural White Paper, to establish programmes to monitor landscape change, including through the national Countryside Quality Counts (CQC) initiative. This project seeks to develop a method to assess landscape change at a more local level, taking into account the AONBs' local distinctiveness and using local data to monitor changes.

## THE AONBs

1.4. The Cornwall and Isles of Scilly AONBs are different from most other AONBs in England in that they are not formed of one contiguous area but rather of a series of discrete and separate areas. In the case of Cornwall, the AONB is made up of 12 areas including Bodmin Moor and localities along both the north and south coasts, whereas the Isles of Scilly are formed of an archipelago of islands including the five main inhabited islands and numerous uninhabited islands. The Tamar Valley AONB is formed around two sides of an estuary and its inland river, also straddling both the counties of Cornwall and Devon. See **Figure 2**.

[1] The guide sates that *'Monitoring condition is about assessing changes over time…it will necessarily be selective, concentrating on particular features of interest. These may be indicators selected to provide a meaningful measure of AONB quality….'* (p64)

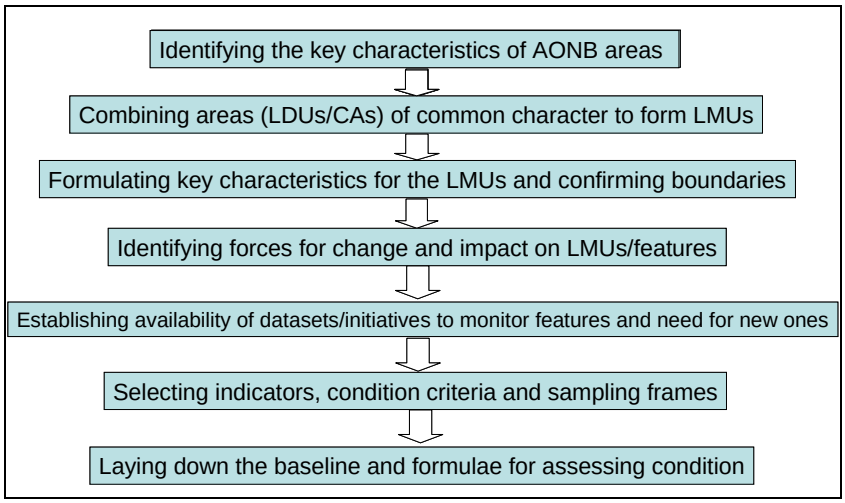
## APPROACH

1.5. Central to this study is the identification of the **landscape condition** of the different areas of the AONBs and, as in the case of CQC, to assess whether this condition is improving, remaining static, or declining over time. It requires (in summary):

- The *identification of areas of common character* (Landscape Monitoring Units) for monitoring landscape condition and its change over time (as described below) and *identification of the key characteristics* that define the character of each Landscape Monitoring Unit (LMU).
- The *identification of landscape indicators for each identified LMU* that capture the character of the landscape and, if measured over time, will help identify any changes in landscape condition. In part the identification of these indicators needs to be driven by:
    - their ability to reflect the key characteristics of that particular landscape;
    - whether that element of the landscape is likely to be subject to change (reflecting the future forces for change acting on the landscape); and
    - whether data is available to measure changes in that indicator – in other words it will always be more expensive to undertake primary data collection.
- The *identification of landscape condition criteria for each LMU.* These set out the desired trajectory of change of the individual indicators if landscape character is to be conserved and enhanced.
- The *identification of a transparent formula to identify the landscape condition of the individual LMUs, AONB areas and AONB as a whole.* This formula (or scoring system) is unique to each LMU, reflecting its underlying landscape character. It will be used by the AONBs to monitor the selected indicators against the results gathered for the baseline, to give an overall impression of landscape condition and change over time at the three different scales.
- *The establishment of monitoring protocols* which will enable a consistent approach to be taken by the AONBs for landscape monitoring over the years; to produce an accurate assessment of landscape change over time.

1.6. This approach underlines the importance of selecting the right landscape areas for monitoring and the right indicators to be able to monitor landscape change. The diagram at **Figure 2** illustrates the main stages of the AONB landscape monitoring project.

**Figure 1: Summary diagram of the project's key stages**




## PURPOSE AND FORMAT OF THIS REPORT

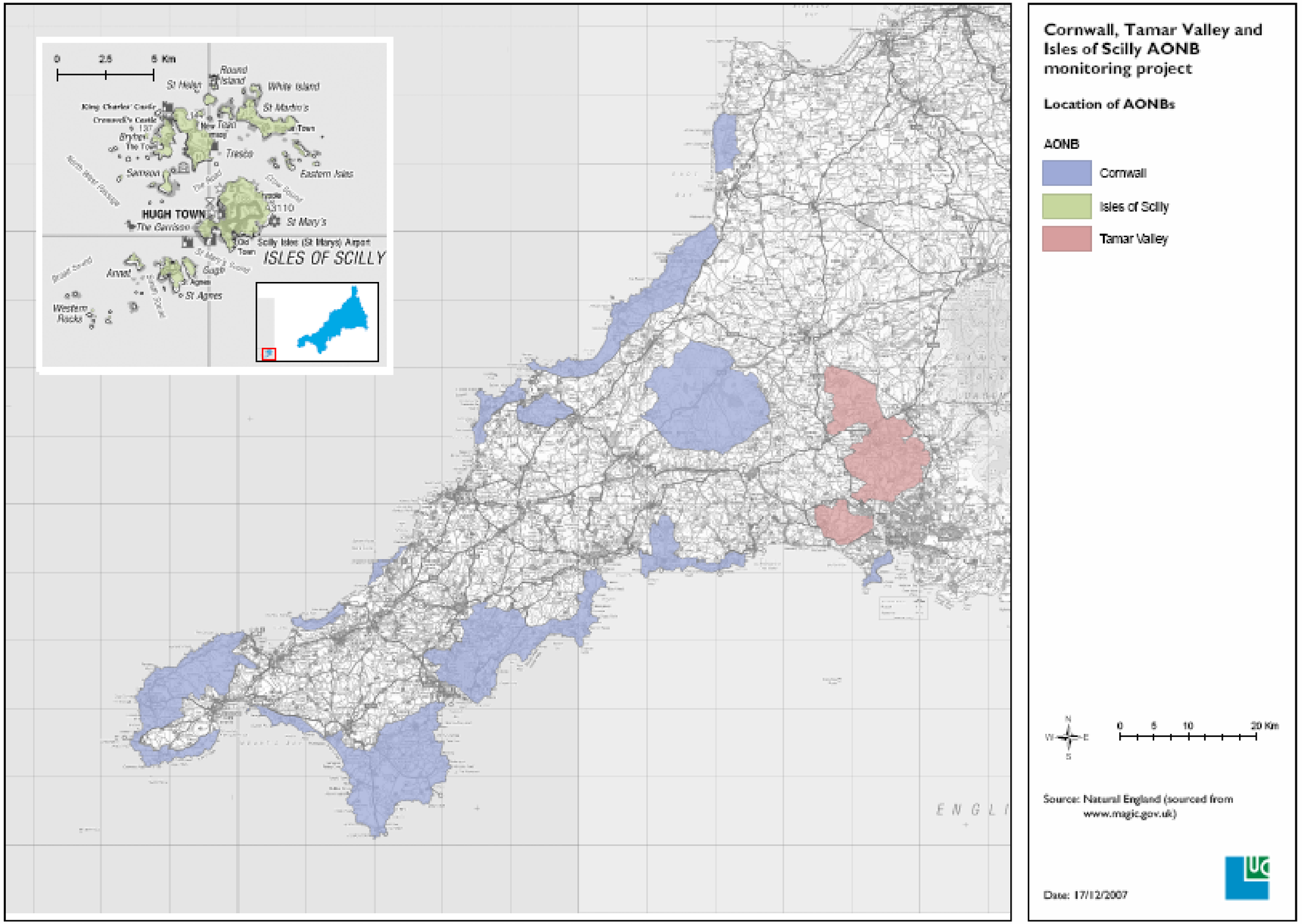
1.7. This report sets out the methodology adopted for the AONB monitoring project based on the work undertaken for the Cornwall, Tamar Valley and Isles of Scilly AONBs. It is intended for this report to be able to be used by other protected landscapes to draw on and adapt for their own landscape monitoring projects. It is split into 5 further sections:

- **Section 2:** describes the need for and method followed to establish Landscape Monitoring Units (LMUs)
- **Section 3:** presents a review of the forces for change prevalent in the AONB landscapes, and how this was used to influence the choice of indicators.
- **Section 4:** outlines the methodology developed to select monitoring indicators.
- **Section 5:** Describes the method developed for monitoring landscape condition and change over time.
- **Section 6:** summarises how the AONBs should use this methodology to carry forward into an ongoing landscape monitoring programme.

1.8. This report is accompanied by four supporting documents:

- **Monitoring guidelines report** – which sets out the monitoring protocols developed for the baseline and future data collection, including for those indicators which will rely on primary data collection through field survey work to lay down the baseline.
- **Baseline results report** – one report for **each** AONB (total three reports) which set out the baseline data results and establish a scoring system to be used to monitor and assess landscape condition. These should be used in conjunction with an ArcReader project that contains all of the mapped information for spatial analysis.

**Figure 2: Location of the Cornwall, Tamar Valley and Isles of Scilly Areas of Outstanding Natural Beauty (AONBs)**



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# 2. DEFINING UNITS TO MEASURE FUTURE LANDSCAPE CHANGE

2.1. This Section summarises the method adopted to identify Landscape Monitoring Units for the AONB landscape monitoring project.

## NEED FOR NEW 'LANDSCAPE MONITORING UNITS' (LMUs)

2.2. The project brief required the consultants to use the 2006 *Living Landscapes Project*, which identified Character Areas (CAs) and Landscape Description Units (LDUs) across the county of Cornwall, to form the basis of the AONB landscape monitoring project. It was apparent early on that the boundaries of the CAs and LDUs would not be able to be used themselves as spatial units to monitor landscape change. The main reasons for this were twofold:

- The county CA/LDU boundaries do not correspond to the boundaries of the AONBs.
- Levels of division are either too many (LDUs) or too few (Character Areas) for monitoring purposes.

2.3. In addition, the Devon side of the Tamar Valley AONB has not been formally characterised, with the equivalent work carried out by Devon County Council yet to be field tested and confirmed.

## METHOD ADOPTED FOR DEFINING LMUs

2.4. Because of the issues highlighted above, separate Landscape Monitoring Units (LMUs) have been identified that are made up of one, or more commonly, a collection of CAs and LDUs. The approach adopted for the identification of LMUs was as follows:

### Identifying key characteristics for the different AONB areas

2.5. The first task was to draw up a set of key characteristics for the different areas of the AONBs, based largely on the divisions used in the AONB assessments (Cornwall AONB, 1997; Tamar Valley AONB, 1992; Isles of Scilly AONB, 2002). These were supplemented by information contained in the descriptions for the *Living Landscapes* project, along with discussions with the AONBs themselves, to ensure information contained in the key characteristics was accurate.

2.6. The purpose of this task was to begin to be able to identify areas within the AONBs of common character, as well as elements within them that will need to follow the same 'trajectory of change' if the overall landscape condition is to be maintained or enhanced.

## Establishing the boundaries of LMUs

2.7. The boundaries of the LDUs defined by the *Living Landscapes* project formed the framework for establishing the boundaries of the LMUs. Taking the key characteristics drawn up for the different AONB areas, the criteria used to define LMUs was as follows:

- The boundaries of LMUs should follow the boundaries of LDUs identified in the most recent landscape character assessments of the counties[2] (the *Living Landscapes* boundaries). This ensures that the monitoring programme fits with all other uses of the most up-to-date landscape assessments.
- Each LMU should be made up of one or a collection of LDUs or Landscape Character Areas that share the same key characteristics / elements that have the potential to be subject to change but they may not share the same key characteristics / elements that are not subject to change. For example, if two LDUs share the same key characteristics except for elevation and geology (which will not be subject to change) then they are considered as one LMU. This reflects that LMUs have been established simply and only to provide a framework for monitoring landscape change.

  **Figure 3** provides an example of how Bodmin Moor has been divided into two LMUs from a total of seven CAs and 20 LDUs that lie wholly or partly within this AONB area.
- The LDUs / Character Areas that make up the same LMU should have the same desired trajectory of change for all landscape characteristics / elements subject to change. For example, they should share the same aspiration for future field pattern. Conversely they should form separate LMUs if the desired direction of travel is different for different landscape elements.
- LDUs / Character Areas should form separate LMUs if their baseline condition score is likely to be very different. An example would be two LDUs with similar landscape characteristics but where one has experienced significant urban intrusion and the other has not (e.g. the two sides of the Fal ria are an example of this situation, which have been divided into two LMUs).
- An LMU may be made up of LDUs / Character Areas that do not lie adjacent to each other (i.e. following the 'landscape type' approach). This may be because separate parts of a single LDU cross into different AONB areas or that separate LDUs in different areas have sufficiently similar character to be considered as a single LMU (however the aim should always be to try and group LDUs as far as this is meaningful to keep the overall monitoring simple and cost effective).

2.8. Throughout the aim has been to minimise the total number of LMUs without compromising the monitoring of changes in landscape condition. Clearly, even within one LDU, there will be a range of key characteristics with, say, open plateau tops contrasting with deeply incised wooded valleys. So long as the location of these different characteristics can be described in words, they can and should form part of

[2] The Devon side of the Tamar Valley AONB used the draft LDU boundaries defined by Devon County Council, which may need to be revisited if any major changes occur following field testing.

the same LMU in that it is this very contrast between these different characteristics that creates the distinctive landscape character of different localities.

2.9. By taking this approach, a total of 23 LMUs have been defined for Cornwall AONB; six for Tamar Valley AONB; and five for the Isles of Scilly (see **Figure 4**). These were discussed and further refined following a meeting with the AONB project leads in September 2007.

2.10. A key reason why the LMU approach was adopted in this study was that many of the LDU boundaries crossed the AONB boundaries. In other AONBs which have their own landscape character assessment this should not be an issue, although where the landscape assessment identifies LDUs, there may be a case for either:

- As in this study, amalgamating some LDUs to create LMUs; or
- Using sample LDUs as 'sample areas' of what is happening in the wider AONB landscape. This was not adopted in this study as the identified LMUs were considered to be sufficiently different to warrant monitoring in their own right.

2.11. Alternatively, where an AONB landscape character assessment is based on Landscape Character Areas or Types, there is no reason why these should not be used as the basic unit for monitoring, always with reference to their key characteristics.

## IDENTIFYING THE KEY CHARACTERISTICS FOR INDIVIDUAL LMUs

2.12. Following the confirmation of the LMU boundaries, the key characteristics drawn up for the AONB areas were refined to apply to the individual LMUs. This was undertaken in consultation with the AONB units and through taking information from the *Living Landscapes* descriptions. The resulting character statements form the basis of the selection of indicators for each of the LMUs (see Part B of this report). The key characteristics formed statements on the following aspects of landscape character:

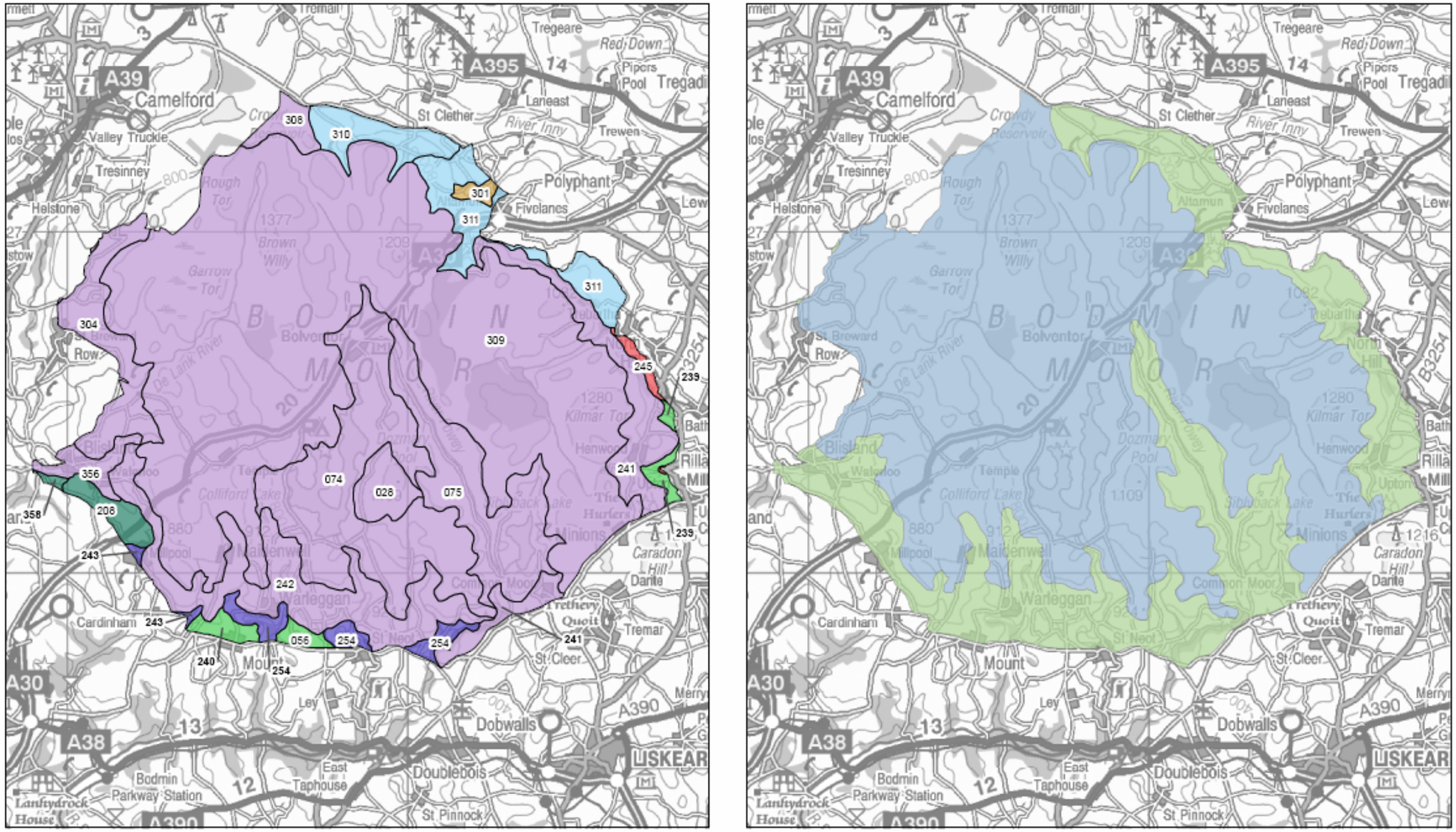
- Landform, watercourses and coastal features
- Views
- Tree/woodland cover
- Semi-natural habitats
- Field pattern and field boundary type(s)
- Agricultural land use
- Historic environment
- Settlement pattern
- Local vernacular styles/materials
- Transport pattern
- Other land uses including tourism/recreation/urban developments

2.13. Each key characteristic comprised a statement which included a number of landscape **elements** which could be subject to landscape monitoring. For example, the following is the key characteristic for semi natural habitats in the St Agnes LMU (Cornwall AONB):

*'Extensive areas of **coastal heathland**, subject to severe wind pruning. **Calcareous wind-blown sand** on some slopes giving rise to lime-loving grasses and flowers. **Small pools** associated with former mining areas are valued habitats'.*

2.14. The coloured text shows that within this key characteristic there are three different landscape **elements** that could potentially be monitored. These elements therefore form the starting point for identifying landscape indicators.

**Figure 3: Example of defining Landscape Monitoring Units for the Bodmin Moor area of Cornwall AONB**




**Bodmin Moor as an example of the derivation of LMUs**

Character Areas

CA21 CA26 CA33

CA22 CA29

CA25 CA32

Landscape Description Units

LMUs

C4

C5

Date: 19/12/2007

Source: Cornwall County Council and Land Use Consultants

0 1.25 2.5 5 Km



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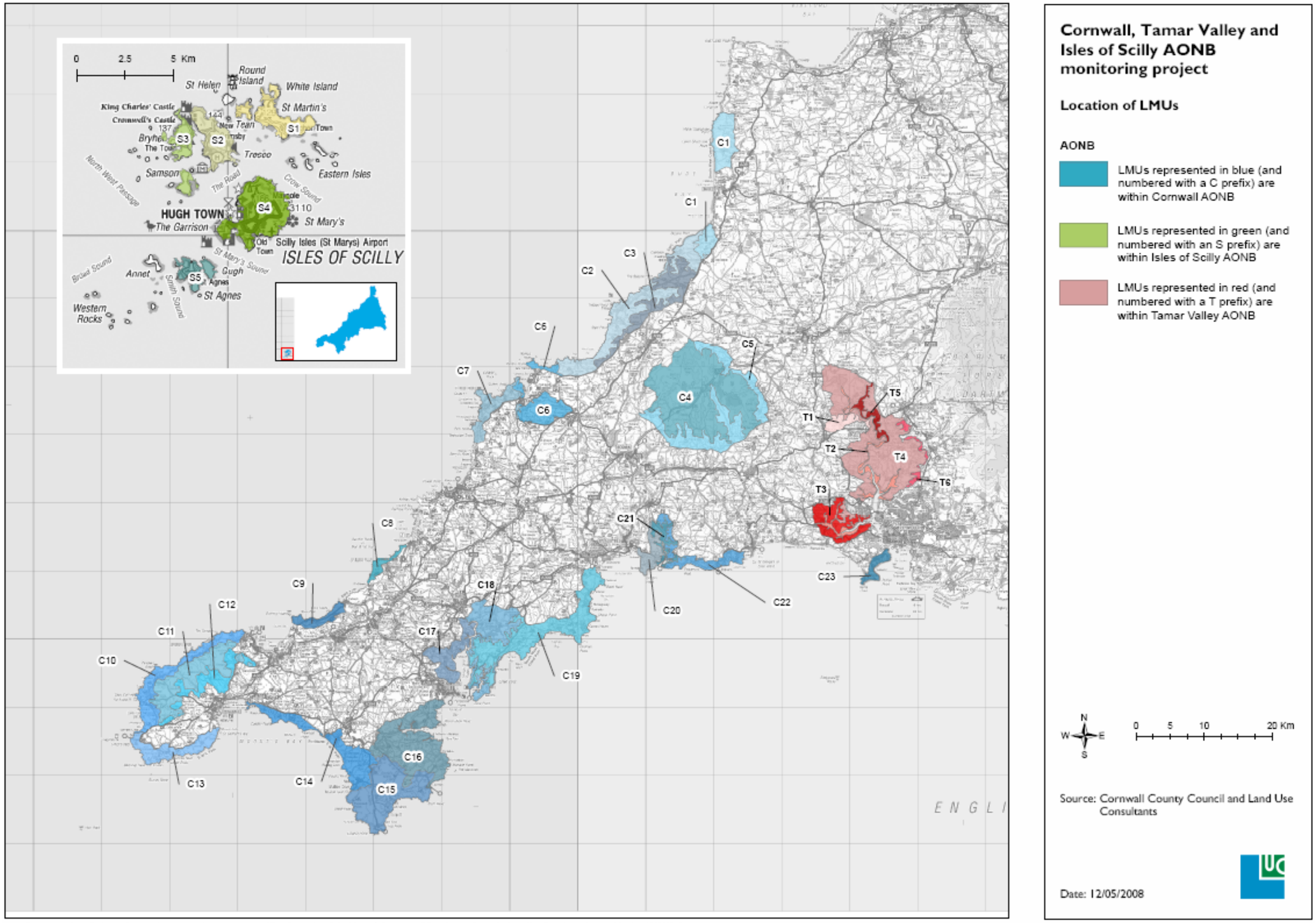
**Figure 4: Division of the three AONBs into Landscape Monitoring Units (LMUs)**



# 3. IDENTIFYING LIKELY FORCES FOR CHANGE IMPACTING ON THE AONBs

3.1. This section has drawn on key literature and research to identify the main forces for change either known to be acting on the AONB landscapes currently or in the recent past, or likely to be an issue in the future. Although this review focused specifically on the forces for change of relevance to the three AONBs this study is concerned with, many that are 'universal' and likely to be of equal relevance to other protected landscapes.

## 'HEADLINE FORCES' IMPACTING ON THE AONBS

3.2. A brief literature review was undertaken of research available both nationally and regionally to identify the main 'headline' forces for change likely to impact on the AONB landscapes. This review included reference to the forces for change identified by LUC and the Universities of Sheffield, East Anglia and Reading in the study of *Future Landscapes*[3] for Natural England (former Countryside Agency) in 2006.

3.3. The main forces for change identified that could influence the choice of monitoring indicators in this study, are as follows:

### Climate change

3.4. The impacts of a changing climate are likely to be a major driver of future change in the landscapes of the AONBs. To combat the causes of climate change there is increasing consensus that we will need to reduce carbon emissions by adopting appropriate mitigation measures. At the same time we will also need to implement adaptive measures to respond to the effects of climate change.

3.5. The Government announced at the end of 2007 that the UK's target to reduce carbon emissions will be increased to achieve up to an 80% reduction in carbon dioxide emissions by 2050. The EU is also pushing for a 25-40% reduction in carbon dioxide below 1990 levels by 2020 in industrialised countries. This has recently been debated at the Climate Change Conference in Bali.

3.6. Currently, agriculture contributes 0.7% of GDP in Great Britain but is the source of 7-8% of greenhouse gas emissions. Along with all other sectors of the economy agriculture will need to reduce emissions of greenhouse gases.

3.7. UKCIP climate change scenarios predict that average daily temperatures in the South West will rise by 2 degrees (low emissions scenario) or 3 degrees (high emissions scenario) by 2050. Summer precipitation levels may decline by 30%, whilst winter precipitation levels may increase by 15% (UKCIP02 Climate Change Scenarios).

[3] Land Use Consultants, University of Sheffield, University of Reading and University of East Anglia (2006) *The Future Character and Function of England's Landscapes: A literature review and commentary on research projects investigating future scenarios for England.* For the Countryside Agency, Cheltenham.

3.8. The number of people in England at high risk from river and coastal flooding could increase from 1.6 million today, to between 2.3 and 3.6 million by the 2080s.

***Key impacts:***

3.9. As a result of climate change and mitigation and adaptive measures key impacts on the landscape may include:

- **Sea level rise and increased storms** means there will be a need to improve coastal defence works to reduce cliff erosion which may also include loss of historic features along the coast (South West Climate Change Impacts Partnership (SWCCIP), 2003). Threats from coastal erosion are predicted to be 'low' in much of Cornwall in the 2080s, although Mounts Bay is predicted to be under 'moderate' risk under a high emissions scenario (Office of Science and Technology, 2004). The Isles of Scilly, which have already experienced flooding events within living memory due to their low lying nature, are particularly susceptible to any increases in sea level rise.
- **Coastal squeeze** means that natural assets in the coastal zone may be lost, such as wetlands, mudflats, saltmarshes, beaches and sand dunes. The flora and fauna associated with these will also be affected (SWCCIP, 2003). Coastal grazing marsh will be the most threatened habitat (Office of Science and Technology, 2004).
- **Increased frequency of flooding.** UKCIP predicts that the north Cornwall coast and Land's End Peninsula will have a 10-15% chance of river flooding in any one year by the 2080s. Amelioration measures are likely to take three forms: (a) slowing the rate of runoff within catchments (e.g. through increased planting and reduced soil compaction)l (b) holding water back in upper catchments (e.g. through controlled flooding or creation of water-holding areas); and (c) engineered flood defence works in the lower catchments.
- **Increased frequency of drought** conditions as summer precipitation levels fall (UKCIP), mean that the need for water management will increase, with more reservoirs and other water storage options.
- **Better management of semi-natural habitats** will be required to respond to climate change. This should include (a) the sensitive management of peat bogs to maximise carbon storage and sequestration; (b) new tree planting for carbon sequestration (away from peat bogs); and (c) the extending / relinking of habitats to increase resilience to climate change.

## Development pressure / lifestyle changes

3.10. Development is set to increase in the South West. In particular:

- **Housing and other development pressure** are likely to be a significant driver for change in parts of the AONBs. The South West Regional Plan sets out housing provision figures up to 2026. Plymouth, Camborne-Pool-Redruth (with 300 new dwellings per year), Falmouth-Penryn (with an average of 140 new dwellings per year) and Truro (with an average of 250 new dwellings per year

including through an urban extension) are identified as Strategically Significant Cities and Towns (SSCTs). They are identified as playing a critical role in delivering development in the period to 2026. The 'associated towns' of Penzance, Newquay and St Austell are also identified as the location for future development. Extensions to the urban areas of St Austell (could impact on Fowey to the east and Roseland to the south-west), Plymouth (could impact on the Tamar Valley in the north and east) and Falmouth (could impact on the Fal ria and Helford River).

- **Need for affordable homes** is being driven by the increasing number of second homes/holiday lets and the rapid increase in house prices, with this being an issue in many parts of the AONBs, and in particular the Isles of Scilly. Whilst clearly desirable, an increase in the affordable housing stock could impact on the character of rural settlements if not implemented with sensitivity.
- **Tourism pressures** are likely to be significant in many parts of the AONBs especially in coastal areas – lifestyle changes and impacts of climate change may lead to a very significant growth in home tourism. Demand for new tourism complexes/exclusive gated resorts and related facilities may be a notable consequence. An expansion in the number and size of caravan sites, and the increased permanence of holiday sites (with static caravans and chalets), is an issue of concern particularly for Cornwall AONB.
- **Sustainable design of new development** should emerge as a response to climate change potentially including micro-power generation, grey water usage, rainwater harvesting and so on, While this is to be welcomed careful design will be required to ensure that these responses do not detract from the traditional character of many settlements, indeed if well executed it could bring positive improvements to new development.
- **Increased light pollution** from road infrastructure developments and adjacent urban centres – *CPRE Night Blight, Intrusion Mapping* – could be a consequence of increased development pressure.
- The continued **lotting up of agricultural holdings** at sale to provide lifestyle holdings and associated pony paddocks may, in some parts of the AONBs, detract from the strongly agricultural character of the landscape (CA, 2006 Future Landscapes).

### Renewable energy developments

3.11. Policy is placing increasing emphesis on renewable energy generation as one response to climate change. This is likely to be a significant driver for change with:

- **Pressure for wind farm developments** both inland and off-shore. The South West renewable energy targets for 2010 are for 66% of renewable energy in Cornwall to come from onshore wind. Offshore renewables (wind and tidal) are also identified as having key potential to meet both national and regional targets. 20% or more of the region's energy is targeted to come from renewable sources by 2020 (South West Regional Assembly, Draft Regional Spatial Strategy).
- **Biomass and bioenergy crops** (see below under 'Agriculture and Forestry').

- **Permitted development for domestic micro-generation.** The Government is proposing to change permitted development rights for micro – generation outlined in the consultation paper *Changes to Permitted Development - Consultation Paper 1: Permitted Development Rights for Householder Microgeneration* (April 2007). This is likely to have an impact on local vernacular buildings and be a force for incremental change in the character of the built environment.

## Agriculture and forestry

3.12. Changes in agriculture and forestry are likely as a consequence of the combined effects of climate change, reforms of the Common Agricultural Policy and changing national policy.

***Agriculture***

- **Increased proportion of land planted for bioenergy/biomass.** There are predictions that biomass crops could cover 20% of the current farmed area in England by 2040 (Countryside Agency, 2006) although there is also a view that increasing emphasis will need to be focused on food production in the face of increasing world food shortages. A study by Scott Wilson (2004) identified 'opportunity' areas for miscanthus growing in Cornwall, including Hartland, the Helford and Fal areas, the Roseland Peninsular and the Tamar Valley.
- **Higher carbon dioxide levels and a longer growing season** will enhance growth of some crops and offer the potential for growing new crops such as sunflower, navy beans, sweetcorn, grapes and bio-fuels including vegetable oils. (SWCCIP, 2003). On the other hand, increases in productivity from a longer growing season may be offset by summer drought.
- **Expansion in horticulture** may result from pressure for reduced food miles, increasingly favourable conditions for many horticultural crops (such as vineyards) and revival in interest in orchard crops, especially cider (with the increasing popularity of cider and related products). These forces could lead to an increase in traditional horticulture (which would be good news for the Isles of Scilly, which has suffered a sharp decline in the industry over the last decade), although the more likely trend will be an increase in industrial scale activities with an associated growth in polytunnels and glass houses (as currently being experienced in the Tamar Valley).
- **Livestock farming changes.** With CAP reforms there may be a reduction in livestock numbers, with reduced grazing intensity in the uplands. Marginal land of high conservation value could suffer from a lack of graziers (Countryside Agency, 2006).
- **Abandonment of agricultural land** could result from CAP reforms although the increasing view is that we may see agricultural abandonment of land in the uplands (and probably continuing in the Isles of Scilly) due to a decline in livestock farming, whilst lowland areas will see more intensive production, responding to food shortages and potential development of energy crops as outlined above. Nevertheless, in upland areas such as Bodmin Moor, new management priorities may emerge in terms of carbon sequestration and water resource management.

- **Push for reduced greenhouse gas emissions** from agriculture to meet national targets may change dietary habits with a shift towards foods associated with lower greenhouse gas emissions during production. This may include a reduction in the number of cattle.
- **Farm diversification** is likely to continue with the pressure for amenity holdings. Diversification could have either positive or negative impacts depending on the nature of any developments. Some diversification activity could encourage sustainable land management practices to support tourism, whilst others could involve the unsympathetic development of traditional farm buildings, as already experienced in the AONBs (Countryside Agency, 2006).

### *Woodlands and forestry*

- **Forestry and woodland management responding to climate change** may result in the choice of different species types/provenance for increased productivity. For example, the Forestry Commission predicts the increased use of Douglas Fir in Cornwall.
- **Planting and extending** ancient/semi-natural woodlands will potentially need to use species of a different provenance to build in adaptability to climate change. (Forestry Commission, 2006).
- **Increased planting of floodplain** forestry (for example, using short rotation coppice species such as willow) may be a suitable adaptation response for frequently flooded agricultural land (SWCCIP, 2003).
- **Higher carbon dioxide concentrations** could increase growth rates and productivity of woodlands (SWCCIP, 2003).

## The Water Framework Directive

3.13. Finally, the Water Framework Directive and the increasing fragility of water reources in the face of climate change, mean that land management will need to be sensitive to effects on the quality and quantity of fresh water resources:

- **Reduced intensity of agriculture.** Some have predicted that implementation of the Water Framework Directive will require that large areas will need to be given over to extensive agriculture to meet water quality targets. However, this is being countered by the overall impacts of climate change on future land use and land management and potentially the increasing pressure that will be placed on land.
- **Measures to control diffuse pollution.** The more likely effects of the Water Framework Directive will be the implementation of land management techniques, such as the use of buffer strips, planting next to watercourses, and contour ploughing, for example, as an integral part of all land management activities.

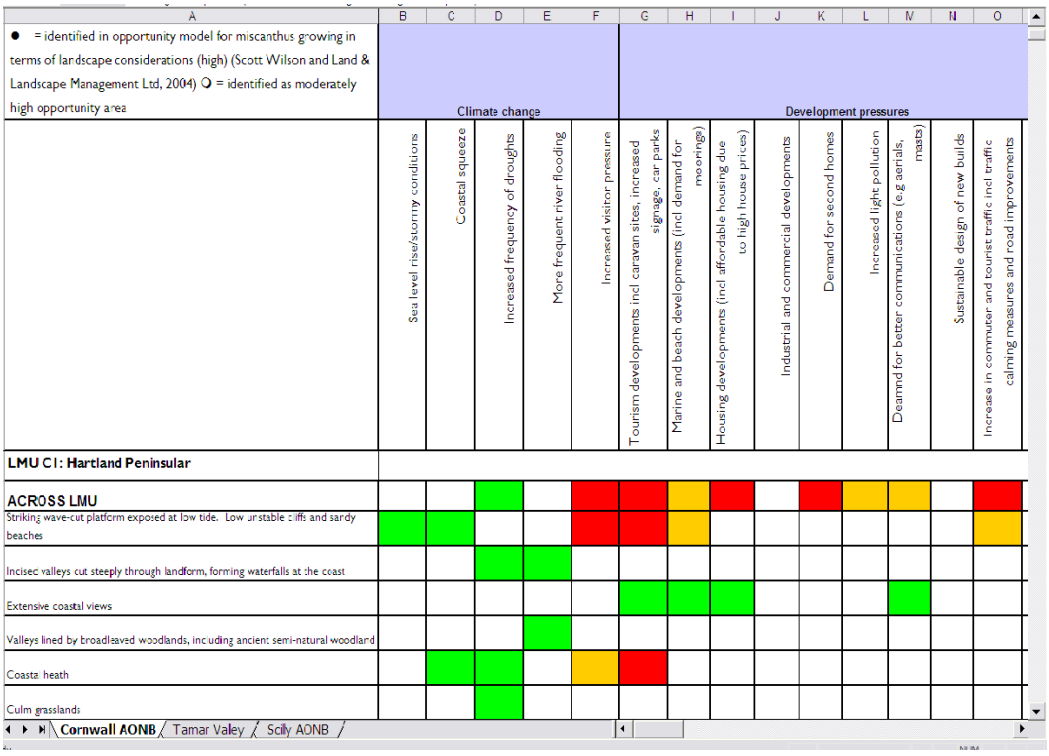
## USING FORCES FOR CHANGE TO INFLUENCE THE CHOICE OF LANDSCAPE INDICATORS

3.14. Having identified the above forces for change, a matrix was developed to look at how the different forces may impact on the landscape elements identified in the LMUs. This matrix also drew on the forces acting on the landscape identified in the *Living Landscapes* project and previous AONB landscape assessments. As illustrated below, this matrix used a 'traffic light' approach to identify where impacts of forces for change:

- were imminent or already happening (red)
- likely to happen in the next decade (amber)
- were likely to cause more long-term changes (green)

3.15. A screenshot of this matrix is shown in **Figure 5** below.

**Figure 5: Screenshot of the matrix illustrating the timescale of forces for change impacting on LMUs and their features**




3.16. The matrix was used to identify which landscape elements are likely to be subject to the most change. Therefore this helped to prioritise indicators within a draft list for consultation (see the next Section).

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# 4. SELECTING MONITORING INDICATORS

## DEFINITION

4.1. **Landscape indicators** can be defined as:

*'elements of data that are collected during a monitoring programme to focus the monitoring activity and measure landscape change'*

4.2. As such they must clearly reflect the variations in character and local distinctiveness found across the landscape(s) in question.

## METHOD OF SELECTION

### Guidelines followed

4.3. The selection of indicators for each of the LMUs has been based on the following guidelines:

- Indicators are based on landscape elements that are or could be subject to future change (building on the identification of likely forces for change and their impacts on the LMUs as described in the previous section)
- Chosen indicators should strongly reflect the local distinctiveness of each LMU and the elements of key importance within it, as identified in the key characteristics.
- The combination of indicators selected for each LMU should together provide a thorough reflection of its landscape character and therefore be able to be used collectively to monitor overall landscape condition.
- Indicators should be able to be measured, ideally, through existing monitoring programmes and data sources or, where this is not possible, through surveys able to be carried out by students or members of the local community.

### Establishing three levels of indicator

4.4. In following the above guidelines established for this project, three levels of indicator have been established for the AONBs:

**Level 1:** Universal Indicators. These are indicators automatically measured across the AONBs, where relevant, using data already easily available e.g. tranquillity, SSSI condition.

**Level 2:** Consistent Indicators. These are indicators of key importance to the character of all or most of the AONBs. Even though the same indicators are used throughout, their 'direction of travel' may vary depending on the LMU in question e.g. nature of field pattern and woodland cover.

**Level 3:** Tailored Indicators. These are indicators that are specific to one or a few LMUs based on local landscape character, for example to measure the extent and condition of designed landscapes (see **Figure 5**).

### Shortlisting the indicators

4.5. Three key guidelines were followed in the selection of indicators for landscape monitoring:

- The central focus on landscape condition.
- The ease with which data can be obtained (as already noted, Level 1 indicators draw on nationally available datasets).
- The forces for change acting on the LMUs and the scale of their likely landscape impacts.

4.6. Two stakeholder workshops were held in January 2008 (one for the Cornwall and Tamar Valley AONBs, and a second for the Isles of Scilly AONB) to use the knowledge of local partners and community representatives to inform the final selection of indicators. Workshop participants were asked to rank the importance of a draft list of 30 indicators, drawn up by the consultants in partnership with the AONBs.

4.7. A total of 25 indicators were short-listed through the workshop exercises. They are as follows:

***Level 1 indicators***

1.1: Levels of tranquillity
1.2: Levels of intrusion (include pylons, windfarms, road traffic)
1.3: Extent of dark night skies
1.4: Coastal change (due to climate change, including coastal defence works)
1.5: Condition of SSSIs

***Level 2 indicators***

2.1: Extent of woodland and tree cover / type
2.2: Agricultural land use: extent of pasture and arable
2.3: Extent of biomass planting
2.4: Field patterns
2.5: Extent of semi-natural habitats
2.6: Presence [and condition] of historic landscape features
2.7: Settlement pattern
2.8: Transport infrastructure
2.9: Local vernacular building styles
2.10: Development at sea (e.g. aquaculture, other off-shore developments)

***Level 3 indicators***

3.1: Extent of covered horticultural production
3.2: Extent of traditional orchards
3.3: Presence of traditional livestock types
3.4: Field boundary condition and species

3.5: Extent [and condition] of designed landscapes
3.6: Extent of bare mining spoil
3.7: Presence of navigation marks (day marks and lighthouses)
3.8: Levels of fishing industry activity
3.9: Number of moorings
3.10: Presence of local car and passenger ferries

4.8. The matrix at **Figure 6** shows which indicators have been selected for the individual LMUs. This clearly shows that there is much variation between the LMUs in terms of both the number and level of indicators selected. This reflects that some of the LMUs contain a diverse range of elements that when taken together contribute towards their special landscape character (such as the Isles of Scilly), whilst others may be characterised by a smaller number of distinctive elements (e.g. the mining heritage area of the Tamar Valley(T5)).

4.9. Although the number of selected indicators for each LMU is far greater than was anticipated at the outset of the project, the AONB teams felt that it was important not to narrow the selection down further. This decision was twofold: 1) to allow the AONBs to make the choices themselves in terms of the indicators selected for future monitoring, dependent on the time and resources available to them (which is as yet unknown); 2) the fact that some of the selected indicators, particularly at Level 1, could be relatively simple to monitor through available data, whilst resources can be directed at other indicators requiring more effort for data collection (e.g. through field survey).

4.10. The results of the workshops, and the exercises undertaken to inform the shortlist are detailed in **Appendix 1**.

**Figure 5: Level 3 indicator selected to monitor the extent and condition of designed landscapes**

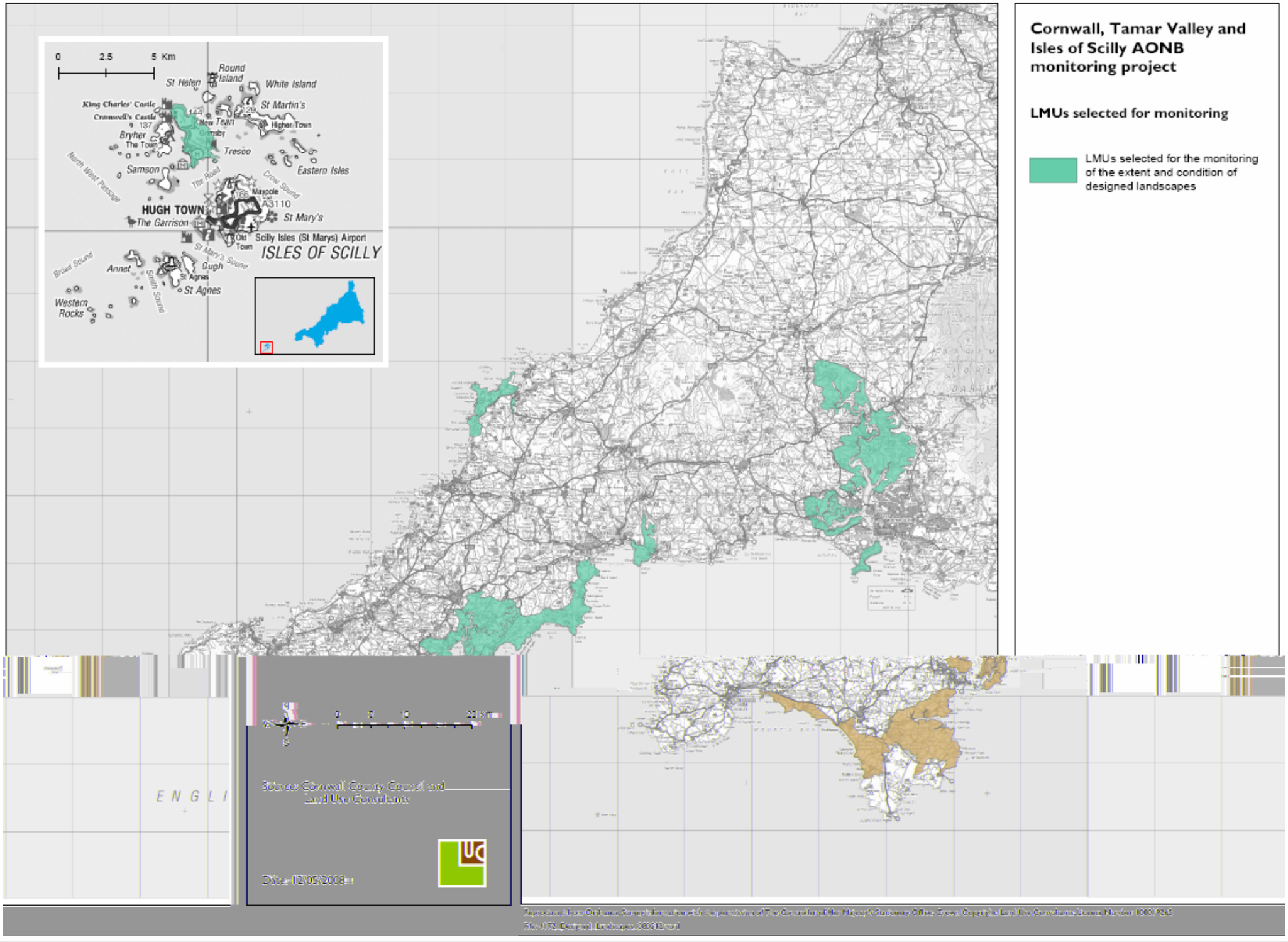

**Figure 6: Matrix of selected indicators by LMU**

| | | LEVEL 1 INDICATORS | | | | | | LEVEL 2 INDICATORS | | | | | | | | | LEVEL 3 INDICATORS | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AONB AREA | LMU | 1.1: Levels of tranquillity | 1.2: Levels of intrusion | 1.3: Extent of dark night skies | 1.4: Coastal change (due to climate change)) | 1.5: SSSI condition | 2.1: Extent of woodland and tree cover / type | 2.2: Agricultural land use | 2.3: Extent of biomass planting | 2.4: Field patterns | 2.5: Extent of semi-natural habitats | 2.6: Presence [and condition]of historic landscape features | 2.7: Settlement pattern | 2.8: Transport infrastructure | 2.9: Local vernacular building styles | 2.10: Developments at sea | 3.1: Extent of covered horticultural production | 3.2: Extent of traditional orchards | 3.3: Presence of traditional livestock types | 3.4: Field boundary condition and species | 3.5: Extent [and condition] of designed landscapes | 3.6: Extent of bare mining spoil | 3.7: Presence of navigation marks | 3.8: Levels of fishing industry activity | 3.9: Number of moorings | 3.10: Presence of local car and passenger ferries | TOTAL NUMBER OF INDICATORS |
| **CORNWALL AONB** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hartland | C1 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | | **15** |
| Pentire Point to Widemouth | C2 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | ● | | | **16** |
| | C3 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | ● | | | | | | | **14** |
| Bodmin Moor | C4 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | ● | ● | | | | | | | **15** |
| | C5 | ● | ● | ● | | ● | ● | ● | ● | ● | | ● | ● | ● | ● | | | | | ● | | | | | | | **13** |
| Camel Estuary | C6 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | | | | | | | ● | | **17** |
| Trevose Head to Stepper Point | C7 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | ● | | | | ● | | | **17** |
| St Agnes | C8 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | ● | | ● | | | **17** |
| Godrevy to Portreath | C9 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | | | | | | ● | | | | **16** |
| West Penwith | C10 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | ● | | ● | | | | | **17** |
| | C11 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | ● | ● | | ● | | | | | **16** |
| | C12 | ● | ● | ● | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | | | ● | | | | | | | **14** |
| | C13 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | ● | | | | ● | ● | | **19** |
| South Coast (Western) | C14 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | ● | ● | ● | | | | | **19** |
| | C15 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | ● | | | | | ● | ● | | **18** |
| | C16 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | | | ● | | | ● | ● | ● | **20** |
| South Coast (Central) | C17 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | ● | | | ● | ● | ● | **18** |
| | C18 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | ● | | | ● | ● | ● | **20** |
| | C19 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | ● | ● | | | ● | ● | | **19** |
| South Coast (Eastern) | C20 | ● | ● | ● | ● | | ● | ● | ● | ● | | ● | ● | ● | ● | ● | | ● | | | ● | | | ● | | | **16** |
| | C21 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | ● | ● | **17** |
| | C22 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | | | | | | | ● | | **17** |
| Rame Head | C23 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | ● | | | ● | ● | | **18** |

| AONB AREA | LMU | LEVEL 1 INDICATORS | | | | | | LEVEL 2 INDICATORS | | | | | | | | | LEVEL 3 INDICATORS | | | | | | | | | | TOTAL NUMBER OF INDICATORS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1.1: Levels of tranquillity | 1.2: Levels of intrusion | 1.3: Extent of dark night skies | 1.4: Coastal change (due to climate change)) | 1.5: SSSI condition | 2.1: Extent of woodland and tree cover / type | 2.2: Agricultural land use | 2.3: Extent of biomass planting | 2.4: Field patterns | 2.5: Extent of semi-natural habitats | 2.6: Presence [and condition]of historic landscape features | 2.7: Settlement pattern | 2.8: Transport infrastructure | 2.9: Local vernacular building styles | 2.10: Developments at sea | 3.1: Extent of covered horticultural production | 3.2: Extent of traditional orchards | 3.3: Presence of traditional livestock types | 3.4: Field boundary condition and species | 3.5: Extent [and condition] of designed landscapes | 3.6: Extent of bare mining spoil | 3.7: Presence of navigation marks | 3.8: Levels of fishing industry activity | 3.9: Number of moorings | 3.10: Presence of local car and passenger ferries | |
| **TAMAR VALLEY AONB** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tamar Valley AONB | T1 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | ● | | | | | **14** |
| | T2 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | ● | ● | **16** |
| | T3 | ● | ● | ● | | ● | ● | ● | ● | ● | | ● | ● | ● | ● | | ● | | | ● | ● | | | | | ● | | **16** |
| | T4 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | | ● | ● | ● | | | | | | **18** |
| | T5 | ● | ● | ● | | ● | ● | ● | ● | ● | | ● | ● | ● | ● | | ● | ● | | | | ● | | | | | | **15** |
| | T6 | ● | ● | ● | | ● | ● | ● | ● | ● | | ● | ● | ● | ● | | | | ● | ● | ● | | | | | | | **15** |
| **ISLES OF SCILLY AONB** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Isles of Scilly AONB | S1 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | ● | ● | | | ● | ● | | | **19** |
| | S2 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | | ● | ● | | **21** |
| | S3 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | ● | ● | | | ● | ● | ● | | **20** |
| | S4 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | ● | ● | ● | | **21** |
| | S5 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | ● | ● | | | ● | | | | **18** |

# 5. METHOD DEVELOPED TO MONITOR LANDSCAPE CHANGE

5.1. This section describes the overall method developed to monitor the indicators selected for assessing future landscape condition and change. It should be read in conjunction with the monitoring protocols and baseline results reports, which set out the method in detail by indicator and present the baseline results by LMU respectively.

## DEVELOPING LANDSCAPE CONDITION CRITERIA

5.2. For indicators to be meaningful and able to be used to measure landscape condition, a set of criteria needed to be developed that identified the 'desired trajectories of change' of the different landscape elements being monitored.

5.3. As a consequence, two statements have been developed for each indicator – one setting out which changes will have **positive** impacts on landscape condition, and one for changes that will have **negative** impacts. Depending on the indicator, either universal statements have been developed to apply to all LMUs for which the indicator has been selected, or statements have been tailored to individual LMUs. For the latter, the different statements reflect local variations in the distribution, or characteristics, of the element(s) to which the indicator relates. The table at **Figure 7** shows which indicators have universal condition criteria, and which have criteria tailored by LMU, along with the rationale behind these variations in criteria type.

5.4. Please see the separate baseline results reports for a list of the condition criteria for each LMU's selected indicators.

## METHODS TO MEASURE INDICATORS

### Identifying existing data sources

5.5. A first step taken in the process of selecting indicators for the project was to establish which elements of the AONB landscapes could be measured through existing monitoring programmes and/or data held either nationally, regionally or locally. This was refined and developed further once the final list of indicators had been selected (see the accompanying monitoring protocols report for details of the data sources and methods used to lay down the baseline).

5.6. The table at **Appendix 2** gives a breakdown of possible monitoring methods and datasets by indicator. This was drawn from sources including:

- Countryside Quality Counts (CQC)
- Natural England – through their ongoing work to develop monitoring indicators for AONBs
- Multi-Agency Geographic Information for the Countryside (MAGIC)

- CPRE – through work being undertaken by LUC to take forward the tranquillity and intrusion mapping and our previous work for CPRE developing the Night Blight maps.
- English Heritage
- Forestry Commission
- South West Observatory
- South West Protected Landscapes Forum
- Cornwall AONB (datasets available through Cornwall County Council)
- Tamar Valley AONB (datasets available through the county councils – Devon and Cornwall)

5.7. It is likely that new monitoring programmes will emerge throughout the timeframe of the monitoring project. The AONBs will need to be proactive in linking into these programmes to gather further information to inform the landscape monitoring (such as the Heritage and Landscapes at Risk project led by English Heritage, which is due to report in July 2008 – potentially being able to add condition information to indicators 2.6 and 3.5).

### Need for sampling

5.8. For some indicators, particularly those relying on aerial photographic interpretation and field survey, monitoring will need to be done on a sample square basis for two reasons: 1) to be as resource efficient as possible for those monitoring methods that are 'labour intensive'; and 2) to establish a fixed sampling frame that can be used for future monitoring against the results of the baseline.

5.9. As a consequence of the above, once the list of indicators had been finalised, the AONBs chose 1km² sample squares (from the Ordnance Survey grid) within the LMUs. This process of square selection followed a set methodology (see **Appendix 3**). As a general rule of thumb, two sample squares were selected in each LMU to account for variations in landscape character based on the indicators selected for monitoring. In some instances, fewer or more squares were selected according to the size of the LMU. In the case of the Isles of Scilly, most of the LMUs selected (the five inhabited islands) were no bigger than 1 km² themselves, meaning that it was only possible to select one sample square for each. In the case of St Mary's, however, two sample squares were selected to account for the difference in character between the built-up area of Hugh Town and the rest of the island. Conversely, LMU T4 in the Tamar Valley AONB is the largest of all LMUs and to reflect the variations in landscape character across this unit, the AONB selected five sample squares for monitoring purposes.

5.10. A GIS shapefile has been created with the selected sample squares.

5.11. The table in **Appendix 2** indicates which indicators have required the selection of a sampling frame (ie sample squares) for monitoring.

### Need for new data collection

5.12. The table in **Appendix 2** also shows which indicators will require field survey work to lay down the baseline and carry out future monitoring. In addition, other data collection, such as fixed point photography, traffic counts

and tie-in with other monitoring programmes (as per paragraph 5.7) needs to be carried out by the AONBs over the next year through Phase 2 of this study. The monitoring protocols developed for these indicators are included in the accompanying monitoring protocols report.

## PRESENTING THE BASELINE RESULTS

5.13. As part of this study, the baseline has been laid down for all indicators except those requiring primary data collection. The separate baseline results reports should be referred to in order to fully understand how the baseline results are presented and linked back to each LMU's character statements. The layout of each report, by Landscape Monitoring Unit (and in the case of Cornwall, under overall headings by AONB area), is summarised as follows:

- Location of the LMU (with map).
- Constituent character areas / LDUs from the county landscape assessment (2007) that make up the LMU.
- Table 1: shows the character statements with bold text indicating landscape elements to be monitored, and a linked column listing the indicators selected to monitor these.
- Table 2: lists the selected indicators from the first table in numerical order, with their condition criteria (positive and negative 'trajectories of change') detailed in a separate column. The second column contains the score code for each indicator. The maximum condition score for the LMU is included at the bottom of the table (see paragraphs 5.16-5.27 below).
- Table 3: is that part of the forces for change matrix relevant to the LMU in question, illustrating the forces for change likely to be acting upon the different landscape elements to be monitored, by likely timeframe.
- Table 4: presents the baseline results for each of the selected indicators, the data source and next date for monitoring. Underlined text indicates where additional baseline data collection needs to be carried out by the AONBs in 2008/9.

**Figure 7: Table showing type of condition criteria**

| Indicator | Type of condition criteria | Rationale for criteria type |
|---|---|---|
| **LEVEL 1 INDICATORS** | | |
| 1.1: Levels of tranquillity | Universal | Across the AONBs, levels of tranquillity are important to local character per se, therefore the condition criteria can be universal statements. |
| 1.2: Levels of intrusion | Universal | As above – regardless of location, levels of intrusion will be monitored in the same way – e.g. no increase would be positive in landscape terms. |
| 1.3: Extent of dark night skies | Universal | As per 1.1 Levels of Tranquillity. |
| 1.4: Coastal change | Universal | The full impacts of climate change on different elements of the coastal landscapes are as yet unknown, therefore universal criteria apply to all. |
| 1.5: Condition of SSSIs | Universal | In all cases, the positive and negative statements will be the same – e.g. the positive criteria seeking to bring or maintain SSSIs in favourable condition. |
| **LEVEL 2 INDICATORS** | | |
| 2.1: Extent of woodland and tree cover / type | Tailored by LMU | The location and type of woodland cover varies significantly by LMU, with desired and undesired changes varying also. Therefore this needs to be reflected in the condition criteria. |
| 2.2: Agricultural land use | Tailored by LMU | Agricultural land use is a defining feature of many LMU landscapes, and as such it is important to reflect local variations in land use types and locations. |
| 2.3: Extent of biomass planting | Universal | The landscape impacts of biomass planting will largely be the same wherever it is located in the future. |
| 2.4: Field patterns | Tailored by LMU | The different field patterns are often a key feature of landscape character, therefore condition criteria need to reflect local variations. |
| 2.5: Extent of semi-natural habitats | Universal | Although the type of semi-natural habitat varies by LMU (as indicated in the character statements), the positive and negative statements remain the same – ie an increase in the extent of characteristic habitats would always be positive in landscape terms. |
| 2.6: Presence [and condition] of historic landscape features | Universal | As per semi-natural habitats – a positive change would always be to maintain the number of visible historic features in the landscape, regardless of their type. |
| 2.7: Settlement pattern | Tailored by LMU | Development pressure is a key force for change – monitoring how this impacts on the particular settlement pattern of each LMU is therefore important. |
| 2.8: Transport infrastructure | Universal | The impacts of traffic calming measures on the rural road network will be similar throughout the AONB landscapes. |
| 2.9: Local vernacular building styles | Universal | The baseline surveys to inform this indicator will be able to pinpoint local vernacular styles, but in all cases a positive change would be for the style to be enhanced and new developments to be in sympathy with local building styles. |
| 2.10: Development at sea | Universal | The visual impacts of any new coastal development will vary by LMU, but at this stage (with no off-shore developments), a universal statement is most appropriate. |

| Indicator | Type of condition criteria | Rationale for criteria type |
|---|---|---|
| **LEVEL 3 INDICATORS** | | |
| 3.1: Extent of covered horticultural production | Universal | In all cases, a positive change in landscape terms would be for a decrease in the presence of glasshouses and polytunnels in the AONB landscapes. |
| 3.2: Extent of traditional orchards | Universal | In all landscapes where orchards are traditionally located, it would always be desirable for their extent to be maintained or increased (and a negative change to see the opposite). |
| 3.3: Presence of traditional livestock types | Tailored (by landscape type – ie uplands versus Isles of Scilly) | As there is no specific 'local' breed of livestock used in the different areas of the AONBs, the same statements were able to apply to all of the upland LMUs. For Scilly, each island is in the same position (eg an increase in livestock of any type would be a positive change). |
| 3.4: Field boundary condition and species | Tailored | The type of field boundary often varies by landscape, therefore requiring tailored indicators to reflect local styles, materials and hedge species. |
| 3.5: Extent [and condition] of designed landscapes | Universal | In all areas where designed landscapes are characteristic, desired trajectories of change will be the same (ie the positive statement would be to maintain their extent). |
| 3.6: Extent of bare mining spoil | Universal | Where mining spoil is characteristic, it would always be desirable to maintain its visual presence in these landscapes (and a negative change to see the opposite). |
| 3.7: Presence of navigation marks | Universal | In all locations where navigation marks are a landscape feature, their continued presence would always be desirable in landscape terms (and their loss would always be a negative change). |
| 3.8: Levels of fishing industry activity | Universal | In all coastal areas where fishing is a traditional industry, the positive statement would always be to maintain this activity (and therefore a decline in activity will be a negative change). |
| 3.9: Number of moorings | Universal | In estuary and coastal landscapes where recreation pressure is an issue, a change in the number and location of moorings will always have the same landscape impacts (ie an increase being a negative change). |
| 3.10: Presence of local car and passenger ferries | Universal | As per 3.7 Presence of navigation marks. |

## MAKING AN ASSESSMENT OF LANDSCAPE CONDITION AND CHANGE

5.14. Once the baseline information has been finalised for each of the indicators chosen for each LMU, the AONB units will be able to periodically monitor landscape change by repeating the methods of data collection, and comparing these results with the baseline. This comparison will need to take account of the condition criteria ('trajectory of change') to establish whether changes are 'positive' or 'negative' for the LMU in question.

5.15. To allow the AONBs to take a consistent approach to assessing what the changes mean in terms of landscape condition, a scoring system has been developed. This is outlined at the beginning of the baseline results reports as it relates to the tables presented by LMU. This scoring protocol is repeated here, as it is an integral part of the overall methodology for the AONB monitoring project.

***Assessing the condition of each Landscape Monitoring Unit***

5.16. To assist each AONB unit in making a consistent assessment of the condition of the different parts of the protected landscape, a scoring system has been developed with the selection of **primary** and **secondary** indicators for each LMU (coded with a 'P' and 'S' in the second table for each LMU). To allow for ease of comparison, each LMU has been assigned a total of <u>five</u> primary indicators, with the remaining being allocated as secondary indicators – the number of which will vary by LMU.

5.17. Different scoring weightings have been attached to the two types of indicator, as follows:

- <u>Primary indicators</u> score **two points** if they meet the condition criteria set out in the positive 'desired trajectory of change'. On the other hand, if these indicators, when measured, follow the negative 'trajectory of change', they lose two points.

- <u>Secondary indicators</u> score and lose **one point**, in line with the above.

5.18. These two types of indicator can only be assigned to those being measured at an LMU, or sample square scale. The maximum score for each LMU, broken down by the total for the primary (always scoring 10) and secondary (which varies by LMU) indicators, is shown at the end of the second LMU table in this report.

5.19. Taking the maximum score as 100%, the allocated scores obtained from future monitoring should always be calculated as a percentage of this maximum score, to account for the varying numbers of indicators selected for each LMU. For example, LMU T1 (Tamar Valley AONB) has a maximum score of 15, so if the monitored indicators score a total of 8 points, this will give the LMU a condition score of 53%.

5.20. We suggest that the percentage bands for landscape condition assessment scoring against the baseline are as follows[4]:

**Box 1: Suggested percentage bands for landscape condition assessment**

| | |
|---|---|
| ➢ 75 – 100% | Very significant improvement in landscape condition |
| ➢ 50 – 74.9% | Significant improvement in landscape condition |
| ➢ 25 – 49.9% | Moderate improvement in landscape condition |
| ➢ 0 – 24.9% | Stable / minor improvement in landscape condition |
| ➢ less than 0% | Declining landscape condition |

***Assessing the landscape condition of AONB areas***

5.21. For AONB areas that have more than one constituent LMU, the AONB unit may wish to calculate a condition score for the AONB area as a whole.

5.22. The total score awarded to each constituent LMU through the monitoring of the primary and secondary indicators against the baseline should be added together. This will give the condition score for the AONB area. Added to this score should be the results from the monitoring of indicators measured at an AONB area scale only – such as 1.1: Levels of Tranquillity. These indicators are coded by an 'AA' in the second LMU table presented in this report, and shaded in light grey to clearly distinguish them from the LMU-scale primary and secondary indicators.

5.23. These indicators will be awarded or deducted **one point** respectively depending on whether monitoring shows that they have met the positive or negative 'trajectories of change'.

5.24. In common with the LMU-scale assessment, the total condition score for the AONB area should be expressed as a percentage to account for the variation in the number of selected indicators by LMU. This will be calculated by taking the total score obtained for the AONB area (obtained by combining the LMU monitoring results), and measuring it against the total of the 'maximum scores' for the LMUs. Added to this should be the maximum score that could be achieved for the AONB area-scale indicators – e.g. for Hartland in the Cornwall AONB this would be five. A percentage can then be calculated to give the AONB area landscape condition score, measured against the percentage bands presented in Box 1, to come up with an overall assessment of landscape condition at this scale.

***Assessing the landscape condition of the AONB***

5.25. One indicator, 1.3 Extent of Dark Night Skies, is only able to be monitored at an AONB-wide scale. This is coded in the second LMU table in this report by an 'A'. In line with the AONB area scale indicators, this will be awarded

[4] These bands may need to be re-visited in light of the application of this methodology by the AONB.

or deducted **one point** respectively depending on whether monitoring shows that the positive or negative 'trajectories of change' have been met.

5.26. If an overall condition score is required for the AONB as a whole, the scoring for this indicator should be incorporated into the combined total of the AONB Areas' scores.

5.27. A percentage score can then be calculated, using the combined total scores of the AONB areas, against their combined 'maximum scores' (added to which should be the maximum one point score for the AONB-scale indicator). Again, the percentage bands presented in Box 1 should be used to give an overall landscape condition score for the AONB as a whole.

# 6. THE WAY FORWARD

6.1. This report summarises the methodology developed for the landscape monitoring of the Cornwall, Tamar Valley and Isles of Scilly AONBs. It is hoped that this will act as a framework for an ongoing landscape monitoring programme in these AONBs.

6.2. It should be noted that as the monitoring programme progresses and develops, the methodology may be tweaked to allow for advances in monitoring processes and the emergence of other monitoring programmes and data to feed into the work of the AONB units. It should therefore not be viewed as 'fixed', indeed, it will only be through its implementation that the methodology will be able to be further refined and improved to meet the changing needs, priorities and pressures faced by the protected landscapes over the coming years and decades.

Land Use Consultants
23 May 2008

# APPENDIX 1:
# RESULTS FROM THE STAKEHOLDER WORKSHOPS

# RESULTS FROM THE AONB MONITORING WORKSHOP FOR THE CORNWALL AND TAMAR VALLEY AONBs

## MONDAY, 14 JANUARY 2008

## LANHYDROCK HOUSE, BODMIN

# 1ST BREAKOUT SESSION: LEVEL 1 INDICATORS

**Task 1:** Prioritise the following Level 1 indicators in order of importance for your group's area as a whole. 1=most important, 5=least important

## GROUP 1: NORTH COAST

**1) Levels of tranquillity**

**1) Levels of intrusion** (include pylons, windfarms, road traffic)

**1) Dark night skies**

**1) Development at sea and within estuaries** (e.g. off-shore wind)

**2) Coastal change (due to climate change)**

**3) Condition of Scheduled Monuments**

**3) Condition of SSSIs**

**4) Road pattern**

## GROUP 2: WEST PENWITH AND LIZARD

**1) Levels of tranquillity**

**1) Levels of intrusion (include pylons, windfarms, road traffic)**

} Based on value as indicators

**2) Condition of SSSIs**

**2) Condition of Scheduled Monuments**

**2) Road pattern**

**2) Development at sea and within estuaries** (e.g. off-shore wind)

**3) Extent of dark night skies** (the group put this lower as felt that it would be a product of the top two indicators)

**4) Coastal change (due to climate change)** including coastal defence works (The group chose this to be least important due to its inevitability - because it and the effects can't be stopped from happening)

## GROUP 3: SOUTH COAST AND BODMIN MOOR

Bodmin Moor

**1) Condition of SSSIs**

**1) Condition of Scheduled Monuments**

**1) Levels of intrusion (include pylons, windfarms, road traffic)**

**2) Extent of dark night skies**

**3) Road pattern**

South Coast

**1) Condition of SSSIs**

**1) Levels of intrusion (include pylons, windfarms, road traffic)**

**2) Condition of Scheduled Monuments**

**2) Coastal change (due to climate change)**

**2) Development at sea and within estuaries** (e.g. off-shore wind)

**3) Road pattern**

**3) Extent of dark night skies**

## GROUP 4: TAMAR VALLEY

*Results shown on handout:*

**1) Levels of tranquillity**

**1) Levels of intrusion (include pylons, windfarms, road traffic**

**1) Extent of dark night skies**

All related to each other

**2) Development at sea and within estuaries**

**3) Condition of SSSIs**

**3) Condition of Scheduled Monuments**

**4) Road pattern**

*Results shown on flip-chart:*

**1) Levels of tranquillity**

**1) Levels of intrusion (include pylons, windfarms, road traffic**

**1) Extent of dark night skies**

All related to each other

**1) Condition of SSSIs**

**1) Condition of Scheduled Monuments**

**3) Development at sea and within estuaries**

**5) Road pattern**

## 1ST BREAKOUT SESSION: LEVEL 1 INDICATORS (TASKS 2 AND 3)

### GROUP 1: NORTH COAST

**Task 2:** Place a 'X' in the appropriate place if any of the indicators are **not** relevant to one or more of the Landscape Monitoring Units within your group's area

| Level 1 indicator | C1 | C2 | C3 | C6 | C7 | C8 | C9 |
|---|---|---|---|---|---|---|---|
| Levels of tranquillity | | | | | | | |
| Levels of intrusion (include pylons, windfarms, road traffic) | | | | | | | |
| Extent of dark night skies | | | | | | | |
| Coastal change (due to climate change) including coastal defence works | | | X | | | | |
| Condition of SSSIs | | | X | | | | |
| Condition of Scheduled Monuments | | | | | | | |
| Road pattern | | | | | | | |
| Development at sea and within estuaries | | | | | | | |

**Task 3:** Prioritise the importance of indicators for each Landscape Monitoring Unit (if different from the general prioritisation undertaken for the first task). 1=most important, 5= least important

| Level 1 indicator | C1 (same as general) | C2 (same as general) | C3 | C6 (same as general) | C7 (same as general) | C8 | C9 |
|---|---|---|---|---|---|---|---|
| Levels of tranquillity | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Levels of intrusion (include pylons, windfarms, road traffic) | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Extent of dark night skies | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Coastal change (due to climate change) including coastal defence works | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Condition of SSSIs | 3 | 3 | | 3 | 3 | 3 | 3 |
| Condition of Scheduled Monuments | 3 | 3 | 3 | 3 | 3 | 2 | 2 |
| Road pattern | 4 | 4 | 5 | 4 | 4 | 5 | 5 |
| Development at sea and within estuaries | 1 | 1 | | 1 | 1 | 1 | 1 |

## GROUP 2: WEST PENWITH AND LIZARD

**Task 2:** Place a 'X' in the appropriate place if any of the indicators are **not** relevant to one or more of the Landscape Monitoring Units within your group's area

| Level 2 indicator | C10 | C11 | C12 | C13 | C14 | C15 | C16 |
|---|---|---|---|---|---|---|---|
| Levels of tranquillity | | | | | | | |
| Levels of intrusion (include pylons, windfarms, road traffic) | | | | | | | |
| Extent of dark night skies | | | | | | | |
| Coastal change (due to climate change) including coastal defence works | | X | X | | | | |
| Condition of SSSIs | | X | X | X | | | |
| Condition of Scheduled Monuments | | | | | | | |
| Road pattern | | | | | | | |
| Development at sea and within estuaries | | Views to the sea | Views to the sea | Views to the sea | | | |

**Task 3:** Prioritise the importance of indicators for each Landscape Monitoring Unit (if different from the general prioritisation undertaken for the first task). 1=most important, 5= least important (*Facilitator to use a Master copy to record the group's agreed allocations)*

| Level 2 indicator | C10 (same order as general) | C11 (same order as general) | C12 (same order as general) | C13 (same order as general) | C14 | C15 | C16 |
|---|---|---|---|---|---|---|---|
| Levels of tranquillity | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Levels of intrusion (include pylons, windfarms, road traffic) | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Extent of dark night skies | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Coastal change (due to climate change) including coastal defence works | 4 | 4 | 4 | 4 | 2 | 4 | 2 |
| Condition of SSSIs | 2 | 2 | 2 | 2 | 2 | 1 | 2 |
| Condition of Scheduled Monuments | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Road pattern | 2 | 2 | 2 | 2 | 4 | 2 | 2 |
| Development at sea and within estuaries | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

## GROUP 3: SOUTH COAST AND BODMIN MOOR

**Task 2:** Place a 'X' in the appropriate place if any of the indicators are **not** relevant to one or more of the Landscape Monitoring Units within your group's area *(Facilitator to use a Master copy to record the results of the group's discussion)*

| Level 2 indicator | C4 | C5 | C17 | C18 | C19 | C20 | C21 | C22 | C23 |
|---|---|---|---|---|---|---|---|---|---|
| Levels of tranquillity | | | | | | | | | |
| Levels of intrusion (include pylons, windfarms, road traffic) | | | | | | | | | |
| Extent of dark night skies | | | | | | | | | |
| Coastal change (due to climate change) including coastal defence works | X | X | | | | | | | |
| Condition of SSSIs | | | | | | | | | |
| Condition of Scheduled Monuments | | | | | | | | | |
| Road pattern | | | | | | | | | |
| Development at sea and within estuaries | X | X | | | | | | | |

**Task 3:** Prioritise the importance of indicators for each Landscape Monitoring Unit (if different from the general prioritisation undertaken for the first task). 1=most important, 5= least important (*Facilitator to use a Master copy to record the group's agreed allocations)*

| Level 2 indicator | C4 | C5 | C17 | C18 | C19 | C20 | C21 | C22 | C23 |
|---|---|---|---|---|---|---|---|---|---|
| Levels of tranquillity | | | | | | | | | |
| Levels of intrusion (include pylons, windfarms, road traffic) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Extent of dark night skies | 2 | 2 | 3 | 3 | 2 | 2 | | 2 | |
| Coastal change (due to climate change) including coastal defence works | | | 1 | 1 | 2 | 2 | 1 | 2 | 2 |
| Condition of SSSIs | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 2 |
| Condition of Scheduled Monuments | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| Road pattern | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Development at sea and within estuaries | | | 1 | 1 | 2 | 2 | 1 | 2 | 1 |

## GROUP 4: TAMAR VALLEY

**Task 2:** Place a 'X' in the appropriate place if any of the indicators are **not** relevant to one or more of the Landscape Monitoring Units within your group's area *(Facilitator to use a Master copy to record the results of the group's discussion)*

| Level 1 indicator | T1 | T2 | T3 | T4 | T5 | T6 |
|---|---|---|---|---|---|---|
| Levels of tranquillity | | | | | | |
| Levels of intrusion (include pylons, windfarms, road traffic) | | | | | | |
| Extent of dark night skies | | | | | | |
| Coastal change (due to climate change) including coastal defence works | X | | X | X | X | X |
| Condition of SSSIs | X | | | | | |
| Condition of Scheduled Monuments | | X | | | | X |
| Road pattern | | | | | | |
| Development at sea and within estuaries | X | | X | X | X | X |

**Task 3:** Prioritise the importance of indicators for each Landscape Monitoring Unit (if different from the general prioritisation undertaken for the first task). 1=most important, 5= least important (*Facilitator to use a Master copy to record the group's agreed allocations)*

| Level 1 indicator | T1 | T2 | T3 | T4 | T5 | T6 |
|---|---|---|---|---|---|---|
| Levels of tranquillity | 1 | 1 | 1 | 1 | 1 | 1 |
| Levels of intrusion (include pylons, windfarms, road traffic) | 1 | 1 | 1 | 1 | 1 | 1 |
| Extent of dark night skies | 1 | 1 | 1 | 1 | 1 | 1 |
| Coastal change (due to climate change) including coastal defence works | | 1 | | | | |
| Condition of SSSIs | | 1 | 1 | 2 | 1 | 1 |
| Condition of Scheduled Monuments | 5 | | | 5 | 1 | |
| Road pattern | 5 | 5 | 5 | 5 | 5 | 5 |
| Development at sea and within estuaries | | 1 | | | | |

This group felt that the indicators were either relevant or not, so did not prioritise further.

# 2ND BREAKOUT SESSION: LEVEL 2 INDICATORS

**Task 1:** Prioritise the following Level 2 indicators in order of importance for your group's area as a whole. 1=most important, 5=least important

## GROUP 1: NORTH COAST

**1) Extent of pasture and arable**

**2) Field patterns**

**3) Settlement pattern**

**4) Local vernacular styles**

**5) Woodland cover** (the group put this as low priority due to lack of woodland cover along this section of the AONB)

## GROUP 2: WEST PENWITH AND LIZARD

**1) Field patterns**

**1) Settlement pattern**

**1) Vernacular building styles**

} These have most visible influences on landscape character in this area

**2) Woodland cover / type**

**2) Extent of pasture and arable**

## GROUP 3: SOUTH COAST AND BODMIN MOOR

This group did not prioritise for the area as a whole, but felt that all of the indicators were relevant.

## GROUP 4: TAMAR VALLEY

**1) Woodland cover/type**

**1) Extent of pasture/arable**

**1) Field patterns**

**2-3) Settlement pattern**

**2-3) Local vernacular**

## 2ND BREAKOUT SESSION: LEVEL 2 INDICATORS (TASKS 2 AND 3)

### GROUP 1: NORTH COAST

**Task 2:** Use the following table to select which indicators are appropriate to the different Landscape Monitoring Units within the area your group is looking at.

| Level 2 indicator | C1 | C2 | C3 | C6 | C7 | C8 | C9 |
|---|---|---|---|---|---|---|---|
| Woodland cover / type | Y | Y | | Y | | Y | |
| Extent of pasture and arable | Y | Y | Y | Y | Y | Y | Y |
| Field patterns | Y | Y | Y | Y | Y | Y | Y |
| Settlement pattern | Y | Y | Y | Y | Y | | |
| Vernacular building styles | Y | Y | Y | Y | Y | Y | |

**Task 3:** Using the selection of indicators in the table above, prioritise the importance of indicators for each Landscape Monitoring Unit (if different from the general prioritisation undertaken for the first task). 1=most important, 5= least important

| Level 2 indicator | C1 | C2 | C3 | C6 | C7 | C8 | C9 |
|---|---|---|---|---|---|---|---|
| Woodland cover / type | 1 | 2 | | 3 | | 4 | |
| Extent of pasture and arable | 1 | 1 | 3 | 2 | 1 | 5 | 4 |
| Field patterns | 1 | 1 | 4 | 4 | 4 | 2 | 5 |
| Settlement pattern | 2 | 1 | 3 | 2 | 2 | | |
| Vernacular building styles | 3 | 1 | 5 | 1 | 1 | 2 | |

The group suggested that the indicator 'extent of arable and pasture' may be too simplistic (e.g. to account for biomass planting).
Settlement pattern should also account for amalgamation of holdings for hobby farming etc. Woodland cover/type should account for characteristic hedgerow trees.

## GROUP 2: WEST PENWITH AND LIZARD

**Task 2:** Use the following table to select which indicators are appropriate to the different Landscape Monitoring Units within the area your group is looking at.

| Level 2 indicator | C10 | C11 | C12 | C13 | C14 | C15 | C16 |
|---|---|---|---|---|---|---|---|
| Woodland cover / type | ALL RELEVANT | | | | | | |
| Extent of pasture and arable | | | | | | | |
| Field patterns | | | | | | | |
| Settlement pattern | | | | | | | |
| Vernacular building styles | | | | | | | |

**Task 3:** Using the selection of indicators in the table above, prioritise the importance of indicators for each Landscape Monitoring Unit (if different from the general prioritisation undertaken for the first task). 1=most important, 5= least important. (*Facilitator to use a Master copy to record the group's agreed allocations)*

| Level 2 indicator | C10 | C11 | C12 | C13 (same as general) | C14 | C15 | C16 |
|---|---|---|---|---|---|---|---|
| Woodland cover / type | 1 | 1 | 3 | 2 | 2 | 1 | 1 |
| Extent of pasture and arable | 1 | 1 | 2 | 2 | 2 | 2 | 3 |
| Field patterns | 1 | 1 | 1 | 1 | 3 | 1 | 1 |
| Settlement pattern | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Vernacular building styles | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

The group suggested it might be more appropriate to have an indicator looking at extent of improved arable/pasture versus unimproved/semi-improved (arguing that improved grass ley is just as bad as intensive arable in landscape terms)

## GROUP 3: SOUTH COAST AND BODMIN MOOR

**Task 2:** Use the following table to select which indicators are appropriate to the different Landscape Monitoring Units within the area your group is looking at.

| Level 2 indicator | C4 | C5 | C17 | C18 | C19 | C20 | C21 | C22 | C23 |
|---|---|---|---|---|---|---|---|---|---|
| Woodland cover / type | ALL RELEVANT | | | | | | | | |
| Extent of pasture and arable | | | | | | | | | |
| Field patterns | | | | | | | | | |
| Settlement pattern | | | | | | | | | |
| Vernacular building styles | | | | | | | | | |

**Task 3:** Using the selection of indicators in the table above, prioritise the importance of indicators for each Landscape Monitoring Unit (if different from the general prioritisation undertaken for the first task). 1=most important, 5= least important.

| Level 2 indicator | C4 | C5 | C17 | C18 | C19 | C20 | C21 | C22 | C23 |
|---|---|---|---|---|---|---|---|---|---|
| Woodland cover / type | 1 | 4 | 1 | 1 | 2 | 2 | 1 | 2 | 1 |
| Extent of pasture and arable | 2 | 1 | 4 | 4 | 1 | 1 | 4 | 1 | 1 |
| Field patterns | 4 | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 2 |
| Settlement pattern | 5 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 3 |
| Vernacular building styles | 3 | 1 | 4 | 4 | 3 | 3 | 4 | 3 | 3 |

## GROUP 4: TAMAR VALLEY

**Task 2:** Use the following table to select which indicators are appropriate to the different Landscape Monitoring Units within the area your group is looking at.

| Level 2 indicator | T1 | T2 | T3 | T4 | T5 | T6 |
|---|---|---|---|---|---|---|
| Woodland cover / type | Y | | Y | Y | Y | Y |
| Extent of pasture and arable | Y | | Y | Y | | Y |
| Field patterns | Y | | Y | Y | | Y |
| Settlement pattern | Y | Y | Y | Y | Y | Y |
| Vernacular building styles | Y | Y | Y | Y | Y | Y |

**Task 3:** Using the selection of indicators in the table above, prioritise the importance of indicators for each Landscape Monitoring Unit (if different from the general prioritisation undertaken for the first task). 1=most important, 5= least important.

| Level 2 indicator | T1 | T2 | T3 | T4 | T5 | T6 |
|---|---|---|---|---|---|---|
| Woodland cover / type | 1 | 5 | 1 | 1 | 1 | 1 |
| Extent of pasture and arable | 1 | 5 | 1 | 1 | 4 | 1 |
| Field patterns | 1 | 4 | 1 | 1 | 4 | 1 |
| Settlement pattern | 2 | 1 | 2 | 2 | 1 | 2 |
| Vernacular building styles | 2 | 1 | 2 | 2 | 1 | 2 |

## 3RD SESSION: LEVEL 3 INDICATORS

Below is a list of Level 3 indicators for reference for both tasks in this exercise:

| Number | Level 3 indicator | Merged for this exercise |
|---|---|---|
| 1 | Extent of estuarine habitats | Extent of habitats |
| | Extent of freshwater wetlands | |
| | Extent of coastal heath | |
| | Extent of dunes/ dune grasslands / beach habitats | |
| | Extent of moorland/ lowland heath | |
| 2 | Type of horticultural production | Horticultural production |
| | Extent of traditional orchards | a) type b) extent of traditional orchards |
| 3 | Field boundary condition | |
| 4 | Extent/condition of parklands | |
| 5 | Presence/absence of mining features | |
| 6 | Condition of navigation markers (day marks and lighthouses) | Marine characteristics |
| | Levels of fishing industry activity (presence/absence) | |
| | Number of boatbuilding enterprises | |
| | Number of moorings | |
| | Presence of traditional chain car ferries | |
| 7 | Change in key viewpoints | |

## GROUP 1: NORTH COAST

| Level 3 indicator | C1 | C2 | C3 | C6 | C7 | C8 | C9 |
|---|---|---|---|---|---|---|---|
| Extent of habitats | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Horticultural production (a) | | | | | | | |
| Horticultural production (b) | | | | 5 | | | |
| Field boundary condition | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Extent/condition of parklands | | | | | | | |
| Presence/absence of mining features | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Marine characteristics | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Change in key viewpoints | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

**Suggested additional indicators:**
Historic environment – to not solely rely on SM information under Level 1 (see also Group 2)

## GROUP 2: WEST PENWITH AND LIZARD

| Level 3 indicator | C10 | C11 | C12 | C13 | C14 | C15 | C16 |
|---|---|---|---|---|---|---|---|
| Extent of habitats | 1 | 1 | 2-3 | 1 | 2 | 1 | 2 |
| Horticultural production (a) | | | | 1 | 3 | 3 | 2 |
| Horticultural production (b) | | | | | | | |
| Field boundary condition | 1 | 1 | 1 | 2 | 3 | 5 | 1 |
| Extent/condition of parklands | | | | | 3 | | 1 |
| Presence/absence of mining features | 1 | 1 | 3 | | 2 | | |
| Marine characteristics | 5 | | | 1 | 2 | 2 | 1 |
| Change in key viewpoints | 1 | 1 | 1 | 1 | 1 | 2 | 1 |
| Historic environment indicator | 1 | 1 | | | | 1 | 2 |

**Suggested additional indicators:** An indicator for the historic environment – to account for important historic landscape elements not covered by the Level 1 SM Condition indicator, Level 3 field boundary condition, or the Level 3 Mining indicator. Perhaps have a Level 3 indicator which tailored condition criteria per LMU. This was also raised by Group 1.

## GROUP 3: SOUTH COAST AND BODMIN MOOR

| Level 3 indicator | C4 | C5 | C17 | C18 | C19 | C20 | C21 | C22 | C23 |
|---|---|---|---|---|---|---|---|---|---|
| Extent of habitats | 2 | 2 | 3 | 3 | 1 | 1 | 3 | 1 | 1 |
| Horticultural production (a) | | | | | | | | | |
| Horticultural production (b) | | | | | | | | | |
| Field boundary condition | 3 | 3 | 5 | 5 | | | 5 | | |
| Extent/condition of parklands | | | 1 | | 3 | | | | 2 |
| Presence/absence of mining features | 5 | 5 | | | | | | | |
| Marine characteristics | | | 2 | | 2 | 2 | | 2 | |
| Change in key viewpoints | 1 | 1 | 4 | 4 | 4 | 3 | 4 | 3 | 3 |
| Type of livestock breed | 4 | 4 | | | | | | | |

**Suggested additional indicator:** Type of livestock breed – to ensure the moorland continues to be grazed by hardy breeds most suited to the conditions of the moor.

## GROUP 4: TAMAR VALLEY AONB

| Level 3 indicator | T1 | T2 | T3 | T4 | T5 | T6 |
|---|---|---|---|---|---|---|
| Extent of habitats | 1 | 1 | 1 | 1 | 1 | 1 |
| Horticultural production (a) | | | | | | |
| Horticultural production (b) | | 1 | 1 | | | |
| Field boundary condition | 1 | | 1 | 1 | 3 | 1 |
| Extent/condition of parklands | | | 1 | 1 | | 1 |
| Presence/absence of mining features | 1 | 1 | | 1 | 1 | |
| Marine characteristics | | 1 | | | | |
| Change in key viewpoints | 1 | 1 | 1 | 1 | 1 | 1 |

**Suggestions for additional indicators:**

1) Smaller scale heritage features e.g. wells, mileposts, etc.

2) More development related indicators (although this will be covered under Level 2 Settlement Pattern indicator): second homes (this is a force for change), population density, numbers of planning applications (these are all ways of measuring the 'settlement pattern' indicator, rather than indicators themselves).

# RESULTS FROM THE AONB MONITORING WORKSHOP FOR THE ISLES OF SCILLY

## THURSDAY, 31 JANUARY 2008

## COUNCIL CHAMBERS, HUGHTOWN

## LEVEL 1 INDICATORS

The group considered the order of Level 1 indicators in the context of the Isles of Scilly as a whole. They felt that all were relevant, deciding on the following order of priority (1=most important).
The group also considered how the different indicators could be measured in the context of Scilly.

**1) Levels of tranquillity:** particularly considering the impacts of all forms of traffic (air, sea, road). The impact of the helicopter flying over Tresco/St Marys was cited as a key detractor from levels of tranquillity.

*Means to monitor:* sea traffic census, web cam (on a time lapse), number of trips for commercial boats, number of helicopter flights, fuel sales, number of car registrations, number of licensed boats, public perception survey (particularly visitors), monitor no flights on a Sunday.

**1) Condition of SSSIs and Scheduled Monuments (should be considered as of equal importance)**

*Means to monitor:* Through Natural England and English Heritage – who already undertake condition monitoring of these sites (which together cover a large proportion of the islands' land area). The mapping of BAP Priority Habitats is being undertaken across Scilly – meaning the current Level 3 indicator for 'Extent of Habitats' can be included as a Level 1 indicator.

**1) Coastal change (due to climate change)** including coastal defence works

*Means to monitor:* Monitoring of coastal erosion is being undertaken through the South West Regional Coastal Monitoring Project (led by Plymouth University)

**2-3) Development at sea (e.g. off-shore renewables, aquaculture)**

*Means to monitor:* Planning records (although the Council only has development control powers for terrestrial developments, they will be statutory consultees for any proposals, and will be able to pass on any information to the AONB).

**2-3) Dark night skies** The group reflected that even low levels of light pollution (e.g. light spillage from windows) was significant on the islands.

*Means to monitor:* Fixed point photography, public perception survey (particularly visitors), information from the astronomy club (visibility of stars), extent of development as a proxy.

**5) Road pattern** The group felt that the pattern of roads was not likely to change on the islands (apart from St Marys and Tresco through surfacing works) and therefore placed this monitoring indicator as a low priority. Levels of traffic were felt to be more important (to be captured under the 'Levels of Tranquillity' indicator).

## LEVEL 2 INDICATORS

The group as a whole discussed the Level 2 indicators, plotting the locations of distinctive tree groups, areas of bulb production and types of shelter hedges on a large map of the islands. In summary, discussions were as follows:

**Location and significance of bulb fields**

- There are now none remaining on Bryher, with a dramatic reduction in production on both St Agnes and St Martin's. The Tresco Estate will soon finish its bulb production, leaving one farm.
- Bulbs are mainly concentrated on St Mary's, but this island has seen around a 25% reduction in production in the last decade.
- Bulbs are no longer grown on higher land; now concentrated in more sheltered locations (e.g. central on St Mary's, and centre and south of St Martin's).
- Linked to the management of bulb strips is the condition of shelter hedges, which have seen a decline where bulb fields have been abandoned.
- Bulb fields are valued in landscape terms for their colour and smell.

**Main types of shelter hedges**

- Pittosporum is the dominant species found across the islands (back to 1870s) – now spreading across other habitats (no longer kept in check by winter frosts – the last being in 1987)
- Other species found include **olearia** (most recent choice due to its frost resistance and particularly common on Tresco), **coprosma**, **euonymus** (St Martin's and Bryher), **escalonia** (older hedges), **tamarisk** (older hedges, also used for making lobster pots on St Martin's), **hebe/hedge Veronica** (in combination with tamarisk around smaller fields), **cordyline** (2 lines on Tresco) and **elm** - with these trees now being of great value due to loss of elms on the mainland from Dutch Elm Disease.

**Field patterns**

- When bulb strips were created from the late 19th century, they sub-divided the pervious medieval and prehistoric fields to create ideal conditions for bulb growing.
- The older field pattern and stone wall/stone hedge boundaries are visible in some locations (as identified in the Historic Landscape Characterisation, 1996).
- Current consensus is to manage the current location of shelter hedges.

**Main locations of significance for tree cover**

These were plotted on a map using Post-it notes. Main points were:

- St Agnes: lines of elm and pine. Old orchards with traditional Scillonian apple varieties.
- Tresco: pine shelterbelts
- Bryher: important for lines of elm
- St Martin's: elm and pine woodland at Lower Town; plantations at Higher Town
- St Mary's: woodland on the north coast and pine shelter belts throughout. Elms at Holy Vale and Rose Hill.

**Discussion on the Level 2 indicators**

The group felt that for Scilly, the 'Woodland cover/type' indicator would be more appropriate as '**Tree** cover/type'. Another change agreed was for the 'Extent of pasture and arable' indicator to be modified to be 'Extent of pasture and **cultivated land**'. The group also agreed that the 'Extent of habitats' indicator (currently at Level 3) should be a Level 1 indicator for Scilly, due to BAP Priority Habitat mapping currently being undertaken by the Wildlife Trust.

**Information available to inform the study**

The group briefly discussed sources of information and monitoring methods that could inform the study. The Isles of Scilly Design Guide (2006) will provide information on settlement pattern, local vernacular styles and key viewpoints (the latter at Level 3). The Historic Landscape Characterisation (1996) would also provide information on field patterns. A Duchy survey of tree cover across St Mary's and Tresco is currently being completed, with data to be made available to the AONB. The RSPB pointed out that monitoring the numbers of different bird species is a good indicator of landscape quality. Agri-environment scheme monitoring (through FEPs) could also be used to inform the Level 2 indicators.

**Prioritising Level 2 indicators by island**

The group was split into two; one considering the Level 2 indicators for St Mary's and Tresco, and the other looking at the indicators for St Agnes and Gugh, St Martin's, and Bryher and Samson. The two groups undertook two tasks – one to prioritise the indicators by island in order of importance, and the other to look at the 'desired trajectories of change' for each indicator.

The results from the group discussions on prioritisation are as follows, by island:

**Bryher and Samson**

*The group chose the following prioritisation:*

**1) Extent of pasture and cultivated land:** it was agreed that this indicator would be subject to the most change.

**1) Vernacular building styles:** a particular issue for the island is the erection of fences and granite stone walls out of keeping with local character.

**2) Tree cover / type:** a key issue is the spread of trees, particularly pittosporum, across other semi-natural habitats and abandoned land (e.g. across heathland on Samson). It is also impacting on views across the island.

**4) Field patterns:** the group agreed that field patterns on the island were unlikely to change.

*The group agreed the following modifications to the 'desired trajectories of change'.*

**Tree cover/type:**

Positive: Maintain existing tree groups, especially around settlements. No further spread of pittosporum, except where it is serving a land use function.

**Extent of pasture/cultivated land:**

Positive: Increase in or maintenance of the area of cultivated land. Maintain areas of pasture. Bring abandoned land back into pastoral land use.

**St Agnes and Gugh**

*The group chose the following prioritisation:*

**Local vernacular styles:** the group felt that this was particularly important, as the local building styles are distinctive and valued aspects of the island's character.

**Field patterns**

**Extent of pasture / cultivated land:** the island benefits from having a viable dairy herd to supply the island, along with other active farmers engaging in flower growing and chicken keeping.

**Tree cover / type:** a key issue is the spread of trees, particularly pittosporum, across other semi-natural habitats and abandoned land, as is the case on most of the islands.

*The group agreed the following modifications to the 'desired trajectories of change'.*

**Tree cover/type:**

Positive: No increase in pittosporum, unless serving a land use purpose. Maintain existing tree groups (including around the island's chaplaincy).

**Extent of pasture / cultivated land**

Positive: Maintain or increase area of pasture. Maintain overall farmed area and the balance between pasture and cultivated land.

**St Martin's and Tean**

*The group decided on the following prioritisation:*

**1) Field patterns:** the group agreed that these are very noticeable on the island, particularly on the southern slopes.

**1) Tree cover / type:** a key issue is the spread of trees, particularly pittosporum, across other semi-natural habitats and abandoned land, as is the case on most of the islands. The island has distinctive lines of trees.

**2) Settlement pattern:** the three settlements are distinctive, and need to remain separate (no coalescence)

**Extent of pasture / cultivated land:** this was felt to be a low priority on the island as it was unlikely to change unless incentives are introduced (e.g. an abbatoir to serve the islands). North of the island's hill conditions are bleak, meaning little land use except low level grazing.

*The group agreed the following modifications to the 'desired trajectories of change'.*

**Tree cover / type:**

Positive: No increase in pittosporum, unless serving a land use purpose. Maintain existing tree groups and lines.

**Extent of pasture / cultivated land:**

Positive: Maintain areas of land under pasture/in active cultivation. Maintain or increase areas of cultivation across the southern part of the island.

**St Mary's**

The group felt that all of the indicators were important for the island, with settlement pattern and vernacular building styles being of particular relevance.

*The group agreed the following modifications to the 'desired trajectories of change':*

**Tree cover / type:**

Positive: Maintenance of tree cover where it exists in appropriate places, and allow to degrade in inappropriate places (e.g. on the site of Scheduled Monuments).

*The group also noted that the pine shelter belts on the island are Lodge Pine and Scots Pine (not Monterey).*

**Extent of pasture / cultivated land:**

Positive: Manage the mosaic of different land uses.

**Settlement pattern:**

*The group agreed that there are issues of concern on the island relating to housing density (to be referred to in the Design Guide).*

## Tresco

*The group decided on the following prioritisation:*

**1) Extent of pasture and cultivated land:** there is some cereal growing for livestock bedding. The land use is a mixture of pasture, arable, bulb fields, grass ley and some grazing animals.

**2) Field patterns:** bulb strips enclosed by elm and pittosporum shelter hedges.

**2) Tree cover / type:** with the group commenting that not all tree cover on the island is good and/or useful (the spread of rhododendron is a particular issue on Tresco, e.g. on Castle Down and sand dunes). There are some areas of semi-natural woodland around Great Pool, and suckering lines of Elm.

**3) Settlement pattern**

**3) Vernacular building styles**

*The group agreed the following modifications to the 'desired trajectories of change':*

**Tree cover / type**
Positive: Reduction in the area of rhododendron spreading across the island.

**Extent of pasture / cultivated land**
Positive: Maintain mixture of agricultural types.

**Field patterns**
Positive: Maintenance of total length of hedges and of field pattern.

## LEVEL 3 INDICATORS

The two groups considered the appropriateness of the Level 3 indicators for their islands, as well as discussing any additional indicators that they felt should be included, particularly given the unique character of the Scillies.

## GROUP 1

### Prioritisation for Bryher, St Agnes and St Martin's

*The 'top 5' Level 3 indicators were decided as:*

**Type of horticulture** (particularly flower growing)

**Extent of habitats** (this should be a Level 1 indicator for the Isles of Scilly)

**Marine characteristics**

**Change in key views** – impact of the spread of pittosporum is a key issue, along with pine/other trees on St Agnes and impacts of development on Bryher. Maintaining views to the sea would be a key measure of quality.

**Field boundary condition** – maintaining height and range of species

*Additional indicators for the Isles of Scilly suggested by this group:*

- Presence/absence of cricket pitches
- Extent of tidal and intertidal flats visible at low tide – particularly characteristic on Bryher and St Martin's
- Visibility and condition of churches and church yards (key visitor attractions)
- Extent/number of waste sites
- Levels of beach litter – already monitored by the AONB as part a national survey (looking at type of litter and quantities).

## GROUP 2

### Prioritisation for Tresco

**1) Extent of habitats** (to be moved to Level 1)

**1) Type of horticultural production** (to be moved to Level 2?)

**1) Change in key viewpoints**

**1) Marine characteristics** (navigation buoys are changing the character of traditional navigation markers)

**1) Field boundary condition** (revealed on the sea bed at low tide)

**2) Extent / condition of parklands**

**3) Extent of traditional orchards**

### Prioritisation for St Mary's

**1) Extent of habitats** (to be moved to Level 1)

**1) Type of horticultural production** (to be moved to Level 2?)

**1) Change in key viewpoints**

**1) Marine characteristics** (navigation buoys are changing the character of traditional navigation markers)

**1) Field boundary condition** (revealed on the sea bed at low tide)

**3) Extent of traditional orchards**

*Additional indicators for the Isles of Scilly suggested by this group:*

- Extent of tidal and intertidal flats visible at low tide
- Number of people on beaches
- Number of stored boats on land (as well as moorings at sea)
- Types of livestock (e.g. traditional milking breeds of cattle (Guernsey, Charolais) and pony breeds)

# APPENDIX 2:

# LIST OF POTENTIAL DATA SOURCES

**Table of indicators and potential monitoring data sources/methods**

| Indicator | Possible monitoring data/method | Requirement for sampling? | Community or student involvement? | Current monitoring frequency (where relevant/known) |
|---|---|---|---|---|
| **LEVEL 1 INDICATORS** | | | | |
| 1.1: Levels of tranquillity | • CPRE/LUC mapping to district level | | | • Usually about every five years |
| 1.2: Levels of intrusion | • CPRE/LUC mapping to district level<br>• Analysis of national renewable energy databases held by BWEA and RESTAS | | | • Usually about every five years<br>• National databases continually updated |
| 1.3: Extent of dark night skies | • CPRE/LUC mapping to district level | | | • Usually about every five years |
| 1.4: Coastal change | • SW Regional Coastal Monitoring Project (LIDAR and Topographic survey) (Plymouth University)<br>• Local knowledge on presence/absence of new coastal defences | | Community | • LIDAR – annual<br>• Topographic – 6-monthly |
| 1.5: Condition of SSSIs | • Condition Monitoring through common standards JNCC monitoring (NE) | | | • Every 6 years/3 year interim reporting |

| Indicator | Possible monitoring data/method | Requirement for sampling? | Community or student involvement? | Current monitoring frequency (where relevant/known) |
|---|---|---|---|---|
| **LEVEL 2 INDICATORS** | | | | |
| 2.1 Extent of woodland and tree cover / type | • National Inventory of Woodland and Trees (Main Woodland Survey and Survey of Small Woodland and Trees)<br>• Cornwall LIFE data (1995)<br>• Landcover Map 2007<br>• Isles of Scilly Habitat Audit for Wildlife Trust Holdings (2003)<br>• Aerial photographic analysis | | | • Every 10 years (National Inventory) |
| 2.2: Agricultural land use | • June Agricultural Survey (ward level only)<br>• IACS data (individual fields but issue of accessing data from RPA)<br>• Countryside Survey 2000/ Land Cover Map 2007<br>• Aerial photographic analysis<br>• Sample farm survey | YES (for sample survey) | | • Annual – Agricultural census |
| 2.3: Extent of biomass planting | • Defra Energy Crop Scheme data<br>• Aerial photographic interpretation | | | • Annual |
| 2.4: Field patterns | • Aerial photographic analysis<br>• Field survey | YES | Student | • Aerial photographs updated approximately every 5 years |

| Indicator | Possible monitoring data/method | Requirement for sampling? | Community or student involvement? | Current monitoring frequency (where relevant/known) |
|---|---|---|---|---|
| 2.5: Extent of semi-natural habitats | • Cornwall LIFE data (1995)<br>• Land Cover Map 2007<br>• Isles of Scilly Habitat Audit for Wildlife Trust Holdings (2003) | | | |
| 2.6: Presence [and condition] of historic landscape features | • County HER / SMR<br>• EH Heritage Counts<br>• EH Heritage at Risk register (in development) – number of SMs 'at risk'<br>• HLS farm visits – condition monitoring (through Genesis database) | YES | | • HER/SMR continually updated<br>• Annual (Heritage Counts)<br>• Every 3-4 years (SM survey) |
| 2.7: Settlement pattern | • Aerial photographic analysis<br>• Fixed point photography to monitor settlement expansion (already in place in some locations where identified as key issue)<br>• Community involvement to identify areas of recent development and increase/decrease in number of caravans/holiday homes<br>• LPA data from council tax/business rates for caravans/holiday homes | YES | Community | |
| 2.8: Transport infrastructure | • Highways Authority information on sign installation and traffic calming scheme locations<br>• Aerial photographic analysis<br>• Survey of sample roads | YES | Community | |

| Indicator | Possible monitoring data/method | Requirement for sampling? | Community or student involvement? | Current monitoring frequency (where relevant/known) |
|---|---|---|---|---|
| 2.9: Local vernacular building styles | • Village Design Statements / Parish Plans/ Conservation Area Appraisals<br>• Cornwall and Scilly Urban Survey<br>• Isles of Scilly Design Guide<br>• Cornwall Industrial Settlements Initiative<br>• WHS registers of buildings and mining features consolidated in place; monitoring of mining settlements' streetscapes.<br>• Sample of planning consents to show number of conditions relating to building styles/materials<br>• Number of permitted developments relating to microgeneration in sample areas<br>• Community involvement in street/building surveys in sample locations | YES | Community | • WHS monitoring (ongoing) |
| 2.10: Development at seas | • Local community knowledge<br>• Fixed point photography<br>• Analysis of national renewable energy databases held by BWEA and RESTAS | YES | Community | • National renewable energy databases continually updated |

| Indicator | Possible monitoring data/method | Requirement for sampling? | Community or student involvement? | Current monitoring frequency (where relevant/known) |
|---|---|---|---|---|
| **LEVEL 3 INDICATORS** | | | | |
| 3.1: Extent of covered horticultural production | • June Agricultural Survey (ward level only)<br>• IACS data (individual fields but issue of accessing data from RPA)<br>• Countryside Survey 2000/ Land Cover Map 2007<br>• Aerial photographic analysis<br>• Field survey | YES | Student | • Annual (June Agricultural Census and IACS) |
| 3.2: Extent of traditional orchards | • UK BAP Priority Habitats mapping?<br>• Tamar Valley AONB dataset showing historic extent of orchards<br>• Cornwall traditional orchards dataset<br>• Aerial photographic analysis<br>• Field survey | YES | Student | |
| 3.3: Presence of traditional livestock types | • Take up of HLS options for native breeds<br>• Sample survey | YES | | |
| 3.4: Field boundary condition and species | • Field survey (e.g. all AONBs have MP targets for sample condition surveys) | YES | Student | |
| 3.5: Extent [and condition] of designed landscapes | • English Heritage Register of Parks and Gardens (GIS shapefile)<br>• English Heritage *Landscapes at Risk* monitoring programme (first reporting due July 2008)<br>• Aerial photographic analysis | | | • Register continually updated |

| Indicator | Possible monitoring data/method | Requirement for sampling? | Community or student involvement? | Current monitoring frequency (where relevant/known) |
|---|---|---|---|---|
| 3.6: Extent of bare mining spoil | • Aerial photographic analysis<br>• World Heritage Site monitoring | YES | | • WHS ongoing monitoring programme (including aerial photographic interpretation and landscape survey at least every 6 years) |
| 3.7: Presence of navigation marks | • Presence on navigation charts (to indicate if in current usage/therefore active management and high levels of visibility in landscape) | | | • Navigation charts continually updated |
| 3.8: Levels of fishing industry activity | • Number of businesses registered against the SIC code for 'fishing' – Annual Business Enquiry data at ward level; ONS statistics.<br>• Marine and Fisheries Agency data – e.g. Sea Fisheries Statistics<br>• Number of active fishing fleets (Harbour Authority records?)<br>• Local community knowledge | | Community | • Annually (ABI data); SIC code statistical update from ONS due 2007 (every 4 years)<br>• Annual - includes landed catches and size of fleet in Newlyn and Falmouth (Sea Fisheries Statistics) |
| 3.9: Number of moorings | • Harbour Authority Records | | | • Should be updated annually |
| 3.10: Presence of local car and passenger ferries | • Ferry timetables<br>• Location on road atlases | | | • Ferry timetables available online (annual updates) |

# APPENDIX 3:
# GUIDELINES FOR
# SAMPLE SQUARE SELECTION

## GUIDELINES FOR SAMPLE SQUARE SELECTION

The selection of sample squares relates to those indicators that require the interpretation of aerial photographs. There are five indicators that will / may rely on aerial photographic interpretation, as follows:

- 2.4: Field patterns

- 2.7: Settlement pattern

- 2.8: Transport infrastructure

- 3.2: Extent of traditional orchards

- 3.6: Extent of mining (specifically focused on mapping the extend of unvegetated mine spoil)

The choice of sample squares (1km x 1km) should reflect the following:

a) there should be two squares per LMU unless one square will cover a significant part of the LMU

b) where an LMU has a coastline, at least one of the sample squares should be on the coast;

c) the coastal square should include one or more coastal settlements / fishing villages subject to development pressure and / or caravan / chalet development. The other square should be inland covering the more traditional medieval settlement pattern and / or former mining villages;

d) in combination the two squares should, as far as possible, cover the range of field types and ages found within that LMU;

e) where prevalent at least one square within an LMU should cover the location of traditional orchards; and

f) where prevalent at least one square within the LMU should cover the location of bare mine spoil.

Land Use Consultants
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