

# Wind Energy Consultancy

## Landscape Capacity and Cumulative Impact

**Final Report**

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## EXECUTIVE SUMMARY

### Study Purpose and Objectives

The Scottish Borders Wind Energy Consultancy addresses Scottish Borders Council's requirement for research into the economic impacts of wind turbines, public perception and the implications of further turbine development on the landscape. The three reports bring together the evidence from these key elements to provide a basis for the consideration of future policy direction, and will provide evidence at the Local Development Plan Examination.

The main objectives of the study are:

- To consider the landscape implications for current and projected wind turbines in the Scottish Borders, including cumulative impact
- To assess public opinion of current and projected wind turbine development within the Scottish Borders
- To consider the aggregate economic contribution from wind turbines
- To provide a thorough and robust report on the above matters to inform the development of Local Plan policy on wind turbines.

The following is a summary of the key findings of all three studies.

### Landscape Study

#### Study Objectives

This study considers the capacity of the Scottish Borders landscape to accommodate onshore wind energy development. The landscape capacity assessment is based on an assessment of landscape sensitivity and value of the different landscape character types and areas in Scottish Borders. The key objectives and outputs are:

- Carrying out an assessment of the key landscape characteristics within the Scottish Borders using a robust methodology identifying sensitivity criteria;
- Setting out a clearer vision for onshore wind farm development and allowing better understanding of the constraints on wind energy in the Scottish Borders and how these can or should be addressed;
- Determining the thresholds of acceptable change and identifying critical factors which are likely to present an eventual limit to development;
- Identifying areas most suitable for wind energy development and areas which require protection.

The study is based on the premise that, given current renewable energy targets, there will be a need to manage future landscape change and effects on visual amenity resulting from wind energy development, and to identify where change is acceptable and where it is not acceptable. In applying the assessment process, the study has addressed

a number of concepts and issues that affect the perceived significance and acceptability of cumulative changes caused by multiple wind energy developments in the landscape.

#### Landscape Character

The Scottish Borders covers a large area of south east Scotland to the south of Edinburgh. At its core is a series of river valleys, including the River Tweed, flowing eastwards into a broad undulating lowland area that has the Lammermuir and Moorfoot Hills to the north and north west, the Central Southern Uplands to the west and south and the Cheviot Hills to the south and south east. To the east the study area borders the North Sea in a dramatic coastal zone. The border with England, Northumberland and the Northumberland National Park is to the south east and south. The majority of the medium sized regionally significant settlements are either found within sheltered valleys surrounded by upland landscapes or within the broad flatter lowland landscapes.

The Scottish Borders is divided into 30 distinctive landscape character types, most of which are subdivided into further geographically separate landscape character areas. These have been assessed for their sensitivity to wind energy development and their capacity to accommodate wind turbines.

#### Landscape Capacity

The capacity for different sizes of turbine across the landscape character types of the Scottish Borders is shown in detail in figures 6.1 a, b & c. Extensive upland areas such as the Moorfoot Hills and parts of the Southern Uplands tend to have the highest inherent capacity for the largest size turbines and turbine developments. This reflects the suitable characteristics of scale, simplicity of landform and lack of small scale developments. Nevertheless, many smaller upland areas, such as the Eildon or Pentland Hills, have greater prominence and visibility in the landscape or have national or local designations in recognition of their scenic, cultural or recreational qualities, greatly limiting capacity. Upland fringe areas are suitable for more modest levels of development including medium and large turbines. Lowland areas are most suitable for medium size turbines, singly or in smaller groupings. Extensive areas, including river valleys, prominent uplands, highly visible escarpments and the coast, have no capacity for wind energy development.

#### Cumulative Impacts of Consented and Proposed Turbines

The emerging pattern of development in and around the Scottish Borders reflects the wider pattern of Scottish wind energy development, where the majority of windfarms and turbines are located in upland areas, with smaller developments in lowland areas.

There are, at January 2013, 311 operational and consented turbines 25m and taller within the Scottish Borders (and 66 small turbines under 25m tall). The vast majority of these are large (162 are 50-<100m tall) and very large turbines (127 over 100m tall), with only 22 medium sized turbines (25m-<50m tall). The majority of turbines are located within windfarms north of the River Tweed in the Upland landscapes, with small groups or individual turbines in the agricultural lowlands and river valleys. Many large and very large turbines are located in the Dissected Plateau Moorland areas of the Lammermuir and Moorfoot Hills and Plateau Grasslands of Lauder Common. Two windfarms with large turbines also lie in the Upland Fringe and Coastal Moorland

landscape character types. The largest windfarm fully within the Scottish Borders is at Dun Law (comprising 61 large turbines). There are only two existing small - medium sized windfarms in the Southern Uplands, south of the River Tweed.

In areas adjacent to Scottish Borders there are two clusters that introduce significant landscape and visual impacts into the Scottish Borders: Clyde Windfarm in South Lanarkshire and the Crystal Rig/Aikengall development either side of the Scottish Borders/ East Lothian border.

There are currently no wind turbines in the Cheviot Hills or Upper Tweed and Teviot Valleys and only minimal turbine development within the majority of the Southern Uplands.

The current levels of development have led to a Landscape with Wind Turbines developing across the north of the Borders, from Lauder Common through to the northern edge of the Lammermuirs, and a smaller area in the Southern Uplands on the western boundary with South Lanarkshire. A wider area of Landscape with Occasional Wind Turbines has developed around this and into the coastal area and Tweed Lowlands.

At January 2013 applications totalled 15 medium sized turbines, 12 large turbines and 157 very large turbines. The majority of proposals comprise very large (100m+) turbines in windfarms, located in Upland and Upland Fringe landscapes in north and north eastern areas of the Scottish Borders; with a secondary cluster proposed in the westernmost area of the Southern Uplands area of Scottish Borders.

Applications for small, medium and large individual turbines continue and are spreading west and south west from the coastal area/ Lammermuir Hills. Proposed turbine development within Scottish Borders is generally extending the existing clusters of turbine development rather than being located in areas that are currently undeveloped.

### **Conclusions**

The assessment of landscape capacity and cumulative effects of current consented development indicates that there is remaining capacity for further turbine developments within areas of the Coastal Zone, Lammermuir and Moorfoot Hills, Central Southern Uplands and small areas of the Cheviot Hills. Nevertheless there are also areas in the Lammermuirs, Coastal Zone and western Southern Uplands where current cumulative impact limits further development. Further development across Scottish Borders needs careful consideration if unacceptable levels of landscape change are to be avoided. Further detail is provided in Table 6.1 and Figure 6.4.

## **Public Attitude Study**

### **Study Objectives**

The purpose of the Public Survey on Attitudes towards Wind Energy is to assess public opinion on current and projected wind turbines provision within the Scottish Borders

### **General Attitudes**

The survey consisted of 400 telephone interviews conducted in the form of a structured questionnaire. Key findings are:

- Generally, there was high awareness of both the Scottish Government's promotion of renewable energy (91% aware) and support of the use of onshore wind power as a form of renewable energy in Scotland (68% support).
- Seven out of ten (70%) of respondents stated that they found the look of wind turbines on the landscape acceptable.

The main benefits of wind energy in Scotland were perceived to be reducing reliance on fossil fuels (15%), helping to reduce carbon emissions (14%), Providing an energy source that helps to protect customers from rises in energy bills created by fluctuating gas prices (14%), 21% could not think of any benefits and 12% stated 'don't know'.

The main disadvantages of wind energy in Scotland were perceived to be making the landscape less attractive (26%), negative impact on views of the landscape (24%). 36% could not think of any disadvantages and 7% stated 'don't know'. However 66% of respondents believe, on balance, the benefits outweighed the disadvantages whereas 24% believe they did not and 12% did not know.

When asked whether they agree or disagree with a range of positive and negative statements about wind turbines in the Scottish Borders, greater proportions of respondents tended to err towards being more positive about wind turbines. In general more respondents agreed with these statements than disagreed, with the exception of wind turbines not having an impact on the landscape where more respondents disagreed than agreed. A significant proportion of respondents also disagreed that there should be more wind turbines built in the Scottish Borders.

Responses to negative statements were mostly concerned about the negative impact on the environment and about a potential reduction in property values as a result of wind turbines being built in the Borders.

### **Attitudes on Proximity to Residences**

The study highlighted that similar proportions of the population would oppose (48%) and support (43%) a wind farm within 1 mile of their home whereas when this was expanded to within 6 miles of their home, this rose to 65% supporting. This indicates that the level of concern decreases as the distance from the respondent's home increases, with respondents being most likely to be opposed to the building of a wind farm when it is in close proximity to their home.

### **Attitudes in Areas under Pressure from Wind Turbine Development**

Responses of those living in the two areas already affected by significant wind energy development tended to be slightly more negative than the general population. This is particularly in terms of identifying benefits of wind energy development and enthusiasm for further wind energy development, specifically in close proximity to residences. There was generally a greater proportion of people in these areas who felt strongly.

## **Economic Study**

### **Study Objectives**

*To consider the aggregate economic contribution from wind turbines particularly in relation to the Scottish Borders, and how the Council might usefully intervene to co-ordinate and maximise the economic benefits.*

### **Current GVA and Jobs Value**

*The Economic Impact of Wind Energy Study identified that In 2012 onshore wind energy contributed at least £10.8 million gross value added (GVA) to the Scottish Borders economy and supported 115 local jobs.*

### **Potential GVA and Jobs Value**

*By 2020 this impact could vary between £9.6 million GVA and 98 jobs (minimum development scenario) and £33.3 million GVA and 325 jobs (maximum development scenario and increased share of contracts in Scottish Borders). There are several actions that could be taken by Scottish Borders Council to help to maximise the opportunity. These relate to labour market and supply chain development and increasing the capacity of local communities to maximise benefits from community benefit funding.*

### **Potential Impact on Tourism Industry**

*In 2011 almost 0.5 million tourists visited the Scottish Borders and they spent almost £150 million. The number of tourists to the Scottish Borders has increased by 17.5% since 2006, compared to an increase of 4.3% across Scotland as a whole. In 2011 tourism accounted for around 9% of employment in the Scottish Borders, slightly higher than across Scotland as a whole where the rate was 7.8%.*

*A minority of tourism businesses have reported concerns about reduced visitor numbers and associated impacts on turnover and employment. It is important that the potential impact of future proposed developments on the tourism sector are comprehensively assessed, in particular visibility from key tourist routes and tourism accommodation.*

*Realising the economic and employment opportunities of wind energy is not inconsistent with maintaining a strong and growing tourism sector, but the Council will have an important role to play in balancing the continued growth of both sectors.*

## **Combined Study Conclusions**

*There is some limited, but not overriding, economic value to be derived from the wind turbine industry. A key factor will be ensuring that it does not impact on the high value tourism industry.*

*There is general acceptance/support for the concept of renewables/ wind turbines, but attitudes are majority negative in response to turbines in proximity to residences. This negative view becomes hardened in those areas already subject to pressure from wind turbines.*

*In context of the above the Council should take a precautionary approach to the introduction of wind turbines. The landscape study sets out a hierarchy of size typologies in relation to their acceptability within the landscape, and also identifies where there are already issues relating to cumulative impact. In terms of cumulative impact those areas identified should be subject to close scrutiny in relation to any further proposals.*



## 1.0 INTRODUCTION

### 1.1 Background

Scottish Borders Council has been proactive in supporting the national policy for the positive provision for the development of windfarms in locations where the technology can operate efficiently and environmental and cumulative impacts can be satisfactorily addressed. However the Scottish Borders Council also has a duty to protect scenic landscapes that are a key asset to the economy of the Scottish Borders.

Scottish Borders Council in their preparation of planning policy and decision making on planning applications for developments must strike a balance between these conflicting objectives. SPG for wind energy was recently reviewed in 2011 in the light of the recent increase in proposals for wind energy projects, particularly single or small groupings of turbines as a result of the introduction of the Feed in Tariff.

Scottish Borders Council has commissioned research into economic impacts, public perception and the implications of further wind turbine development on the landscape. In this respect Scottish Borders Council has appointed Ironside Farrar Ltd to carry out a robust independent assessment of the current and potential landscape impacts of future turbine development which will inform the development of planning policy on windfarms in the new Local Development Plan.

Scottish Government policy in SPP and web based guidance clearly indicates that cumulative development within areas may lead to eventual limits on further development and that this should be considered as a significant constraint. Areas where cumulative development has reached a threshold of acceptability are a Stage 1 constraint in a Spatial Framework, requiring significant protection from further development.

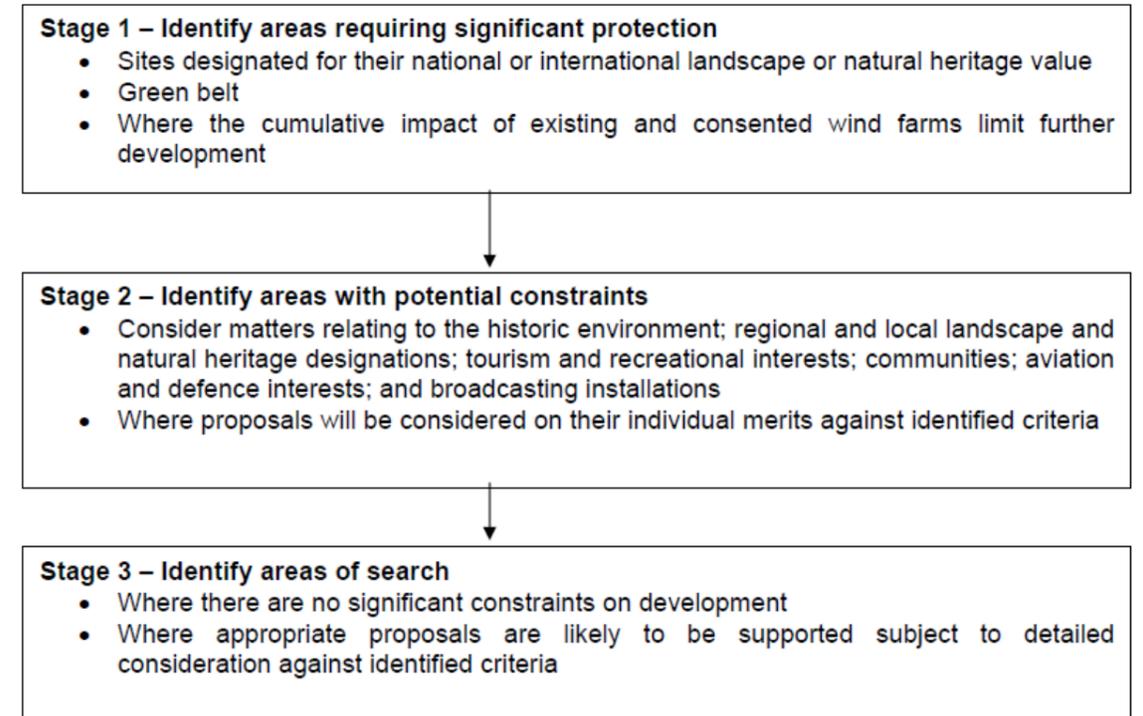
### 1.2 Consultancy Appointment

Ironside Farrar has been appointed by Scottish Borders Council to carry out the *Wind Energy; Consultancy Services to deliver Economic, Landscape and Community Impact Study*. This report concentrates on the landscape and assesses the current and projected potential impact of wind turbine development on the Scottish Borders landscape, including the consideration of cumulative impacts. The key objectives and outputs of this study are:

- Carrying out an assessment of the key landscape characteristics within the Scottish Borders using a robust methodology identifying sensitivity criteria;
- Setting out a clearer vision for onshore wind farm development and to allow better understanding of the constraints on wind energy in the Scottish Borders and how these can or should be addressed;
- Determining the thresholds of acceptable change and identifying critical factors which are likely to present an eventual limit to development;
- Identifying areas most suitable for wind energy development.

This study on behalf of Scottish Borders Council specifically assesses landscape capacity and the impact of cumulative wind energy development in order to determine where significant protection from further development may be required. This study addresses these requirements through a staged assessment process described in sections 2.0 to 6.0.

**Figure 1.1: Extract from Current Scottish Government Guidance on Preparing Spatial Frameworks**



### 1.3 National and Local Policy

National and local planning policies in Scotland are well disposed towards the development of onshore wind energy. However it is accepted that there are limitations imposed by environmental sensitivities and the capacity of areas to accept cumulative development. Therefore the acceptability of multiple windfarms and turbines and the cumulative landscape and visual impacts of development has to be considered in the light of national and development plan policy. **Appendix 1** reviews current national policy and guidance and *The New Way Forward Scottish Borders Structure Plan 2001 - 2018*.

### 1.4 Landscape Capacity and Cumulative Impacts

SPP and Scottish Government guidance identifies cumulative impacts and landscape capacity as being critical to the identification of broad areas of search. This study has thus

been prepared to inform the Council on the issues of landscape capacity and cumulative impact. Accordingly it comprises three main themes:

- A strategic landscape capacity study, investigating the inherent capacity of landscapes within the Scottish Borders to accommodate wind energy development;
- A cumulative assessment examining the level of cumulative development of operating, consented and proposed wind turbines and wind farms in the Scottish Borders.
- Guidance on the levels and types of wind turbine development throughout the Scottish Borders that would be acceptable in landscape terms, taking into account the first two considerations and the findings of the Economic Study and Public Opinion Survey,

**It is emphasised that this is a strategic level study providing a context for consideration of capacity for, and the cumulative effects of, existing and potential future wind turbine developments. No site specific conclusions should be drawn from it in relation to currently proposed or potential future wind turbines and windfarms.**

**All wind energy proposals should be considered on their own unique locational and design characteristics as well as their strategic context. All proposals should be subject to consideration of landscape, visual and cumulative impact assessment including (if required) a full environmental assessment.**

## 2.0 CUMULATIVE IMPACT AND CAPACITY METHODOLOGY

### 2.1 Purpose of Methodology

The purpose of the following assessment is to determine the landscape capacity of Scottish Borders to accommodate wind energy development and to determine the levels of cumulative development that would be acceptable across the local authority area. The assessment takes into account current cumulative development within and around Scottish Borders and is based on the premise that current renewable energy policies will lead to a future level of landscape change within Scottish Borders that requires careful management.

The key objectives of the study are outlined in Chapter 1. The methodology serves these objectives through a clear assessment of landscape and visual sensitivity and capacity across Scottish Borders; together with an assessment of the cumulative effects of current consented wind energy development and the potential for accommodating future development.

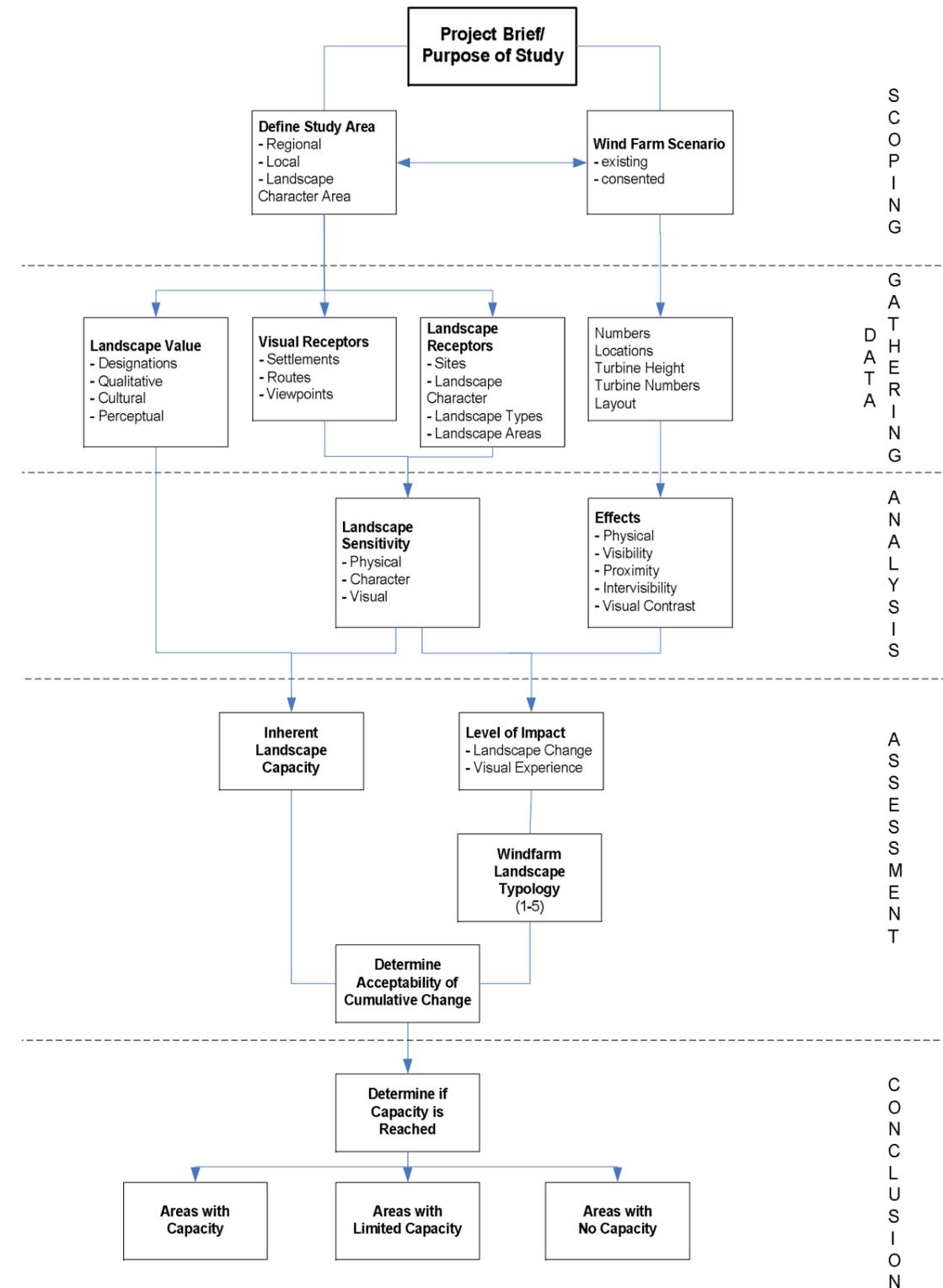
Nevertheless, it is recognised in guidance that the assessment of landscape capacity and cumulative impacts is not a straightforward exercise. The background considerations and detailed methodology for this process are detailed in **Appendix 2** of this report. The following summarises the methodology and explains how the findings and recommendations are presented.

### 2.2 Study Stages

The assessment comprises the following stages (see Figure 2.1 opposite).

- 1) Define study area, characterise landscape and visual baseline and scope wind energy types to be included in the strategic study.
- 2) Assess landscape/ visual sensitivity and landscape value based on landscape character types (LCTs) and landscape character areas (LCAs) in Scottish Borders.
- 3) Assess the inherent capacity of the Scottish Borders landscape to accommodate wind energy development of different types and scales, based on the assessment of sensitivity and value of the LCTs and LCAs.
- 4) Record the current type and extent of consented wind energy development in Scottish Borders and the surrounding local authorities.
- 5) Determine the extent to which the cumulative consented development has reached the capacity of the landscape to accommodate wind energy developments.
- 6) Further to the assessment of landscape capacity and cumulative development identify areas in which:
  - there is no inherent landscape capacity for wind energy development;
  - there is inherent landscape capacity for wind energy development.
  - consented cumulative development in areas with inherent capacity limits landscape capacity for further wind energy development;

Figure 2.1. Cumulative Impact and Landscape Capacity Methodology Flowchart



The resulting spatial strategy is supported by guidance on appropriate types and levels of wind energy development for the areas in which there is capacity, taking note of the potential limitations imposed by already consented development. Currently proposed developments are assessed in the light of the assessment findings and proposed strategy.

## 2.3 Scope of Assessment

### 2.3.1 Area Covered

The study focuses primarily on the local authority area of Scottish Borders, although areas beyond the boundary are considered in terms of the visual influence of nearby wind turbines and neighbouring contiguous landscape types.

### 2.3.2 Wind Energy Development Types

The study considers all sizes of turbines and developments operating, consented or proposed, as well as the potential for future scenarios where appropriate.

However turbines under 25m to blade tip are not included in the strategic assessment. These are better considered in terms of localised generic siting and design criteria. Turbines under 25m are not considered to have the same qualities of scale, prominence and widespread visibility that lead to the wider cumulative impacts that characterise larger turbines with a blade tip higher than 25m.

## 2.4 Landscape and Visual Baseline

The landscape baseline assessment includes a description and classification of landscape character and records of designations and other features that contribute to landscape value.

The **landscape character assessment** is based on landscape character types (LCTs) and landscape character areas (LCAs) in Scottish Borders identified and described in the *Borders Landscape Assessment* (ASH Consulting Group for SNH, 1998). Further landscape character types in neighbouring areas are also identified. These are detailed in other publications in the national series.

**Landscape value** is determined partly through landscape designations. There are two nationally designated areas in Scottish Borders. Local landscape designations have recently been reviewed and cover extensive parts of the local authority area. There are also many Historic Gardens and Designed Landscapes throughout Scottish Borders. Related designations that contribute to landscape value and character are recorded. These include natural and cultural heritage designations, recreational/ visitor facilities and core paths.

The **visual baseline** assessment is detailed in **Chapter 4**. It involves a computer-based intervisibility assessment based on different turbine heights and receptor types. This approach should not be considered in isolation from other factors such as landscape

character. Nevertheless it is a comprehensive visibility test which helps to identify the areas that are most likely to be visually sensitive and areas in which wind turbines of different heights might be visible or more easily concealed.

## 2.5 Determining Landscape Sensitivity and Capacity

A method for determining landscape sensitivity and capacity is detailed in **Appendix 2**. This involves consideration of the two main elements outlined in 2.2 above:

- 1) The sensitivity of the landscape fabric and character to wind energy development, which includes landscape features, elements and characteristics and its visual sensitivity which includes intervisibility and receptors types.
- 2) The value of the landscape as determined by stakeholders. This may include national or local recognition by landscape designation or cultural association, or value to a community of interest such as a local residents or an interest group.

**Appendix 2** describes a breakdown of the physical and perceptual characteristics that contribute to landscape character, visual sensitivity and value. Each criterion is described and evaluated in terms of its sensitivity to wind energy development. An overall assessment of **high, medium or low** is derived from a composite of all the criteria. There is no consistent relative weighting of criteria as, in the case of each landscape type, different criteria are likely to be critical in the sensitivity assessment. Nevertheless factors such as scale, landform and perceptual qualities are often critical in determining sensitivity.

Following the above assessment, an overall professional judgement on capacity for developments of different types is made on the basis of sensitivity and value. Landscape capacity is rated according to the degree to which wind turbines may be accommodated without adverse effects on sensitivity and value. The descriptive criteria below for **high, medium** and **low** describe the main thresholds on a continuum between no capacity and high capacity.

**Low Capacity:** A landscape that is both sensitive to wind turbine development and has a high value, where only a slight level of change can be accommodated without significantly affecting any of the key defining criteria

**Medium Capacity:** A landscape that has some sensitivity to wind turbine development and has some aspects of value; where a moderate level of change can be accommodated which may significantly affect some of the defining criteria

**High Capacity:** A landscape that has low sensitivity to wind turbine development and has low value, and can accommodate change that significantly affects most of the key defining criteria

Broadly speaking there is an inverse relationship between landscape sensitivity/value and capacity. However, this is not a simple relationship that can be expressed in a matrix: a

balance of judgement is made in each case as landscape value may be a more important factor than sensitivity in some cases; and vice versa in others.

Turbines of particular heights and the sizes and layout of types of turbine development may relate better to some LCTs than others and limited geographical extent of LCAs of some otherwise suitable LCTs may limit capacity for development.

## 2.6 Defining Landscape Change and Cumulative Capacity

An understanding of cumulative impacts and change in the landscape is key to determining acceptable levels of development and whether or not areas have reached cumulative capacity. This is discussed below and in further detail in **Appendix 2**.

### 2.6.1 Cumulative Capacity

Scottish Government Guidance for Onshore wind turbines (web based update 24 Oct 2012) underlines the landscape and visual issues associated with increasing levels of cumulative wind turbine development:

*'In areas approaching their carrying capacity the assessment of cumulative effects is likely to become more pertinent in considering new wind turbines... In other cases, where proposals are being considered in more remote places, the thresholds of cumulative impact are likely to be lower, although there may be other planning considerations.'*

SNH guidance *Siting and Designing Windfarms in the Landscape (Dec 2009)* and *Assessing the Cumulative Impact of Onshore Wind Energy Developments (March 2012)* lists the factors that affect the perception of cumulative impact of windfarm development:

- the distance between individual windfarms (or turbines),
- the distance over which they are visible,
- the overall character of the landscape and its sensitivity to windfarms,
- the siting and design of the windfarms themselves, and
- the way in which the landscape is experienced.

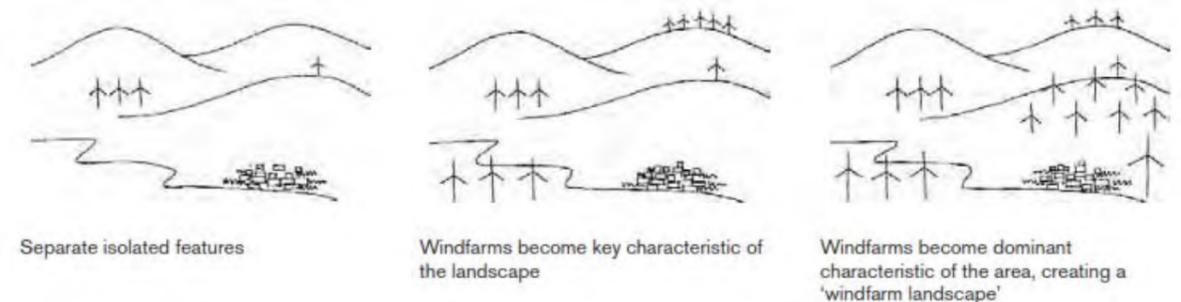
To this list might be added turbine height and windfarm size. In determining an acceptable level of development, it is necessary to clearly define what differing levels of development actually entail. The methodology therefore sets out defined levels of change to the landscape and visual environment that might occur or be experienced depending on the size, number and location of turbines to be built within an area.

The descriptions in Table 2.1, opposite, set out a gradated landscape typology that defines increasing levels of cumulative landscape and visual impact of turbines by describing their effect on landscape character and the experience of those living in or travelling through the landscape.

Further generic illustration of this concept is provided in Part 1 section 5 of the SNH guidance (see 5.5 and 5.6 of the SNH guidance and the illustrative sketches below the table).

**Table 2.1: Description of Levels of Cumulative Wind Turbine Development**

Wind Turbine Landscape Type	Landscape Character	Visual Experience
<b>Landscape with no Wind Turbines</b>	A landscape type or area in which no, or a minimal number/size of wind turbines is present, or visible from neighbouring areas.	There would be no, or negligible, effects on visual receptors.
<b>Landscape with Occasional Wind Turbines</b>	A landscape type or area in which windfarms or wind turbines are located and/or are close to and visible. However they are not of such a size, number, extent or contrast in character that they become one of the defining characteristics of the landscape's character.	Visual receptors would experience occasional close-quarters views of a windfarm or turbines and more frequent background views of windfarms or turbines. Some of the turbines would not be perceived as being located in the landscape character type or area. No overall perception of wind turbines being a defining feature of the landscape.
<b>Landscape with Wind Turbines</b>	A landscape type or area in which a windfarm, windfarms or wind turbines are located and/or visible to such an extent that they become one of the defining characteristics of the landscape character. However, they are clearly separated and not the single most dominant characteristic of the landscape.	Visual receptors would experience frequent views of windfarms or wind turbines as foreground, mid-ground or background features, affecting their perception of the landscape character. However there would be sufficient separation between windfarms and turbines and sufficient areas from which wind turbines are not visible such that they would not be seen as dominating the landscape over all other landscape features.
<b>Wind Turbine Landscape</b>	A landscape type or area in which windfarms or wind turbines are extensive, frequent and nearly always visible. They become the dominant, defining characteristic of the landscape. Nevertheless there is a clearly defined separation between developed areas.	Visual receptors would experience views of windfarms as foreground, mid-ground and background features, to the extent that they are seen to dominate landscape character. Few areas would be free of views of wind turbines.
<b>Windfarm</b>	Landscape fully developed as a windfarm with no clear separation between groups of turbines. Few if any areas where turbines not visible.	Visual receptors would always be close to and nearly always in full view of wind turbines.



## 2.6.2 Determining Acceptable Levels of Change

The SNH siting and design guidance identifies three broad levels of cumulative change in the landscape that may be set by local authorities depending on landscape sensitivity and value and local policy objectives:

- **Landscape Protection:** Maintain existing landscape character.
- **Landscape Accommodation:** Accept a degree of change providing this does not fundamentally alter key landscape characteristics and visual resources.
- **Landscape Change:** Accept large amounts of change that may fundamentally alter key landscape characteristics and visual resources.

The descriptions in Table 2.1 provide a basis on which to understand and determine levels of change. However it is the collective decision of stakeholders including local authorities and their population that ultimately determines the levels of landscape change that are acceptable across their area.

## 2.7 Presentation of Assessment and Findings

The study assessment and findings are presented in the following chapters:

### Chapter 3: Landscape Baseline

This chapter defines and describes the study area, including the geographical extent and landscape character of Scottish Borders and its surroundings. It also reviews other relevant information including landscape designations and other landscape-related constraints such as natural heritage and cultural heritage designations.

The information in Chapter 3 informs the assessment of the sensitivity and value of each LCT or LCA, as detailed in Chapter 6.

### Chapter 4: Visual Baseline

This chapter details the analysis carried out to establish the relative visibility and visual sensitivity of different parts of Scottish Borders. This involves a computer-based intervisibility assessment based on different turbine heights and receptor types. The resulting maps are shown in **Appendix 3**. The colours on the maps are indicative of relative visibility and visual sensitivity and are analysed in Chapter 4.

The information and analysis in chapter 4 informs the assessment of overall landscape sensitivity as detailed in Chapter 6.

### Chapter 5: Wind Turbines in the Study Area

This chapter describes the operating, consented and proposed wind turbine developments in the study area at April 2013. A detailed list of existing and consented developments and applications is given in **Appendix 4** and illustrated in Figures 5.1 and 5.2. There is an analysis of turbine size ranges and distribution in relation to landscape. Following this

there is a discussion of the factors involved in wind turbine location, size, design and distribution that affect landscape, visual and cumulative impacts.

## Chapter 6: Assessment of Landscape Capacity and Cumulative Change

This chapter analyses and assesses the information in the previous sections to determine the landscape and visual impacts of, and capacity for, wind energy development across Scottish Borders. The assessment is summarised in **Table 6.1** and **Figures 6.1 to 6.3**. The assessment informs the subsequent spatial strategy and includes guidance on turbine size and distribution. Further details of how to read Table 6.1 together with the figures are given in at the start of Chapter 6.

This assessment is carried out for each of the six main regional landscape areas of Scottish Borders:

- 1) Midland Valley;
- 2) Lammermuir and Moorfoot Hills;
- 3) Coastal Zone;
- 4) Tweed Lowlands;
- 5) Cheviot Hills;
- 6) Central Southern Uplands.

This includes all thirty LCTs in Scottish Borders and their component LCAs which are represented across the regional landscape areas. The capacity assessment and current cumulative change for the LCTs and LCAs in each regional area is combined to come to an assessment of capacity and cumulative effects.

Finally the regional assessments are combined to make an assessment for the whole local authority area. Further spatial guidance regarding areas with restricted capacity and areas with capacity for further development are given at the end of Chapter 6.

## 2.8 Potential Opportunities and Constraints

The main spatial findings of the detailed assessment are summarised on a map in **Figure 6.4**. This shows the distribution of the following areas:

- Areas with highest inherent landscape capacity for wind energy development
- Areas with limited inherent landscape capacity for wind energy development
- Areas with no inherent landscape capacity for wind energy development
- Areas where capacity is limited by existing/ consented cumulative development (which overlap with parts of the above areas)

## 2.9 Limitations to Assessment

It is emphasised that this assessment is focused on landscape and visual issues. Areas which have been identified as having capacity for wind energy development on this basis may be restricted by other unrelated factors such as protection of wildlife, effects on residential amenity, aviation restrictions or lack of grid connection. These potential constraints are not the subject of this assessment and are covered separately by the SPG.



### 3.0 LANDSCAPE BASELINE

The following section defines and describes the study area, including the geographical extent and landscape character of the Scottish Borders and its surroundings. It also reviews other relevant information including landscape-related designations, natural heritage and cultural heritage constraints. Most of these constraints are identified in Stages 1 and 2 of the spatial framework. However it is the extent to which may have a bearing on landscape character and value that is the primary consideration in this cumulative impact study.

#### 3.1 Study Area

The study area for this assessment is shown in Figure 3.1. The Scottish Borders covers a large area of south east Scotland to the south of Edinburgh. The central area of this planning authority is a broad undulating lowland area that has the Lammermuir and Moorfoot Hills to the north and north west, the large Southern Uplands Plateau to the west and south and the Cheviot Hills to the south and south east. To the east the study area borders the North Sea creating a dramatic coastal zone. The border with England, Northumberland and the Northumberland National Park is to the south east and south. The majority of the medium sized regionally significant settlements are either found within sheltered valleys surrounded by upland landscapes or within the broad flatter lowland landscapes. East Lothian Council, Midlothian Council and West Lothian Council are to the northern border of the Scottish Borders area. To the west is South Lanarkshire, to the south west is Dumfries and Galloway, the English Border and Northumberland are to the south east.

The study focuses on the local authority area of the Scottish Borders Council for the purposes of determining landscape capacity. Nevertheless, there are a number of existing, consented and proposed windfarms and turbines in neighbouring local authority areas. Some consideration has been given to these, due to the extensive visual influence exerted by most wind turbines. The study area therefore includes a 15km buffer around its boundary.

#### 3.2 Baseline Landscape Character Assessment

##### 3.2.1 Landscape Context

The Landscape of the Scottish Borders centres on the lowland landscape through which the River Tweed and Whiteadder Water meander. This lowland landscape is surrounded by higher land to the north, west and south. To the east the Scottish Borders area borders the North Sea. To the north lies the elevated incised plateau landscape of the Lammermuir and Moorfoot Hills. To the north west the landscape takes on the characteristics of the broad Midland Valley, this broad valley landscape rises up with increasing steepness to the ridge line summit of the Pentland Hills to the north east and Southern Uplands to the south west. To the west and south west lie the Southern Uplands

and to the south/ south east lie the Cheviot Hills upland landscape, the upland valley of the River Teviot separates these two upland landmasses. The upland landscapes are contiguous within the neighbouring council areas of East Lothian, Midlothian and West Lothian to the north to north west, South Lanarkshire to the west and Dumfries and Galloway to the south west. The Cheviot Hills upland landscape is contiguous with the upland landscape within Northumberland and the Northumberland National Park to the south and south east. The Liddel Water valley enters Cumbria to the south. Within the central area surrounded by uplands lies the broad lowland landscape of the Tweed Valley, this landscape character is continuous across the River Tweed into the lowland area of Northumberland towards Berwick-upon-Tweed and the North Sea Coast.

The Scottish Borders area is predominantly an inland landmass with a comparatively short coastal zone. The total land area is 4,732Km<sup>2</sup> and has a population of approximately 109,270 (2002). There are no extensive urban areas in the Scottish Borders with extensive areas of farmland and extensive sparsely populated upland areas.

The landscape of the Scottish Borders is diverse with adjoining areas of extensive upland environments enclosing narrow valleys that open onto the agricultural lowland basin. This variety of landscapes within the Scottish Borders and neighbouring area is illustrated in Figure 3.2.

The Lammermuir and Moorfoot Hills and the Southern Uplands are formed from folded resistant Sandstones, Limestones, Shales, Grits and Greywackles. The Eastern Cheviot massif in contrast is of volcanic origin with the lowland merse underlain by Limestones and Sandstones. The Lowland merse landscape is interrupted by igneous intrusions that have been weathered into prominent landmarks such as the Eildon Hills and rounded glacial Drumlins in the east.

The uplands enveloping the lowlands create an upland landscape with a central lowland basin, the majority of which is drained by the extensive River Tweed catchment. The Liddel water drains the southern point of the Borders towards the Solway and the Irish Sea to the south west. The eye water is also a separate and smaller watershed to the Tweed's, draining a smaller watershed in the north east and entering the North Sea at Eyemouth.

Throughout the Borders area there are important strategic transport corridors, most notably the A1/ east coast mainline along the eastern area that roughly follows the coast but curves inland slightly before rejoining the coast. Secondary, slightly less important routes through the Scottish Borders includes the A68. These routes have created important connections between England and Scotland.

##### 3.2.2 Landscape Character

The *Borders Landscape Character Assessment* (ASH Consulting Group 1998), published by SNH, identifies 6 regional landscape character areas which are primarily determined by elevation, landform, land use and proximity to the coast. These are:

- Coastal Zone
- Lammermuir and Moorfoot Hills
- Midland Valley

- Central Southern Uplands
- Cheviot Hills
- Tweed Lowlands

These 6 regional character areas have been divided into 5 regional landscape character types (Uplands, Upland Fringe, Lowlands, Coastal and River Valley) with further subdivisions into 30 local landscape character types (LCTs) as set out in Table 3.1 below. Most of the types are subdivided further into geographically separated landscape character areas (LCAs). Regional and local landscape character types and areas are shown in Figures 3.3 and 3.4.

**Table 3.1. Landscape Character Areas in Scottish Borders (based on The Borders Landscape Assessment)**

Regional Character Areas	Regional Landscape Character Types	Local Landscape Character Types
<b>THE MIDLAND VALLEY</b>		
	Uplands	1 Dissected Plateau Moorland
	Upland Fringe	8 Rolling Farmland 11 Grassland with Hills
<b>LAMMERMUIR &amp; MOORFOOT HILLS</b>		
	Upland	1 Dissected Plateau Moorland 2 Plateau Grassland
	Upland Fringe	13 Poor Rough Grassland 12 Undulating Grassland 8 Rolling Farmland 14 Upland Fringe Moorland 11 Grassland with Hills 9 Platform Farmland
	River Valley	26 Pastoral Upland Fringe Valley 28 Wooded Upland Fringe Valley 24 Upland Valley with Farmlands 23 Pastoral Upland Valley 25 Upland valley with Woodland
<b>COASTAL ZONE</b>		
	Coastal	19 Coastal Farmland 21 Coastal Moorland 20 Coastal Pasture
	River Valley	30 Coastal Valley

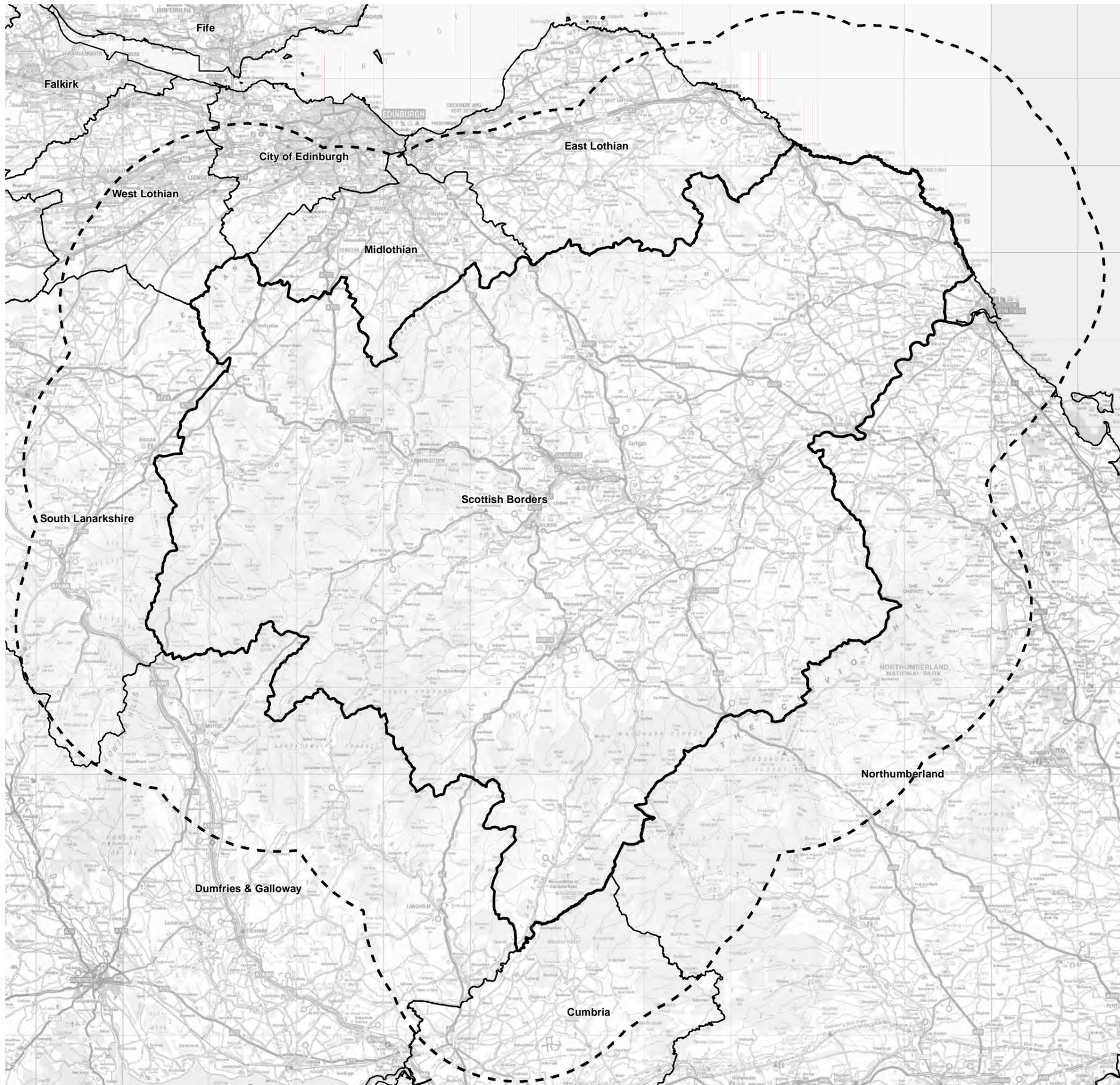
<b>CENTRAL SOUTHERN UPLANDS</b>		
	Upland	3 Plateau Outliers 4 Southern Uplands with Scattered Forests 5 Southern Uplands Forest Covered
	Upland Fringe	11 Grassland with Hills 10 Grassland with Rock Outcrops 8 Rolling Farmland
	River Valley	22 Upland valley with Pastoral Floor 25 Upland Valley with Woodland 27 Upland Fringe Valley with Settlements 28 Wooded Upland Fringe Valley 26 Pastoral Upland Fringe Valley
<b>CHEVIOT HILLS</b>		
	Upland	5 Southern Uplands Forest Covered 7 Cheviot Foothills 6 Cheviot Uplands
	Upland Fringe	11 Grassland with Hills 8 Rolling Farmland
	River Valley	28 Wooded Upland Fringe Valley 26 Pastoral Upland Fringe valley
<b>TWEED LOWLANDS</b>		
	River Valley	29 Lowland valley with Farmland
	Lowland	17 Lowland Margin Platform 18 Lowland Margin with Hills 16 Rolling Lowland Margin 15 Lowland with Drumlins 16 Rowling lowland Margin

### 3.3 Landscape Designations

Landscape designations are an indication of landscape value as determined by society. Landscape designations form part of the baseline for both the assessment of landscape capacity, and the preparation of a spatial framework. Landscape designations within the study area are noted below, and are shown in Figure 3.5, in relation to landscape character areas.

#### 3.3.1 National Designations

Within the Scottish Borders area there are two National Scenic Areas: Upper Tweeddale and the Eildon and Leaderfoot areas. Within the study area but outwith the Scottish Borders region there is the Northumberland National Park which borders an eastern section of the Cheviot Uplands area.



### Legend

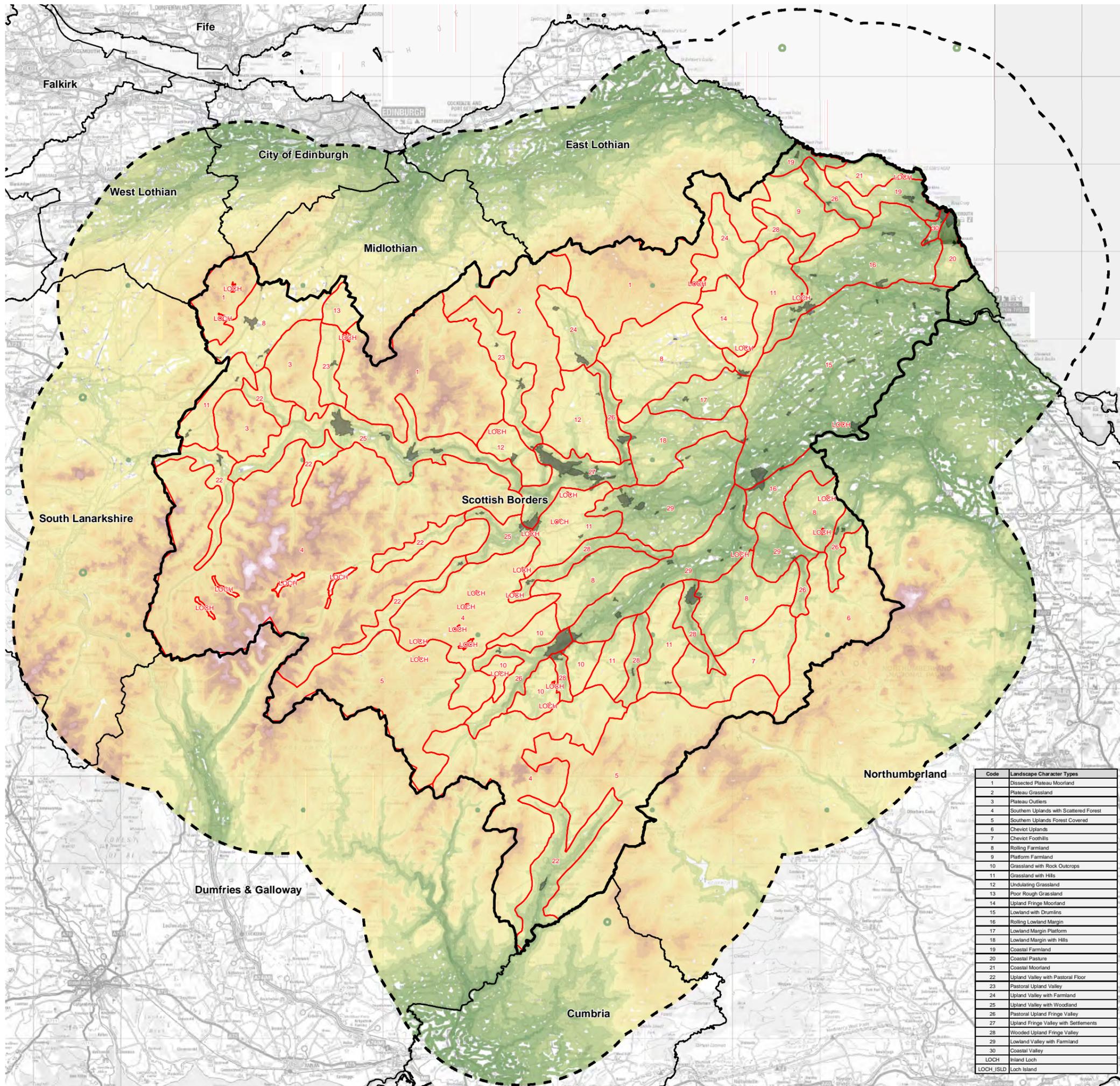
-  SBC Local Authority Boundary
-  Local Authority Boundary 15km Buffer
-  Other Local Authority Boundaries

### Figure 3.1

### Study Area







### Legend

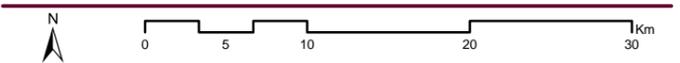
- SBC Local Authority Boundary
- Local Authority Boundary 15km Buffer
- Other Local Authority Boundaries
- Landscape Character Areas
- Settlements

### Elevation

- 800 - 850m AOD Contours
- 750 - 800m AOD Contours
- 700 - 750m AOD Contours
- 650 - 700m AOD Contours
- 600 - 650m AOD Contours
- 550 - 600m AOD Contours
- 500 - 550m AOD Contours
- 450 - 500m AOD Contours
- 400 - 450m AOD Contours
- 350 - 400m AOD Contours
- 300 - 350m AOD Contours
- 250 - 300m AOD Contours
- 200 - 250m AOD Contours
- 150 - 200m AOD Contours
- 100 - 150m AOD Contours
- 50 - 100m AOD Contours
- 0 - 50m AOD Contours

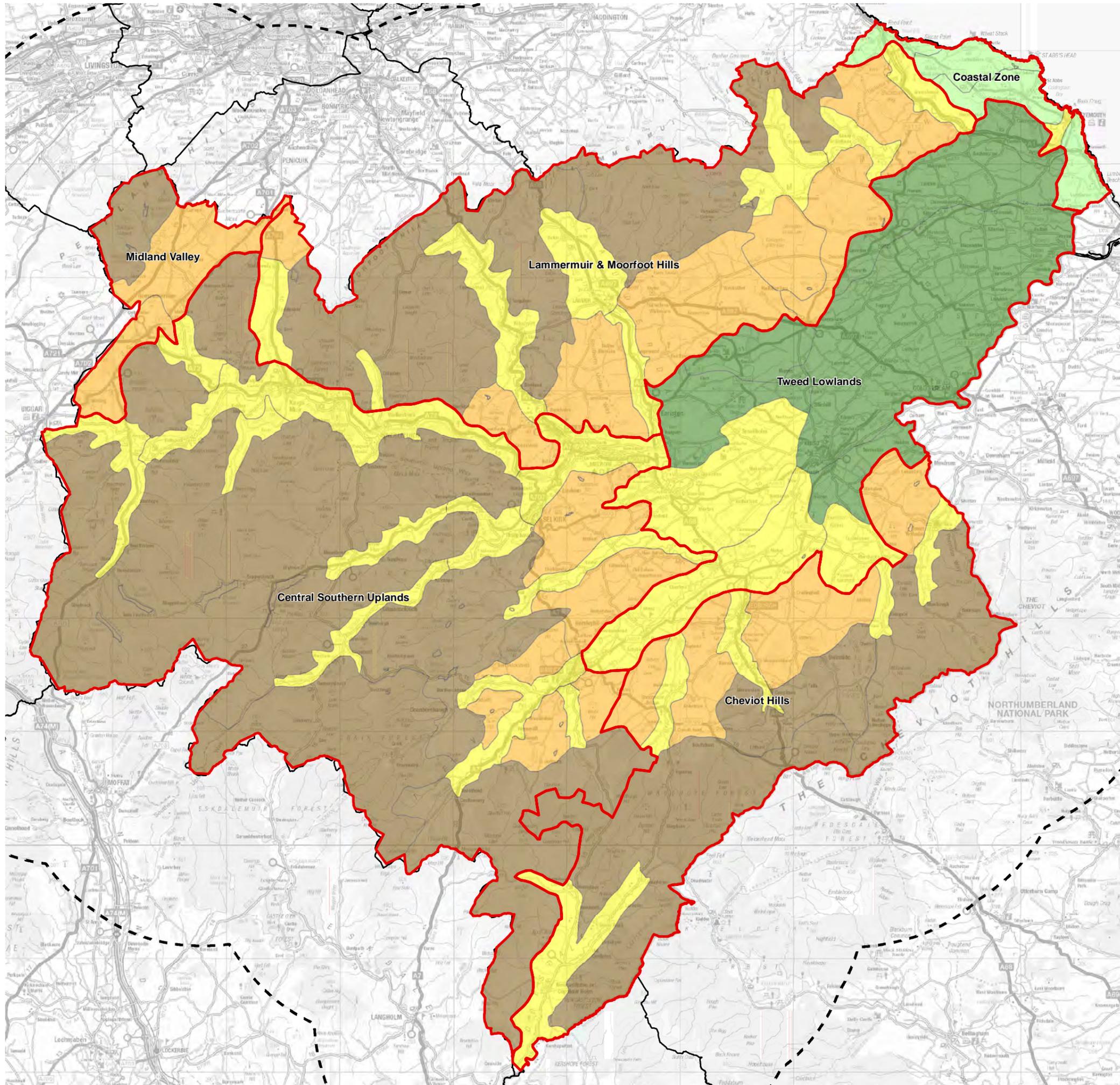
Code	Landscape Character Types
1	Dissected Plateau Moorland
2	Plateau Grassland
3	Plateau Outliers
4	Southern Uplands with Scattered Forest
5	Southern Uplands Forest Covered
6	Cheviot Uplands
7	Cheviot Foothills
8	Rolling Farmland
9	Platform Farmland
10	Grassland with Rock Outcrops
11	Grassland with Hills
12	Undulating Grassland
13	Foor Rough Grassland
14	Upland Fringe Moorland
15	Lowland with Drumlins
16	Rolling Lowland Margin
17	Lowland Margin Platform
18	Lowland Margin with Hills
19	Coastal Farmland
20	Coastal Pasture
21	Coastal Moorland
22	Upland Valley with Pastoral Floor
23	Pastoral Upland Valley
24	Upland Valley with Farmland
25	Upland Valley with Woodland
26	Pastoral Upland Fringe Valley
27	Upland Fringe Valley with Settlements
28	Wooded Upland Fringe Valley
29	Lowland Valley with Farmland
30	Coastal Valley
LOCH	Inland Loch
LOCH_ISLD	Loch Island

**Figure 3.2**  
Topography



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**Legend**

- Regional Landscape Areas
- Local Authority Boundary 15km Buffer
- Other Local Authority Boundaries

**Regional Landscape Character Types**

- Upland
- Upland Fringe
- Lowland
- Coastal
- River Valley

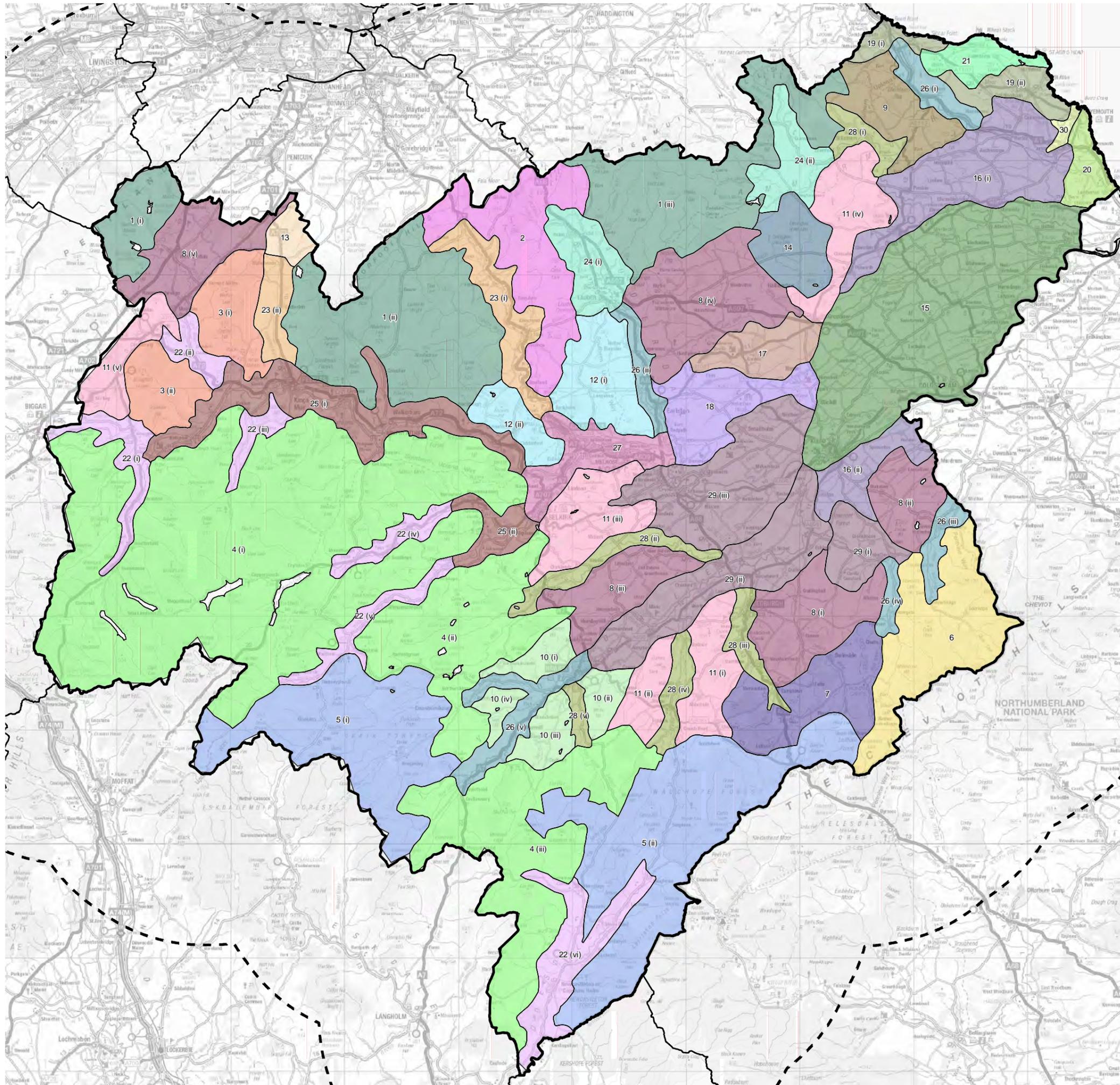
**Figure 3.3**

**Regional Landscape Character Types**



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**Legend**

- SBC Local Authority Boundary
- Local Authority Boundary 15km Buffer
- Other Local Authority Boundaries

<p><b>1 - Dissected Plateau Moorland</b></p> <ul style="list-style-type: none"> <li>1 (i) Western Pentlands</li> <li>1 (ii) Moorfoot Plateau</li> <li>1 (iii) Lammermuir Hills</li> </ul> <p><b>2 - Plateau Grassland</b></p> <ul style="list-style-type: none"> <li>2 Lauder Common</li> </ul> <p><b>3 - Plateau Outliers</b></p> <ul style="list-style-type: none"> <li>3 (i) Eddleston / Lyne Interfluvium</li> <li>3 (ii) Broughton Heights</li> </ul> <p><b>4 - Southern Uplands with Scattered Forest</b></p> <ul style="list-style-type: none"> <li>4 (i) Broadlaw Group</li> <li>4 (ii) Dun Knowe Group</li> <li>4 (iii) Cauldcleuch Head Group</li> </ul> <p><b>5 - Southern Uplands Forest Covered</b></p> <ul style="list-style-type: none"> <li>5 (i) Craik</li> <li>5 (ii) Wauchope / Newcastleton</li> </ul> <p><b>6 - Cheviot Uplands</b></p> <ul style="list-style-type: none"> <li>6 Cocklaw Group</li> </ul> <p><b>7 - Cheviot Foothills</b></p> <ul style="list-style-type: none"> <li>7 Falla Group</li> </ul> <p><b>8 - Rolling Farmland</b></p> <ul style="list-style-type: none"> <li>8 (i) Oxnam</li> <li>8 (ii) Lempitlaw</li> <li>8 (iii) Minto Hills</li> <li>8 (iv) Westruther Platform</li> <li>8 (v) West Linton Synclinal Belt</li> </ul> <p><b>9 - Platform Farmland</b></p> <ul style="list-style-type: none"> <li>9 Eye Water Platform</li> </ul> <p><b>10 - Grassland with Rock Outcrops</b></p> <ul style="list-style-type: none"> <li>10 (i) Whitehaugh</li> <li>10 (ii) Midgard</li> <li>10 (iii) Allan Water</li> <li>10 (iv) Chisholme</li> </ul> <p><b>11 - Grassland with Hills</b></p> <ul style="list-style-type: none"> <li>11 (i) Bonchester / Dunion</li> <li>11 (ii) Rubers Law</li> <li>11 (iii) Eldon Hills</li> <li>11 (iv) Knock Hill</li> <li>11 (v) Skirling</li> </ul> <p><b>12 - Undulating Grassland</b></p> <ul style="list-style-type: none"> <li>12 (i) East Gala</li> <li>12 (ii) West Gala</li> </ul> <p><b>13 - Poor Rough Grassland</b></p> <ul style="list-style-type: none"> <li>13 Leadburn</li> </ul> <p><b>14 - Upland Fringe Moorland</b></p> <ul style="list-style-type: none"> <li>14 Greenlaw Common</li> </ul> <p><b>15 - Lowland with Drumlins</b></p> <ul style="list-style-type: none"> <li>15 Lower Merse</li> </ul>	<p><b>16 - Rolling Lowland Margin</b></p> <ul style="list-style-type: none"> <li>16 (i) Eye Water lowlands</li> <li>16 (ii) Maxwellheugh</li> </ul> <p><b>17 - Lowland Margin Platform</b></p> <ul style="list-style-type: none"> <li>17 Gordon Platform</li> </ul> <p><b>18 - Lowland Margin with Hills</b></p> <ul style="list-style-type: none"> <li>18 Black Hill / Hume Crags</li> </ul> <p><b>19 - Coastal Farmland</b></p> <ul style="list-style-type: none"> <li>19 (i) Cockburnspath</li> <li>19 (ii) Coldingham</li> </ul> <p><b>20 - Coastal Pasture</b></p> <ul style="list-style-type: none"> <li>20 Lamberton Moor</li> </ul> <p><b>21 - Coastal Moorland</b></p> <ul style="list-style-type: none"> <li>21 Coldingham Moor</li> </ul> <p><b>22 - Upland Valley with Pastoral Floor</b></p> <ul style="list-style-type: none"> <li>22 (i) Upper Tweed / Biggar Water</li> <li>22 (ii) Lyne Water</li> <li>22 (iii) Manor Water</li> <li>22 (iv) Upper Yarrow</li> <li>22 (v) Upper Ettrick</li> <li>22 (vi) Liddel Water</li> </ul> <p><b>23 - Pastoral Upland Valley</b></p> <ul style="list-style-type: none"> <li>23 (i) Gala Water</li> <li>23 (ii) Eddleston Water</li> </ul> <p><b>24 - Upland Valley with Farmland</b></p> <ul style="list-style-type: none"> <li>24 (i) Upper Leader</li> <li>24 (ii) Upper Whiteadder</li> </ul> <p><b>25 - Upland Valley with Woodland</b></p> <ul style="list-style-type: none"> <li>25 (i) Middle Tweed</li> <li>25 (ii) Lower Ettrick / Yarrow</li> </ul> <p><b>26 - Pastoral Upland Fringe Valley</b></p> <ul style="list-style-type: none"> <li>26 (i) Eye Water</li> <li>26 (ii) Lower Leader</li> <li>26 (iii) Bowmont Water</li> <li>26 (iv) Kale Water</li> <li>26 (v) Upper Teviot / Bothwick Water</li> </ul> <p><b>27 - Upland Fringe Valley with Settlements</b></p> <ul style="list-style-type: none"> <li>27 Tweed / Gala / Ettrick Confluence</li> </ul> <p><b>28 - Wooded Upland Fringe Valley</b></p> <ul style="list-style-type: none"> <li>28 (i) Middle Whiteadder</li> <li>28 (ii) Ale Water</li> <li>28 (iii) Jed Water</li> <li>28 (iv) Rule Water</li> <li>28 (v) Slitrig Water</li> </ul> <p><b>29 - Lowland Valley with Farmland</b></p> <ul style="list-style-type: none"> <li>29 (i) Lower Kale</li> <li>29 (ii) Lower Teviot</li> <li>29 (iii) Lower Tweed</li> </ul> <p><b>30 - Coastal Valley</b></p> <ul style="list-style-type: none"> <li>30 Lower Eye Water</li> </ul>
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**Figure 3.4**  
Landscape Character Areas



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### 3.3.2 National Scenic Areas

The two national scenic areas within the Scottish Borders are located along the River Tweed. The western most NSA, the Upper Tweeddale NSA is located to the west of Peebles to an area around the A701. The Eildon and Leaderfoot NSA is centred on the confluence of the Leader Water and River Tweed, extending east along the Tweed to Melrose and Darnick, the Eildon Hills and south to the outskirts of Newton St Boswells. Recent legislation defines a National Scenic Area as an area "of outstanding scenic value in a national context". The purpose of a NSA designation is to identify the finest scenery within Scotland and to ensure it is protected from inappropriate development.

### 3.3.3 Local Landscape Designations

Within the Scottish Borders region there are 9no. Special Landscape Areas as illustrated within the Supplementary Planning Guidance Local Landscape Designations August 2012.

These SLAs comprise:

- 1) Tweedsmuir Uplands SLA;
- 2) Tweed, Ettrick and Yarrow Confluences SLA;
- 3) Tweed Lowlands SLA;
- 4) Teviot Valleys SLA;
- 5) Lammermuir Hills SLA;
- 6) Cheviot Foothills SLA.
- 7) Tweed Valley SLA;
- 8) Berwickshire Coast SLA;
- 9) Pentland Hills SLA

There are a number of local landscape designations within the surrounding areas that are contiguous with Scottish Borders SLAs. The Pentlands SLA is contiguous with designated areas in West Lothian and Mid Lothian and South Lanarkshire as the Pentland Hills and Black Mount SLA. The Lammermuir Hills SLA extends north into East Lothian; The Cheviot Hills SLA is contiguous with the Northumberland National Park over the English Border to the east and south and the Tweedsmuir Uplands SLA extends south into Dumfries and Galloway. This SLA is partly contiguous with the Tinto Hill and Clyde Valley SLA in South Lanarkshire. The coastal zone SLA within the Scottish Borders continues north along the coast into East Lothian.

### 3.3.4 Historic Gardens and Designed Landscapes

There are 31 Historic Gardens and Designed Landscapes (HGDL) within the Scottish Borders area and a total of 33 within the whole study area. Whilst this is not a statutory designation it is a landscape factor that contributes to the assessment of landscape character and value. These are taken into account in the assessment. Similarly there is an

identified 186 designed landscapes (including those identified in the inventory of Historic Gardens and Designed Landscapes) within the Scottish Borders. While the majority of these are not on the inventory and are not a statutory designation they could potentially affect the landscape's value and character.

### 3.3.5 Wild Land Areas

SNH has recently completed an assessment of relative wildness across Scotland (*Mapping Scotland's Wildness, Non Technical Methodology, SNH, 2013*). The assessment uses a detailed analysis of four main attributes (Perceived naturalness; rugged/ challenging terrain; remoteness from roads and lack of human artefacts) to establish relative wildness across Scotland which is expressed as a map.

This mapping has been used to identify the largest areas of wild land, which have been selected as core wild land areas, of which there are 43 in Scotland, mainly in the Highlands and Islands (*Core Areas of Wild Land in Scotland, SNH 2013*).

The wild land mapping highlights a number of higher and more remote areas of Scottish Borders as having relatively high wildness values. This is shown in Figure 3.6. The figure shows the two core areas of wild land that have been identified in Scottish Borders:

- 1) Broad - Dollar - Black Laws
- 2) Talla - Hart Fell (extends into Dumfries and Galloway)

The relative wildness maps and core areas have been factored into the assessment of sensitivity and capacity.

## 3.4 Other Designations

There are a number of designations that, whilst not solely landscape related, clearly indicate landscape value and inform the assessment process. These are shown in Figures 3.5 & 3.7.

### 3.4.1 Countryside Around Towns

Countryside around towns (CAT) has been created within a core area of Central Borders, this has been created around the settlements of Galashiels, Tweedbank, Melrose, Gattonside, Dingleton, Newton St Boswells and St Boswell. The designation seeks the protection and enhancement of this area and recognises the importance of this area as a landscape and recreational resource for the settlements. This area of central borders has a number of settlements separated by short distances and the designation seeks to prevent any further or potential visual or physical coalescence of these settlements and supports the NSA in the protection and enhancement of this area.

### 3.4.2 Regional Park

The Pentlands Regional Park designation is not located within the Scottish Borders, however it is located within Midlothian, City of Edinburgh Council and West Lothian regions

to the north, north east and north west of the Scottish Borders section of the Midland Valley area. This designation is partly related to scenic quality and partly to recreation and will have an impact on any development proposals in this area.

### 3.4.3 Historic and Cultural Designations

Scheduled Ancient Monuments (SAMs) are primarily a historic or archaeological designation. However they can be of landscape significance in their own right and contribute to the character and value of a landscape. Furthermore, effects on their setting can be a consideration for neighbouring development proposals e.g. Castles, Monuments and Cairns.

Conservation Areas are primarily an urban designation. Nevertheless the appearance of a settlement can be a key feature contributing to the surrounding rural landscape and equally the setting of a Conservation Area can be affected by developments in the surrounding countryside.

There are a total of 43 conservation areas within the Scottish Borders these are concentrated throughout the sheltered valleys and agricultural lowlands within the historic population centres.

Listed Buildings feature throughout the urban and rural areas. The greatest concentrations are located within settlements found within the sheltered valleys and broad fertile farmland areas. Listed Buildings are generally not found within the upland areas. Listed buildings contribute to landscape character and value, their setting is a consideration for neighbouring development proposals.

### 3.4.4 Nature Conservation Designations

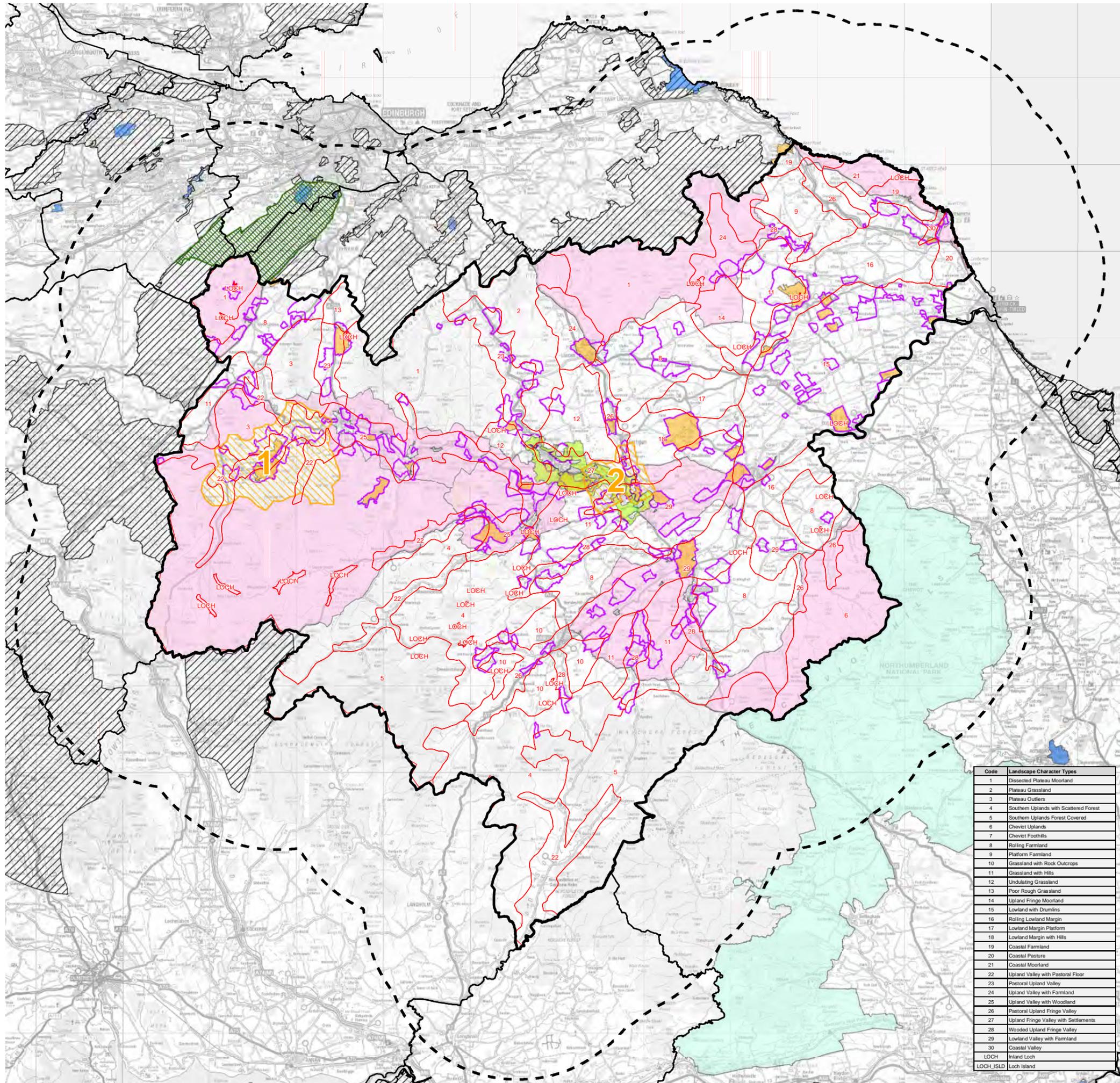
Areas designated for their nature conservation interest and importance include SPAs SACs, Ramsar Sites, SSSIs and National Nature Reserves (NNRs). All are national or international designations and subject to the highest level of constraint in spatial frameworks. Whilst these constraints are primarily related to nature conservation interests, the designated area often contributes to the character and value of a landscape through its relatively undisturbed natural features and potential visitor interest.

In the Scottish Borders the distribution of these designations is found throughout the region, the main rivers and tributaries, including the River Tweed, are SSSI's and SACs. Within the upland areas of the Moorfoot Hills and Southern Uplands there are larger areas designated as SSSIs and SACs. There is a large SPA and SSSI that is partly within the Scottish Borders and partly within Dumfries and Galloway in the southern area of the Scottish Borders region.

## 3.5 MOD Eskdalemuir Seismological Array

The Eskdalemuir seismological array is an MOD facility located within Dumfries and Galloway within the Eskdale Forest in the valley of the White Esk. This facility has no bearing on landscape quality or sensitivity. However it is currently surrounded by a 10km exclusion zone within which no turbine development can occur, this exclusion zone comes

into Scottish Borders area occupying a large area of the **Southern Uplands Forest Covered (Craik Forest LCA)**. A further consultative area of 50km extends from the facility in which turbine development is limited to a 'noise budget' that has already been reached. Applications for turbine developments in this area are subject to mitigation measures that must be agreed with the MOD/ Eskdalemuir seismological array to reduce/ eliminate noise that would interfere with the seismological array. The location and zones are shown in Figure 3.8.



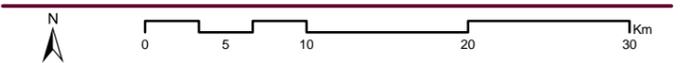
### Legend

- SNH Local Authority Boundary
- Local Authority Boundary 15km Buffer
- Other Local Authority Boundaries
- Landscape Character Areas
- National Scenic Area:
  - 1. Upper Tweedsdale
  - 2. Eildon and Leaderfoot
- Regional Park
- Country Parks
- Countryside Around Towns Area
- SBC Designed Landscapes
- Historic Gardens and Designed Landscapes
- Special Landscape Areas
- Landscape Designations outside SBC
- National Park

Code	Landscape Character Types
1	Dissected Plateau Moorland
2	Plateau Grassland
3	Plateau Outliers
4	Southern Uplands with Scattered Forest
5	Southern Uplands Forest Covered
6	Cheviot Uplands
7	Cheviot Foothills
8	Rolling Farmland
9	Platform Farmland
10	Grassland with Rock Outcrops
11	Grassland with Hills
12	Undulating Grassland
13	Foor Rough Grassland
14	Upland Fringe Moorland
15	Lowland with Drumlins
16	Rolling Lowland Margin
17	Lowland Margin Platform
18	Lowland Margin with Hills
19	Coastal Farmland
20	Coastal Pasture
21	Coastal Moorland
22	Upland Valley with Pastoral Floor
23	Pastoral Upland Valley
24	Upland Valley with Farmland
25	Upland Valley with Woodland
26	Pastoral Upland Fringe Valley
27	Upland Fringe Valley with Settlements
28	Wooded Upland Fringe Valley
29	Lowland Valley with Farmland
30	Coastal Valley
LOCH	Inland Loch
LOCH_ISLD	Loch Island

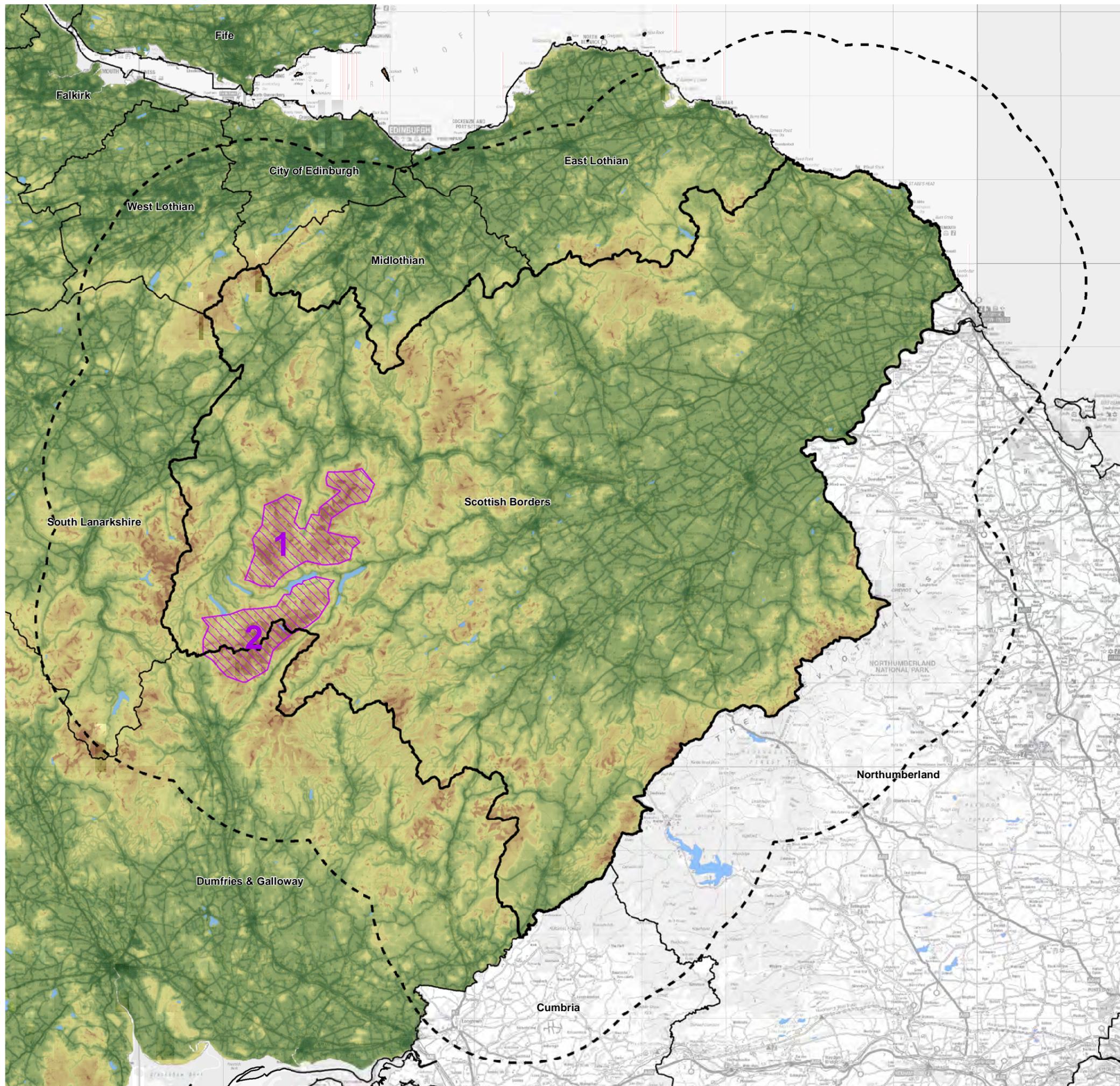
### Figure 3.5

## Landscape Designations & Landscape Character Areas



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### Legend

- SBC Local Authority Boundary
- Local Authority Boundary 15km Buffer
- Other Local Authority Boundaries
- Core Wild Land Areas:**
  - 1. Broad - Dollar - Black Laws
  - 2. Talla - Hart Fell
- Lochs
- Level of Wildness**
  - High
  - Low

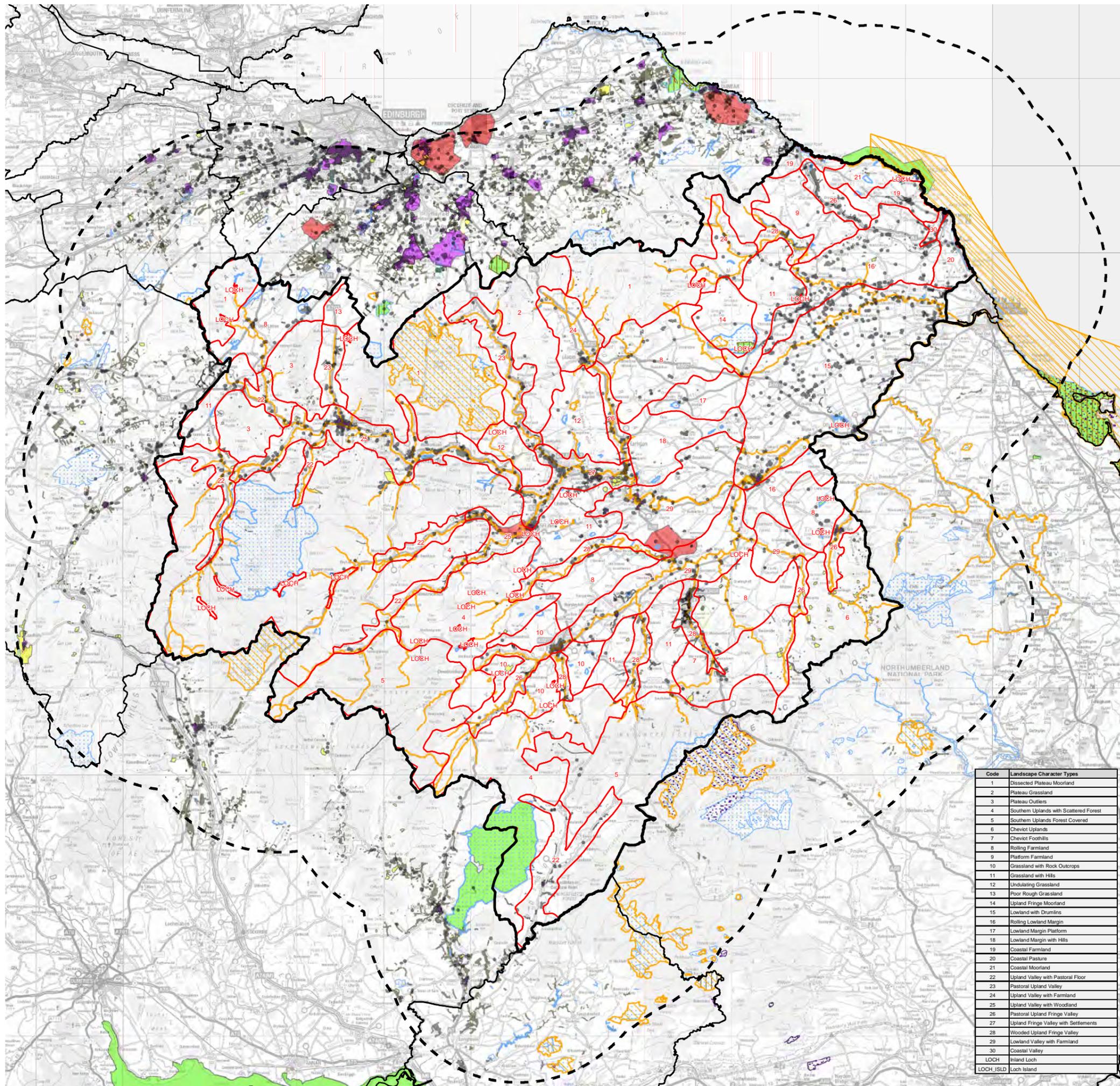
**Figure 3.6**

**Scottish Borders: Relative Wildness**



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### Legend

- SBC Local Authority Boundary
- Local Authority Boundary 15km Buffer
- Other Local Authority Boundaries
- Landscape Character Areas
- Listed Buildings
- Special Areas of Conservation
- Sites of Special Scientific Interest
- RAMSAR Sites
- National Nature Reserve
- Special Protected Areas
- Scheduled Ancient Monuments
- Conservation Area
- Ancient Woodland Inventory
- Inventory of Historic Battlefields

Code	Landscape Character Types
1	Dissected Plateau Moorland
2	Plateau Grassland
3	Plateau Outliers
4	Southern Uplands with Scattered Forest
5	Southern Uplands Forest Covered
6	Cheviot Uplands
7	Cheviot Foothills
8	Rolling Farmlands
9	Platform Farmland
10	Grassland with Rock Outcrops
11	Grassland with Hills
12	Undulating Grassland
13	Floor Rough Grassland
14	Upland Fringe Moorland
15	Lowland with Dumlins
16	Rolling Lowland Margin
17	Lowland Margin Platform
18	Lowland Margin with Hills
19	Coastal Farmland
20	Coastal Pasture
21	Coastal Moorland
22	Upland Valley with Pastoral Floor
23	Pastoral Upland Valley
24	Upland Valley with Farmland
25	Upland Valley with Woodland
26	Pastoral Upland Fringe Valley
27	Upland Fringe Valley with Settlements
28	Wooded Upland Fringe Valley
29	Lowland Valley with Farmland
30	Coastal Valley
LOCH	Inland Loch
LOCH_ISLD	Loch Island

**Figure 3.7**

## Natural and Cultural Designations

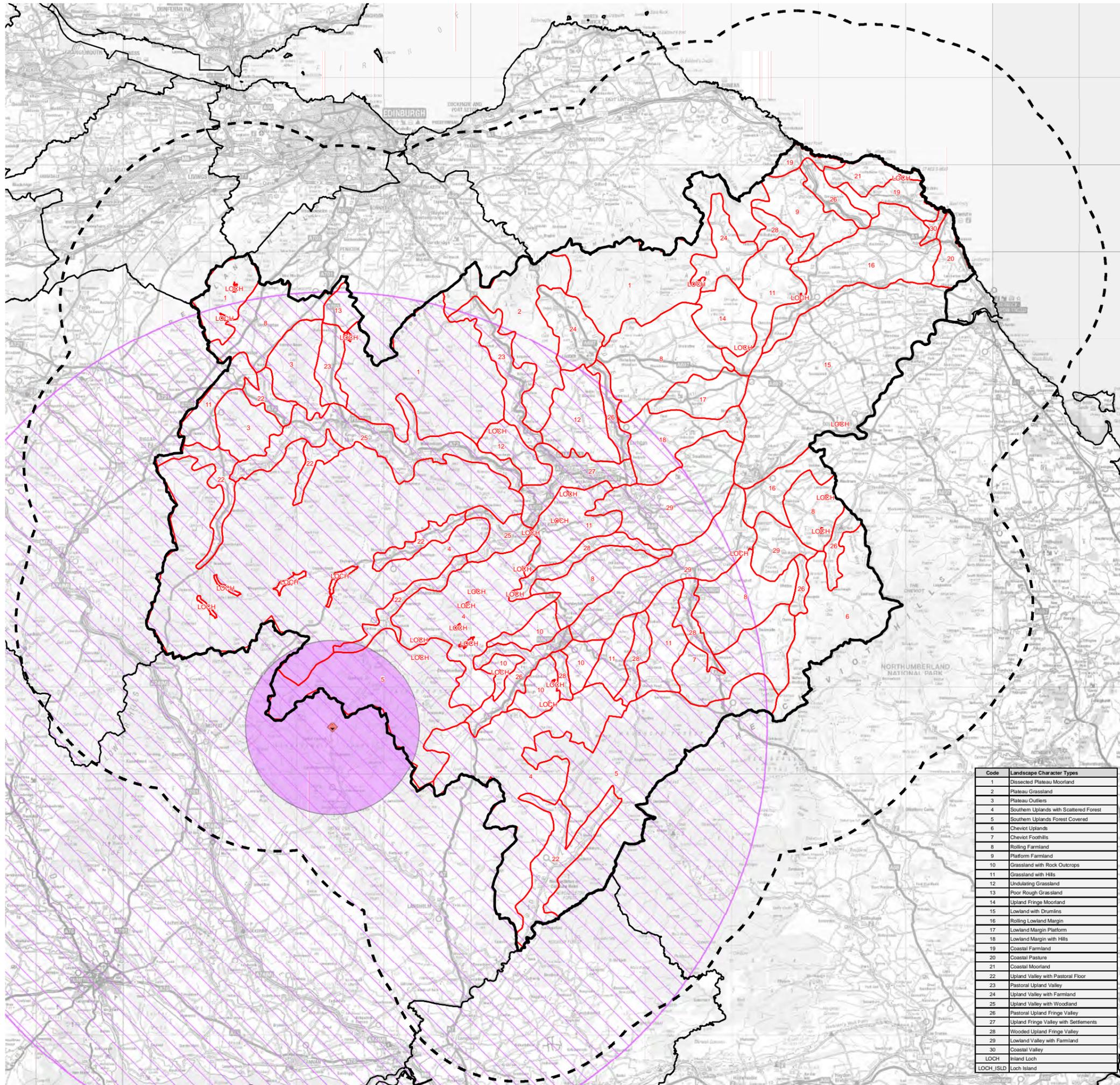


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### Legend

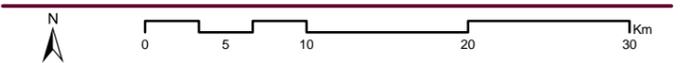
- SBC Local Authority Boundary
- Local Authority Boundary 15km Buffer
- Other Local Authority Boundaries
- Landscape Character Areas
- MoD EKA Seismological Array
- MoD EKA Seismological Array 10km Exclusion Zone
- MoD EKA Seismological Array 50km Statutory Safeguard Area



Code	Landscape Character Types
1	Dissected Plateau Moorland
2	Plateau Grassland
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4	Southern Uplands with Scattered Forest
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27	Upland Fringe Valley with Settlements
28	Wooded Upland Fringe Valley
29	Lowland Valley with Farmland
30	Coastal Valley
LOCH	Inland Loch
LOCH_ISLD	Loch Island

**Figure 3.8**

**MoD EKA Seismological Array**



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## 4.0 VISUAL BASELINE

The following section details the analysis that was carried out to establish the relative visibility and visual sensitivity of different parts of the Scottish Borders region.

### 4.1 Visual Receptors

In a study of landscape capacity and cumulative landscape impacts, it is important to consider visibility, and the effects of cumulative impact on visual receptors. This not only feeds into the assessment of landscape sensitivity and capacity (see Section 2.2), but also builds up a picture of how visual receptors in and around the Scottish Borders would perceive wind turbines within the Borders landscape.

The types of potentially sensitive visual receptors within the Scottish Borders are broadly categorised into three groups, represented by the locations in brackets:

- Residents (dwellings and settlements)
- Travellers (roads, railway)
- Visitors (visitor destinations, viewpoints and recreational footpaths and cycle routes)

Whilst there are working receptors in the Scottish Borders, these have not been included, as it is common practice in LVIA that people at work are considered to be low sensitivity visual receptors.

Based on desk study and site analysis, three groups of receptors were identified as follows:

- Settlements, representing concentrations of residential receptors;
- Routes, representing travelling receptors, and including the main A roads, promoted tourist routes, railways, and long-distance footpaths, cycleways and the proposed Borders Railway;
- Viewpoints, representing visitors and residents, selected from popular walking destinations and long distance footpaths, visitor attractions, and viewpoints identified on OS maps, including several viewpoints outside the Scottish Borders but within the study area. These viewpoints were selected with the agreement of the officers of Scottish Borders Council.

The locations of the settlements, routes, and viewpoints are illustrated on Figure 4.1. The assessment includes receptors in the study buffer area of 15km beyond the Scottish Borders boundary.

Individual residential properties are not included in the visibility mapping although notice is taken of the frequency and distribution of dwellings in the analysis of each landscape character type.

## 4.2 Visibility Analysis

An assessment of visibility was made from the settlements, routes and viewpoints illustrated in Figure 4.1. This was carried out using a computer based technique in which the intervisibility between receptors and landforms, or objects of specific heights on the landforms, is determined. The more intervisibility, the greater the visual sensitivity is likely to be. The method is described in more detail in **Appendix 2**.

The extent of the visibility assessment was limited to a 15km radius from the receptors. In our experience, this is the distance within which the great majority of significant impacts from wind farms are likely to occur. Whilst it is recognised that impacts occur beyond this distance, up to 35km and beyond, as recognised by EIA best practice, this is not an EIA assessment and the results are considered to adequately distinguish between locations of potentially greater or lesser sensitivity.

Results of the visibility analysis are illustrated in Figures 4.3 a-e, 4.4 a-e & 4.5 a-e (in **Appendix 3**). The colours show the differences in visual sensitivity across the Scottish Borders area. Red colours indicate areas that are most visible from the greatest number of receptors, grading through orange, yellow and green to blue/ purple areas that are seen by fewest receptors and uncoloured areas that would not be seen at all.

### 4.2.1 Settlements

Figures 4.3 a-e show that the areas most likely to be seen from settlements are located in the north western higher areas of the Pentlands and Moorfoot Hills, the central lowlands and from the high isolated regionally important landmark hills e.g. Eildon Hills and Black Hill. These areas have visibility from the highest number of receptors due to the elevation and the north western area's proximity to Edinburgh and other large settlements within Midlothian. The central lowlands area has the higher concentration of settlements around which it is clear there is a higher intervisibility. For all heights of turbine the most sensitive locations within Scottish Borders would be the Eildon Hills, Black Hill and the Scott's View area above the River Tweed. Areas around Hawick, Peebles, Kelso and Coldstream as well as the central Galashiels to Melrose cluster of settlements are also potentially more highly exposed to views of turbines and windfarms. Eildon Hills, Black Hill and the northern exposed slopes of the Moorfoot Hills and Pentland Hills are visually sensitive to any height of turbine. The areas of least sensitivity are generally located on the upland areas of the Lammermuir Hills, Moorfoot Hills, Lauder Common, The Southern Uplands and Cheviot Hills that envelop the central lowlands area. The outer slopes of these upland areas have a higher sensitivity than the central areas of each upland area. This reflects the screening benefits created by high plateau landforms creating topographical containment as well as a much lower population density within these uplands landscapes.

In terms of landscape character areas the most visually sensitive are the Upland landscapes to the south of Edinburgh (*Upland and Upland Fringe*) and the central isolated hills (*Rolling Farmland and Lowland Margin with Hills*), followed by the slopes above settlements in the Upper Tweed and Teviot Valley's and the rolling Lowland landscapes of the Lowland with Drumlins around Kelso and Coldstream. These areas of high intervisibility are visible from Edinburgh and the regionally large settlements within the Tweed Valley.

#### 4.2.2 Routes

The routes (Figures 4.4 a-e) show a similar pattern of visual sensitivity but with other areas being more emphasised. Interestingly the areas of highest sensitivity shifts from the Moorfoot and Pentland Hills area south of Edinburgh to the central lowland areas of Scottish Borders. In particular the area around the Eildon Hills and Black Hill are highlighted as before, however there are now additional areas alongside an area from Peniel Heugh to the area south of Kelso (Bowmont Forest), Black Law (to the East of Jedburgh) and along the coastal border area around Ayton Hill elevated above the A1. The central Lowlands Merse area also has a relatively high intervisibility. This visibility mapping reflects the concentration of important routes through the Scottish Borders, especially the A68, A7, A697 and the coastal A1 route. The mapping also takes account of the East Coast Mainline railway and the proposed Borders Railway that will roughly travel alongside the A7 from Edinburgh to Galashiels.

The most visually sensitive landscapes types are again the prominent isolated hills within the central lowland areas (*River Valleys*), seen prominently from many roads and railway lines. However there are areas within the uplands landscapes, especially on the northern border between East Lothian at the Lammermuir Hills either side of the A68 and the area of the Moorfoot Hills bordering Mid Lothian either side of the A7 and the A703. Areas of the Southern Uplands east and north east of Biggar also have a higher visibility and sensitivity.

Again the areas of least visibility and sensitivity are in the centre of more elevated upland areas of the Moorfoot and Lammermuir Hills (south of the border with Mid Lothian and East Lothian), the Southern Uplands and the Cheviot Hills. However there is a small pocket of higher visibility around the Carter Bar A68 England/ Scotland border through which the A68 passes.

#### 4.2.3 Viewpoints

The viewpoints (Figures 4.5 a-e) show a similar story to that shown by the Settlements and Routes visibility mapping. Visibility from viewpoints is similar to the previous visibility mapping due to the topography of the central lowlands surrounded by *Upland Fringe* and *Upland Landscapes* roughly extending either side along the Tweed Valley.

There are however differences in the visibility within the Cheviot Hills area. This area has a higher visibility and sensitivity than the previous visibility mapping due to the location of the Pennine Way along the England/ Scotland Border and the number of viewpoints along this route looking onto the landscape. This includes the Carter Bar Viewpoint on the A68 England/ Scotland border which allows for a wide panoramic view over the Scottish Borders and provides a first impression of Scotland to visitors.

The central area between Selkirk and Jedburgh, south of Galashiels and Melrose is again of the highest visibility and sensitivity, this area includes the Eildon Hills and Black Hill. The higher ground either side of the A72 between Peebles and Selkirk has a higher visibility and sensitivity, this could be explained in the number of elevated viewpoints along the Southern Upland Way in this area and the promoted viewpoints elevated above settlements in this area. There is again an area of higher visibility within the Lowland

Merse area, coastal areas including Coldingham Moor and the area around Ayton Hill west of the A1 corridor.

On the basis of the viewpoints selected the areas with the least visibility are located in the upland areas of the Moorfoot Hills and Southern Uplands areas. This is closely followed by areas within the Lammermuir Hills and Pentlands.

#### 4.2.4 Analysis of Visibility

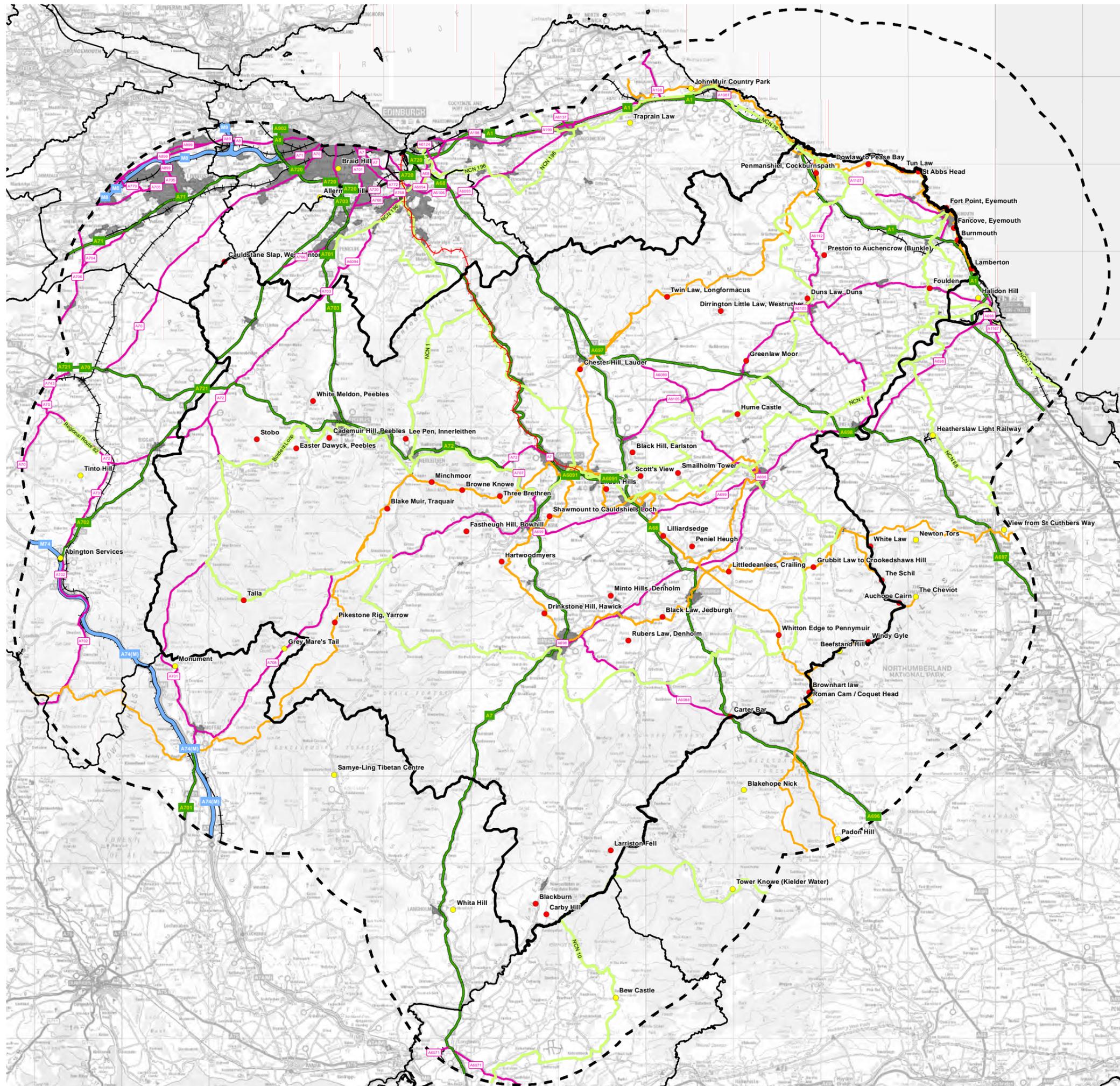
The visibility analysis confirms empirical observations of visual sensitivity across Scottish Borders, i.e. that it is the central areas close to populated areas that have the highest visual sensitivity as well as the north east upland areas of the Moorfoot and Pentland Hills facing Edinburgh. However it gives a more refined and nuanced assessment, determining which geographical areas are the most and least visually sensitive.

Based on the computer assessment and on observation, the following areas are of highest visual sensitivity, a factor that will have a bearing on their capacity for wind turbine development:

- The summits and northern slopes of the Pentlands and Moorfoot Hills orientated towards Edinburgh;
- The Central lowlands between Selkirk and Jedburgh to the south of Galashiels and Melrose;
- Prominent landmark hills in the central lowland areas including the Eildon Hills and Black Hill around Melrose and Peniel Heugh north of Jedburgh;
- The higher coastal land to the west of the A1 north of the England – Scotland border;
- The coastal zone bound by the A1 and East Coast Mainline;
- There are also smaller pockets of medium visual sensitivity within the Cheviot Hills, along the A7 between Selkirk and Peebles on the elevated land framing the valley and the higher land within the Scottish Borders north east of Biggar.

The least visually sensitive areas include:

- A large area of the Southern Uplands in the south west of the study area
- bordering South Lanarkshire in the west and Dumfries and Galloway Dumfries in the south west;
- Areas of the Lammermuir and Moorfoot Hills bordering Mid Lothian and East Lothian;
- Areas within the Cheviot Hills east of B6357 (not the area bordering the Northumberland National Park)



### Legend

- SBC Local Authority Boundary
- Local Authority Boundary 15km Buffer
- Other Local Authority Boundaries
- Settlements

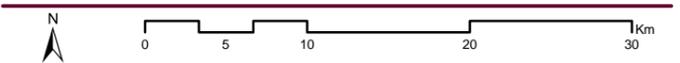
### Viewpoints

- Within SBC Boundary
- Outwith SBC Boundary
- National Cycle Network and Borders Loop
- Long Distance Footpaths

### Road Classifications

- Motorway
- Primary Road
- A Road
- Proposed Borders Railway
- Existing Railway

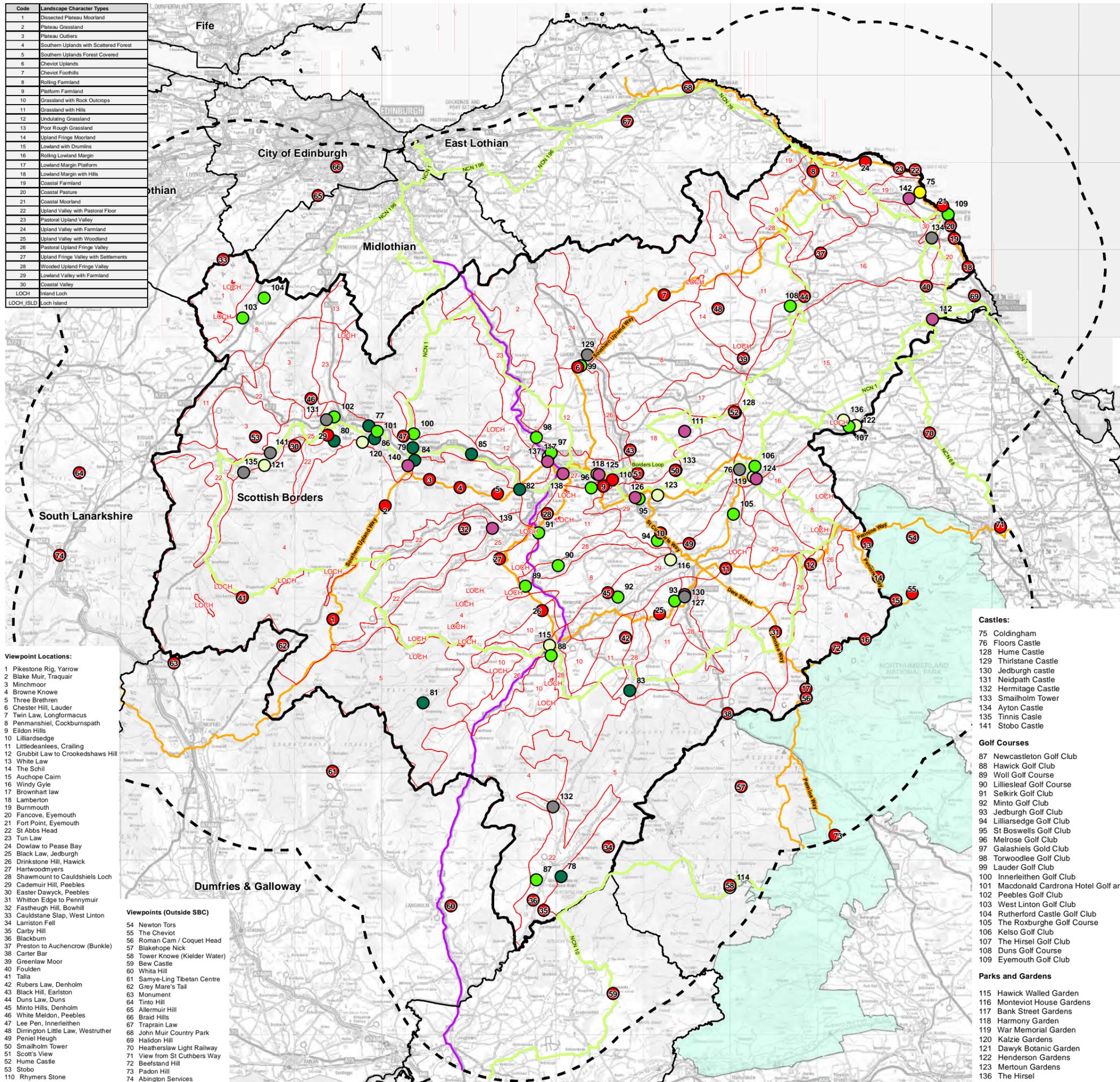
**Figure 4.1**  
Transport Routes,  
Settlements & Viewpoints



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Code	Landscape Character Types
1	Dissected Plateau Moorland
2	Plateau Grassland
3	Plateau Outliers
4	Southern Uplands with Scattered Forest
5	Southern Uplands Forest Covered
6	Cheviot Uplands
7	Cheviot Foothills
8	Rolling Farmland
9	Platform Farmland
10	Grassland with Rock Outcrops
11	Grassland with Hills
12	Undulating Grassland
13	Poor Rough Grassland
14	Upland Fringe Moorland
15	Lowland with Dumlins
16	Rolling Lowland Margin
17	Lowland Margin Platform
18	Lowland Margin with Hills
19	Coastal Farmland
20	Coastal Pasture
21	Coastal Moorland
22	Upland Valley with Pastoral Floor
23	Pastoral Upland Valley
24	Upland Valley with Farmland
25	Upland Valley with Woodland
26	Pastoral Upland Fringe Valley
27	Upland Fringe Valley with Settlements
28	Wooded Upland Fringe Valley
29	Lowland Valley with Farmland
30	Coastal Valley
LOCH	Inland Loch
LOCH_ISLD	Loch Island



## Legend

- SBC Local Authority Boundary
- Local Authority Boundary 15km Buffer
- Other Local Authority Boundaries
- Landscape Character Areas
- Northumberland National Park
- Borders Historic Route
- Major Promoted Paths
- National Cycle Network and Borders Loop
- Viewpoint
- Castles
- Forests & Woodlands
- Parks & Gardens
- Historic Buildings & Homes
- Golf Courses
- Beach

### Viewpoint Locations:

- 1 Pikestone Rig, Yarrow
- 2 Blake Muir, Traquair
- 3 Minchmoor
- 4 Browne Knowe
- 5 Three Brethren
- 6 Chester Hill, Lauder
- 7 Twin Law, Longformacus
- 8 Penmanshiel, Cockburnspath
- 9 Eildon Hills
- 10 Lilliersedge
- 11 Littledeanlees, Crailing
- 12 Grubbit Law to Crookedshaws Hill
- 13 White Law
- 14 The Schil
- 15 Auchope Cairn
- 16 Windy Gyle
- 17 Brownhart law
- 18 Lambert
- 19 Burnmouth
- 20 Fancove, Eyemouth
- 21 Fort Point, Eyemouth
- 22 St Abbs Head
- 23 Tun Law
- 24 Dowlaw to Pease Bay
- 25 Black Law, Jedburgh
- 26 Drinkstone Hill, Hawick
- 27 Hartwoodmyers
- 28 Shawmount to Cauldshields Loch
- 29 Cademuir Hill, Peebles
- 30 Easter Dawyck, Peebles
- 31 Whitton Edge to Penymuir
- 32 Fastheugh Hill, Bowhill
- 33 Cauldstane Slap, West Linton
- 34 Larriston Fell
- 35 Carby Hill
- 36 Blackburn
- 37 Preston to Auchencrow (Bunkle)
- 38 Carter Bar
- 39 Greenlaw Moor
- 40 Foulden
- 41 Talia
- 42 Rubers Law, Denholm
- 43 Black Hill, Earlston
- 44 Duns Law, Duns
- 45 Minto Hills, Denholm
- 46 White Meldon, Peebles
- 47 Lee Pen, Innerleithen
- 48 Dinnington Little Law, Westruther
- 49 Peniel Heugh
- 50 Smailholm Tower
- 51 Scott's View
- 52 Hume Castle
- 53 Stobo
- 110 Rhymsers Stone

### Viewpoints (Outside SBC)

- 54 Newton Tors
- 55 The Cheviot
- 56 Roman Cam / Coquet Head
- 57 Blakehope Nick
- 58 Tower Knowe (Kielder Water)
- 59 Bew Castle
- 60 White Hill
- 61 Samye-Ling Tibetan Centre
- 62 Grey Mare's Tail
- 63 Monument
- 64 Tinto Hill
- 65 Allermuir Hill
- 66 Braid Hills
- 67 Traprain Law
- 68 John Muir Country Park
- 69 Halidon Hill
- 70 Heatherslaw Light Railway
- 71 View from St Cuthbers Way
- 72 Beefstand Hill
- 73 Padon Hill
- 74 Abington Services

### Castles:

- 75 Coldingham
- 76 Floors Castle
- 128 Hume Castle
- 129 Thirstane Castle
- 130 Jedburgh castle
- 131 Neidpath Castle
- 132 Hermitage Castle
- 133 Smailholm Tower
- 134 Aytoun Castle
- 135 Tinnis Castle
- 141 Stobo Castle

### Golf Courses

- 87 Newcastleton Golf Club
- 88 Hawick Golf Club
- 89 Woll Golf Course
- 90 Lilliesleaf Golf Course
- 91 Selkirk Golf Club
- 92 Minto Golf Club
- 93 Jedburgh Golf Club
- 94 Lilliersedge Golf Club
- 95 St Boswells Golf Club
- 96 Melrose Golf Club
- 97 Galashiels Golf Club
- 98 Torwoodlee Golf Club
- 99 Lauder Golf Club
- 100 Innerleithen Golf Club
- 101 Macdonald Cardrona Hotel Golf and Country Club
- 102 Peebles Golf Club
- 103 West Linton Golf Club
- 104 Rutherford Castle Golf Club
- 105 The Roxburghe Golf Course
- 106 Kelso Golf Club
- 107 The Hirsell Golf Club
- 108 Duns Golf Course
- 109 Eyemouth Golf Club

### Parks and Gardens

- 115 Hawick Walled Garden
- 116 Monteviot House Gardens
- 117 Bank Street Gardens
- 118 Harmony Garden
- 119 War Memorial Garden
- 120 Kaizie Gardens
- 121 Dawyk Botanic Garden
- 122 Henderson Gardens
- 123 Mertoun Gardens
- 136 The Hirsell

### Forests and Woodlands:

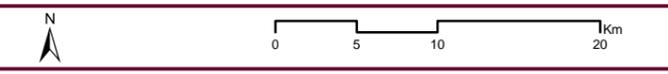
- 77 Glentress Forest
- 78 Newcastleton
- 79 Caberston Forest
- 80 Cademuir Forest
- 81 Craik Forest
- 82 Yair Forest
- 83 Craigbank Wood
- 84 Innerleithen
- 85 Thornielee Forest
- 86 Cardrona Forest
- 114 Kielder Water & Forest Park

### Historic Buildings and Homes

- 111 Mellerstrain House & Gardens
- 112 Paxton House, Gallery & Country Park
- 124 Kelso Abbey
- 125 Melrose Abbey
- 126 Dryburgh Abbey
- 127 Jedburgh Abbey
- 137 Gala House
- 138 Abbotsford House
- 139 Bowhill
- 140 Traquair House
- 142 Coldingham Priory

**Figure 4.2**

## Tourism Infrastructure



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## 5.0 WIND TURBINES IN THE STUDY AREA

The following section describes the various turbine sizes and size categories then lists and describes the operating, consented and proposed wind turbine developments in the study area at a point in time, February 2013. Following this there is a discussion of the factors involved in windfarm location, size, design and distribution that affect landscape, visual and cumulative impacts.

### 5.1 Turbine Size

Turbine size is the first factor to consider in assessing the impacts of wind turbines. In particular, smaller turbines are considered to be more appropriate in lowland landscapes, which are usually more complex and varied than uplands, and where there are generally smaller scale features such as trees and buildings that provide a ‘scale reference’ against a turbine. Conversely, upland landscapes are generally simpler in character, larger in scale and there are fewer human scale reference features, meaning that larger turbines are more easily accommodated (see SNH guidance *Siting and Designing Windfarms in the Landscape*, 2009).

Turbine size for installed or consented commercial windfarms in Scotland varies from ca. 55m to blade tip at the original Hagshaw Hill to a current maximum of 147m. However, considerably smaller turbines are now commonly installed for the non-commercial scale proposals typical of recent Feed in Tariff schemes. Current consents within the study area vary from many turbines of under 25m height on various domestic and farm FiT schemes to 125m high at Toddleburn and Fallago Rig Mark II. In this study we have mapped four size categories which would have differing relationships with the scale and character of the landscape and with one another. These are listed in Table 5.1 below.

**Table 5.1. Turbine Size Categories**

Size Category	Blade Tip Height	Typical Use
Small	Turbines less than 25m in height	Typically used for domestic and farm FiT schemes
Medium	Turbines 25m to <50m in height	Typically used for farm and industrial FiT schemes
Large	Turbines 50m to <100m in height	Single turbine FiT schemes and smaller turbines used in commercial schemes
Very Large	Turbines over 100m high.	Most commercial windfarms

There is a significant range of available commercial turbines sizes. However even the smaller commercial turbines are very much larger than any other common vertical object in

the landscape, such as a house or trees, with only electricity pylons (typically 25-50m tall) coming close in size. Even the medium size of turbine falls within this height bracket and is therefore much larger than most trees and buildings. Furthermore, by being kinetic structures, the visual prominence of turbines is increased relative to existing static features.

The small domestic scale turbines (<25m) are however closer to the heights of common visual references such as houses and trees and their landscape and visual impacts tend to be much more localised due to localised screening and backclothing by landforms and trees.

SNH considers that smaller turbines can be used to mitigate landscape impacts in a lowland situation with a smaller scale landscape pattern and scale indicators. As it has to be balanced against losses in output, size reduction should be used in specific cases where a clearly identified benefit can be achieved. The following are criteria by which this may be judged:

- mitigating significant landscape or visual impacts on a highly valued or sensitive receptor;
- avoiding an adverse scale relationship with a landform or other key landscape element or feature;
- allowing an intervening landform and/or forest to screen views of turbines from certain receptors; or
- achieving a significant reduction in overall visibility by virtue of relationship to surrounding landform and trees.

Where reduction in impact would be a matter of degree rather than a clear quantitative change the benefits are less clear cut.

SNH guidance also recommends that where two or more developments are in close proximity to one another, turbines of a similar size should be used. The use of significantly different turbine sizes within a single windfarm or between two windfarms in close proximity can otherwise lead to adverse visual and scale effects which increase the appearance of clutter, or create odd perspectives when seen from certain viewpoints.

### 5.2 Turbine Distribution

The study area, for the purposes of visibility, landscape and visual impacts of turbines includes the Scottish Borders region, plus a 15km buffer around its boundary, taking in the majority of East Lothian and Mid Lothian, the southern area of Edinburgh City Council, the eastern area of West Lothian and South Lanarkshire and the north eastern area of Dumfries and Galloway. The study area also extends into northern England and includes the northern tip of Cumbria and the north western area of Northumberland. The extents of the study area are illustrated on Figure 3.1.

Consented and proposed wind energy developments within the study area are listed, together with details (where available) of location, number and height of turbines, etc, in

Appendix 4. The locations are shown in Figure 5.1 (Scottish Borders) and 5.2 (whole study area).

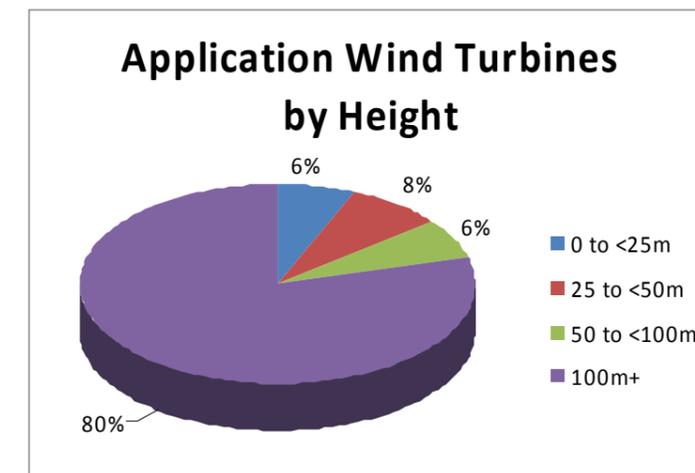
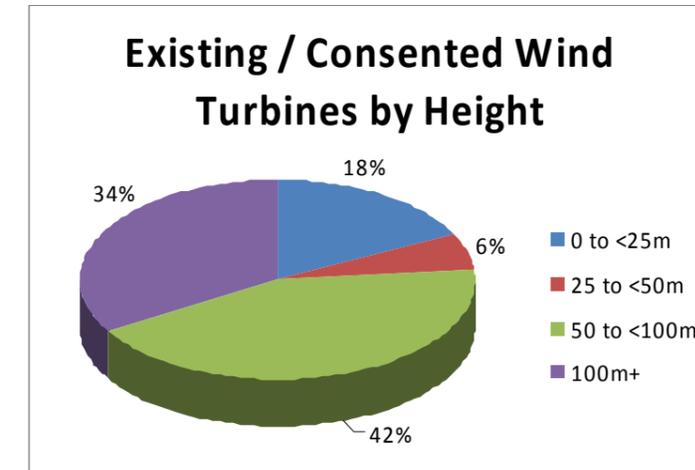
At January 2013 there were, within Scottish Borders, a total of 66no. turbines under 25m tall that are consented or operational and 12no. at application stage, 22no. turbines 25m – 50m tall that are consented or operational and 15no. that are planning application stage pending a decision. The distribution of small turbines under 25m tall is fairly evenly distributed with the exception of the more upland areas where only the occasional small turbine is found and these are associated with individual farmsteads.

Medium sized turbines (25m-50m tall) are generally found in the lowlands merse area of the Tweed Valley and the more elevated platform areas between the uplands and lowland landscapes of the Borders Region and the coastal zone area. The small and medium turbines at consented and application stage are generally found as individual turbines or small groups of two to three turbines. There are no existing or proposed windfarms of small or medium sized turbines in groups larger than three turbines.

There are currently 162 Large turbines 50m-100m high consented or operational and 12 large turbines pending planning application. Existing large turbines are generally within medium sized groups of between 22 and 25, there is one large windfarm consisting of 66 large turbines at Dun law either side of the A68 within the Lammermuir Hills on the Scottish Borders at the border with East Lothian Council. These windfarms are found within the upland areas of the Lammermuir and Moorfoot Hills and the Coastal Coldingham Moor. There are no existing or proposed windfarms consisting of large turbines within the Southern Uplands. Proposed turbines of this size can be found in one group of 9no. turbines within Lauder Common north of the existing Long Park windfarm and as individual to small groups of three or fewer turbines. Existing Large turbines and applications for Large turbines are generally within the uplands and upland fringe/ platform areas of the Scottish Borders. The large turbines, either as groups or individual turbines are predominantly located north of the Tweed Valley.

Existing very large turbines and applications for very large turbines, (100m high and over) are found in medium to large windfarms throughout the upland areas of the Scottish Borders. The largest existing or consented group of very large turbines fully within the Scottish Borders is 48no. very large turbines located at Fallago Rig in the Lammermuir Hills. The largest group of very large turbines in the Lammermuirs is however at the Crystal Rig/ Akingall windfarm development. This windfarm totals 119no. turbines, consisting of 25 large turbines and 94no very large turbines and straddles the border between Scottish Borders and East Lothian.

Another very large windfarm (Clyde) consisting of 152 very large turbines is located just across the border with South Lanarkshire to the west of Scottish Borders, this very large windfarm also has an application for an extension consisting of 57 very large turbines that will create a larger windfarm totalling 209 very large turbines, 7 of which will be located on the border with or within Scottish Borders. The majority of very large turbines are located in the Lammermuir and Moorfoot Hills with the occasional windfarm in the Southern Uplands and none in the Cheviot Hills or lowland areas.



### 5.2.1 Operating and Consented Wind Turbines

Scottish Borders has a higher than average number of windfarms in terms of groups of large and very large sized turbines when compared to other areas of Scotland. Groupings of large and very large turbines are generally within the large to medium size groupings and towards the lower end of the scale of very large sized groupings. The largest group of very large turbines within Scottish borders is 48no. very large turbines over 100m high at Fallago Rig. The largest windfarm within 15km of Scottish Borders; Clyde Windfarm, South Lanarkshire with 152 very large turbines located to the west of Scottish Borders.

Of the consented and operational windfarms in Scottish Borders, there are two very large windfarms with over 50 large or very large turbines, these are:

- Dun Law; 61no. large turbines
- Crystal Rig/ Akingall windfarm developments; 25no. large and 20no. very large turbines within Scottish Borders (cluster is straddling the Scottish Borders and East

Lothian border and in total comprises 25no. large turbines and 94no. very large turbines)

There are four large sized windfarms with between 20 and 59 large or very large turbines, these are:

- Fallago Rig; 48no. very large turbines
- Bowbeat windfarm; 24no. large turbines
- Black Hill windfarm; 22no. large turbines
- Drone Hill Windfarm; 22no. large turbines

There are four medium sized windfarms with between 10 and 20 large or very large turbines, these are:

- Toddleburn windfarm; 12no. very large turbines
- Long Park windfarm; 19no. very large turbines
- Glenkerie windfarm; 11no. very large turbines
- Langhope Rig; 10no. very large turbines

There are no small/ medium sized windfarms (between 3 and 9no. large or very large turbines) in Scottish Borders and three windfarms of three large or very large turbines:

- Carcant windfarm; 3no. very large turbines
- Brockholes windfarm; 3no. large turbines
- Hoprigshiels windfarm; 3no. very large turbines

There is also one consented windfarm to the south west of Cockburnspath consisting of 2no very large turbines.

The existing consented and operational windfarms of medium to very large size are located in the Southern Uplands, Moorfoot Hills or the Lammermuir Hills. The remaining 5no. large turbines are found as individual turbines or as a small groups consisting of two turbines and are generally found throughout the central lowlands and upland fringe areas only with one large turbine located within an industrial estate in Kelso.

The 22no. existing medium sized turbines are found as single turbines or as small groups consisting of 3 or less turbines and are generally located within the river valleys, upland fringe and lowland merse areas north and east of Galashiels and Kelso. Within the Upland areas of the Moorfoot Hills, Lammermuir Hills, Pentland Hills, Southern Uplands and Cheviot Hills there are no medium sized turbines 25m-50m tall.

### 5.2.2 Proposed Windfarms

Proposed windfarms consisting of 10no. turbines or more (of large or very large turbines and Medium, large or Very Large sized windfarms) are within the Southern Uplands, Lammermuir Hills, Lauder Common and the Coastal Coldingham Moor. Applications for developments consisting of very large and large turbines are beginning to be more frequent on the Upland Fringe areas of the Scottish Borders. There are 2 windfarms at

planning application stage for a large sized windfarm (consisting between 20no. and 50no. very large or large turbines), these are:

- Earlishaugh windfarm consisting of 24no. very large turbines over 100m high.
- Rowantree windfarm consisting of 23no. very large wind turbines

There are 3no. proposed Medium sized windfarms consisting of between 10no. and 20no. very large turbines (Medium sized windfarm), these are:

- Penmanshiel Farm; 15no. very large turbines
- Quixwood Farm consisting of 14 very large turbines
- Blythe Farm (Brunta Hill) consisting of 10no. very large turbines

There are 7 proposed windfarms between 3 and 9 very large turbines, these are:

- Corsbie Moor, consisting of 9no. very large turbines
- Gilston, consisting of 7no. very large turbines
- Carcant consisting of 3no. very large turbines
- Blackburn Farm, consisting of 6no. very large turbines
- Land south west of Monashee Farm, consisting of 6 very large turbines
- Whitton, consisting of 6no. very large turbines
- Barrel Law, consisting of 6no. very large turbines

There is one proposed small/ medium windfarm consisting of 9no. large turbines. This windfarm is located to the north of the existing Long Park windfarm. There are 3no proposed single large turbines, one of these is located in the Pentland Hills, one is located north of Denholm and the last is located to the north west of Gordon.

Proposed medium sized turbines are found in groups of two or one turbines, these are generally distributed within the lowland areas and river valleys to the north and west of Galashiels and Kelso and are not located on the uplands or upland fringe. The distribution of proposed medium sized turbines is also extending to the foothills of the Cheviot Hills and Southern Uplands with applications for 2no. turbines at Stewards Cottage south of Jedburgh and at Helenslea, Primesidemill south west of Town Yetholm.

### 5.2.3 Pattern of development

Together with the operational and consented projects, a clear pattern of wind power development emerges, with the largest turbines and groups located in the Uplands and Upland Fringe areas of the Lammermuir and Moorfoot Hills with the occasional existing small/ medium sized group of large turbines within the Southern Uplands. The majority of medium and small turbines are found in the lowlands, upland fringe and some river valleys as small groups to singular turbines. There are no medium sized turbines within the uplands areas.

Applications for large and very large turbines are found within the Upland areas and within the Upland Fringe areas, especially within the area north and west of Galashiels and Kelso

to the coastal areas. Applications for small and medium sized turbines continue to be for small windfarms to singular turbines within the lowland areas, Upland Fringe and River Valleys.

There are fewer current, operational and proposed (application stage) turbines in the Southern Uplands and Cheviot Hills and with the exception the impacts Clyde Windfarm and extension will have the majority of existing and proposed windfarm developments are located north of the River Tweed.

### 5.3 Landscape Character of Turbine Locations

Within the Scottish Borders, most of the operating and consented windfarms consisting of very large turbines 100m+ high are located in Upland areas. However applications for windfarms consisting of very large turbines will potentially extend this distribution into the Upland Fringe and Coastal areas.

Operating and consented turbine developments consisting of large turbines are predominantly located in the Uplands areas, however there are existing or operational windfarms and turbines within the Upland Fringe, Lowlands, Coastal and River Valley areas of Scottish Borders, applications for windfarms consisting of large turbines are found within the Upland, Upland Fringe and Coastal areas of the Scottish Borders.

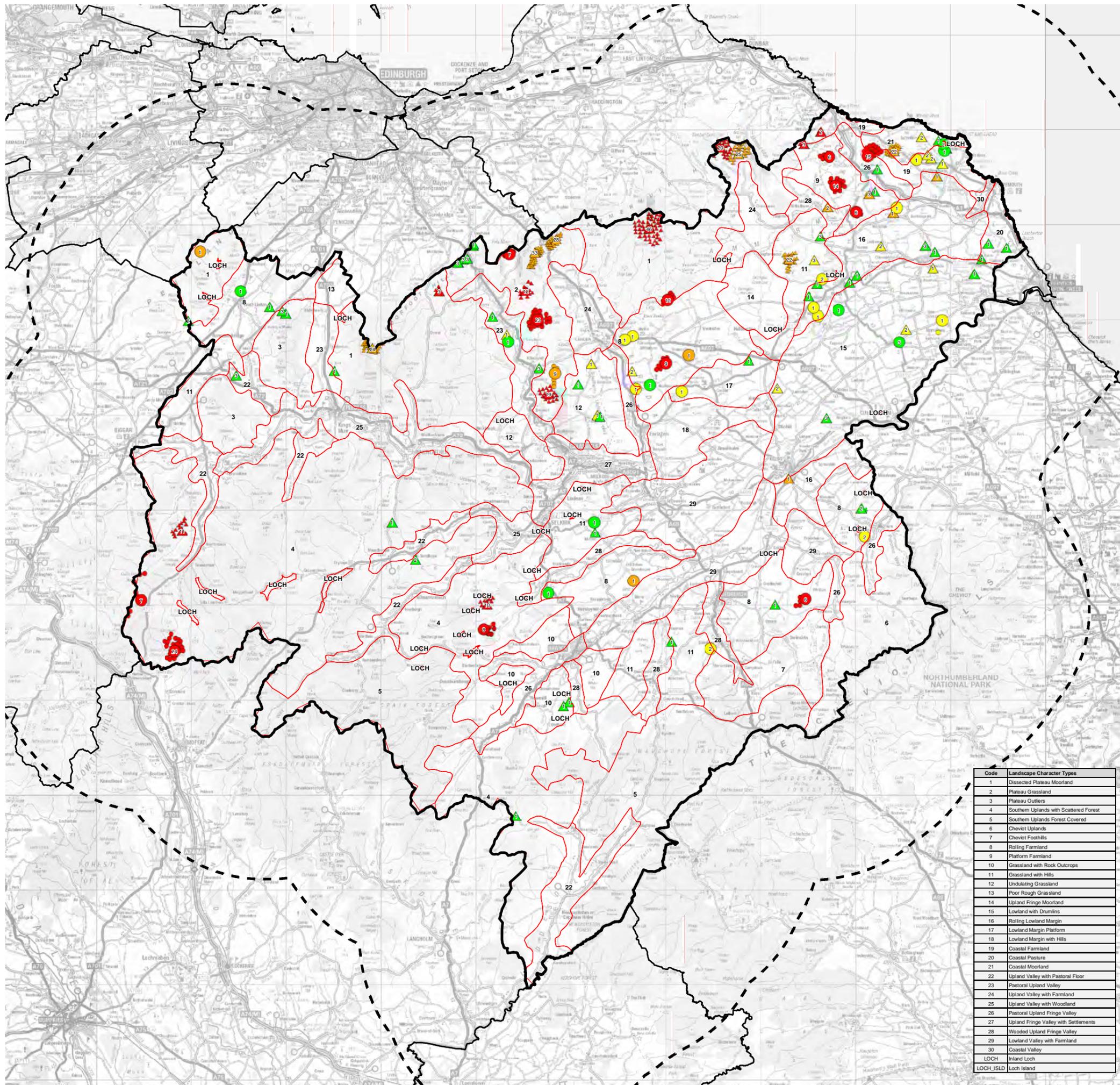
Operational and consented windfarms consisting of medium sized turbines are not found within the Uplands areas but are found within the Upland Fringe, Lowland, Coastal and River Valley landscape types with applications found within the Upland Fringe and Lowland landscapes.

Large and very large scale developments consisting of Large and Very Large turbines are currently only found in the Lammermuir and Moorfoot Hills landscape character areas. There is however an application for a large scale development consisting of 36no. very large turbines in the Southern Uplands landscape character area near the border with Dumfries and Galloway where the very large development of Clyde Windfarm and extension will have a impact within the eastern area of the Scottish Borders. Table 5.1 below lists the individual developments relative to their locations.

This tendency for large and very large turbine development to be located within the Uplands and Upland Fringe landscapes within Scottish Borders is partly due to the high number of upland landscapes available and partly by the existing SPG. In landscape terms, upland areas offer a larger-scale landscape, which can accommodate larger turbines and it is rational to locate turbines in open and elevated areas to take advantage of higher wind speeds. On the other hand, upland areas often represent “unspoiled” or “wilderness” landscapes, with few overtly man-made features, and the construction of wind turbines could be seen as an unwelcome industrial addition.

Coastal landscape areas are often of open, simple character and visible from both inland and from the coastal settlements and areas outwith Scottish Borders.

In lowland areas and River Valleys, the scale and pattern of the landscape is generally smaller, meaning that the largest windfarms and turbines can appear incongruous, particularly given the greater array of “reference features” available with which to compare them. Together with the proximity of settlements and properties there are clear sensitivities in such landscapes. Nevertheless, a location within the lowland area better reflects the relationship between energy production and the consumer, as well as generally being easier to service in terms of both access and connection to the electricity grid.



### Legend

- SBC Local Authority Boundary
- Local Authority Boundary 15km Buffer
- Other Local Authority Boundaries
- Landscape Character Areas

### Windfarm: Status, Height Category

- Existing / Consented, Cat 1: 0 to <25m
- Existing / Consented, Cat 2: 25 to <50m
- Existing / Consented, Cat 3: 50 to <100m
- Existing / Consented, Cat 4: +100m
- Application, Cat 1: 0 to <25m
- Application, Cat 2: 25 to <50m
- Application, Cat 3: 50 to <100m
- Application, Cat 4: +100m

Code	Landscape Character Types
1	Dissected Plateau Moorland
2	Plateau Grassland
3	Plateau Outliers
4	Southern Uplands with Scattered Forest
5	Southern Uplands Forest Covered
6	Cheviot Uplands
7	Cheviot Foothills
8	Rolling Farmland
9	Platform Farmland
10	Grassland with Rock Outcrops
11	Grassland with Hills
12	Undulating Grassland
13	Floor Rough Grassland
14	Upland Fringe Moorland
15	Lowland with Drumlins
16	Rolling Lowland Margin
17	Lowland Margin Platform
18	Lowland Margin with Hills
19	Coastal Farmland
20	Coastal Pasture
21	Coastal Moorland
22	Upland Valley with Pastoral Floor
23	Pastoral Upland Valley
24	Upland Valley with Farmland
25	Upland Valley with Woodland
26	Pastoral Upland Fringe Valley
27	Upland Fringe Valley with Settlements
28	Wooded Upland Fringe Valley
29	Lowland Valley with Farmland
30	Coastal Valley
LOCH	Inland Loch
LOCH_ISLD	Loch Island

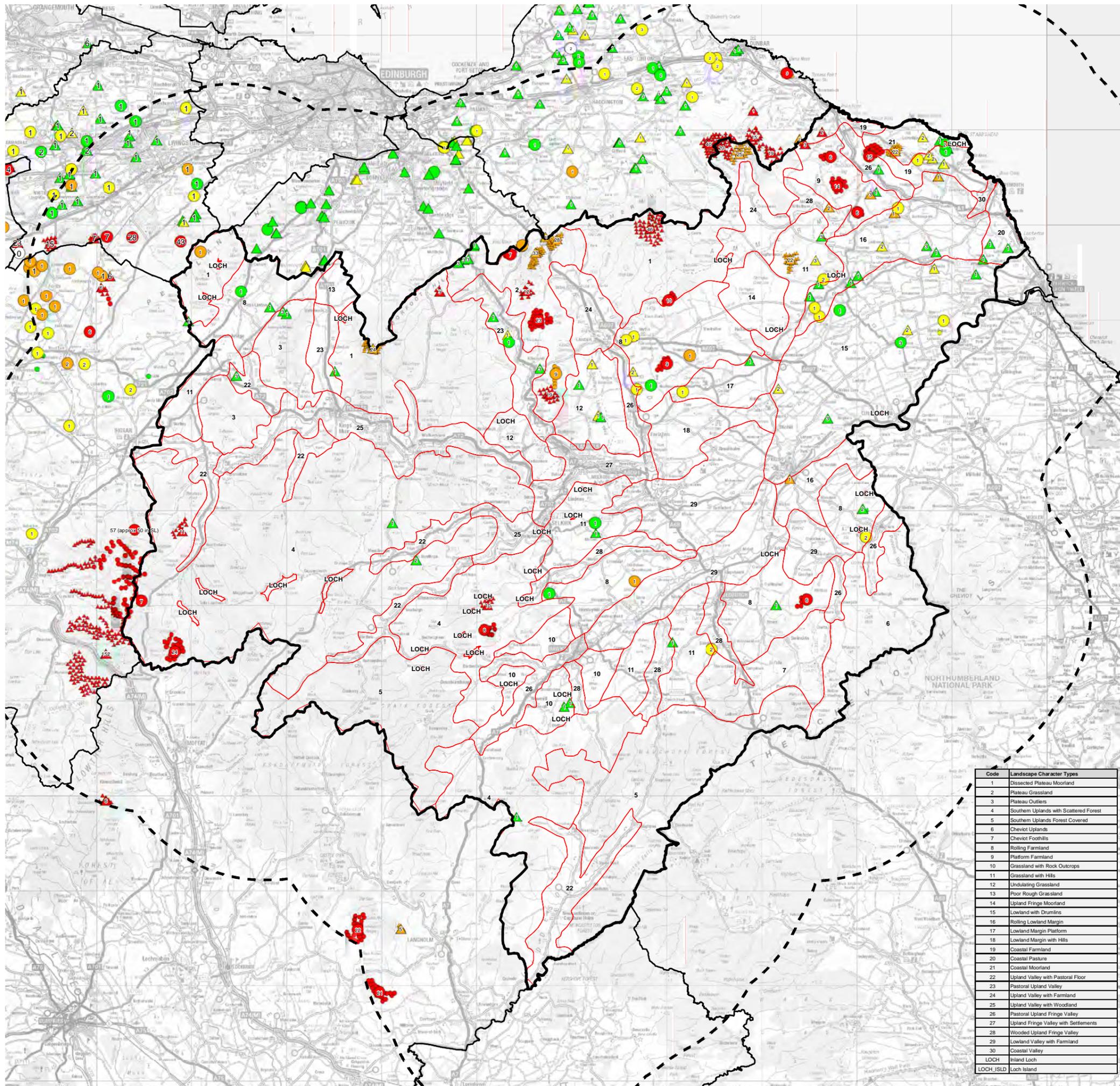
**Figure 5.1**

**Existing, Consented & Proposed  
Wind Turbines in Scottish Borders**



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### Legend

- SBC Local Authority Boundary
- Local Authority Boundary 15km Buffer
- Other Local Authority Boundaries
- Landscape Character Areas

### Windfarms: Status, Height Category

- Existing / Consented, 0 to <25m
- Existing / Consented, 25 to <50m
- Existing / Consented, 50 to <100m
- Existing / Consented, +100m
- Application, 0 to <25m
- Application, 25 to <50m
- Application, 50 to <100m
- Application, +100m
- Application, Unknown Height

Code	Landscape Character Types
1	Dissected Plateau Moorland
2	Plateau Grassland
3	Plateau Outliers
4	Southern Uplands with Scattered Forest
5	Southern Uplands Forest Covered
6	Cheviot Uplands
7	Cheviot Foothills
8	Rolling Farmland
9	Platform Farmland
10	Grassland with Rock Outcrops
11	Grassland with Hills
12	Undulating Grassland
13	Floor Rough Grassland
14	Upland Fringe Moorland
15	Lowland with Drumlins
16	Rolling Lowland Margin
17	Lowland Margin Platform
18	Lowland Margin with Hills
19	Coastal Farmland
20	Coastal Pasture
21	Coastal Moorland
22	Upland Valley with Pastoral Floor
23	Pastoral Upland Valley
24	Upland Valley with Farmland
25	Upland Valley with Woodland
26	Pastoral Upland Fringe Valley
27	Upland Fringe Valley with Settlements
28	Wooded Upland Fringe Valley
29	Lowland Valley with Farmland
30	Coastal Valley
LOCH	Inland Loch
LOCH_ISLD	Loch Island

**Figure 5.2**

**Existing, Consented & Proposed  
Wind Turbines in Study Area**



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**Table 5.2: Turbine Location and Heights in Relation to Regional Landscape Character**

Operating/ Under Construction/ Consented					
Regional Character Type	Upland	Upland Fringe	Lowland	Coastal	River Valley
<b>Very Large (100m+ high)</b>	Crystal Rig (Phase 2), Fallago Rig Mark 2, Toddleburn, Glenkerie, Carcant,	Hoprigshiels		Neuk Farm	
<b>Large (50m – 100m high)</b>	Bowbeat, Crystal Rig (Phase 1 & 1A), Dun Law (Phase 1), Dun Law (Phase 2), Halkburn/ Longpark, Langhope Rig	Black Hill, Brockholes,	Land north east of Greenburn Farm, Pressmains Farm, Pinnaclehill Industrial Estate,	Coldingham Moor/ Drone Hill,	Land north east of Weirburn House,
<b>Medium (25m – 50m high)</b>		Castlemains Farmhouse, Whitslaid Farm, Larkhill, Langshaw Farm,	Land south of Whitsome, Nethermains Farm, Easter Howlands Farm, Lintlaw Farm,	3 Bogangreen Cottages, Buskin Farmhouse, Crosslaw Farm, Lumsdaine Farm	Land north west of Symington Mains Farm

Planning Application					
Regional Character Type	Upland	Upland Fringe	Lowland	Coastal	River Valley
<b>Very Large (100m+ high)</b>	Blythe Farm, Gilston, Rowantree, Earlshaugh, Land south west of Whitslade (Barrel Law), Clyde Extension.	Land south west of Monashee Farm, Quixwood Farm, Blackburn Farm, Whitton, Corsbie Moor.			Penmanshiel Farm,
<b>Large (50m – 100m high)</b>	Baddingsgill Gamekeepers Cottage, Allanshaws Farm (Shawpark)	Standhill Farm Cottage, Bassendeanhill Farm,		Penmanshiel Farm,	
<b>Medium (25m – 50m high)</b>		Helenslea, Primesidemill, Thirlstane Farmhouse,	Woodend Farm, Kirkburn House, Sunnyside Farm,		

**5.4 Factors Affecting Landscape and Visual Impacts of Wind Turbines**

There are a number of overlapping and interacting factors which affect the potential landscape and visual effects of wind turbines. The three main turbine factors are:

- Size of turbine (also type/ design/ colour)
- Numbers of turbines (within groups and/ or single turbines spread across an area)
- Distribution of turbine groupings (spacing between groups and/or single turbines)

The effects of these factors will in turn differ depending on the character of the landscape in which the turbines are located.

**5.4.1 Windfarm Size**

There is no current ‘accepted’ classification of commercial windfarm sizes in Scotland. Existing and proposed wind energy developments vary in turbine numbers and turbine sizes; from single small turbines to over 200 very large turbines. Individual turbines vary in size from below 25m to more than 140m, with maximum outputs from a few kW to greater than 3MW.

For the purposes of this study, it is worth considering the wider Scottish context of wind energy development. The table below refers to small, medium, large etc. size wind energy developments. For clarity we have adopted wind energy development size categories related wherever possible to published guidance or planning application procedures. The 20MW size above which SPG and SPP principally applies is shown in the Table 5.3 below.

**Table 5.3. Wind Energy Development Size Categories**

Size Category	Size Criteria	Planning Criteria/ Illustrative Examples
<b>Small</b>	A development of 3 or fewer turbines.	As defined by SNH guidance on assessment of small scale wind energy development ( <i>SNH 2012</i> )
<b>Small/Medium</b>	A windfarm of more than 3 turbines up to 20MW output	Windfarms above 20MW are required to be covered by SPG in SPP6 Annex A.  <i>Eg. Between 4 turbines over 50m and 10x2MW turbines or 6x3MW turbines</i>
<b>SPG 'Cutoff' 20MW</b>		
<b>Medium</b>	A windfarm between 20MW and 50MW output	Windfarms up to 50MW are dealt with as local planning authority applications.  <i>Eg. Between 7x3MW and 16x3MW turbines</i>
<b>Large</b>	Windfarms greater than 50MW output	Windfarms over 50MW are section 36 Applications dealt with by Scottish Ministers.  <i>A minimum size of 20x2.5MW or 17x3MW turbines</i>
<b>Very Large</b>	Windfarms greater than 100MW output	<i>A minimum size of 50 turbines over 100m tall</i>

The wind energy developments in Scottish Borders covers the whole range of turbine sizes and development size range. The largest windfarm, consented or proposed, within the study area is Clyde Windfarm within South Lanarkshire with 152no. x 125m high turbines at 350MW installed capacity. This windfarm is within South Lanarkshire, however the visual impacts of this windfarm extend far into Scottish Borders. This very large windfarm has a planning application to extend the windfarm by 57no. x 142m high turbines, 7no. of which will be within or on the border with Scottish Borders.

**5.4.2 Turbine Numbers and Landscape Impacts**

Wind turbines considered out of their landscape context are usually simple, aerodynamic and functional structures that many consider to have a clear aesthetic of 'form following function' in their design. Landscape and visual impact issues relate primarily to their scale and potential incongruity in a landscape rather than to the aesthetics of the turbine design.

In this case, the number of turbines in a wind energy development has a bearing on the visual image of the development that extends well beyond the proportion of a landscape area that is covered:

- Small clusters of turbines still express the aesthetics of the individual turbines and the blade movement of each turbine is discernible. The cluster is seen as a discrete item within a landscape, becoming a significant feature but generally not dominating or changing the character of a large area.
- In large groupings of turbines there is area coverage of the landscape, rather than a discrete grouping. The individual turbines usually become lost in a mass, blade movements are perceived across the whole area and there is a more 'cluttered' appearance.
- As turbine numbers increase it is increasingly difficult to design a wind energy development such that overlap and clustered alignments are avoided when seen from surrounding viewpoints. Design mitigation becomes a matter of avoiding excessive clutter, skylining and proximity to sensitive receptors as much as creating aesthetically balanced groupings.

It is recognised that these qualities grade into one another depending on the exact size of development (eg. 3, 6, 12, 20, 50, 100+ turbines) and on how the turbines are grouped (eg. in mass groupings or in lines along ridges). Nevertheless, to the extent that they are more easily contained and definable, smaller windfarms would have a disproportionately lesser influence on the landscape than large windfarms and are less likely to dominate areas and blur boundaries between landscape types.

In small groupings, odd numbers of turbines (ie 1, 3 or 5) usually present a more balanced composition than even numbers, unless there is a strong regular pattern or line in the landscape to which the turbines can be related.

The study area of the Scottish Borders can be described as a central lowlands and major valleys surrounded by Uplands. There are Upland, Upland Fringe, River Valley, Lowland and Coastal landscape types, medium to large scale developments of large or very large turbines has to date been restricted to the Upland Landscapes, however planning applications containing very large turbines are increasingly being submitted for Upland Fringe areas, especially within the eastern area of Scottish Borders near the North Sea Coast.

**5.5 Turbine Layout**

Another factor to be considered is the layout of turbines within a windfarm. Whilst the optimum layout, including turbine separation distances and position in relation to the prevailing wind will relate to maximising output, there will be other practicalities. Thus turbine layout may vary according to turbine numbers, the availability of land, topography, access and numerous environmental constraints. Once these factors have been taken into consideration the overall aesthetic of the windfarm can be considered.

Layouts will relate to landforms and patterns in the landscape as well as the need to present a coherent image from the surrounding viewpoints. Thus in lowland landscapes with a strong geometric pattern the turbines may be organised in lines of a grid, whereas in the case of a distinct landform such as a ridge or coastline they may be arranged in a curved line following the landform. In upland landscapes turbines may be arranged in a more organic pattern, following ridgelines or clustered around rounded hilltops. Attention should be paid to the relationship of outer turbines in large groups ensuring that there are no 'outliers' creating an untidy or disorganised appearance.

When two or more developments are in close proximity or a windfarm is being expanded there can be cumulative issues relating to site layout if these are clearly contrasting (eg. a geometric layout adjacent to an organic layout). Such developments should be designed to achieve a harmonious layout and relationship.

## 5.6 Windfarm Distribution

### 5.6.1 Pattern of Windfarm Development

When considering cumulative impacts of turbines and windfarms it is not just the number of turbines in the landscape that affects impacts but also the pattern of development. This has an effect on the ability of the landscape to absorb change and on visual receptors. The dispersal of the turbines in small groups has some advantages in that each grouping is less dominant within the landscape and presents a less cluttered visual image. There is also less likelihood of 'swamping' landscapes and blurring the boundaries between different landscape types and features if there are distinct gaps between clusters of wind turbines. However, the increased number of windfarms or turbine clusters also means that there is an increased likelihood of seeing a windfarm or turbine and at closer proximity than if the turbines were concentrated into fewer locations.

The emerging trend in Scotland is for the concentration of wind turbines into fewer, larger, windfarms. This arises initially via large windfarm proposals and then through the later extension of many existing windfarms. The pattern may also play out on a wider regional scale or 'clusters and spaces' where groups of windfarms lie within large areas separated by significant areas without turbines. This often reflects the distribution of landscapes which are more and less appropriate to windfarm development.

The cluster and space pattern has become slightly diluted by the recent proliferation of smaller FiT schemes and single turbines which relate more to the location of small scale consumers than to regional landscapes.

The pattern of existing and proposed development in Scottish Borders reflects the trend for larger windfarms and clusters with large areas free of turbines or windfarms. This is illustrated within Scottish Borders by the cluster of developments in within the Upland areas of the Lammermuir and Moorfoot Hills and Lauder Common with the relatively undeveloped Southern Uplands.

### 5.6.2 Separation Distances between Turbines and Windfarms

Separation distance between turbines and windfarms has a bearing on how they are perceived together and within the landscape, particularly in relation to defining the limits of cumulative development. Whilst a clear visual separation between two or more windfarms may be achieved by a certain physical distance, this distance would depend on the size and number of the turbines or windfarms, the type of landscape(s) in which they are located and the degree to which they affect the character of the landscape.

Considering this in simple terms, turbines have both a direct effect on the landscape in which they lie and an indirect effect on the surrounding area. Therefore, although two turbines or windfarms may be separated by some distance and seen as clearly separate, the landscape in which they lie may be considered to be dominated by turbines. Only beyond a certain distance would the intervening landscape be considered to retain its original character, separating two turbine dominated landscape areas.

Table 2.1 develops this concept further by considering the effects of multiple wind energy developments and describes cumulative development thresholds. Further to a capacity assessment, an acceptable level of development within a landscape area may be agreed (eg. *Landscape with Occasional Wind Turbines* or *Wind Turbine Landscape*). The accepted level of development would then be achieved by a combination of turbine sizes, windfarm sizes and separation distances between groupings, relating to the scale (including topographical containment) and character of the landscape i.e. its capacity for that degree of development.

As an example a large scale upland plateau landscape accommodating a number of windfarms would be considered a *Wind Turbine Landscape* if the windfarms are large or very large, the topography is subordinate in scale to the turbines and the windfarms are separated by distances less than their typical extents. If the topography has a relief that is clearly greater than the turbine heights, and/ or the windfarms are smaller and the separation between the windfarms is clearly greater than their extents, the landscape may be considered a *Landscape with Wind Turbines*. Finally a lowland landscape which is small in scale, with many small scale reference features, may easily be dominated by wind turbines. In this case the objective may be to limit development to a *Landscape with Occasional Windfarms* by allowing only small clusters of smaller turbines separated by substantial distances and with cumulative visibility reduced by localised tree or landform screening.

In each case different scales and patterns of landscape and development would require different turbine sizes, groupings and separation distances to lead to a particular windfarm landscape type. Such an approach has been adopted in this study and sizes and separation distances are recommended and explained in the following chapter.

### 5.6.3 Distribution in Relation to Landscape Type

As discussed above, some landscape types have less capacity for development than others. In this case it would be appropriate to consider the relative merits of guiding development to the areas most capable of accommodating development, or to directing different types and scales of development to the areas most suited to each. Subject to the

specific impacts of any particular proposal, this would reduce the potential for the most significant and adverse landscape impacts. It would also restrict the wind turbine landscape typologies to a more narrowly defined range of landscapes, thereby reducing the perception of unplanned proliferation of wind farms throughout a local authority area.

In Scottish Borders operational and consented developments consisting of large and very large turbines have largely been located in Upland Plateau areas and are mainly of a large to medium scale. Whilst large areas are free from turbine or windfarm development, there are significant proposals located within the Upland Plateau areas. These proposed developments are encroaching into the Southern Uplands and Cheviot Hills within the southern, eastern and western areas of the Scottish Borders and proliferating within the north eastern area of the Scottish Borders near the coastal landscape character area.

The central lowland area to the east of Galashiels and Melrose also has a number of existing individual turbine/ small windfarm developments, however these are predominantly small or medium sized turbines in groups not exceeding 3no. turbines. This development pattern is continued within the turbine proposals currently at planning application stage.

A large area of the Southern Uplands and Cheviot Hills to the south of the River Tweed, west of Galashiels and Kelso is free from or has very limited turbine or windfarm development. Currently this is in part due to the Eskdalemuir seismological array exclusion zone, not a landscape designation but impacting on turbine development and distribution within this area of the Southern uplands. The Northumberland National Park in northern England has also restricted the turbine and windfarm development within the Cheviot Foothills area of the Scottish Borders.

The landscape effects of the consented wind turbine developments in the Scottish Borders are further detailed in chapter 6 of this report. The distribution of windfarm landscape typologies (as described in Table 2.1) is shown in Figure 6.2 in the following chapter.

In strategic terms the established and evolving pattern of development should be taken into consideration as it reflects a clear rationale driven partly by landscape, visual and amenity issues (sensitive or valuable landscapes, proximity to settlements and recreational areas) and partly by technical issues (available land, available grid capacity, wind speed and seismology array). The number, size and distribution of further development should be considered very carefully in order to maintain differences in character between the uplands, upland fringe, the river valleys, the lowlands and the coastal zone.

Also, in accordance with SNH guidance *Siting and Designing Windfarms in the Landscape* (SNH, 2009), consideration should be given to preserving areas in which no development is yet located or consented. These can provide significant gaps between clusters of wind turbines in which their visual influence is minimal. This again will reinforce distinctiveness between landscapes.

## 6.0 ASSESSMENT OF LANDSCAPE CAPACITY AND CUMULATIVE CHANGE

### 6.1 Assessment Purpose and Process

The purpose of the following assessment is to determine the capacity of the Scottish Borders landscape to accommodate wind turbine development and to determine what levels of cumulative development would be acceptable across the local authority area. The assessment also takes into account the level of cumulative development that already exists within and around Scottish Borders and is based on the premise that current renewable energy policies will lead to an inevitable level of landscape change within Scottish Borders that requires careful management.

The assessment involves four stages:

- 1) Firstly assessing the inherent capacity of the Scottish Borders landscape to accommodate wind turbine development;
- 2) Secondly, assessing the degree of cumulative change resulting from operating and consented wind turbines in the study area and in Scottish Borders;
- 3) Thirdly, assessing the extent to which cumulative consented development has reached the limit of the landscape's capacity to acceptably accommodate wind energy developments.
- 4) Finally, assessing the level of further development that could acceptably be accommodated within areas of Scottish Borders. This includes, where appropriate, commentary on the likely acceptability of currently proposed wind turbines.

An assessment methodology is given in Chapter 2 and further detailed in **Appendix 2**. The assessment and its findings are summarised in **Table 6.1** overleaf and **Figures 6.1 to 6.4**.

**Table 6.1** is divided into ten columns which summarise the assessment and guidance. The assessment works from left to right:

- The LCTs and the LCAs of which they comprise are listed in column 1.
- The assessment of sensitivity and value of each LCT/ LCA is summarised in columns 2-5 (derived from the detailed assessment of LCTs shown in tabulated form in **Appendix 5**).
- Further to the sensitivity/ value assessment the landscape capacity for different turbine size categories is shown in column 6 of the table. This is mapped as landscape capacity maps in **Figure 6.1a-c**. These maps used coloured areas to represent the inherent capacity of the landscape for different turbine size categories and do not take into account the cumulative effects of existing/ consented wind energy development. The areas shown are indicative and boundaries should not be considered as precise edges between areas of differing capacity.
- Column 7 is an assessment of the current level of cumulative change based on the distribution of existing and consented wind energy developments as detailed in

chapter 5. The extent of wind turbine landscape types (as described in **Table 2.1** above) is noted in Table 6.1 and shown as a map in **Figure 6.2**.

- Column 8 details proposed limits to future development. This is derived from a consideration of the inherent landscape capacity. The cumulative landscape effects that would result from this are illustrated in **Figure 6.3** as a map of wind turbine landscape types.
- Guidance on wind turbine sizes, numbers and distribution is given in column 9. The purpose of this is to assist in managing future wind energy development to the proposed acceptable limit.
- Column 10 comments on existing, consented and proposed developments in the LCAs as well as discussing landscape capacity issues and giving further guidance on turbine sizes and siting.

This assessment is carried out for each of the 30 LCTs in Scottish Borders. Many of the LCTs appear as LCAs more than once across the six main regional landscape areas of Scottish Borders:

- 1) Midland Valley;
- 2) Lammermuir and Moorfoot Hills;
- 3) Coastal Zone;
- 4) Tweed Lowlands;
- 5) Cheviot Hills;
- 6) Central Southern Uplands.

The LCTs and component LCAs are grouped into each regional area in which they appear and each LCA is given a separate assessment. Table 6.1 is split into the six regional groupings. This is followed in 6.3 by overall assessments of capacity and cumulative effects for each regional landscape area.

### 6.2 Guidance

Table 6.1 also gives guidance on turbine sizes, cluster sizes and separation between groups of turbines for each landscape type that would limit cumulative development to the proposed acceptable level. This relates to turbines of medium, large and very large size. As highlighted in 2.7, guidance on small turbines, below 25m to blade tip is not included in this study, guidance applies at a local level and is more generic.

Section 5.3 to 5.5 of this report contains detailed discussion of how turbine size, group size and group separation affects perceptions of wind energy and landscape character. Further guidance is given in SNH's *Siting and Designing Windfarms* publication. The following briefly outlines the main considerations in developing the specific guidance for this assessment given in Table 6.1.

### 6.2.1 Turbine Size

The guidance on turbine sizes generally relates most clearly to the horizontal and vertical scale of the landscape; complexity of landscape pattern and the presence or absence of smaller scale features and elements such as trees and houses.

Medium size turbines are most able to be accommodated within the smaller scale landscapes with more complex patterns and smaller scale reference features. The larger turbines (large and Very Large Turbines) are generally restricted to larger scale landscapes with simpler landforms where there are fewer small scale references. Smaller, medium sized, turbines may also be accommodated in such landscape types although their proximity to larger size turbines would need to be carefully controlled as they could become scale references.

### 6.2.2 Turbine Group Size

Turbine group sizes relate to scale and complexity of the landscape, particularly to landform and pattern. In general larger scale more simple landscapes with gentle landforms and simpler patterns can accommodate larger groups of turbines, subject to having the physical capacity (ie. available area). In the case of Scottish Borders there are some large extensive areas with large scale and simple landforms and patterns comparable to the uplands in other parts of Scotland which have accommodated the largest windfarms.

### 6.2.3 Separation between Turbine Groups

Turbine size and group size can be generically related to landscape character when applied to a single turbine or windfarm, or across a number of windfarms. However, separation between groups of turbines is the single most important factor in controlling cumulative effects. This is because of the high prominence and extensive visibility of most turbines leading to effects on landscape character well beyond the turbine, as discussed in detail in 5.6.2.

The guidance in Table 6.1 therefore gives approximate separation distances that should be applied between turbine groupings (including single turbines) in order to achieve the desired turbine landscape typology.

The main factors controlling the proposed separation distance are:

- 1) Proposed Turbine Landscape Typology: each proposed typology detailed in Table 2.2 requires a different separation distance to achieve the landscape and visual criteria described.
- 2) Turbine Size: larger turbines require a greater separation than smaller turbines to achieve the same landscape typology.
- 3) Group Size: larger groups of turbines require a greater separation distance to achieve the same landscape typology.
- 4) Landscape character type: this has an effect on all the above factors. In terms of visibility, more open landscapes with modest landforms are likely to require greater

separation distances, whereas landscapes with significant topography and woodland cover give the potential to reduce visibility. Factors such as scale and pattern can have a more subjective effect. The presence of other tall objects and of development also affects the perception of turbine development.

The distances given in Table 6.1 are approximate, relating primarily to (1) and (2) above. Landscape character including topography is also important: where landforms are capable of visually separating turbine groups the distance between landforms is a consideration in setting distances. For example:

- in the *Rolling Farmland (BDR8)* which is a proposed *Landscape with Occasional Turbines*, the separation distances are designed to ensure a degree of screening: a distance of 3-5km is the separation required to ensure that a significant landform separates groups of medium size turbines and 5-10km is the distance that the nearest large turbines, if seen above landforms, will become a minor feature in the view.
- In contrast *Plateau Grassland (BDR2)*, which is a proposed *Landscape with Turbines*, has undulating plateau like landforms and large and very large turbines in larger groups are separated by 5-10km, such that they are likely to be partially inter-visible but nevertheless clearly separated but encouraging a 'cluster' of developments in one area.

In the case of small landscape character areas the separation distances for larger turbines in particular mean that, in theory, only one grouping would be comfortably accommodated within the area. The separation may then apply between a development in that landscape unit and one in an adjacent character area.

As the recommended distances are an approximate range it is emphasised that separation distances between specific proposals should be considered in more detail on a case by case basis.

### 6.2.4 Other Factors which Influence Guidance

The capacity assessment for some generic landscape types does not cover the variation found between or even within individual geographical units of that type. This is usually because of one or two key landscape factors which override the characteristics including:

- All or part of the character area is much more prominent and visible than the bulk of the area covered by the landscape type;
- A particularly small area is covered by the character area compared with the main areas of the landscape type;
- Some or all of the character area lies in an area designated to protect a landscape or setting of a town (eg. National Scenic Areas);
- Close proximity to other more sensitive neighbouring character areas which would be significantly affected by wind energy proposals otherwise suitable for the character area.

- Close proximity to other landscape types, settlements or industry which reduces the sensitivity of a landscape character or part of an area compared with the bulk of the area covered by the landscape type.

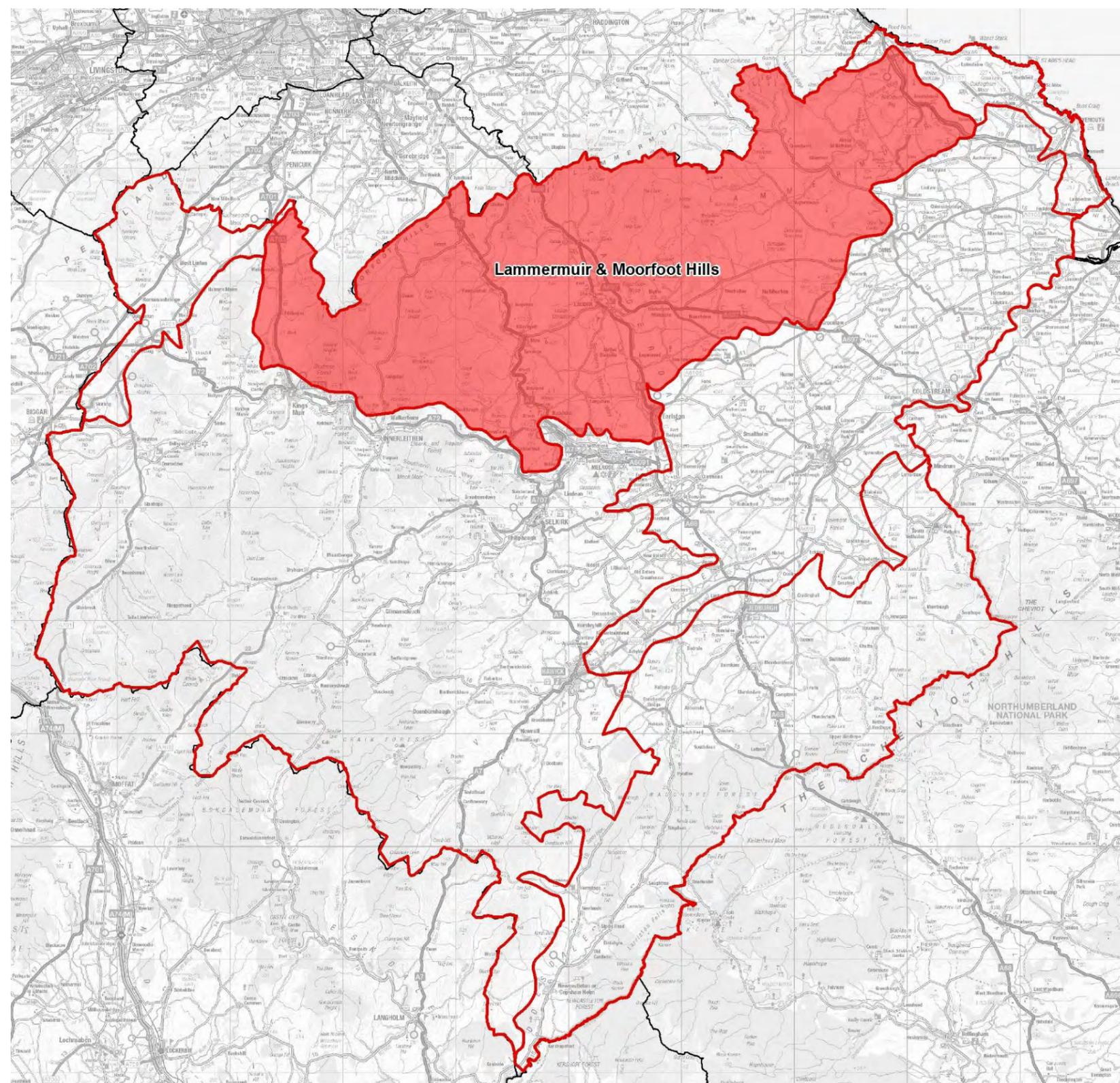
A combination of any of these factors might limit the ability of a specific landscape character area or part of an area to accommodate a level of development otherwise acceptable to the type. The main areas are identified in Table 6.1 and Figures 6.1 to 6.4 but any specific development should be considered in more detail and assessed against local factors where appropriate.

**Finally it is emphasised that this assessment is focused on landscape and visual issues. Areas which have been identified as suitable on this basis may be restricted by other unrelated factors such as protection of wildlife, proximity to dwellings, aviation restrictions, lack of grid connection or within the exclusion zone/consultation zone of the seismological array at Eskdalemuir. These issues are not the subject of this assessment and are covered by the SPG.**



Landscape Type	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	Landscape Capacity (Related to turbine size)			Predominant Operational/ Consented Landscape Type	Proposed Acceptable Limits of Development	Turbine Guidance Turbine Sizes Max. Numbers in Group Min Group Separation Distances	Comment
					M	L	VL				
<b>Key:</b> No Capacity  Low Capacity  Medium Capacity  High Capacity											
<b>Midland Valley</b>											
<b>1. Dissected Plateau Moorland</b> i) Western Pentlands LCA	Medium	Medium/High	Medium/High	High				<i>Uplands with no Wind Turbines</i>	<i>Uplands with Occasional Wind Turbines</i>	Turbine Sizes: Medium (25-50m) Group Sizes: Individual Separation Distances: 3-5km (medium)	Application for one 50-100m turbine. The Western Pentland LCA has a higher value due to the Pentlands Regional Park to the immediate northeast, north and north west and the SLA designation covering this LCA in recognition of its scenic qualities, the western slopes and highest peaks are prominent features from settlements and key transport routes. The area is only suitable for single medium sized turbines, these would be better sites if visually they were associated with the individual farmsteads in the central lower areas of the LCA.
<b>8. Rolling Farmland</b> v) West Linton LCA	Medium/High	Medium/High	Medium/High	Medium/High				<i>Upland Fringe with No Wind Turbines</i>	<i>Upland Fringe with Occasional Wind Turbines</i>	Turbine Sizes: Medium (25-50m) Group Sizes: Small (1-3) Separation Distances: 3-5km (medium)	There is one existing turbine 0-25m high and three immediately within the neighbouring BDR3 area to the south west. There is one application for a single turbine 0-25m. The area has a low to medium capacity for single or small groups up to 3no. medium sized turbines (25-50m). The western area of the LCA is part of a larger SLA and influenced by the Pentlands Regional Park outwith the SBC area. Development within this area would have a negative impact on these designations. Turbine development would be better accommodated in this LCA if turbines were visually associated with farmsteads and small settlements.
<b>11. Grassland with Hills.</b> v) Skirling LCA (v)	Medium/High	Medium/High	Medium/High	Medium/High				<i>Upland Fringe with No Wind Turbines</i>	<i>Upland Fringe with Occasional Wind Turbines</i>	Turbine Sizes: Medium (25-50m) Group Sizes: Individual Separation Distances: 3-5km (medium) ; 5-10km (large)	There are no existing or proposed wind turbines within this LCA. The area has a low capacity for individual medium turbines only. This LCA is visible from a number of local high points including the regional landmark and popular viewpoint of Tinto Hill summit. The south eastern area of this LCA is part of a larger SLA, development within this LCA should be sited to avoid negative impacts on this SLA. Turbine development would be better accommodated if turbines were located alongside individual farmsteads and could visually be read as part of the agricultural development.

**Table 6.1(ii). Summary of Landscape Capacity and Cumulative Effects and Guidance for Future Wind Energy Development – Lammermuir and Moorfoot Hills**



Landscape Type	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	Landscape Capacity (Related to turbine size)			Predominant Operational/ Consented Landscape Type	Proposed Acceptable Limits of Development	Turbine Guidance Turbine Sizes Max. Numbers in Group Min Group Separation Distances	Comment
					M	L	VL				
<b>Key:</b> ○ No Capacity ● Low Capacity ● Medium Capacity ● High Capacity											
Lammermuir and Moorfoot Hills											
1. <b>Dissected Plateau Moorland</b> ii) Moorfoot Plateau LCA	Low/ Medium	Medium	Medium	Medium/ High	●	●	●	Uplands with Occasional Wind Turbines and Uplands with no Wind Turbines	Uplands with Wind Turbines (southern section Uplands with Occasional Wind Turbines)	Turbine Sizes: Medium (25-50m); Large (50-100m); Very large (100m+) Group Sizes: medium to large windfarm developments (under 50 turbines) Separation Distances: 3-5km (medium); 5-10km (large and very large)	<p>The Moorfoot Plateau is relatively undeveloped, there are two windfarms, one windfarm has 24 large turbines 50-100m high and the other has 3no. very large turbines of 100m+, there is also one existing or consented turbine under 25m high.</p> <p>With the exception of the southern area (an SLA), the Moorfoot Hills LCA has no landscape designations and could accommodate further turbine development of medium to large (under 50no. turbines) developments of large turbines 50-100m high within the plateau moorland area east of the B709. There are select areas within this character area where turbines of 100m+ will be acceptable in smaller developments. Turbine developments should not encroach onto the visually prominent escarpment facing Edinburgh. There is also capacity for medium sized turbines, these would be better accommodated if they were sited alongside farmsteads and dwellings and could visually be read as domestic generation.</p> <p>Although not a landscape designations there is a large SSSI and SAC that could inhibit turbine development in this LCA.</p>
iii) Lammermuir Plateau	Low/ Medium	Medium/ High	Medium	High	●	●	●	Northern area Uplands with Wind Turbines, southern area Uplands with Occasional Wind Turbines.	Northern area Uplands with Wind Turbines, southern area Uplands with Occasional wind Turbines.	Turbine sizes: Medium (25m-50m) & Large (50m-100m) Very Large (100m+) Group sizes: small (1-3) to small/ medium (up to 10no. turbines) Separation Distances: 3-5km (Medium), 5-10km (Large)	<p>The Lammermuir Plateau has been subject to more extensive windfarm development and is reaching maximum capacity. There are large windfarms within this area, Fallago Rig windfarm has 48no. very large turbines. There is a separate cluster of windfarms (Crystal Rig/ Akingall) on the border of ELC and SBC in the east of this LCA. Within this existing cluster of windfarms there are 94no. very large turbines and 25no. large turbines. Within this LCA there is an application for 10no. very large turbines in the south of the LCA, this is alongside the Southern Upland Way north east of Lauder.</p> <p>The vast majority of this LCA is part of a larger SLA designation in recognition of the special scenic qualities this landscape has. This designation along with the long distance Southern Upland Way will impose a limitation on the number and siting of turbines in the south of this LCA.</p> <p>The northern area of this character area is reaching capacity and becoming a Wind Turbine Landscape with cumulative landscape and visual impacts of the numerous wind turbine development in this area, however there is still capacity for limited development within small areas around Fallago Rig taking advantage of areas with lower intervisibility and topographical containment for further windfarm developments of large or very large sized turbines. To limit cumulative impacts any development should visually be read as part of an existing cluster development. It is important that clusters of turbine development are well separated to prevent the landscape becoming a wind turbine landscape, cumulative impacts of existing developments within ELC and the neighbouring LCA will further limit development and should be taken into consideration when assessing future developments. There is capacity for medium sized turbines where these are sited alongside farmsteads and dwellings and could visually be read as domestic generation.</p>

Landscape Type	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	Landscape Capacity (Related to turbine size)			Predominant Operational/ Consented Landscape Type	Proposed Acceptable Limits of Development	Turbine Guidance Turbine Sizes Max. Numbers in Group Min Group Separation Distances	Comment
					M	L	VL				
Key:  No Capacity  Low Capacity  Medium Capacity  High Capacity											
2. <b>Plateau Grassland</b> Lauder Common	Medium	Medium	Medium	Low/ Medium				<i>Uplands with Wind Turbines and small areas of Uplands with Occasional Wind Turbines</i>	<i>Uplands with Wind Turbines</i>	Turbine Sizes: Medium (25m-50m), Large (50m-100m), limited very large (100m+)  Group Sizes: Medium to Large groups (up to 50no. turbines).  Separation Distances: 3-5km (Medium), 5-10km (Large and Very Large)	Currently there are 61no. large turbines in the north of the LCA, to the south/ south west of this there are 12no. very large turbines and a windfarm in the south of this LCA consisting of 19no. very large turbines. There is also a cluster of approximately 13no. small turbines in the north west of this LCA along the border with Midlothian.  In addition to this there are applications for 7no. very large turbines in the north of the LCA on the Midlothian council border, another application for 23no. very large turbines within the central area (Rowantree Windfarm) and an application for 9no. medium sized turbines high in a line extending from the southern most group of 19no. existing very large turbines.  This landscape could accommodate additional turbine development to that already consented, however if the majority of the turbine and windfarm applications were granted this landscape could potentially exceed capacity and risk developing into a wind turbine landscape. Consequently there are concerns the landscape is reaching saturation point and overall cumulative impact is a major consideration. Wind turbine development within this LCA needs to be restricted to well separated clusters and not be located on the much more visually prominent outer slopes, development should take advantage of the topographical containment created by the wider sections of this elevated plateau. There are no landscape designations or long distance paths within this area.
8. <b>Rolling Farmland</b> iv) Westruther Platform	Medium/ High	Medium/ High	Medium/ High	Medium/ High				<i>Upland Fringe with No Wind Turbines</i>	<i>Upland Fringe with Occasional Wind Turbines</i>	Turbine Size: Medium (25m-50m), Large (50m-100m)  Groups Sizes: Individual, small, maximum 3no. turbines  Separation Distances: 3-5km (Medium), 5-10km (Large)	There are currently 2no. medium size turbines in the western area of the LCA located above the Whitslaid Farmstead.  There is an application for 2no. medium sized wind turbines in the western area of this LCA, one application for a large single turbine located approximately centrally near Bassendean and an application for a windfarm consisting of 9no. very large turbines to the north east of Legerwood. There is an application for a windfarm consisting of 10no. very large turbines located just outside the LCA to the north east of Blythe. This proposed windfarm will be close to the Southern Upland Way.  Due to the undulating upland rural grazing farmland character of this landscape there is limited capacity for medium to large turbines only, due to intervisibility there is no capacity for very large turbines in this LCA. Large turbines are likely to be limited to the lower end of the typology scale. Capacity is reduced the presence of numerous individual farmsteads and small settlements and further reduced in the western area of the LCA by the presence of important transport routes (A68 just outwith the LCA) and long distance footpaths that will increase visibility and recreational value in this western area of the LCA. The southern area of the LCA (south of the A697) also has a higher intervisibility that places a restriction on turbine developments.

Landscape Type	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	Landscape Capacity (Related to turbine size)			Predominant Operational/ Consented Landscape Type	Proposed Acceptable Limits of Development	Turbine Guidance Turbine Sizes Max. Numbers in Group Min Group Separation Distances	Comment
					M	L	VL				
<b>Key:</b> ○ No Capacity ● Low Capacity ● Medium Capacity ● High Capacity											
<b>9. Platform Farmland</b> Eye Water Platform	Medium/High	High/Medium	Medium/High	High/Medium	●	●	○	<i>Upland Fringe with Occasional Wind Turbines, Northern area Upland Fringe with Wind Turbines.</i>	<i>Upland Fringe with Occasional Wind Turbines, Northern area Upland Fringe with Wind Turbines.</i>	Turbine Size: Medium (25m-50m), Large (50m-100m) Groups Sizes: Individual and Small (up to 3 turbines) Separation Distances: 3-5km (Medium), 5-10km (Large)	<p>There is currently one small windfarm consisting of 3no. Large turbines. This is poorly sited on top of a visually prominent escarpment above the busy A1 and east coast mainline corridor, it is very prominent with cumulative impacts associated with Drone Hill windfarm to the east.</p> <p>There are currently 4no. applications within this LCA, these windfarms are comprised of (from south to north) 6no. very large turbines, 14no. very large turbines, 6no. very large turbines and 3no. very large turbines. The northern section of this LCA is also very close to the consented 19no. very large turbines at Akingall (ELC), which will be viewed as an extension to the existing Crystal Rig/ Akingall cluster resulting in a greater cumulative impact for any development in this LCA. The existing Drone Hill windfarm to the east is visible from the higher more elevated areas of the LCA. Cumulative impacts will increase with any future proposed turbine development.</p> <p>Due to the scale and landuse of this landscape there is medium capacity for medium scale turbines, low capacity for large scale turbines in maximum small sized windfarms up to 3no. turbines and small pocket of low capacity in the northern section which has low intervisibility. Capacity is reduced in this landscape by the increased settlement pattern. If all proposed windfarms were consented, capacity would be exceeded and this landscape would risk becoming a landscape with wind turbines. This landscape has a small area in the north western section that is part of a larger SLA and the Southern Upland Way passes through this area in a south west to north east direction between St Bathen and Penmanshiel Wood. The important transport routes along the eastern coastal area and higher intervisibility of the eastern outer slopes and southern area create areas not suitable for turbine development in the eastern to southern extents of the LCA.</p>
<b>11. Grassland with Hills</b> iv) Knock Hill	Medium	Medium/High	Medium/High	Medium/High	●	●	○	<i>Upland Fringe with Occasional Wind Turbines</i>	<i>Upland Fringe with Occasional Wind Turbines</i>	Turbine Size: Medium (25m-50m), Large (50m-100m) Groups Sizes: Individual, Small/ Medium groups Separation Distances: 3-5km (Medium), 5-10km (Large)	<p>There is currently one medium sized windfarm located at Black Hill approximately in the centre of this LCA consisting of 22no. large turbines. There is another smaller windfarm of 3no. medium sized turbines. Within the northern section located on the boundary there are three existing small scale turbines (under 25m). There is an application for 2no medium sized turbines in the eastern area of this LCA (west of DUNS).</p> <p>There is very limited remaining capacity for windfarms or turbines in this landscape. Individual medium capacity turbines will be more easily accommodated especially if these are visually and physically associated with farmstead developments. There is potential capacity for an additional turbine development, however if additional windfarms are added to this landscape it is at risk of becoming a landscape with wind turbines. Additional turbine development within this LCA could potentially be viewed from the Southern Upland Way. Towards the northern part there may be opportunities for turbines at the lower end of the large scale typology.</p>

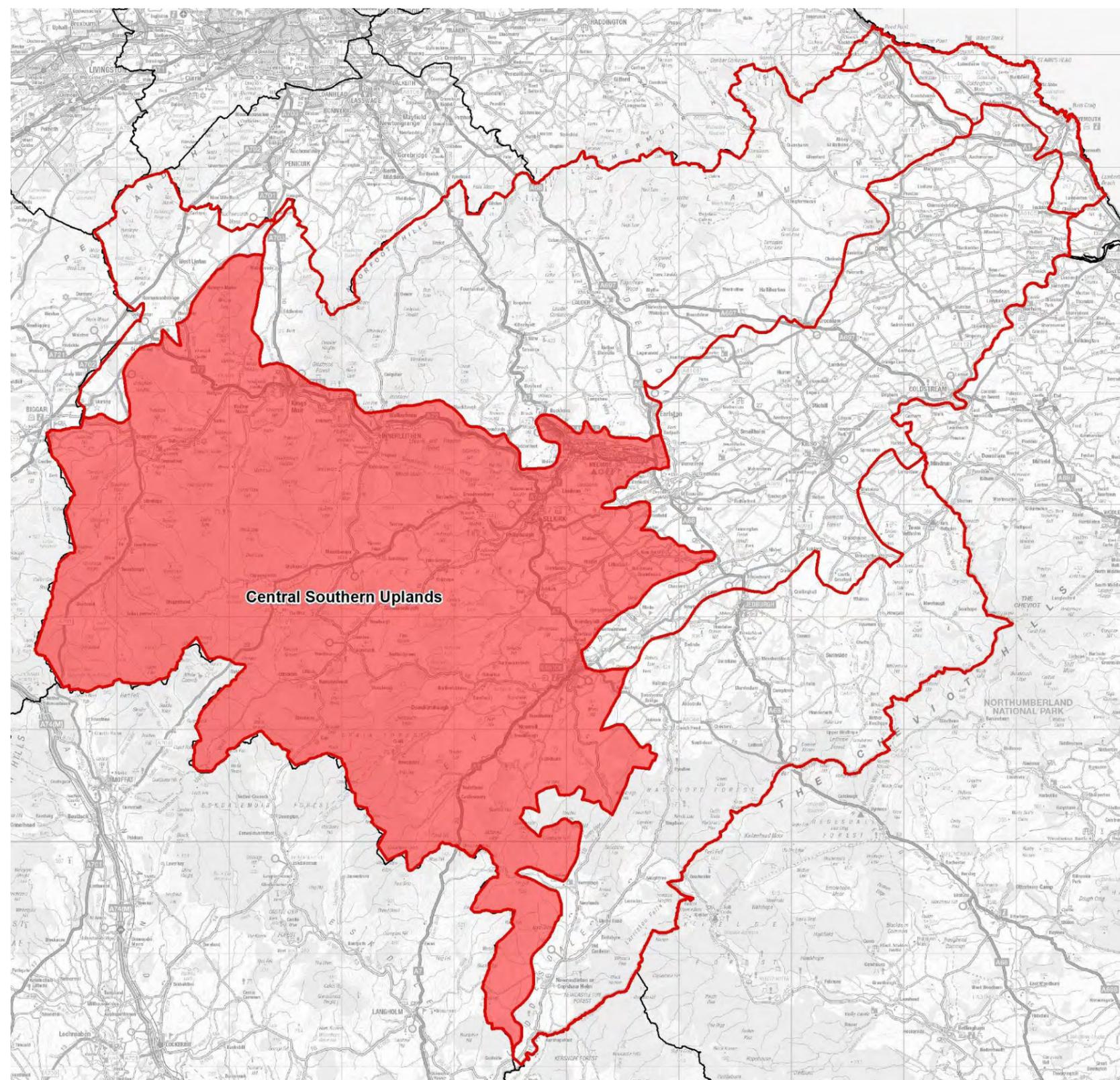
Landscape Type	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	Landscape Capacity (Related to turbine size)			Predominant Operational/ Consented Landscape Type	Proposed Acceptable Limits of Development	Turbine Guidance Turbine Sizes Max. Numbers in Group Min Group Separation Distances	Comment
					M	L	VL				
<b>Key:</b> No Capacity  Low Capacity  Medium Capacity  High Capacity											
<b>12. Undulating Grassland</b>  i) East Gala  ii) West Gala	Medium  Medium	High  High	Medium/High  Medium/High	High/Medium  High/Medium	 	Upland Fringe with Occasional Wind Turbines  Upland Fringe with no Wind Turbines	Upland Fringe with Occasional Wind Turbines  Upland Fringe with Occasional Wind Turbines	Turbine Size: Medium (25m-50m). Groups Sizes: Individual. Separation Distances: 3-5km  Turbine Size: Medium (25m-50m). Groups Sizes: Individual. Separation Distances: 3-5km	Currently there are 2no. individual medium sized turbines, both are located alongside the Southern Upland Way, one in the north of the East Gala LCA and one in the south. There are currently no wind turbines or windfarms within the West Gala LCA.  There are no planning applications for windfarms or wind turbines in the East or West Gala LCA.  There is limited capacity for individual turbines within the more isolated or rural areas of these LCAs sited away from settlements and the Southern Upland Way, there is no capacity for large or very large turbines or windfarms due to proximity to settlements and both areas having a higher intervisibility. The northern areas either side of the Southern Upland Way has capacity for medium sized individual turbines within East Gala and only a small area in the north west of west Gala has capacity for individual medium sized turbine development.		
<b>13. Poor Rough Grasslands</b> Leadburn	Medium/High	High/Medium	Medium/High	Low/Medium		Upland Fringe with No Turbines	Upland Fringe with Occasional Wind Turbines	Turbine sizes: Small (under 25m), Medium (25-50m) Group Sizes: individual Separation Distances: 3-5km	There are no current applications for turbines in this LCA. The small area, undulating landform, high intervisibility to and from Mid Lothian and Edinburgh and the presence of major transport routes within this character area dictates that this LCA is only suitable for individual (small to) medium sized turbines. There is no capacity for medium turbines in the northern and north eastern areas of the LCA where intervisibility with Mid Lothian and Edinburgh is greatest and there is no capacity for large or very large turbines within this LCA.		
<b>14. Upland Fringe Moorland</b> Greenlaw Common	Low/Medium	Medium/High	Medium	Medium/High		Upland Fringe with No Turbines, eastern area Upland Fringe with Occasional Turbines	Upland Fringe with Occasional Wind Turbines	Turbine sizes: Medium (25m-50m) Group Sizes: Individual Separation distances: 3-5km	This landscape currently has no windfarms or wind turbines or applications for windfarms or turbines.  There is a visible windfarm at Black Hill, north east of the character area, this contains 22 large turbines.  This area could accommodate individual medium sized turbines with a domestic scale and character within the southern area of the LCA, these turbines could be sited alongside individual farmsteads and properties to enforce this domestic scale. The northern area is part of a larger SLA and has 2no. prominent hills. This area of the LCA has very limited capacity.		

Landscape Type	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	Landscape Capacity (Related to turbine size)			Predominant Operational/ Consented Landscape Type	Proposed Acceptable Limits of Development	Turbine Guidance Turbine Sizes Max. Numbers in Group Min Group Separation Distances	Comment
					M	L	VL				
<b>Key:</b> ○ No Capacity ● Low Capacity ● Medium Capacity ● High Capacity											
<b>23. Pastoral Upland Valley</b>  ii) Eddleston Water  i) Gala Water	High/Medium  High/Medium	High/Medium  High/Medium	<b>High/Medium</b>  <b>High/Medium</b>	<b>High/Medium</b>  <b>High/Medium</b>	●  ●	○  ○	○  ○	<i>River Valley with no turbines</i>  <i>River Valley with Occasional Turbines</i>	<i>River Valley with occasional Wind Turbines</i>  <i>River Valley with Wind Turbines</i>	Turbine Size: Medium (25-50m) Group Sizes: Individual turbines to small groups of 3 or less. Separation distances: 3-5km.  Turbine Size: Medium (25-50m) Group Sizes: Individual turbines to small groups of 3 or less. Separation distances: 3-5km	The Eddleston Water LCA currently has no windfarms or turbines present and no applications for windfarms or turbines in this area. The Gala Water LCA currently has one existing medium sized turbine and no applications for additional turbines.  This area has limited capacity for (small or) medium sized turbines as individual turbines or small groups of 3 or less turbines. There is no capacity for large or very large turbines. There southern most areas of each LCA contains Landscape designations that reduced the capacity to no capacity in these areas. Gala Water LCA contains the A7 tourist route and proposed Borders Railway Line will travel within this valley, the steep sides of this valley landscape should not contain turbines as they are highly prominent slopes.
<b>24. Upland Valley with Farmland</b>  i) Upper Leader  ii) Upper Whiteadder	High/Medium  High/Medium	High/Medium  High/Medium	<b>High/Medium</b>  <b>High/Medium</b>	<b>Medium/High</b>  <b>Medium/High</b>	●  ●	○  ○	○  ○	<i>River Valley with No Turbines, northern area River Valley with Wind Turbines.</i>  <i>River Valley with No Turbines, northern area River Valley with Wind Turbines.</i>	<i>Southern River Valley with Occasional Wind Turbines, Northern Area River Valley with Wind Turbines.</i>  <i>Southern River Valley with Occasional Wind Turbines, Northern Area River Valley with Wind Turbines.</i>	Turbine Size: Medium (25-50m) Group Sizes: Individual turbines to small groups of 3 or less. Separation distances: 3-5Km (Medium).  Turbine Size: Medium (25-50m) Group Sizes: Individual turbines Separation distances: 3-5Km (Medium).	There are no consented windfarms or turbines present in these LCAs and no applications for turbines or windfarms. The large Dun Law windfarm just to the north of the Upper Leader LCA consists of 61no. large turbines is visible on the horizon to the north from most areas within the Upper Whiteadder LCA and would have a cumulative impact with any turbine development within this LCA.  The Upper Whiteadder LCA is part of a SLA but has less intervisibility, settlement development and less transport infrastructure present increasing capacity for medium sized turbines within the LCA to medium. The southern area of this LCA contains the Southern Upland Way that combined with the SLA designation reduces capacity to none in this area.  The Upper Leader LCA also contains part of a SLA to the eastern prominent slopes, due to this the eastern area of the LCA has no capacity. The central, wider less prominent areas of this valley LCA has capacity for (small and) medium sized individual turbines, these will be better accommodated if the turbines are visually associated with agricultural patterns, farmsteads and individual properties or could be visually associated with existing settlements.
<b>25. Upland Valley with Woodland</b>  i) Middle Tweed (small section within this regional area).	High	High	<b>High</b>	<b>High</b>	○	○	○	<i>River Valley with No Turbines</i>	<i>River Valley with Occasional Wind Turbines</i>	No Capacity	There are no operational or consented windfarms or turbines in this area and there are no applications for turbines or windfarms in this area.  Due to the rural narrow Valley landscape there is no capacity for medium, large or very large turbine development within this part of the larger LCA.

Landscape Type	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	Landscape Capacity (Related to turbine size)			Predominant Operational/ Consented Landscape Type	Proposed Acceptable Limits of Development	Turbine Guidance Turbine Sizes Max. Numbers in Group Min Group Separation Distances	Comment
					M	L	VL				
<b>Key:</b> ○ No Capacity ● Low Capacity ● Medium Capacity ● High Capacity											
<b>26. Pastoral Upland Fringe Valley</b>  ii) Lower Leader  i) Eye Water	High/Medium  High/Medium	High/Medium  High/Medium	<b>High/Medium</b>  <b>High/Medium</b>	<b>Medium/High</b>  <b>Medium/High</b>	●  ●	○  ○	○  ○	<i>River Valley with Occasional Wind Turbines southern area River Valley with no Wind Turbine.</i>  <i>River Valley with Occasional Wind Turbines</i>	<i>Uplands with Occasional Wind Turbines</i>  <i>Uplands with Occasional Wind Turbines</i>	Turbine Size: Medium (25-50m) Group Sizes: Individual Separation distances: 3-5km (Medium).  Turbine Size: Medium (25-50m) Group Sizes: Individual Separation distances: 3-5km (Medium).	Currently within the Lower Leader LCA there are no windfarms or turbines and one application for a medium sized turbine. There are two medium sized turbines within LCA 8 (iv) to the east that are clearly visible from the Lower Leader LCA area.  This LCA has limited capacity for (small to) medium sized individual turbines only. There is no capacity for large or very large turbines. Capacity is reduced by the important transportation links between England and Scotland (A68) increasing visibility and prominence of this area. The southern area of the Lower Leader LCA has no capacity due to the NSA designation and the increased settlement pattern found here.  Within the Eye Water LCA there is currently one turbine under 25m high. There is an application that straddles the border of the Eye Water LCA and LCA 21 to the east. This application is for fifteen very large turbines, three of which would lie in this LCA.  This LCA has capacity for (small to) medium sized individual turbines only. There is no capacity for large or very large turbines. Capacity is reduced by the important transportation links between England and Scotland (A1 and East Coast mainline railway) increasing visibility and providing a first impression of Scotland. Although no turbines are within this LCA the external influences mean the Eye Water LCA is a Landscape with occasional turbines and could potentially become a landscape with turbines if applications for large and very large turbines are approved in the future.
<b>28. Wooded Upland Fringe Valley</b>  i) Middle Whiteadder	High/Medium	High/Medium	<b>High/Medium</b>	<b>High/Medium</b>	●	○	○	<i>River Valley with Occasional Wind Turbines</i>	<i>River Valley with Occasional Wind Turbines</i>	Turbine Size: Medium (25-50m) Group Sizes: Individual turbines Separation distances: 3-5km (Medium).	Currently there are two large turbines in the eastern area of the LCA. There are no applications for wind farms or wind turbines.  This area has limited capacity for individual medium sized turbines only, this is due to the smaller scale landscape of the river valley. Medium sized turbines will fit better in the landscape if these individual turbines are located alongside farmstead developments and visually can be read as domestic scale turbines.



**Table 6.1(iii). Summary of Landscape Capacity and Cumulative Effects and Guidance for Future Wind Energy Development – Central Southern Uplands**



Landscape Type	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	Landscape Capacity (Related to turbine size)			Predominant Operational/ Consented Landscape Type	Proposed Acceptable Limits of Development	Turbine Guidance Turbine Sizes Max. Numbers in Group Min Group Separation Distances	Comment
					M	L	VL				
<b>Key:</b> ○ No Capacity ● Low Capacity ● Medium Capacity ● High Capacity											
<b>Central Southern Uplands</b>											
<b>3. Plateau Outliers</b> i) Eddleston/ Lyne Interfluve  ii) Broughton Heights	Medium  Medium	Medium/ High  Medium/ High	<b>Medium/ High</b>  <b>Medium/ High</b>	<b>High/ Medium</b>  <b>High</b>	●  ●	●  ○	○  ○	<i>Uplands with No Wind Turbines</i>  <i>Uplands with No Wind Turbines southern area</i> <i>Uplands with no Wind Turbines</i>	<i>Uplands with Occasional Wind Turbines</i>  <i>Uplands with Occasional Wind Turbines southern area</i> <i>Uplands with no Wind Turbines</i>	Turbine size: medium (25-50m), large (50m-100m).  Group sizes: small groups (up to 3 turbines)  Separation distances: 3-5Km (medium) 5-10Km (Large)  Turbine size: medium (25-50m)  Group sizes: small groups (up to 3 turbines)  Separation distances: 3-5Km (medium)	There currently is 4no. existing consented small turbines in the north eastern area of the Eddleston/ Lyne Interfluve LCA. There is a Section 36 proposal currently pending for 18no turbines at Cloich Forest  The Eddleston/ Lyne Interfluve area has a low capacity for medium turbines and possible capacity for turbines at the lower end of the large typology range. Turbines should be arranged in small groups within the central areas of the LCA or where they can visually be associated with farmsteads, individual properties and small settlements or where they follow agricultural patterns in the landscape. Large turbine developments should be avoided in the more prominent areas and take advantage of the topographical containment the landscape provides.  There are no turbines or windfarms within the Broughton Heights LCA nor are there any applications for windfarms or turbines.  Broughton Height has no capacity for Large turbines and only low capacity for medium sized turbines due the SLA and NSA designations and prominent outer slopes forming the skyline from lower elevations around the LCA. The outer slopes are prominent and visible from the valleys below, especially to the south and west of the LCA where they form the skyline of the NSA to the south and from the lower elevations to the west. These more prominent areas have no capacity fro turbine development.

Landscape Type	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	Landscape Capacity (Related to turbine size)			Predominant Operational/ Consented Landscape Type	Proposed Acceptable Limits of Development	Turbine Guidance Turbine Sizes Max. Numbers in Group Min Group Separation Distances	Comment
					M	L	VL				
Key:  No Capacity  Low Capacity  Medium Capacity  High Capacity											
4. Southern Uplands with Scattered Forests  i) Broadlaw Group	Medium	High/Medium	Medium	High				Uplands with Occasional Wind Turbines and Uplands with no Wind Turbines (small western area of 'Landscape with Wind Turbines')	Large area 'Uplands with No Wind Turbines', smaller area in west 'Uplands with Wind Turbines and Wind Turbine Landscape.	Turbine Size: Medium (25m-50m), Large (50m-100m) and Very Large (100m+)  Group Size: Small – Medium – large.  Separation distances: 3-5km (medium) 5-10km (Large and Very Large)	There is currently one medium sized windfarm comprised of 11 very large turbines located within the western area of the Broadlaw Group LCA at Glenkerie near the border with South Lanarkshire to the north of Tweedsmuir  There is one application within the Broadlaw Group LCA and one application located on the border with and into South Lanarkshire, the Clyde windfarm extension. The Clyde extension will extend the existing 152 very large turbine windfarm with a proposed 57 very large turbines (9 turbines are located either on the border of just within the SBC area). There is an application to the south east of the Clyde extension near the SBC boundary with Dumfries and Galloway for 24 very large turbines (Earlshaugh).  The north eastern area of this LCA contains part of a NSA, the vast majority is also a large SLA and there are two Core Areas of Wild Land. The Southern Upland Way passes through the central/ eastern area of the LCA. The western area of this LCA is becoming a Landscape with wind turbines influenced from developments outwith the SBC area. The majority of the internal area has topographical containment created by a large upland area and as a result has lower intervisibility. The Southern Upland Way and spur like landforms between valleys in the eastern areas increases prominence of these areas. As a result of intervisibility and landscape designations the northern and north eastern areas of the LCA have no capacity for medium, large or very large turbines. The remaining area has capacity for medium turbines however these would be better suited to individual turbines or small groups of 3no. turbines at farmsteads, individual properties and small groupings of properties, medium turbines are not suitable for a larger scale windfarm development. Capacity for large and very large turbines only exists in the western area of the LCA where these would visually be seen as an extension to the existing very large windfarm development cluster within South Lanarkshire. The existing landscape designations (SLA & NSA); core areas of wild land; Southern Upland Way as well as the large undeveloped area (a gap between clusters) with no windfarms or turbines reduces the capacity of this landscape for windfarm development. This area should remain as an undeveloped gap between existing and potential clusters of turbine development.

Landscape Type	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	Landscape Capacity (Related to turbine size)			Predominant Operational/ Consented Landscape Type	Proposed Acceptable Limits of Development	Turbine Guidance Turbine Sizes Max. Numbers in Group Min Group Separation Distances	Comment
					M	L	VL				
<b>Key:</b> ○ No Capacity ● Low Capacity ● Medium Capacity ● High Capacity											
ii) Dun Knowe Group LCA	Medium	Medium/Low	Medium	High	●	●	●	Central area of Uplands with Occasional Wind Turbines surrounding area is Uplands with No Wind Turbines	Uplands with Wind Turbines	Turbine Size: Medium (25m-50m), Large (50m-100m) and Very Large (100m+) Group Size: Small, Medium. Separation distances: 3-5km (medium) 5-10km (Large and Very Large)	<p>Within the Dun Knowe Group LCA there is currently one medium sized windfarm consisting of 10 very large turbines to the west of Hawick (Langhope Rig) and one application for a small/ medium sized windfarm approximately 2km south of the consented windfarm (Barrel Law), it is proposed this will consist of 8no. very large turbines.</p> <p>The Dun Knowe Group has limited existing turbine development and can accommodate additional development of medium, large and very large turbines. There are no designations, long distance footpaths and little human settlement within and nearby, although issues regarding any forestry removal should be addressed and mitigated where required. The surrounding topography also provides a degree of topographical containment for large and very large turbines, intervisibility within this area is generally fairly low. Medium scale turbines can be accommodated as individual turbines or as small groups of 3 or less and should be located alongside farmsteads and individual properties and their presence should be associated with domestic generation.</p> <p>This area could form part of a new cluster of turbine development as long as the spaces surrounding this new cluster are maintained free of turbine developments.</p>
iii) Cauldcleuch Head Group	Medium	Medium/Low	Medium	High	●	●	●	Uplands with No Wind Turbines	Uplands with Occasional Wind Turbines, western area Uplands with Wind Turbines	Turbine Size: Medium (25m-50m), Large (50m-100m) and Very Large (100m+) Group Size: Small, Medium. Separation distances: 3-5km (medium) 5-10km (Large and Very Large)	<p>Within the Cauldcleuch Head Group LCA there are no windfarms or turbines or applications for windfarms or turbines.</p> <p>There are no landscape designations, long distance footpaths, the area is sparsely populated and has a low intervisibility. There is capacity therefore for medium scale turbines as individual turbines or small groups of 3no or less, these should be sited alongside farmsteads and individual properties and be seen as domestic scale energy generation. There is capacity for large and very large turbines in the more elevated upland areas where topographical containment reduces intervisibility. Although not a landscape designation the southern area of this LCA contains a large SSSI and SPA which may impact on potential turbine developments. Consideration must also be given to the setting of Hermitage Castle.</p>

Landscape Type	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	Landscape Capacity (Related to turbine size)			Predominant Operational/ Consented Landscape Type	Proposed Acceptable Limits of Development	Turbine Guidance Turbine Sizes Max. Numbers in Group Min Group Separation Distances	Comment
					M	L	VL				
<b>Key:</b> ○ No Capacity ● Low Capacity ● Medium Capacity ● High Capacity											
<b>5. Southern Uplands Forest Covered</b>  i) Craik LCA	Medium	Low	Medium/low	Medium/High	●	●	●	<i>Uplands with No Wind Turbines</i>	<i>Uplands with Wind Turbines</i>	Turbine Size: Medium (25m-50m), Large (50m-100m) and Very Large (100m+)  Group Size: Small, Medium.  Separation distances: 3-5km (medium) 5-10km (Large and Very Large)	Currently there are no windfarms or turbines or applications for windfarms or turbines within this area.  This LCA contains no landscape designations, low intervisibility and is a sparsely populated area of the Scottish Borders. Due to these factors there is capacity for medium, large and very large turbines. Issues regarding any forestry removal should be addressed and mitigated where required. Medium sized turbines should be sited alongside individual farmsteads and properties and visually be read as domestic power generation. Large and very large turbines can be accommodated in the larger scale elevated upland areas and take advantage of the topographical containment created by the landscape. The western most area contains a portion of the Southern Upland Way, this long distance footpath impacts on the capacity of the landscape to no capacity for large and very large turbines in the western area of this LCA.
<b>8. Rolling Farmland</b>  iii) Minto Hills LCA	Medium/High	Medium/High	Medium/High	Medium/High	●	○	○	<i>Upland Fringe with No Wind Turbines</i>	<i>Upland Fringe with Occasional Wind Turbines</i>	Turbine Size: Medium (25m-50m).  Group Size: Individual or small groups (maximum 3no.)  Separation distances: 3-5km (medium)	There are currently no windfarm or turbines present in this area and one application for a single turbine under 25m high in the western section of this area along the A7 between Hawick and Selkirk and one application for a large turbine north east of the Minto Hills.  Due to the open and relatively elevated lowland/ upland fringe character of this LCA there is no capacity for large or very large turbines or windfarms. The occasional medium sized wind turbine could be accommodated as individual turbines or small groups, especially when associated with a farmstead. There is no capacity for small/ medium, large or very large windfarms or large or very large single turbines due to the open rolling landscape affording long distance views, locally prominent hills within the LCA and the regionally prominent and landmark hill (Rubra Law) to the south east. The southern area also is part of a larger SLA and has no capacity for any turbine development.

Landscape Type	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	Landscape Capacity (Related to turbine size)			Predominant Operational/ Consented Landscape Type	Proposed Acceptable Limits of Development	Turbine Guidance Turbine Sizes Max. Numbers in Group Min Group Separation Distances	Comment
					M	L	VL				
<b>Key:</b> ○ No Capacity ● Low Capacity ● Medium Capacity ● High Capacity											
<b>10. Grassland with Rock Outcrops</b>  ii) Midgard LCA	Low/ Medium	Medium	Medium	Medium	●	●	○	<i>Upland Fringe with No Wind Turbines</i>	<i>Upland Fringe with Occasional Wind Turbines</i>	Turbine Size: Medium (25m-50m), large (50-100m).  Group Size: Individual to Small groups (maximum 3no.)  Separation distances: 3-5km (medium), 5-10km (Large)	There are no existing/ consented or proposed windfarms in this LCA.  There is medium and low capacity for medium and large sized turbines respectfully. Medium capacity for medium sized turbines only exists in the central, eastern and southern area of this LCA away from the more prominent slopes facing Hawick within the areas with less intervisibility, the outer more prominent slopes facing Hawick have low capacity due to a greater intervisibility. On the outer slopes facing Hawick medium sized turbines will be better sited if there is a visual connection with a farmstead/ individual dwelling and are locally sited to reduce impacts. The central area with medium capacity has low visibility from Hawick which will enable individual turbines or small windfarms consisting of medium to large turbines to be accommodated in this LCA. There is no capacity for large turbine developments on the peripheral slopes of this LCA due to greater intervisibility, prominence from Hawick and the SLA designation in the northern corner of the LCA reducing capacity.
iii) Allan Water LCA	Low/ Medium	Medium/ Low	Medium/ Low	Medium	●	●	○	<i>Upland Fringe with No Wind Turbines</i>	<i>Upland Fringe with Occasional Wind Turbines</i>	Turbine Size: Medium (25m-50m), large (50-100m),  Group Size: Individual, small/ medium sized windfarms (maximum 10 no.)  Separation distances: 3-5km (medium), 5-10km (Large)	There are two small, under 25m high wind turbines located in the north eastern section of this LCA along the eastern boundary. There are no applications for wind turbines or windfarms in this area.  The northern, eastern and western outer slopes of this LCA have low capacity for individual medium sized turbines only, These would be better accommodated in the landscape if they are associated with individual properties or farmsteads. Capacity here is reduced by the greater intervisibility from settlements and traffic routes in the valleys below. The more central and southern areas of this LCA have a lower intervisibility from Hawick, transport routes and viewpoints, there are no landscape designations in this LCA and therefore this LCA has capacity for medium and large turbines or a small/ medium sized windfarm consisting of medium or large turbines. Large Windfarms are not suitable in this LCA.
iv) Chisholme LCA	Low/ Medium	Medium	Medium	Medium	●	○	○	<i>Upland Fringe with No Wind Turbines</i>	<i>Upland Fringe with Occasional Wind Turbines</i>	Turbine Size: Medium (25m-50m)  Group Size: Individual  Separation distances: 3-5km.	There are currently no existing or applications for windfarms or turbines within this LCA.  There are no landscape designations within this LCA and only the occasional individual farmstead development present, the north eastern slopes are more prominent to Hawick but a sufficient distance from Hawick to accommodate individual medium sized turbines, these should be sited to reduce visual impacts and be visually connected to farmstead developments.

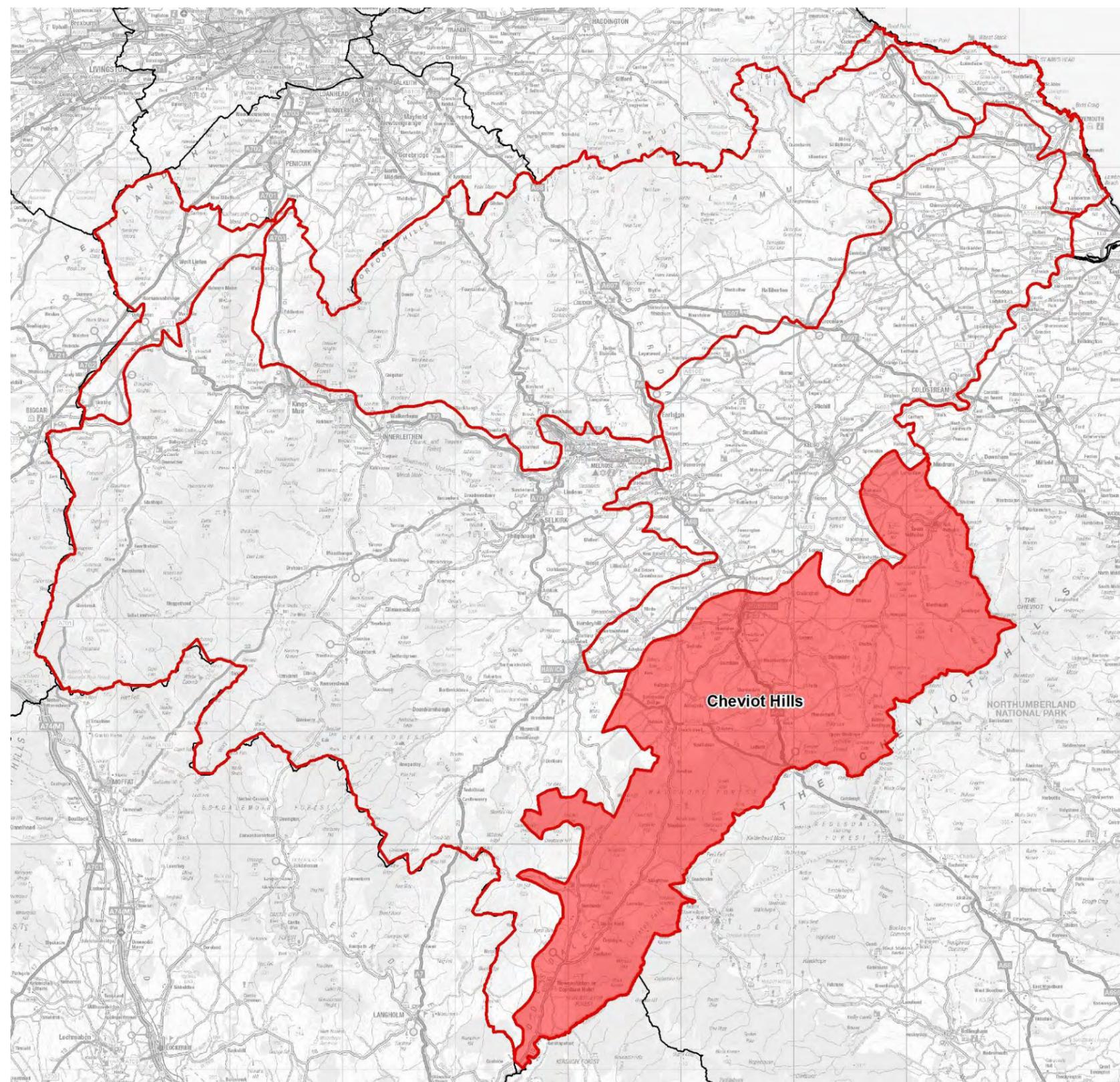
Landscape Type	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	Landscape Capacity (Related to turbine size)			Predominant Operational/ Consented Landscape Type	Proposed Acceptable Limits of Development	Turbine Guidance Turbine Sizes Max. Numbers in Group Min Group Separation Distances	Comment
					M	L	VL				
<b>Key:</b> No Capacity  Low Capacity  Medium Capacity  High Capacity											
i) Whitehaugh LCA	Low/ Medium	Medium	Medium	Medium				<i>Upland Fringe with No Wind Turbines</i>	<i>Upland Fringe with Occasional Wind Turbines</i>	Turbine Size: Medium (25m-50m).  Group Size: Individual, small to small/ medium sized windfarms.  Separation distances: 3-5km (medium).	There are currently no existing or applications for windfarms or turbines within this LCA.  There is medium capacity for medium sized turbines as individual elements or as a small or small/ medium sized windfarm. There is no capacity for medium sized turbines on the south eastern prominent slopes facing Hawick. Due to increased intervisibility within this LCA there is no capacity for large or very large turbines.
11. Grassland with Rock Outcrops	High	High	High	High				<i>Upland Fringe with No Wind Turbines</i>	<i>Upland Fringe with No Wind Turbines, small southern and western areas of Upland Fringe with Occasional Wind Turbines</i>	Turbine Size: Medium (25m-50m).  Group Size: Individual and small groups (3no. or less)  Separation distances: 3-5km (medium)	There is one existing small turbine under 25m high approximately between Selkirk and St Boswells with an application for another small turbine under 25m high to the north of the existing turbine alongside the A699.  The Eildon Hills are regionally prominent landmarks and viewpoints and recognised for it's scenic qualities by the SLA and NSA designations. The Borders Abbey Way travels through the more open undulating areas of the LCA. There is no capacity for development on or around the NSA or SLA and no capacity on or around the Eildon Hills due to visual and cultural sensitivities. However there is limited capacity for individual and small groups of medium sized turbines within the southern and western areas of this LCA, these turbines will be better accommodated in this landscape if situated alongside farmsteads and individual properties and sited to reduce impacts.
22. Upland Valley with Pastoral Floor	High/ Medium	High/ Medium	High/ Medium	High				<i>Upland Valley with No Wind Turbines</i>	<i>Upland valley with Occasional Wind Turbines southern section Upland Valley with No Wind Turbines</i>	Turbine Size: Medium (25m-50m).  Group Size: Individual and small groups (3no. or less)  Separation distances: 3-5km (medium)	There are two existing small turbines under 25m high.  This area has no capacity in the southern area for medium large or very large turbines due to the NSA and SLA landscape designations. However the northern area has capacity for individual turbines, the landscape will be able to accommodate individual medium sized turbines where these are visually read as part of a farmstead development.
ii) Lyne Water LCA	High/ Medium	High/ Medium	High/ Medium	High				<i>Upland Valley with No Wind Turbines</i>	<i>Upland Valley with No Wind Turbines</i>	No Capacity	There are currently no windfarms or turbines within this LCA and there are no applications for turbines or windfarms.  This area has no capacity for any turbine development due to the openness of the landscape, views from Tinto Hill and for the valley's scenic qualities as recognised by it's designation as part of a larger SLA and NSA.
i) Biggar Water/ Upper Tweed LCA	High/ Medium	High/ Medium	High/ Medium	High				<i>Upland Valley with No Wind Turbines</i>	<i>Upland Valley with No Wind Turbines</i>	No Capacity	These valleys are narrower and much more enclosed by the surrounding hills with longer views afforded up and down the valley. Manor Water LCA is also part of a larger SLA and NSA designation, the northern strip of the linear Upper Yarrow LCA is also part of a large SLA. Due to the topography allowing views up and down the valley the designations covering some or all of the LCAs there is no capacity for medium, large or very large turbines.
Manor Water LCA (iii) Upper Yarrow LCA (iv) Upper Ettrick LCA (v)	High/ Medium	High/ Medium	High/ Medium	Medium				<i>Upland Valley with No Wind Turbines</i>	<i>Upland Valley with No Wind Turbines</i>	No Capacity	

Landscape Type	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	Landscape Capacity (Related to turbine size)			Predominant Operational/ Consented Landscape Type	Proposed Acceptable Limits of Development	Turbine Guidance Turbine Sizes Max. Numbers in Group Min Group Separation Distances	Comment
					M	L	VL				
<b>Key:</b> No Capacity  Low Capacity  Medium Capacity  High Capacity											
<b>25. Upland valley with Woodland</b>  i) Middle Tweed LCA  ii) Lower Ettrick/ Yarrow LCA	High	High	High	High				Upland Valley with no Wind Turbines	Upland Valley with Occasional Wind Turbines, western section Upland Valley with No Wind Turbines	Turbine Size: Medium (25m-50m)  Group Size: Individual  Separation distances: 3-5km (medium)	The Middle Tweed valley is designated as part of a NSA and SLA, the western area of this LCA has no capacity due to these designations. The valley contains the medium to regionally large settlements of Innerleithen and Peebles as well as a number of smaller settlements and numerous individual dwellings and farmsteads. The Middle Tweed also contains a busy A road that follows the floor of the valley, from which mid to long distance views are afforded up and down the valley and onto the prominent slopes that look down onto the valley. There is only low capacity within the flat/ gently sloping valley floor for individual turbines where these can be visually associated with individual farmsteads, turbines should be sited to minimise visual impacts. The slopes facing the valley have no capacity due to their prominence.
<b>26. Pastoral Upland Fringe Valley</b>  v) Borthwick Water/ Upper Teviot LCA	High/ Medium	High/ Medium	High/ Medium	Medium/ High				Upland Valley with no Wind Turbines	Upland Valley with the occasional Wind Turbines	Turbine Size: Medium (25m-50m)  Group Size: Individual  Separation distances: 3-5km (medium)	There are currently no existing or proposed turbines in this LCA. There is limited capacity within this landscape type, however there is capacity for individual medium sized wind turbines within the broader simpler areas of the valley landscape. There is no capacity for turbines on the more prominent steeply sided slopes of the valley or within the more enclosed Borthwick Water Valley section of this LCA. Turbines should be sited in the landscape so they are associated with a farmstead or individual property. There is also no capacity within the north eastern area of the LCA due to the settlement of Hawick.
<b>27. Upland Fringe Valley with Settlements</b>  Tweed/ Gala/ Ettrick Confluence	High	High	High	High				Upland Valley with no Wind Turbines	Upland Valley with no Wind Turbines Western areas Upland Valley with Occasional Wind Turbines	Turbine Size: Medium (25m-50m)  Group Size: Individual  Separation distances: 3-5km (medium)	There are no existing or proposed turbines within this LCA.  Due to the amount of settlement development and associated infrastructure, proposed transport connections (proposed borders railway) and views within the broad valley landscape, there is only very limited capacity for medium sized wind turbines. The eastern area is also part of a larger SLA and NSA and contains the Southern Upland Way as well as being overlooked by the regionally prominent landmarks of the Eildon hills. For these reasons the LCA has only very limited capacity for individual medium sized turbines located in the south eastern portion of this LCA, turbine development will be best accommodated alongside individual dwellings and farmsteads.

Landscape Type	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	Landscape Capacity (Related to turbine size)			Predominant Operational/ Consented Landscape Type	Proposed Acceptable Limits of Development	Turbine Guidance Turbine Sizes Max. Numbers in Group Min Group Separation Distances	Comment
					M	L	VL				
<b>Key:</b> No Capacity  Low Capacity  Medium Capacity  High Capacity											
<b>12. Wooded Upland Fringe Valley. (BDR28)</b> ii) Ale Water  v) Slitrig Water	High/ Medium  High/ Medium	High/ Medium  High/ Medium	High/ Medium  High/ Medium	High/ Medium  High/ Medium	  	  	  	<i>Upland Valley with No Wind Turbines</i>  <i>Upland Valley with No Wind Turbines</i>	<i>Upland Valley with Occasional Wind Turbines, western section Upland Valley with Wind Turbines</i>  <i>Upland Valley with Occasional Wind Turbines</i>	Turbine Size: Medium (25m-50m)  Group Size: Individual  Separation distances: 3-5km (medium)	There are no wind turbines or windfarms or applications for windfarms/ wind turbines in these LCAs.  There are no landscape designations (SLA & NSA) in these LCA, however both areas do contain designated designed landscapes. There are numerous individual farmsteads and properties throughout these valleys and the landscapes of both are undulating with spurs interrupting views along them. For these reasons is low capacity within each LCA for medium sized turbines only and these should only be sited alongside individual farmsteads and properties and sited to reduce visual impacts. Turbines should not be sited on the more prominent slopes of the valleys.



**Table 6.1(iv). Summary of Landscape Capacity and Cumulative Effects and Guidance for Future Wind Energy Development – Cheviot Hills**



Landscape Type	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	Landscape Capacity (Related to turbine size)			Predominant Operational/ Consented Landscape Type	Proposed Acceptable Limits of Development	Turbine Guidance Turbine Sizes Max. Numbers in Group Min Group Separation Distances	Comment
					M	L	VL				
<b>Key:</b> ○ No Capacity ● Low Capacity ● Medium Capacity ● High Capacity											
<b>Cheviot Hills</b>											
<b>5. Southern Uplands Forest Covered</b>  ii) Wauchope/ Newcastleton	Medium	Low	Medium/Low	Medium	●	●	●	Uplands with No Wind Turbines	Uplands with Occasional Wind Turbines	Turbine Size: Medium (25m-50m), Large (50m-100m) and Very Large (100m+)  Group Size: Individual (Medium), small/ medium – Medium (Large and Very Large Turbines)  Separation distances: 3-5Km (medium), 5-10Km (Large and very large)	There are no existing windfarms or wind turbines in this landscape and none in application stage.  This upland large scale wooded landscape has potential to accommodate the occasional windfarm consisting of medium, large and very large turbines. Small/ medium to medium sized windfarms are suitable in this landscape. This landscape can accommodate turbine developments due to the upland topography creating topographical containment, the sparsely populated landscape with the occasional farmstead being present and the lower degree of intervisibility from settlements, transport routes and viewpoints. Medium sized turbines should be located alongside individual farmsteads. This should not become a landscape with wind turbines, therefore emphasis should be placed on the limited capacity of this landscape. This is due to its location relatively close to the Northumberland National Park. The Carter Bar/ A68 England Border viewpoint has a much higher local sensitivity with no capacity in the area immediately in the vicinity of this iconic viewpoint or in the short to mid range view looking north.
<b>6. Cheviot Uplands</b>  Cocklaw Group LCA	Medium/Low	Medium/High	Medium/High	High	●	○	○	Upland landscape with No Wind Turbines	Upland landscape with No Wind Turbines, northern section Upland landscape with Occasional Wind Turbines	Turbine Size: Medium (25m-50m)  Group Size: Individual  Separation distances: 3-5Km (medium)	There are currently no windfarms or wind turbines within this landscape and there are none at planning application stage.  This LCA is wholly within a SLA designation and borders the Northumberland national park, the proximity of this National Park and the Pennine Way that roughly follows the border with England limits capacity, there is no capacity within any part of this LCA for large or very large turbines. This is due to the proximity of the Pennine Way and external views from a regional high point on Cheviot Hill in Northumberland National Park, the Carter Bar viewpoint on the A68 England – Scotland border which provides a popular panoramic viewpoint over this area. There is however limited and low capacity for Medium sized turbines, however this capacity is very much restricted to the valley floors and only where these would be sited alongside individual farmsteads and properties and visually can be read as domestic energy generation.
<b>7. Cheviot Foothills</b>  Falla Group LCA	Medium/High	High	Medium/High	High/Medium	●	○	○	Upland landscape with No Wind Turbines	Upland landscape with Occasional Wind Turbines	Turbine Size: Medium (25m-50m)  Group Size: Individual (Medium)  Separation distances: 3-5km (medium)	Currently there are no windfarms or wind turbines within this LCA and there are no planning applications for wind farms or turbines.  This upland fringe farmland and rough pasture farmland landscape has large or higher intervisibility. The southern and eastern areas are also designated as a SLA and from the important and popular Carter Bar viewpoint there is a open panoramic view across this landscape. There is only low capacity for medium turbines in the northern areas of this LCA either side of the A68, these as individual medium sized turbines should be sited in areas with lower intervisibility and alongside individual farmsteads and dwellings where these turbines can be visually read as domestic energy generation.

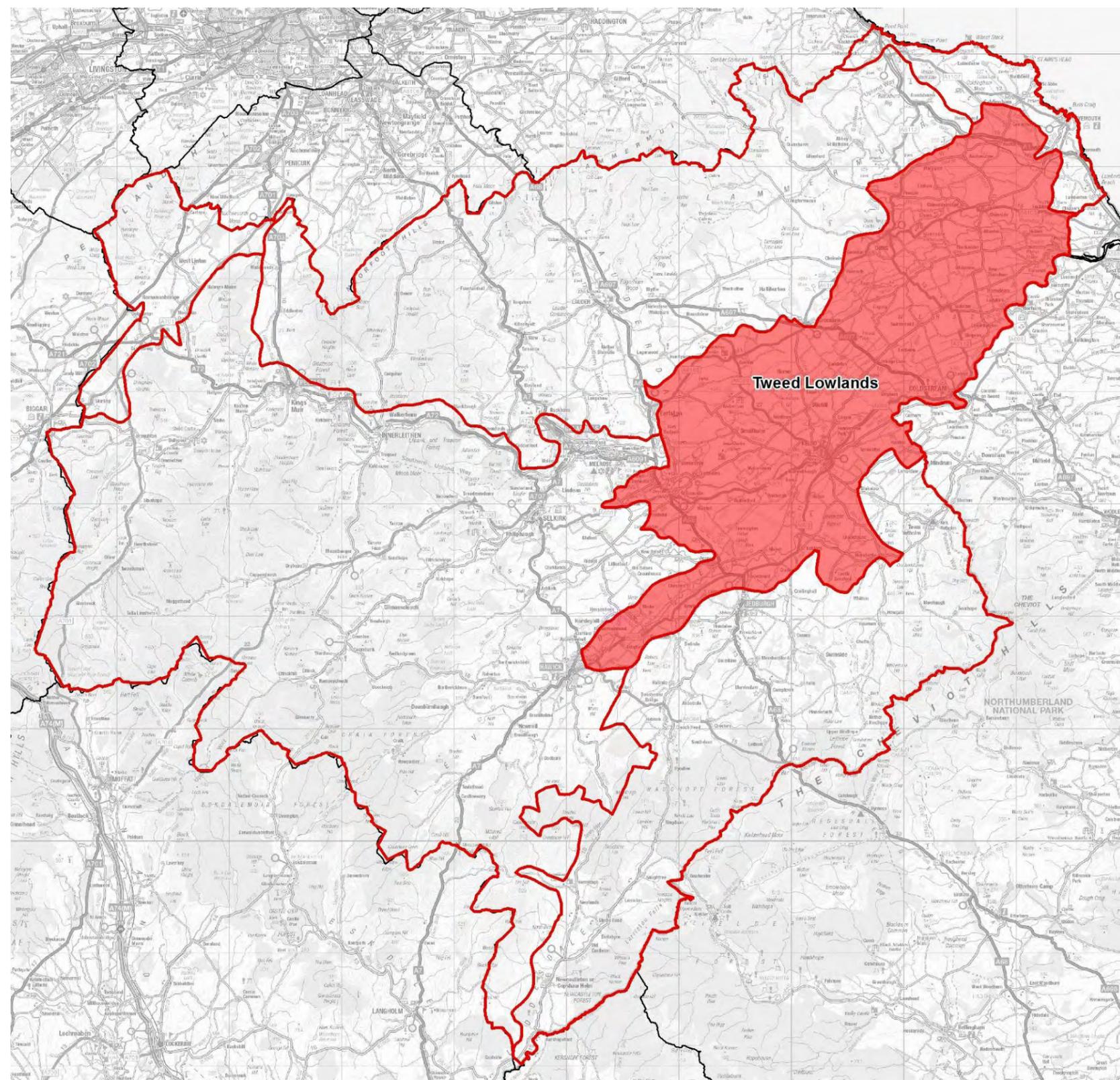
Landscape Type	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	Landscape Capacity (Related to turbine size)			Predominant Operational/ Consented Landscape Type	Proposed Acceptable Limits of Development	Turbine Guidance Turbine Sizes Max. Numbers in Group Min Group Separation Distances	Comment
					M	L	VL				
Key:  No Capacity  Low Capacity  Medium Capacity  High Capacity											
8. <b>Rolling Farmland</b>  i) Oxnam LCA	Medium/ High	Medium/ High	<b>Medium/ High</b>	<b>Medium/ High</b>				<i>Upland Fringe with No Wind Turbines</i>	<i>Upland Fringe landscape with Occasional Wind Turbines</i>	Turbine Size: Medium (25m-50m), Large (50m-100m).  Group Size: Individual (Medium), small/ medium (Large Turbines)  Separation distances: 3-5km (medium), 5-10km (Large)	There is currently one application for a small/ medium sized windfarm consisting of 6no very large turbines located in the eastern area of this LCA. There are no existing operational windfarms in this LCA and only one small turbine (under 25m high turbine) in operation.  The western area of this LCA contains part of a SLA and the regionally large settlement of Jedburgh is located within the north west of this LCA. Outwith these areas the landscape is sparsely populated with individual farmsteads and small settlements within more sheltered valleys. The landscape has a lower intervisibility from settlements and transport routes but a higher intervisibility from viewpoints, to the south there is the important Carter Bar panorama on the England – Scotland border, views from the Pennine Way along the England/ Scotland Border and from regionally prominent hills within the central lowland areas. Therefore this LCA has low capacity for medium sized turbines as individual or small groups up to 3no. within the areas with lower intervisibility and where these can be viewed as connected to areas of habitation or individual farmsteads. There is limited low capacity for large turbines in the central area of this LCA, this area has limited capacity due to the intervisibility from viewpoints as discussed and turbines should be sited sensitively in small/ small – medium group. There is no capacity for very large turbines.
ii) Lempitlaw LCA	Medium/ High	Medium/ High	<b>Medium/ High</b>	<b>Medium/ High</b>				<i>Upland Fringe with No Wind Turbines</i>	<i>Upland Fringe landscape with Occasional Wind Turbines</i>	Turbine Size: Medium (25m-50m).  Group Size: Individual to small groups (3no. maximum).  Separation distances: 3-5km (medium).	Currently there are two small turbines within this LCA, located approximately centrally in the LCA. There is an application for two medium sized turbines in the south east of the area to the south west of Town Yetholm.  This area has limited capacity for medium sized turbines only as individual turbines or as small groups of turbines. There is no capacity for medium sized wind farms or for large or very large turbines. A small eastern area of the LCA is part of a larger SLA. Capacity is reduced due to the proximity of the LCA to the Northumberland National Park in England and the rolling intact agricultural landscape with a higher intervisibility from Settlements, transport routes and Viewpoints.

Landscape Type	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	Landscape Capacity (Related to turbine size)			Predominant Operational/ Consented Landscape Type	Proposed Acceptable Limits of Development	Turbine Guidance Turbine Sizes Max. Numbers in Group Min Group Separation Distances	Comment
					M	L	VL				
<b>Key:</b> No Capacity  Low Capacity  Medium Capacity  High Capacity											
<b>11. Grasslands with Hills</b>  i) Bonchester/ Dunion LCA  ii) Rubers Law LCA	Medium/ High  High	High  High	<b>High/ Medium</b>  <b>High</b>	<b>Medium/ High</b>  <b>High</b>	 	 	<i>Upland Fringe with No Wind Turbines</i>  <i>Upland Fringe with No Wind Turbines</i>	<i>Upland Fringe with Occasional Wind Turbines, northern section Upland Fringe with no Wind Turbines</i>  <i>Upland Fringe with No Wind Turbines, southern and western areas Upland Fringe with Occasional Turbines</i>	Turbine Size: Medium (25m-50m)  Group Size: Individual  Separation distances: 3-5Km (medium)  No capacity	Currently there are no consented or operational windfarms or turbines in this area and only one planning application for two medium sized turbines in the east of this LCA on the border with BDR28.  The majority of this area is within a SLA, this designation recognises the special scenic qualities of this landscape. The LCA contains an even spread of dwellings, farmsteads and small settlements, large and very large turbines and turbine developments are not suitable to this landscape as they will be visible from Jedburgh, the Teviot and Ale Valleys and potentially from the Carter Bar/ A68 England – Scotland Border viewpoint. There is low capacity for individual medium sized turbines in the southern section of the LCA is these were to be visually associated with farmsteads and individual dwellings and sited sensitively to reduce visual impacts.  There are no consented or operational windfarms or turbines in this area and there are no planning applications for windfarms or turbines.  Due to the prominence, intervisibility, scenic values, designation as part of a SLA and recreational value of this area there is no capacity for turbine development in this LCA.	
<b>22. Upland Valley with Pastoral Floor</b>  vi) Liddel Water LCA	High/ Medium	High/ Medium	<b>High</b>	<b>High</b>			<i>Upland valley with No Wind Turbines</i>	<i>Upland valley with No Wind Turbines</i>	No Capacity	There are no consented or operational windfarms or turbines in this area and there are no planning applications for windfarms or turbines.  Due to the scenic qualities, scale of this landscape allowing long to mid distance views up and down the valley and settlements, farmsteads and dwellings dotted throughout this LCA there is no capacity for medium, large or very large turbines or windfarms.	
<b>26. Pastoral Upland Fringe Valley</b>  iii) Bowmont Water LCA  iv) Kale Water LCA	High  High/ Medium	High  High/ Medium	<b>High</b>  <b>High/ Medium</b>	<b>Medium/ High</b>  <b>Medium/ High</b>	 	 	<i>River Valley with No Wind Turbines</i>  <i>River Valley with No Wind Turbines</i>	<i>River Valley with Occasional Wind Turbines</i>  <i>River Valley with Occasional Wind Turbines</i>	Turbine Size: Medium (25m-50m)  Group Size: Individual  Separation distances: 3-5km (medium)  Turbine Size: Medium (25m-50m)  Group Size: Individual  Separation distances: 3-5km (medium)	There are no consented or operational windfarms or turbines in these LCAs and there are no planning applications for windfarms or turbines. There is an application within BDR8 that will be visible from within the Bowmont Water LCA for two medium sized turbines located to the south west of Town Yetholm.  Due to the scenic values as recognised by the SLA designation and recreational value (Pennine Way) of this area there is no capacity for large or very large turbine development in this LCA. Large scale turbines and developments will also be visible from the Northumberland National Park. Medium sized Individual turbines can be accommodated within these landscape, these will be better accommodated if these were sited alongside a farmstead or individual property.	

Landscape Type	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	Landscape Capacity (Related to turbine size)			Predominant Operational/ Consented Landscape Type	Proposed Acceptable Limits of Development	Turbine Guidance Turbine Sizes Max. Numbers in Group Min Group Separation Distances	Comment
					M	L	VL				
Key:  No Capacity  Low Capacity  Medium Capacity  High Capacity											
28. <b>Wooded Upland Fringe Valley</b>	High/Medium	High/Medium	<b>High/Medium</b>	<b>High/Medium</b>				<i>River Valley with No Wind Turbines</i>	<i>River Valley with No Wind Turbines</i>	No capacity	Within the Rule Water LCA there is one small turbine alongside a residential property and no other turbines or planning applications for wind turbines in this LCA. Within the Jed Water LCA there are no existing windfarms or turbines and there are no applications for windfarms or turbines.  Due to the valley landscapes allowing mid range views along the valley, the settlement of Jedburgh in the north of the Jed Water LCA and the busy A68 providing an important link between England and Scotland there is no capacity for medium, large or very large turbines or for windfarms. The majority of both LCAs are designated as SLAs and any turbine development should be resisted.
iv) Rule Water LCA iii) Jed Water LCA	High/Medium	High/Medium	<b>High/Medium</b>	<b>High/Medium</b>				<i>River Valley with No Wind Turbines</i>	<i>River Valley with Occasional Wind Turbines, northern area</i> <i>River Valley with No Turbines</i>	No capacity	



**Table 6.1(v). Summary of Landscape Capacity and Cumulative Effects and Guidance for Future Wind Energy Development – Tweed Lowlands**

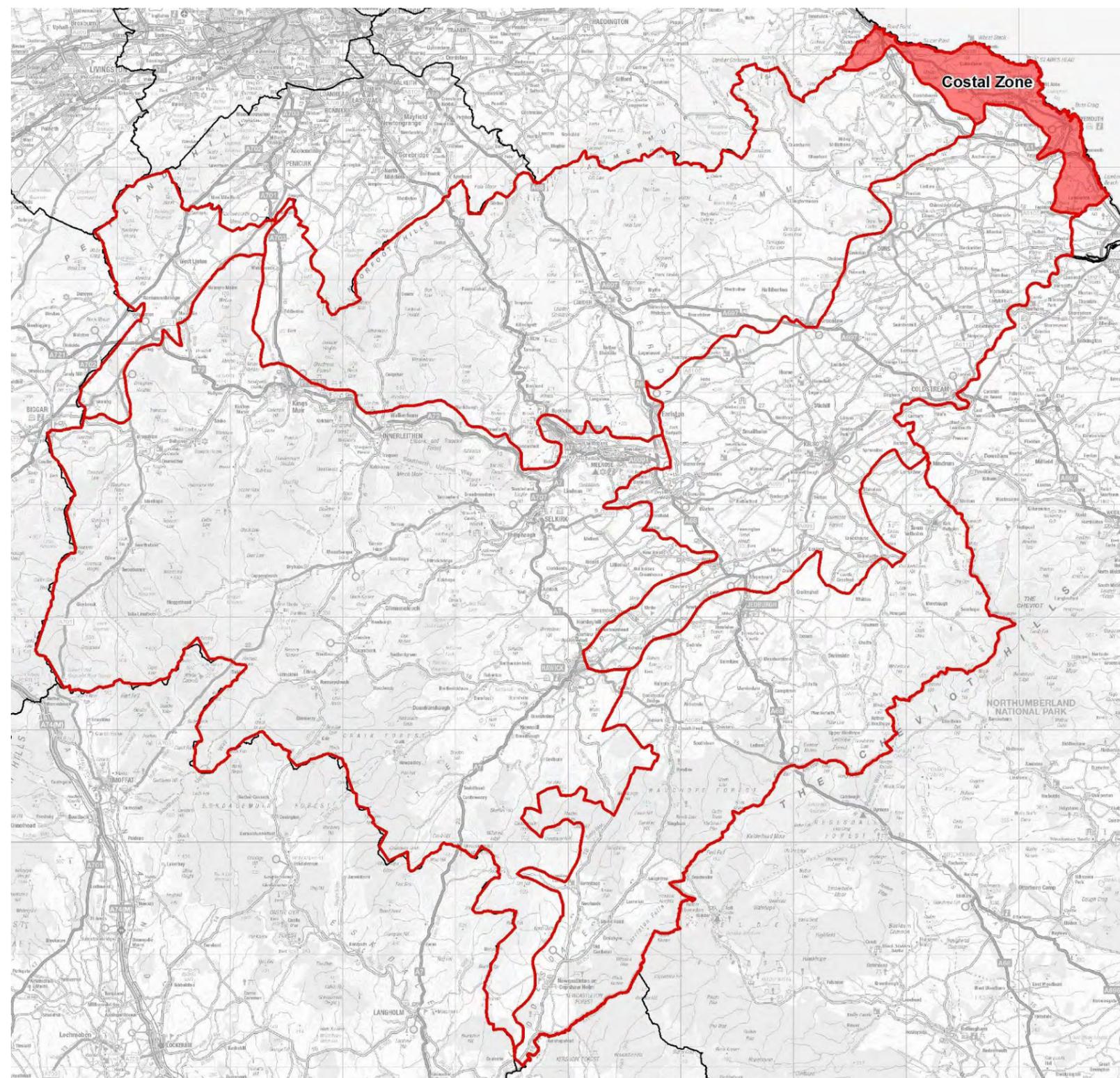


Landscape Type	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	Landscape Capacity (Related to turbine size)			Predominant Operational/ Consented Landscape Type	Proposed Acceptable Limits of Development	Turbine Guidance Turbine Sizes Max. Numbers in Group Min Group Separation Distances	Comment
					M	L	VL				
<b>Key:</b> ○ No Capacity ● Low Capacity ● Medium Capacity ● High Capacity											
<b>Tweed Lowlands</b>											
<b>29. Lowland valley with Farmland</b>  i) Lower Kale LCA  ii) Lower Teviot LCA  iii) Lower Tweed LCA	High	High	High	High	●	○	○	<i>River Valley with No Wind Turbines</i>  <i>River Valley with No Wind Turbines</i>  <i>River Valley with No Wind Turbines</i>	<i>River Valley with Occasional Wind turbines</i>  <i>River Valley with No Wind Turbines north eastern section River Valley with Occasional Wind Turbines</i>  <i>River Valley with No Wind Turbines, Northern and Southern sections River Valley with Occasional Wind Turbines</i>	Turbine Size: Medium (25m-50m). Group Size: Individual. Separation distances: 3-5km (medium).  Turbine Size: Medium (25m-50m). Group Size: Individual. Separation distances: 3-5km (medium).  Turbine Size: Medium (25m-50m). Group Size: Individual. Separation distances: 3-5km (medium).	There are no existing wind turbines or windfarms in these LCAs and there are no proposed turbines or windfarms.  Due to the open gently undulating character of this landscape affording mid distance views across the rolling landscape from higher points this landscape has no capacity for large and very large turbine developments. This landscape is overlooked by hills in the east (The Cheviots) as well as more local hills (Eildon Hills and Rubers Law) and has a higher intervisibility from settlements, transport routes and viewpoints. The scenic qualities found in this landscape are reflected in the SLA designation (Lower Teviot LCA) and SLA and NSA designation (Lower Tweed LCA). The rolling and wooded landscape however will provide suitable locations for discretely located individual medium sized turbines outwith the SLAs and NSA, visually these will be better located alongside individual farmsteads and dwellings. The whole of the Lower kale LCA has limited capacity for medium sized turbines, this area is not designated as a SLA and has a lower intervisibility. A small northern area within the Lower Tweed LCA only has low capacity for individual medium sized turbines, this area is outwith the SLA and NSA and has a lower intervisibility. The majority of the Lower Teviot LCA has no capacity for medium sized turbines, however the north eastern area outwith the SLA designation and with lower intervisibility has limited capacity for medium sized turbines. Medium sized turbines in each of the highlighted areas should be individual turbines only and visually be associated with farmsteads and individual properties and be read as domestic generation.
<b>15. Lowland with Drumlins</b>  Lower Merse LCA	Medium/High	Medium/High	Medium/High	Medium/High	●	○	○	<i>Lowlands with Occasional Wind Turbine</i>	<i>Lowlands with Occasional Wind Turbine</i>	Turbine Size: Medium (25m-50m). Group Size: Individual to small groups (maximum 3no.) Separation distances: 3-5km (medium).	Currently there are 5 existing medium sized turbines 25m-50m high, these are either individual turbines or in a small group of two. There is currently an application for 1 single medium sized turbine to the south east of Chirnside.  Due to the undulating landscape created by the Drumlins there is low capacity for medium sized turbines only. These should be sensitivity sited within this undulating landscape to limit this LCA becoming a landscape with turbines. Turbines that are visually associated with farmsteads and settlements will be better accommodated in this landscape. There is no capacity for medium sized turbines in the southern area (north east of Kelso) due to the higher intervisibility. There is no capacity for large or very large turbines and steps should be taken to limit visual impacts with thoughtful siting of turbines.

Landscape Type	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	Landscape Capacity (Related to turbine size)			Predominant Operational/ Consented Landscape Type	Proposed Acceptable Limits of Development	Turbine Guidance Turbine Sizes Max. Numbers in Group Min Group Separation Distances	Comment
					M	L	VL				
Key:  No Capacity  Low Capacity  Medium Capacity  High Capacity											
16. <b>Rolling Lowland Margin</b>  ii) Maxwellheugh LCA  i) Eye Water Lowland LCA	Medium/High  Medium/High	High/Medium  High/Medium	Medium/High  Medium/High	Medium  Medium	  	  	  	Lowlands with Occasional Wind Turbine  Lowlands with Occasional Wind Turbines	Lowlands with Occasional Wind Turbine  Lowlands with Occasional Wind Turbines	No Capacity  Turbine Size: Medium (25m-50m). Group Size: Individual to small groups. Separation distances: 3-5km (medium).	Planning consent has previously been granted for a turbine within the industrial estate on the southern edge of Kelso, although this has now lapsed. There are currently no applications for additional turbines in this LCA.  There is no further capacity for turbines or windfarms in this LCA due to the open exposed character of this LCA and the topography allowing long distance views down onto and from the settlement of Kelso and the flat farmland to the north, this area has a higher intervisibility.  There are currently 2 medium turbines to the south of Lintlaw farmstead, 2 separate large turbines one to the north of Auchencrow and another to the south west of Coldingham. There are 4 small turbines north east of Chirside, 2 small turbines north east of Duns and 1 small turbine north west of Gavinton.  There are currently three applications for medium turbines; 2 are located to the south west of Gavinton, one to the north west of Auchencrow. Just outside the LCA there is one application for 2no. medium sized turbines to the west of Duns that will be visible from this LCA and one application for 6no. very large turbines to the north of Preston within the BDR9.  This LCA has very limited capacity for additional medium sized turbine development and currently risks exceeding capacity due to the volume of applications. Capacity is limited to the occasional well sited medium sized turbine as individual turbines or small groups, not exceeding 3no. turbines. The south western area of this LCA has no capacity for medium sized turbines due to the settlement of DUNS and a higher degree of intervisibility. Capacity for medium sized turbines only is a consequence of the gently undulating open landscape that affords medium to long distance views, this LCA also contains the busy A1 road that provides an important connection between England and Scotland.
17. <b>Lowland Margin Platform</b>  Gordon Platform LCA	High/Medium	High/Medium	High/Medium	Medium				Lowlands with Occasional Wind Turbines, western section Lowlands with No Wind Turbines	Lowlands with Occasional Wind Turbines	Turbine Size: Medium (25m-50m). Group Size: Individual to small groups (maximum 3no) Separation distances: 3-5km (medium).	There is currently one small turbine under 25m tall associated with a farmstead to the east of Greenlaw. There is one application for a single medium sized turbine 25m-50m tall to the east of Gordon.  This landscape has limited capacity for medium sized turbines only as individual turbines or small groups of a maximum of 3no. turbines, this is due to the open character of the undulating farmland landscape and settlement pattern within the LCA. Medium sized turbines must be limited to reduce the likelihood of this landscape becoming a landscape with turbines. Medium sized turbines will be better accommodated within this landscape if they are associated with farmstead developments. There is no capacity for medium sized turbine sin the eastern area of the LCA due to a greater intervisibility. There is no capacity for large or very large turbines.

Landscape Type	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	Landscape Capacity (Related to turbine size)			Predominant Operational/ Consented Landscape Type	Proposed Acceptable Limits of Development	Turbine Guidance Turbine Sizes Max. Numbers in Group Min Group Separation Distances	Comment
					M	L	VL				
Key:  No Capacity  Low Capacity  Medium Capacity  High Capacity											
18. <b>Lowland Margin with Hills</b>  Black Hill/ Hume Crags LCA	Medium/ High	High	Medium/ High	Medium/ High				<i>Lowlands with No Wind Turbines, eastern area</i> <i>Lowlands with Occasional Wind Turbines</i>	<i>Lowlands with Occasional Wind Turbines, south western area</i> <i>Lowlands with No Wind Turbines</i>	Turbine Size: Medium (25m-50m).  Group Size: Individual to small groups (maximum 3no.)  Separation distances: 3-5km (medium).	There are no existing turbines and no planning applications for turbines in this LCA.  Due to the undulating open landscape character there is limited capacity for individual or small groups (3no. max) of medium sized turbines only, medium sized turbines must be limited to reduce the likelihood of this landscape becoming a landscape with turbines. Capacity is reduced by the open undulating agricultural landscape that affords medium to long distance views across the landscape from popular viewpoints such as Black Hill. Capacity is reduced to no capacity along the west and south western areas of the LCA due to the NSA and SLA as well as the settlements and busy transport corridors. There is no capacity for large or very large turbines within this LCA.

**Table 6.1(vi). Summary of Landscape Capacity and Cumulative Effects and Guidance for Future Wind Energy Development – Coastal Zone**



Landscape Type	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	Landscape Capacity (Related to turbine size)			Predominant Operational/ Consented Landscape Type	Proposed Acceptable Limits of Development	Turbine Guidance Turbine Sizes Max. Numbers in Group Min Group Separation Distances	Comment
					M	L	VL				
Key:  No Capacity  Low Capacity  Medium Capacity  High Capacity											
Costal Zone											
19. Coastal Farmland  i) Cockburnspath LCA	High/Medium	High/Medium	High/Medium	High/Medium				Coastal Zone with No Wind Turbines south western section Coastal Zone with Wind Turbines	Coastal Zone with Occasional Wind Turbines south western section Coastal Zone with Wind Turbines	Turbine Size: Medium (25m-50m)  Group Size: Individual, small  Separation distances: 3-5km (medium)	<p>Currently there is one consented/ existing windfarm at Neuk Farm, consisting of 2no. very large turbines within this LCA, and one consented/ operational windfarm consisting of 3no. very large turbines located on the border of this LCA and 9, Platform Farmland, Eyewater Platform, both windfarms are located to the south west of Cockburnspath. There is another application for 6no very large turbines within the Platform Farmlands to the south of the 2no. very large turbines at Neuk Farm. This windfarms will be visible from this LCA and would have a visual impact on this landscape. The 22no. large turbines that comprise Drone Hill windfarm are visible on the skyline from this LCA, as will the application for the 15 very large turbines at Penmanshiel windfarm that would visually read as an extension to Drone Hill windfarm on the skyline from within the LCA. Within East Lothian the recently consented Aikengall II extension will increase the cumulative impacts of any proposed turbine development in this area.</p> <p>Due to the open gently undulating landscape with open views to the North Sea this LCA has very limited capacity for wind turbine development. Capacity is reduced in this LCA by the openness of the landscape, the end/ beginning of the Southern Upland Way within the Platform Farmlands and Berwickshire Coastal Path and by the cumulative visual impacts of existing windfarms in the surrounding LCA. The coastal zone of this LCA is part of a larger SLA along this coast and includes the busy and strategically important A1 road corridor and the East Coast main line. The existing and proposed wind turbine and windfarm development will impact on this landscape, potentially creating a landscape with wind turbines in the western area of the LCA. This LCA has inherent capacity for medium, scale turbines only. Cumulative impact issues are a concern for larger scale typologies. Individual medium sized turbines could be accommodated if these were sited alongside farmsteads and individual dwellings.</p>

Landscape Type	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	Landscape Capacity (Related to turbine size)			Predominant Operational/ Consented Landscape Type	Proposed Acceptable Limits of Development	Turbine Guidance Turbine Sizes Max. Numbers in Group Min Group Separation Distances	Comment
					M	L	VL				
<b>Key:</b> No Capacity  Low Capacity  Medium Capacity  High Capacity											
ii) Coldingham LCA	High/Medium	High/Medium	Medium/High	High/Medium				Coastal Zone with Occasional Wind Turbines	Coastal Zone with Occasional Wind Turbines	Turbine Size: Medium (25m-50m), Group Size: Individual, small to small/ medium Separation distances: 3-5km (medium),	Currently there are 4 individual medium sized turbines to the north west of Coldingham within the LCA and one large turbine located to the south west of Coldingham. In the western area of the LCA there is the existing Drone Hill Windfarm, 5no. out of the 22no. large turbines are within this LCA and 3no. out of the proposed 15no very large turbines proposed at Penmanshiel windfarm are along the north western boundary of this LCA. Within the LCA there is one application for one medium size turbine 25m – 50m high.  This landscape has limited capacity for medium sized turbines only. There is no capacity along the coastal zone of this LCA due to it's higher prominence, recreational use and designation as a SLA. There is capacity further inland west of the coastal area where individual to small groups of 3 no. turbines or less could be accommodated especially if these were sited alongside individual farmsteads and properties. Cumulative impact issues prevent larger scale typologies in the LCA.
<b>20. Coastal Pasture</b>  Lamberton Moor LCA	High/Medium	High/Medium	High/Medium	High/Medium				Coastal Zone with No Wind Turbines	Coastal Zone with Occasional Wind Turbines	Turbine Size: Medium (25m-50m). Group Size: Individual to small groups (maximum 3no). Separation distances: 3-5Km (medium).	There are currently two small turbines under 25m high within this LCA and no new current planning applications for new turbines.  There is limited capacity for medium sized turbines only as individual turbines or small groups up to 3no. There is no capacity along the coastal zone due to prominence, greater intervisibility and designation as a SLA. Turbines should be sited away from the coastal visual resource containing the Berwickshire Coastal Path to areas with a lower prominence. The western areas of the LCA are suitable for sensitive turbine development and will be better accommodated if these are associated with individual farmsteads, small settlements and individual properties.
<b>21. Coastal Moorland</b>  Coldingham Moor LCA	Medium/High	Medium/High	Medium/High	Medium/High				Coastal Zone with Occasional Wind Turbines	Coastal Zone with Occasional Wind Turbines	Turbine Size: Medium (25m-50m) Group Size: Individual to medium sized groups. Separation distances: 3-5Km (medium)	Currently within this LCA there is an operational 22no large turbine windfarm (Drone Hill) and two medium sized turbines to the north of Lumsdaine. There is an application for 15no. very large turbines located to the west of the existing Drone Hill windfarm. Although separate this will read visually as an extension to the existing windfarm.  There is limited capacity within this LCA for medium sized turbines only. Limitations are placed on this landscape by the SLA designation within the majority of this LCA, there is no capacity along the coastal zone due to the increasing capacity for longer distance views along through this sensitive zone. Capacity is increased towards the west, but as turbine height increases capacity is reduced on the escarpment that overlooks the A1 corridor. Cumulative impact issues prevent larger scale typologies in this LCA.
<b>30. Coastal Valley</b>  Lower Eye Water LCA	High	High	High	High				River Valley with No Wind Turbines	River Valley with No Wind Turbines	No Capacity.	This LCA currently has no proposed windfarms or turbines and no applications for windfarms or turbines.  Due to the enclosed incised valley landscape with settlements, areas of woodlands, scenic values and coastal location there is no capacity for windfarms or turbine developments.

### 6.3 Overall Assessment of Capacity and Cumulative Development

#### 6.3.1 Landscape Character, Sensitivity and Capacity

The landscape of the Scottish Borders is highly varied and complex consisting of a wide range of landscape typologies found in many other parts of Scotland. It is a unique and complex blend of lowland, upland and coastal landscapes. The main population centres within the Scottish Borders are concentrated throughout the more sheltered lowlands and main river valleys where key infrastructure routes pass and join. There are significant numbers of moderate or small sized settlements within the Tweed and Ettrick Valleys as well as the central and eastern agricultural lowlands where these rivers join and flow towards the North Sea.

#### 6.3.2 Midland Valley; Landscape Character, Sensitivity and Capacity

Areas within the Midland Valley regional landscape area have capacity for medium sized turbines only, there are also areas with no capacity and there is no capacity for large or very large turbines within this regional landscape character type.

Within the upland landscape character area, *Dissected Plateau Moorlands* there is a small area within the LCA that is contained by topography and has low capacity for medium sized turbines, the northern, north eastern and western higher areas of this LCA have no capacity due to the prominence, surrounding landscape designations and intervisibility with Edinburgh and Mid Lothian. The more elevated areas often have a higher wilderness value and increased recreational use. The Upland Fringe landscape types have a low to medium and a low capacity for medium sized turbine developments only, there are also areas of no capacity and there is no capacity within these Upland Fringe landscape character areas for large or very large turbines. This is due to the greater development, intervisibility and landscape designations outwith the Scottish Borders influencing capacity. There is no capacity for medium sized turbine developments in the more prominent northern and western areas and no capacity within the southernmost area within and around the NSA.

#### 6.3.3 Lammermuir and Moorfoot Hills; Landscape Character, Sensitivity and Capacity

Within the Upland landscape character types of the Lammermuir and Moorfoot Hills there is low capacity for medium sized turbines, areas of medium and medium – low capacity for large turbines and areas of medium low and low capacity for very large turbines. There are areas of capacity for each height of turbine within the uplands landscapes as well as areas of no capacity for medium, large or very large turbines.

Large areas of *Dissected Plateau Moorland (Moorfoot Plateau and Lammermuir Hills)* have low capacity for medium sized turbines. The southern, northern and eastern outer slopes of the *Moorfoot Plateau LCA* have no capacity for medium sized turbine developments due to increased prominence and intervisibility. The southern portion of the *Lammermuir Hills LCA* has no capacity for turbine development due to the presence of the SLA designation and the southern upland way increasing the visibility of this upland area. There is low capacity for medium sized turbines within the *Plateau Grassland LCA*, there is a small area on the southern tip that has greater prominence and intervisibility and therefore no capacity for medium sized turbines.

There is medium and medium – low capacity for large size turbines within these Upland landscape units and smaller areas of medium – low and low capacity for very large turbines. The areas of capacity within each upland landscape character area decreases in size as the height of turbine increases, this is due to the greater visual impacts the larger sized turbines will have and the reduction in areas of capacity illustrates each landscape's ability for topographical containment. Capacity for large and very large turbines is greater in select areas of these upland landscape typologies due to the simple landscape character, lower settlement and population densities, lower intervisibility and topographical containment afforded by the plateau landscapes. The majority of the *Dissected Plateau Moorland, Moorfoot Plateau* landscape character area has a non – landscape designation (SSSI) that could potentially limit turbine development.

The *Upland Fringe* landscape character areas; *Poor Rough Grasslands (Leadburn), Undulating Grassland (East Gala and West Gala), Rolling Farmland (Westruther Platform), Upland Fringe Moorland (Greenlaw Common)* and *Grassland with Hills (Knock Hill)* all have low landscape capacity for medium sized turbines with areas of no capacity. The *Platform Farmland LCA (Eye Water Platform)* has a medium – low capacity for medium sized turbines, eastern areas of this LCA have no capacity for turbine development. The areas of no capacity within each upland fringe landscape unit have greater intervisibility and prominence, some specific areas have greater recreational use (Southern Upland Way), form the skyline for and will be visible from more populated less elevated areas.

There is low capacity for large turbines in the north eastern less prominent areas of the *Rolling Farmland LCA (Westruther Platform)*, the western area of the *Platform Farmland (Eye Water Platform)* and northern area of the *Grassland with Hills (Knock Hill)*. Capacity within these LCAs extends to the large turbine typology due to the lower intervisibility, lower settlement patterns, less prominent areas and less transport infrastructure present.

The River Valley landscape character areas *Pastoral Upland Valley (Gala Water and Eddleston Water), Upland Valley with Farmland (Upper Leader), Pastoral Upland Fringe Valley (Lower Leader and Eye Water)* and *Wooded Upland Fringe Valley (Middle Whiteadder)* all have areas of low capacity for medium sized turbines. All of these LCA also have areas of no capacity for turbine development within the more prominent areas or areas with greater recreational value and greater intervisibility. The northern area of *Upland Valley with Farmland, Upper Whiteadder* has a medium – low capacity for medium sized turbine development, this is due to the sparsely settled landscape, lower visibility and lower intervisibility within this LCA. There is no capacity for large or very large turbines within these river valley landscapes due more settled landscapes, more complex landscape patterns and greater intervisibility.

#### 6.3.4 Central Southern Uplands; Character, Sensitivity and Capacity

Within the Upland Landscape Character areas of the Central Southern Uplands there are areas of low capacity for medium sized turbines but no capacity in the north eastern area, small areas of medium capacity for large turbines in the north eastern area, central and southern areas and larger areas of no capacity separating these areas. There are also areas of medium capacity in the upland landscapes for very large turbines in the north eastern, central and southern areas of the Uplands areas.

Upland landscape character types in the Central Southern Uplands: *Plateau Outliers (Eddleston/ Lyne Interfluvium and Broughton heights)*, *Southern Uplands with Scattered Forest (Broadlaw Group, Dun Knowe Group and Cauldcleugh Head Group)* and *Southern Upland Forest Covered (Craik)* all have large areas of low capacity for medium sized turbines. This low capacity is due to medium sized turbines having domestic qualities and being more suited to being sited alongside individual farmsteads and dwellings, which are sparsely distributed throughout these LCA. There is no capacity for medium sized turbines within the north western section of *Southern Uplands with Scattered Forest, Broadlaw Group* and the southern areas of the *Plateau Outliers, Eddleston/ Lyne Interfluvium and Broughton Heights* due to the presence of the NSA of the Upper Tweed Valley.

The north western area of the *Southern Uplands with Scattered Forest (Broadlaw Group)* and the more central areas of the *Southern Uplands with Scattered Forest (Dun Knowe Group)* extending into the eastern portion of the *Southern Uplands Forest Covered (Craik)* and areas of *Southern Uplands with Scattered Forest (Cauldcleugh Head Group)* have medium capacity for large and very large turbines. This capacity is a reflection of the simple upland landscapes with simple patterns and low levels of human settlement with lower intervisibility and prominence created by topographical containment. There are also large areas between these areas of capacity where there is no capacity for large or very large turbine developments, this is mainly due to NSA and SLA designations, areas classified as having a higher wilderness quality, the route of the Southern Upland Way, important transport corridors and areas of higher intervisibility that reduce the landscape's inherent capacity to none for large and very large turbines.

The Upland Fringe landscapes in the Central Southern Uplands: *Grassland with Hills (Eildon Hills)* and *Rolling Farmland (Minto Hills)* both have low capacity for medium sized turbines and areas of no capacity for medium sized turbines. The northern section of the *Grassland with Hills (Eildon Hills LCA)* has no capacity due to the regional landmark and important recreational resource of the Eildon Hills, these are also part of a larger NSA. The *Grassland with Rock Outcrops (Whitehaugh, Midgard, Allan Water)* have medium low capacity for medium sized turbines and the *Chisholme LCA* has medium capacity for medium sized turbines. The outer slopes facing the more settled Teviot Valley generally have low capacity due to increased prominence and intervisibility from Hawick and the transport infrastructure within the Teviot and Borthwick valleys. There is no capacity for Large or Very Large turbines within the *Grassland with Hills (Eildon Hills)*, *Rolling Farmland (Minto Hills)* and *Grassland with Rock Outcrops (Whitehaugh)* due to greater intervisibility, greater prominence, a more settled landscape, NSA and SLA designations and a greater complexity of patterns and processes within the landscape. Within the *Grassland with Rock Outcrops* there are areas (*Midgard and Allan Water LCA*) that have low capacity for large turbines. These are generally within the central areas where there is a degree of topographical containment, simpler and less complex landscape patterns, lower intervisibility, no landscape designations and a sparsely settled landscape pattern. The outer slopes of these LCAs have no capacity for large scale turbines due to prominence and increased intervisibility. None of the LCAs has capacity for very large turbines.

River Valley landscapes in the Central Southern Uplands have a combination of low or no capacity for Medium sized turbines and no capacity for large or very large turbines.

There is no capacity for medium, large or very large sized turbines within the *Upland Valley with Pastoral Floor (Upper Tweed/ Biggar Water, Manor Water, Upper Yarrow and Upper Ettrick LCAs)*, and all have no capacity for medium, large or very large turbines due to the presence of the NSA and SLA landscape designations.

There is a combination of low capacity and no capacity for medium sized turbines within the *Upland Valley with Pastoral Floor (Lyne Water)*, *Upland Valley with Woodland (Middle Tweed and Lower Ettrick/ Yarrow LCAs)*, *Upland Fringe Valley with Settlement (Tweed/ Gala/ Ettrick Confluence LCA)*, *Wooded Upland Fringe Valley (Ale Water and Slitrig Water LCAs)*, *Pastoral Upland Fringe Valley (Upper Teviot/ Borthwick Water LCA)*. The areas of no capacity are generally within the more elevated and prominent slopes of these valley LCAs. These River Valley landscapes are less suitable landscapes for turbine development as they generally have more complex with smaller scale landscapes with greater human influence and settlements and have greater visibility which is not suitable for large and very large turbines and only at certain locations suitable for medium turbines.

### 6.3.5 Cheviot Hills; Landscape Character, Sensitivity and Capacity

The Uplands landscape character types within the Cheviot Hills generally have a low or no capacity for medium sized turbines. The majority of the uplands in this regional area have no capacity for large or very large turbines, however a small area in the south of the Cheviot Hills regional area has low capacity for large and very large turbines.

The Uplands landscape character types in the Cheviot Hills Regional Landscape Character Type; *Southern Uplands Forest Covered (Wauchope/ Newcastleton)*, *Cheviot Uplands (Cocklaw Group)* and *Cheviot Foothills (Falla Group)* have a combination of low or no capacity for medium sized turbines. There is no capacity within the *Cheviot Uplands (Cocklaw Group)* and *Cheviot Foothills (Falla Group)* for large or very large turbines. The northern area of the *Southern Uplands Forest Covered (Wauchope/ Newcastleton)* contains a central band of low capacity for large and very large turbines. The northern and southernmost areas of this LCA have no capacity for large or very large turbines. These Upland Landscape Character Types have simpler, less complex landscape characteristics, simple landforms and patterns, less prominence and less development within them. However the proximity of the Northumberland National Park in England, landscape designations within the uplands and key transport routes between England and Scotland reduce capacity.

The Upland Fringe landscape Character Type generally has a low or no capacity for medium turbines and with the exception of one small area that has low capacity for large turbines this landscape type has no capacity for Large or very large turbines.

The *Rolling Farmland (Oxnam and Lempitlaw)* areas have low capacity for medium sized turbines, the *Grasslands with Hills (Bonchester/ Dunion) LCA* has low capacity for medium sized turbines in the southern section of the LCA and no capacity in the more prominent northern section. There is no capacity within the *Grasslands with Hills (Rubers Law)* as this LCA is more prominent, has a greater degree of intervisibility, contains the regionally prominent and recreational hill top of Rubers Law and forms part of a SLA designation. The only area with low capacity for large turbines within the *Upland Fringe landscape Character Type* is within the central area of *Rolling Farmland (Lempitlaw) LCA*, this area

has lower intervisibility, has intervening topography visually separating it from the Northumberland National Park and viewpoints within the National Park, the landscape also has less complex landforms and patterns and does not have a landscape designation offering protection. However due to the proximity of important viewpoints along the English Border from the Pennine Way and A68 Carter Bar panorama there is only low capacity for large turbines. There is no capacity for very large turbines within the Upland Fringe Landscape Character Types within the Cheviot Hills.

River Valley landscape types in the Cheviot Hills have low capacity and no capacity for medium sized turbines and no capacity for Large or very large turbines.

There is low capacity for medium sized turbines within the *Pastoral Upland Fringe Valley (Bowmont Water and Kale Water)*. Development of medium sized turbines must reflect the scale and complexity of the landscapes and complement human habitation patterns found within the valleys. There is no capacity for Large or very large turbines in these river valley landscape types. The *Wooded Upland Fringe (Jed Water and Rule water)* and *Upland Valley with Pastoral Floor (Liddel Water)* have no capacity for medium, large or very large turbines. This is due to the longer distant views afforded within these valleys and complexity in the landform, patterns in the landscape and the smaller scale landscapes present. The river valleys also have a greater concentration of human activities and influence with small to medium settlements and key transport routes.

### 6.3.6 Tweed Lowlands; Landscape Character, Sensitivity and Capacity

Capacity within the Tweed Lowlands is low or no capacity for medium sized turbines and no capacity for large or very large turbines.

The River Valley landscape character type *Lowland Valley with Farmland (Lower Kale)* has low capacity for medium sized turbines and no capacity for large or very large turbines. The *Lowland Valley with Farmland (Lower Teviot and Lower Tweed LCAs)* have areas of low capacity and areas of no capacity for medium sized turbines, the *Lower Teviot LCA* has a small area of low capacity in the north eastern area and the *Lower Tweed LCA* has a small area which has low capacity for medium sized turbines in the north eastern area of the LCA, the remaining area of the LCA has no capacity for medium sized turbines. There is low capacity and no capacity due in part influenced by neighbouring areas being less suitable for turbine development and due to the smaller scale landscapes, increases in complexity, landforms and landscape pattern as well as landscape designations and increased human habitation. There is no capacity within these River Valley Landscapes for Large or very large turbine developments.

The Lowlands landscape types also have a combination of areas that have low capacity for medium scale turbines and no capacity for medium sized turbines, there is also no capacity for large or very large turbines. The northern area of the *Lowlands with Drumlins (Lowland Merse)*, the adjoining northern area of *Rolling Lowland Margin (Eye Water Lowlands)* the central and eastern areas of the *Lowland Margin Platform (Gordon Platform)* and the northern and eastern areas of *Lowland Margin with Hills (Black Hill/ Hume Crags)* have low capacity for medium sized turbines. The southern area of the *Lowlands with Drumlins (Lowland Merse)*, *Rolling Lowland Margin (Eye Water Lowlands)*, the south western area of the *Lowland Margin with Hills (Black Hill/ Hume Crags)* and the whole of

the *Rolling Lowland Margin (Maxwellheugh)* have no capacity for medium sized turbines. This is a reflection of the varied human habitation patterns and infrastructure corridors, landscape designations, intervisibility, and complexity of landscapes and the patterns found within them. There is no capacity for large or very large turbines within this regional landscape type.

### 6.3.7 Coastal Zone; Landscape Character, Sensitivity and Capacity

The *Coastal Zone* Regional Landscape Character Types have low capacity in the more discrete areas for medium turbines. There is no capacity for large or very large turbines.

There is low capacity for medium sized turbines within the south eastern areas of *Coastal Farmland (Cockburnspath and Coldingham)*, *Coastal Moorland (Coldingham Moor)* and *Coastal Pasture (Lamberton Moor)*. However the eastern and north eastern areas of each landscape type have no capacity. This is a reflection of the more complex landscape character and patterns in the landscape found along this coastal area and the increased inherent recreational value of this coastal area.

### 6.3.8 Scottish Borders Summary; Landscape Character, Sensitivity and Capacity

Within the Scottish Borders there are large Upland and Upland Fringe areas that are undeveloped, have a low population and contain less infrastructure or human influence. These are generally the areas within the Scottish Borders that have a higher wilderness quality (Figure 3.8), these 'wildness' areas of land have the least human interference and influence within the Scottish Borders and include areas of the Lammermuir and Moorfoot Hills; areas within the Southern Uplands and smaller areas of the Pentlands and Cheviot Hills. There is a clear correlation between topography, 'wilderness' land and human settlement/ distribution throughout the Scottish Borders: the more elevated areas have less settlement or human habitation and generally have a higher wilderness value than less elevated areas of the main river valleys and agricultural lowlands which have small, medium and regionally large settlements and a greater human influence.

This combination of complex and varied landscape typologies, along with other key factors including wildness will limit capacity of large, medium and small turbines and turbine developments resulting in a wide variety of capacities that reflect the landscape's value and sensitivities determined by key factors discussed in Appendix 1 Cumulative Assessment Methodology. Areas with the highest inherent capacity for large and very large turbines are generally located in the upland areas of the Lammermuir and Moorfoot Hills, Southern Uplands and areas within the Cheviot Hills, all of which have higher wildness values. The Lowland areas and River Valley Regional Landscape Character Types have no inherent capacity for large or very large turbines. However a number of transitional Upland Fringe landscape character types have medium capacity for developments containing medium sized turbines, the lowlands and river valleys tend to have low capacity for medium sized turbines only.

Generally the emerging pattern of development in the Scottish Borders reflects the current pattern of Scottish windfarm development, the higher upland areas of the Scottish Borders tend to have the highest capacity for turbine developments. These Upland areas reflect the suitable characteristics of scale, simplicity of landform and lack of small scale development. Some upland areas however have greater prominence and visibility in the

landscape or have national or local designations in recognition of their scenic, wildness cultural or recreational qualities impacting on capacity.

### 6.3.9 Existing and Consented Windfarms

The current level of operational and consented development within the Scottish Borders is by no means the highest but is relatively high when compared with some areas in Scotland, e.g. Midlothian. Most windfarms are located in the northern to north eastern plateau, platform and coastal moorland areas of the Scottish Borders, some clusters straddle the border with East Lothian Council. Existing windfarm developments in these areas generally consist of Large or Very Large Turbines. Alongside this trend there is an emerging tendency for small, medium and occasionally large turbines as individual turbines or small groups up to 3no. turbines in the central lowlands, coastal zone, platform and river valley landscapes. The majority of turbine developments regardless of development size or turbine height are coincidentally located north of the River Tweed. The main areas of development or clusters of development, as illustrated on Figures 5.1 and 5.2 are:

- Within the Lammermuir and Moorfoot Hills and Lauder Common. Windfarms within these plateau hills range in size from 61no. large turbines at Dun Law, 46no. very large turbines at Fallago Rig, 45no. turbines (20no. very large and 25no. large turbines) at the Akingall/ Crystal Rig within the Scottish Borders area of the cluster (119no. existing or consented turbines in total within this cluster), 19no. very large turbines at Long Park, 24no. large turbines at Bowbeat and 3no. very large turbines at Carcant. There is also a cluster of small turbines either side of the A7 road along the border between Scottish Borders and Midlothian.
- The western area of the Scottish Borders within the Central Southern Uplands there is one medium sized windfarm consisting of 11no. very large turbines at Glenkerie. However the very large Clyde Windfarm (152 very large turbines) within South Lanarkshire close to the Scottish Borders exerts a significant landscape and visual influence on this western area of Scottish Borders.
- A cluster of individual turbines and medium sized windfarms is emerging in the north east of the Scottish Borders within the *Coastal moorland, Platform Farmland, Grassland with Hills* and the *Rolling Lowland Margins* landscapes. These consist of two separate windfarms: 22no. large turbines at Blackhill and 22no. large turbines at Drone Hill, between and to the south of these windfarms there are numerous individual turbines and small groups of turbines (up to 3no. turbines). These developments range between small, medium and large sized turbines.

The only other area which has medium sized development is at Langhope Rig within the *Southern Uplands with Scattered Forest* north west of Hawick, this windfarm consists of 10no. very large turbines and is an isolated development with no other medium, large or very large turbine development near by.

There are currently no wind turbines in the Cheviot Hills or Upper Tweed and Teviot Valleys and only minimal turbine development within the majority of the Southern Uplands.

Within the study area outside the Scottish Borders there are two developments or clusters that introduce significant landscape and visual impacts into the Scottish Borders. These are Clyde Windfarm in South Lanarkshire and the Akingall/ Crystal Rig development along the Scottish Borders/ East Lothian border.

### 6.3.10 Proposed Windfarms

There are several further proposed windfarms and many smaller proposals in and around the Scottish Borders. The majority of proposals consist of large turbines and are located in the Uplands and Upland Fringe landscapes in the north and north eastern areas of the Scottish Borders with a secondary cluster proposed in the western most area of the Southern Uplands area of Scottish Borders. Applications for small, medium and large individual turbines continue and are spreading west and south west from the coastal area/ Lammermuir Hills. Proposed turbine development within Scottish Borders is generally extending the existing clusters of turbine development:

- Large turbines in upland areas, extending into upland fringe landscapes with very large turbines in Lammermuir hills uplands and upland fringe areas.
- Visual impacts of Clyde Windfarm extension of 57no. very large turbines and a proposed 24no. very large turbines at Earlsbaugh in the western area of the Southern Uplands in the Scottish Borders.
- Proposed additional turbine development within the Lauder Common upland area between the Moorfoot Hills and Lammermuir Hills. Proposed developments here comprise: 23no. very large turbines at Rowantree windfarm, 7no. very large turbines at Gilston and 9 large turbines in a line north of the existing Long Park windfarm.
- A proposed medium sized windfarm consisting of 8no. very large turbines located within the Southern Uplands south of the existing 10no very large turbine windfarm potentially expanding turbine development.
- Within the coastal area and platform farmlands there is a cluster of proposed developments; 6no. very large turbines at Blackburn Farm, 14no. very large turbines at Quixwood Farm and 15no. very large turbines at Penmanshiel windfarm west of the existing 22no. large turbines at Drone Hill windfarm, while not strictly in the coastal area the visual impacts of the 6no. very large turbines proposed at land south west of Monashee Farm will contribute to the landscape and visual impacts.

There are no turbines proposed within the Cheviot Hills or the upper Tweed and Teviot valleys, there is minimal proposed turbine development within the Southern Uplands east of the A701.

In the study area beyond the Scottish Borders and not including the Clyde Extension or the extension to the Akingall/ Crystal Rig clusters there are no significant proposed turbine development in East Lothian, and minimal small or medium individual turbine proposals within Midlothian. Within West Lothian there are a number of large and medium scale proposed developments consisting of large turbines, these will consist of 43no very large turbines, 28no. very large turbines and 7no. very large turbines. In addition to these proposed developments there are a number of proposals for individual small or medium

sized turbines. Within South Lanarkshire there are a number of proposals for individual or groups of 2no. medium or large turbines potentially developing a turbine development cluster transcending the South Lanarkshire – West Lothian Council border. Within Dumfries and Galloway there are two proposed windfarms consisting of 22no. and 21no. very large turbines to the west of Langholm, however these will have minimal landscape and visual impacts on the Scottish Borders due to distance and intervening landform between the windfarms and the Scottish Borders.

## 6.4 Capacity for Further Development

This assessment has demonstrated that the landscape of Scottish Borders is able to successfully accommodate wind energy development, but of an appropriate type and extent. Appropriate development relates to the varied characteristics of the landscapes found in the Scottish Borders and the visual sensitivities of the settlement patterns and population of the Scottish Borders. Within the Scottish Borders there are large expanses of upland landscape typologies inherently suitable for large scale turbine development, however other key factors used in the assessment of sensitivity influence landscape and development capacities.

The main capacity for development lies within the larger scale Upland landscape areas which can accommodate larger turbine sizes. Other areas have more limited capacity not appropriate for larger turbine sizes or larger development sizes and some areas have very limited or no capacity.

At current levels of development there is capacity for further appropriate wind energy development in Scottish Borders. Future development in each landscape type or area should follow the guidance given in Table 6.1. The aim of the guidance is to ensure that the acceptable capacity for development in terms of turbine sizes, cluster sizes and spacing between clusters is not exceeded and that other issues guiding or limiting development are taken into account.

Some of this capacity would be fully used or exceeded when current proposals are taken into account. The main limitations on capacity are discussed below.

### 6.4.1 Areas with Very Limited or No Capacity

Significant areas of Scottish Borders have no assessed capacity for wind turbine developments, these areas are:

- The upland areas of the Pentland Hills in the Midland Valley and the escarpment facing a large population centre of Edinburgh and Midlothian. These areas are highly prominent to a large population and have a higher recreational value.
- A large area of the Upper Tweed Valley and prominent slopes of the Central Southern Uplands, Broughton Heights and Moorfoot Hills due to national and local landscape designations, settlement pattern and a higher degree of intervisibility. These upland landscape character types also do not contain turbine developments and as such could become a gap between clusters of developments.

- Upland River valleys within the Southern Uplands due to settlement patterns, scale of landscapes and well as local and national landscape designations. Intervisibility from the valleys to the upland areas would also be higher.
- Areas within the Uplands of the Cheviot Hills, this is due to this landscape's proximity to the Northumberland National Park in England that borders and overlooks the Scottish Borders, local landscape designations and important recreational usage including tourism and the setting of the panoramic Carter Bar viewpoint of the Southern Scottish Borders from the England – Scotland border.
- A large central area of the Mid Tweed Valley, adjoining upland fringe and Tweed Lowland landscapes. This is due to local and national landscape designations, a larger population and settlement pattern within the lowlands and river valleys as well as prominence, smaller scale landscapes with more complex patterns and processes and a higher degree of intervisibility within this area of the Scottish Borders.
- An area of the Lammermuir Hills consisting of Upland, River Valley and Upland Fringe landscapes. This is due to local landscape designations, long distance recreational routes and a higher degree of intervisibility.
- The coastal zone also has no capacity for turbine development due to prominence, scenic value and local landscape designations.

It is recommended that these landscape areas remain completely or largely undeveloped to protect their character and to provide gaps between areas of development.

In areas with very limited capacity only small groupings of carefully located turbines or, at some locations, single turbines should be employed. These potential developments would in most cases be better accommodated alongside farmsteads or individual properties and be limited to medium sized turbines, see Table 6.1 for additional guidance on each area. Areas with very limited capacity are:

- Areas of the Midland Valley Upland and Upland Fringe landscape character types. Development should respond positively to the existing scale, settlement patterns and complexities found within the landscape.
- The lower flatter elevations of the Mid Tweed Valley landscape along the lower areas of the Tweed Valley but only within the less sensitive areas with lower intervisibility.
- The less prominent, but not peripheral, southern slopes of the Moorfoot Hills, Lauder Common and the Lammermuir Hills. This is due to local landscape designations, prominence, recreational usage and a lower degree of topographical containment on the outer areas of these Upland and Upland Fringe Landscapes.
- The transition zone area between the Upland Fringe of the Lammermuir Hills and the Lowlands Landscapes of the Tweed Lowlands, this area has limited capacity due to no landscape designations undulating farmland landscapes with distributed smaller settlements and individual farmsteads and a lower intervisibility.
- The undulating landscape of lowland Merse area also has limited capacity for turbine developments in the less sensitive locations that have lower intervisibility.

- Areas within the Cheviot Hills, *Upland Fringe* and *River Valleys* within the more discrete areas set at a distance from the Northumberland National Park and key viewpoints but within less complex open areas where there are less settlements and lower intervisibility.
- The outlying areas, but not peripheral slopes of the Southern Uplands; Uplands, *Upland Fringe* and *River Valley* landscapes. Limited capacity here is due to the lower intervisibility and larger scale less complex landscapes/ landforms and simpler patterns in the landscape.
- River Valley landscapes of the Gala Water, Leader Water and Eye Water. The limited capacity within these landscapes is due to the smaller scale landscape character, settlement and transport patterns and the more complex landscape patterns and processes within them.

When assessing the acceptability of large and very large turbine proposals in neighbouring landscape character areas, proximity to these sensitive areas should be taken into account.

#### 6.4.2 Areas with Higher Capacity.

In areas that have limited and highest capacity for turbine development, small or medium groups of medium (and at select areas very large developments of turbine), large and possibly very large turbines could potentially be accommodated. Any proposals in these strategic areas will need to respond to the landscape's pattern and scale and avoid the areas with highest visibility and areas of higher complexity and landscape pattern. These strategic areas are:

- Areas of Upland landscape within the central Moorfoot Hills and Lauder Common with lower intervisibility from receptors, larger scale simpler landscapes and patterns resulting in less complexity, sited away from settlements and areas of local landscape designations. These strategic areas take advantage of the screening properties and topographic containment created by the upland landscape. Although not a landscape designation a large area of the Moorfoot Hills has been designated as SSSI and SAC that could restrict turbine development.
- An area of Upland landscape character within the Lammermuir Hills including the location of an existing large windfarm (Fallago Rig) where there is lower intervisibility, a simpler landscape pattern and landforms, lower settlement densities. This area is however designated as a SLA which would limit development of turbines within this strategic area. Although suitable for turbine development the area either side of the Southern Upland Way recreational route has no capacity, this is due to the greater recreational use and SLA.
- Within the eastern area of the Central Southern Uplands there are two strategic areas of limited capacity extending from the Dumfries and Galloway border north into the Scottish Borders. These strategic areas have lower intervisibility, human settlement, no landscape designations and are simpler landscapes with less complex patterns within them. Although not a landscape designation these areas are partly within the

Eskdalemuir windfarm exclusion zone that will have an impact on potential for turbine developments.

- The western Upland area of the Southern Uplands, although a local landscape designation would experience visual impacts of the existing 152no. very large turbines at Clyde Windfarm in South Lanarkshire, this impact is likely to increase with an unopposed proposed extension of 57no. very large turbine extension up to and within the Scottish Borders. It is envisaged that strategically this area could extend into the Scottish Borders in areas of lower prominence, settlement pattern, intervisibility and on the less complex landforms with less complex patterns. The A701 and Tweed Valley could in this instance act as a natural boundary to further turbine development in the Central Southern Uplands of the Scottish Borders.

#### 6.4.3 Areas Where Cumulative Impact Limits Further Development Capacity

As described above, a number of landscape types in Scottish Borders have the capacity to accept wind turbine development of varying scales. The existing and consented developments located in some of these areas leads to the potential for further cumulative development to exceed the capacity of the landscape. The boundaries of the areas where cumulative impact is considered to limit further significant development are shown in Figure 6.4 and described below. They are defined by:

- The developed areas of windfarms and turbines (operational and consented) and the extent of their influence on the surrounding landscape;
- The acceptable level of development within the landscape units and for those surrounding them;
- The extent of area within which further significant development should be limited in order to maintain acceptable levels of development within the area, and avoid unacceptable cumulative landscape and visual impacts between the existing windfarms and turbines and any new turbines outside the area.

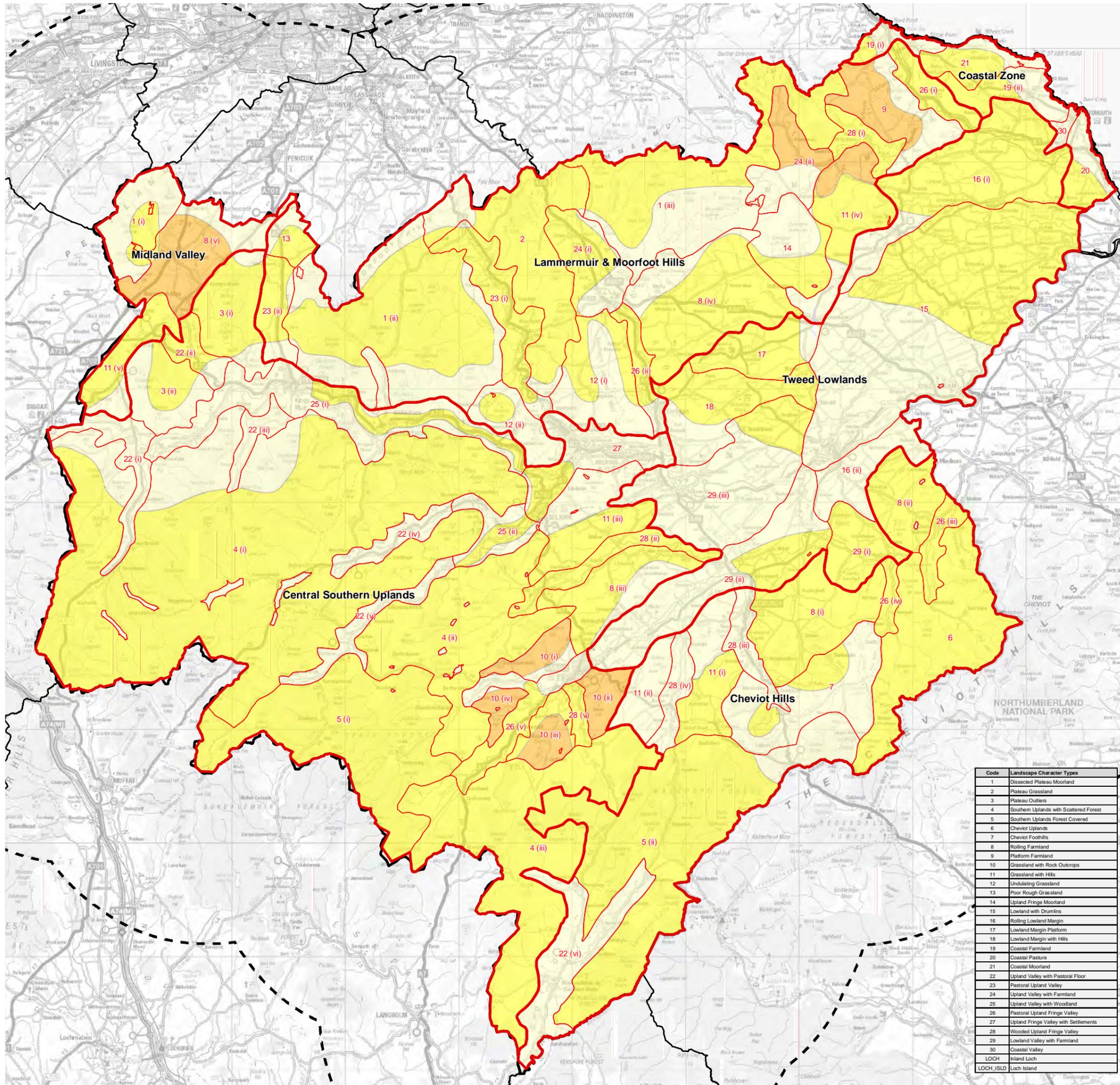
The boundaries shown in Figure 6.4 are indicative. They are described in more detail for each area in Table 6.2 below, together with the main objectives for limiting further development. In the case of specific development proposals there would be an assessment relating to the objectives of the area.

Elsewhere there are much more limited extents of development and the guidance in Table 6.2 is intended to steer future development to an acceptable level.

**Table 6.2: Areas Where Cumulative Impact Limits Further Development: Description and Key Objectives (see Figure 6.4 for Map)**

Coastal Zone, Lammermuir Hills and Lauder Common	
<p><b>Description</b></p> <p>The boundaries of this area include:</p> <ul style="list-style-type: none"> <li>• A small section of the A1 and East Coast Mainline Railway corridor, River Valley landscape <i>Pastoral Upland Fringe Valley; Eye Water</i>.</li> <li>• The Coastal Zone area of <i>Coastal Moorland</i> and <i>Coastal Farmland</i> between the settlements of Cockburnspath and Coldingham;</li> <li>• The Lammermuir Hills Upland landscape of <i>Dissected Plateau Moorlands</i> extending across the border into East Lothian and includes the cluster development at Akingall/ Crystal Rig and Fallago Rig.</li> <li>• The Upland Fringe and River valley Landscapes of the <i>Platform Farmland; Eye Water Platform, Wooded Upland Fringe Valley; Eye Water</i> and <i>Upland Valley with Farmland; Upper Whiteadder</i>.</li> <li>• The Upland Landscape of <i>Plateau Grassland; Lauder Common</i>.</li> </ul>	<p><b>Development Situation and Key Objectives</b></p> <p>This area encompasses the very large cluster of 25no. large and 94no. very large turbines at Aikengall and Crystal Rig windfarms (total number of turbines within cluster straddling the border with ELC); 48no. very large turbines at Fallago Rig; 22no. large turbines at Drone Hill Windfarm; 61no. large turbines at Dun Law, 19no. very large turbines at Longpark, 12no very large turbines at Toddleburn, 3no very large turbines at Hoprigshiels and 2no. very large turbines at Neuk Farm and 3no. large turbines at Pressmains Farm.</p> <p>Currently these existing windfarms have suitable separation distances. Nevertheless there are cumulative impacts resulting from these developments. The upland area of the Lammermuir Hills <i>Dissected Plateau LCA</i> in this area is currently a <i>Landscape with Wind Turbines</i> typology due to the Akingall/ Crystal Rig and Fallago Rig developments. The Plateau Grassland, <i>Lauder Common</i> is also a <i>landscape with Wind Turbines</i> typology due to the Dun Law, Toddleburn and Longpark windfarm developments. The <i>Platform Farmlands; Eye Water Platform, Pastoral Upland Fringe Valley; Eye Water</i> and <i>Coastal Moorland; Coldingham Moor</i> are all <i>Landscape with Occasional Turbines</i> Typologies due to individual small, medium or large turbines to small groups of two or three large or very large turbines. The <i>Coastal Moorland; Coldingham Moor</i> area contains the 22no. large turbines at Drone Hill.</p> <p>There are proposals for 8no. separate turbine developments within this area, all for very large turbines (14no. very large turbines at Quixwood farm, 6no. very large turbines at Blackburn farm, 6no. very large turbines at Monashee farm, 7no. very large turbines at Gilston, 23no. very large turbines at Rowantree and 9no. large turbines at Allanshaws farm).</p> <p>The key objectives governing the area are:</p> <ul style="list-style-type: none"> <li>• Retaining sufficient spacing between individual windfarms and turbines to maintain the <i>Landscape with Wind Turbines</i> and <i>Landscape with Occasional Wind Turbine</i> typology. Development of turbines must be controlled in this area of the Scottish Borders if the <i>Wind Turbine Landscape</i> typology is to be avoided;</li> <li>• To prevent the over development of the <i>Platform Farmlands; Eye Water Platform LCA</i> this landscape character type has been identified as having only low capacity for large turbines in table 6.1;</li> <li>• To prevent a proliferation of turbines visible from the A1 and East Coast Mainline Railway corridor;</li> <li>• To prevent the overdevelopment of the Upland landscape <i>Plateau Grassland, Lauder Common LCA</i> and to avoid this landscape from developing into a <i>Wind Turbine Landscape</i>;</li> <li>• To prevent the unacceptable proximity of larger turbines to settlements and individual dwellings;</li> <li>• Retaining sufficient spacing between operational and consented windfarm developments and the Southern Upland Way;</li> <li>• To support an organised pattern of development within the Upland areas, promoting development in concentrated areas whilst maintaining sufficient spacing between neighbouring clusters of developments;</li> <li>• To minimise visibility from sensitive receptors in surrounding areas, especially from the more visually prominent areas of the northern escarpment slopes of the Lammermuirs visible from and facing the larger population centre of Edinburgh, East Lothian and Mid Lothian.</li> </ul>

Western area of the Central Southern Uplands	
<p><b>Description</b></p> <p>The boundaries of this area include:</p> <ul style="list-style-type: none"> <li>• The Uplands area of the Southern Uplands regional landscape character type within the western part of the Scottish Borders, between the boundary with South Lanarkshire and the Tweed Valley/ A701;</li> <li>• Impacts resulting from the development of the 152no. very large turbine development at Clyde Windfarm and potential extension.</li> </ul>	<p><b>Development Situation and Key Objectives</b></p> <p>Currently this area has one consented medium sized windfarm consisting of 11no. very large turbines at Glenkerie windfarm, the area also experiences landscape and visual impacts of existing 152no. very large turbine development at Clyde Windfarm. The area also encompasses the proposed extension to Clyde Windfarm which comprises of 57no. very large turbines which come up to the border of and into Scottish Borders and the proposed 24no. very large turbine development at Earlishaugh near the boundary with Dumfries and Galloway. The objectives governing the area are:</p> <ul style="list-style-type: none"> <li>• Promote the contained development of a wind farm cluster, using the strong landscape feature of the Tweed Valley and A701 as a barrier to limit development spreading east across the Southern Uplands;</li> <li>• Preventing the Uplands area of the Southern Uplands (east of the Tweed Valley and A701) from becoming a <i>Landscape with Occasional Wind Turbines</i> by maintaining this landscape as a <i>Landscape with no Wind Turbines</i> creating a gap between potential clusters of turbines.</li> <li>• To prevent unacceptable proximity of larger turbines to settlements and other visually sensitive locations;</li> </ul>



### Legend

- Regional Landscape Areas
- SBC Local Authority Boundary
- Local Authority Boundary 15km Buffer
- Other Local Authority Boundaries
- Landscape Character Areas

### Landscape Capacity

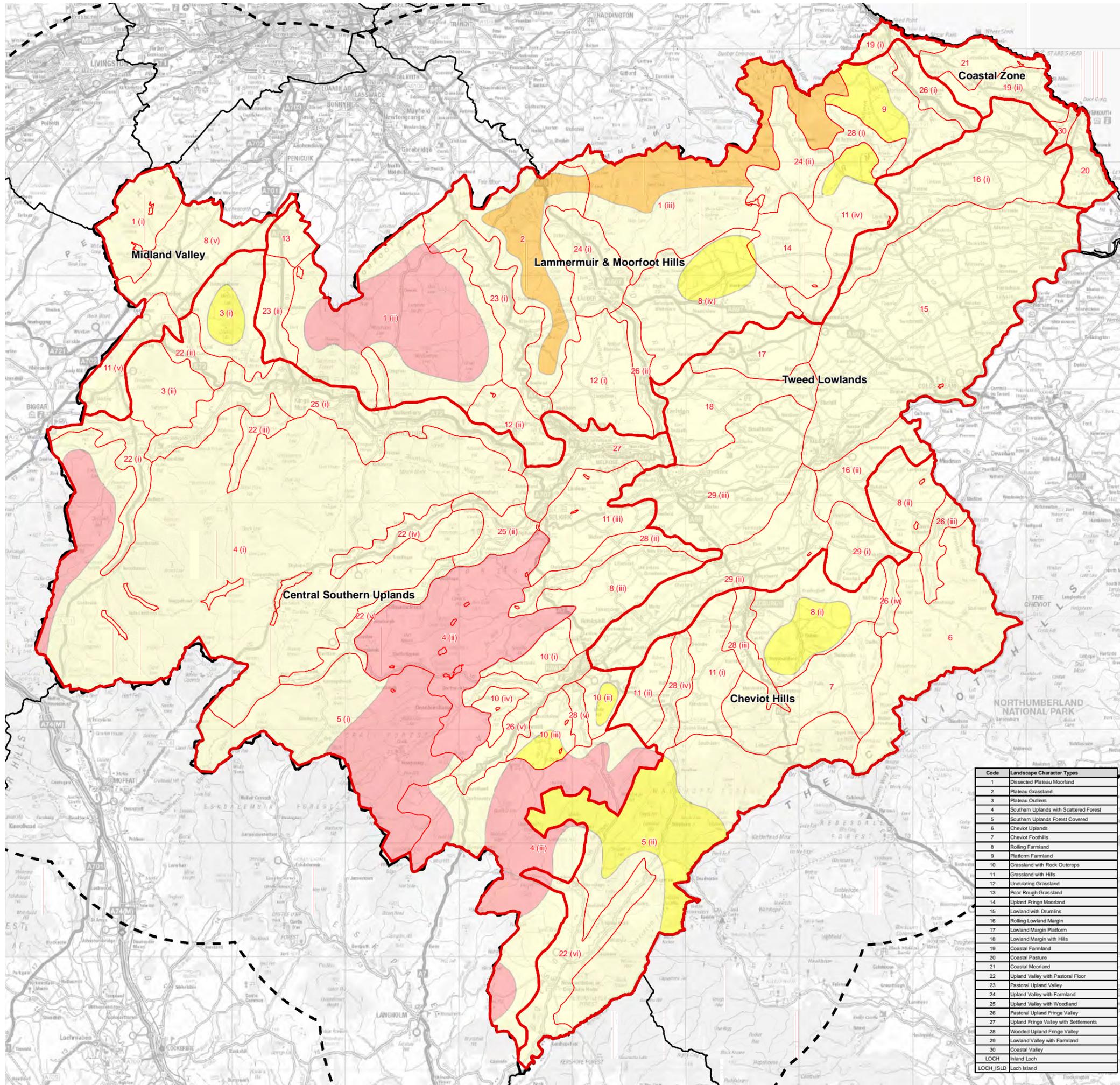
- Medium High Capacity
- Medium Capacity
- Medium Low Capacity
- Low Capacity
- No Capacity

Code	Landscape Character Types
1	Dissected Plateau Moorland
2	Plateau Grassland
3	Plateau Outliers
4	Southern Uplands with Scattered Forest
5	Southern Uplands Forest Covered
6	Cheviot Uplands
7	Cheviot Foothills
8	Rolling Farmlands
9	Platform Farmland
10	Grassland with Rock Outcrops
11	Grassland with Hills
12	Undulating Grassland
13	Poor Rough Grassland
14	Upland Fringe Moorland
15	Lowland with Drumlins
16	Rolling Lowland Margin
17	Lowland Margin Platform
18	Lowland Margin with Hills
19	Coastal Farmland
20	Coastal Pasture
21	Coastal Moorland
22	Upland Valley with Pastoral Floor
23	Pastoral Upland Valley
24	Upland Valley with Farmland
25	Upland Valley with Woodland
26	Pastoral Upland Fringe Valley
27	Upland Fringe Valley with Settlements
28	Wooded Upland Fringe Valley
29	Lowland Valley with Farmland
30	Coastal Valley
LOCH	Inland Loch
LOCH_ISLD	Loch Island

**Figure 6.1a**  
25 - 50m Medium  
Inherent Landscape Capacity







**Legend**

- Regional Landscape Areas
- SBC Local Authority Boundary
- Local Authority Boundary 15km Buffer
- Other Local Authority Boundaries
- Landscape Character Areas

**Landscape Capacity**

- Medium High Capacity
- Medium Capacity
- Medium Low Capacity
- Low Capacity
- No Capacity

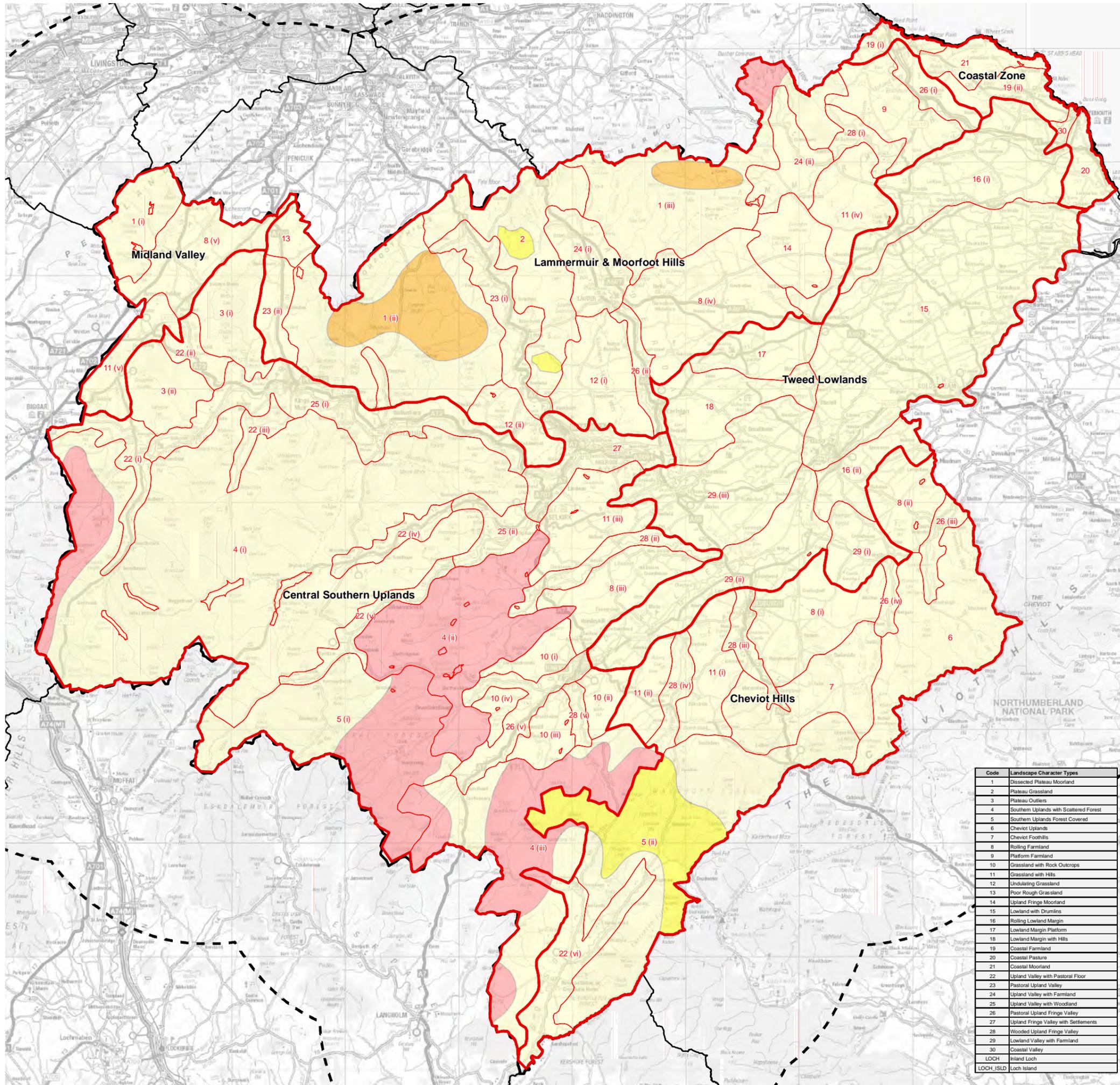
Code	Landscape Character Types
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2	Plateau Grassland
3	Plateau Outliers
4	Southern Uplands with Scattered Forest
5	Southern Uplands Forest Covered
6	Cheviot Uplands
7	Cheviot Foothills
8	Rolling Farmlands
9	Platform Farmland
10	Grassland with Rock Outcrops
11	Grassland with Hills
12	Undulating Grassland
13	Floor Rough Grassland
14	Upland Fringe Moorland
15	Lowland with Drumlins
16	Rolling Lowland Margin
17	Lowland Margin Platform
18	Lowland Margin with Hills
19	Coastal Farmland
20	Coastal Pasture
21	Coastal Moorland
22	Upland Valley with Pastoral Floor
23	Pastoral Upland Valley
24	Upland Valley with Farmland
25	Upland Valley with Woodland
26	Pastoral Upland Fringe Valley
27	Upland Fringe Valley with Settlements
28	Wooded Upland Fringe Valley
29	Lowland Valley with Farmland
30	Coastal Valley
LOCH	Inland Loch
LOCH_ISLD	Loch Island

**Figure 6.1b**  
**50 - 100m Large  
Inherent Landscape Capacity**



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**Legend**

- Regional Landscape Areas
- SBC Local Authority Boundary
- Local Authority Boundary 15km Buffer
- Other Local Authority Boundaries
- Landscape Character Areas

**Landscape Capacity**

- Medium High Capacity
- Medium Capacity
- Medium Low Capacity
- Low Capacity
- No Capacity

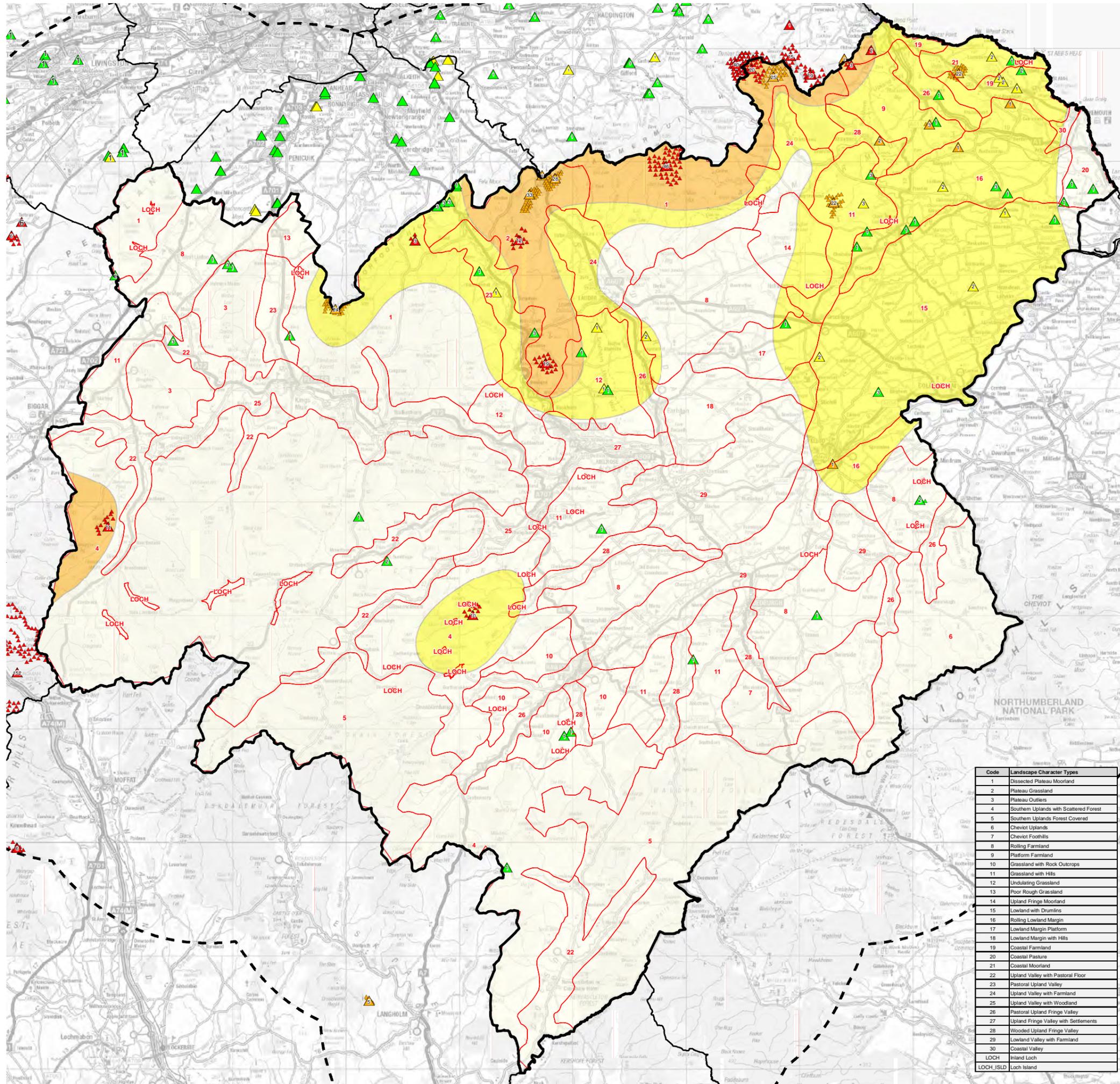
Code	Landscape Character Types
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2	Plateau Grassland
3	Plateau Outliers
4	Southern Uplands with Scattered Forest
5	Southern Uplands Forest Covered
6	Cheviot Uplands
7	Cheviot Foothills
8	Rolling Foothills
9	Platform Farmland
10	Grassland with Rock Outcrops
11	Grassland with Hills
12	Undulating Grassland
13	Floor Rough Grassland
14	Upland Fringe Moorland
15	Lowland with Drumlins
16	Rolling Lowland Margin
17	Lowland Margin Platform
18	Lowland Margin with Hills
19	Coastal Farmland
20	Coastal Pasture
21	Coastal Moorland
22	Upland Valley with Pastoral Floor
23	Pastoral Upland Valley
24	Upland Valley with Farmland
25	Upland Valley with Woodland
26	Pastoral Upland Fringe Valley
27	Upland Fringe Valley with Settlements
28	Wooded Upland Fringe Valley
29	Lowland Valley with Farmland
30	Coastal Valley
LOCH	Inland Loch
LOCH_ISLD	Loch Island

**Figure 6.1c**  
**+100m Very Large  
Inherent Landscape Capacity**



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### Legend

- SBC Local Authority Boundary
- Local Authority Boundary 15km Buffer
- Other Local Authority Boundaries
- SNH Landscape Character Areas

### Windfarms: Status, Height Category

- Existing / Consented, Cat 1: 0 to <25m
- Existing / Consented, Cat 2: 25 to <50m
- Existing / Consented, Cat 3: 50 to <100m
- Existing / Consented, Cat 4: +100m

### Typology

- Wind Turbine Landscape
- Landscape with Wind Turbines
- Landscape with Occasional Wind Turbines
- Landscape with no Wind Turbines

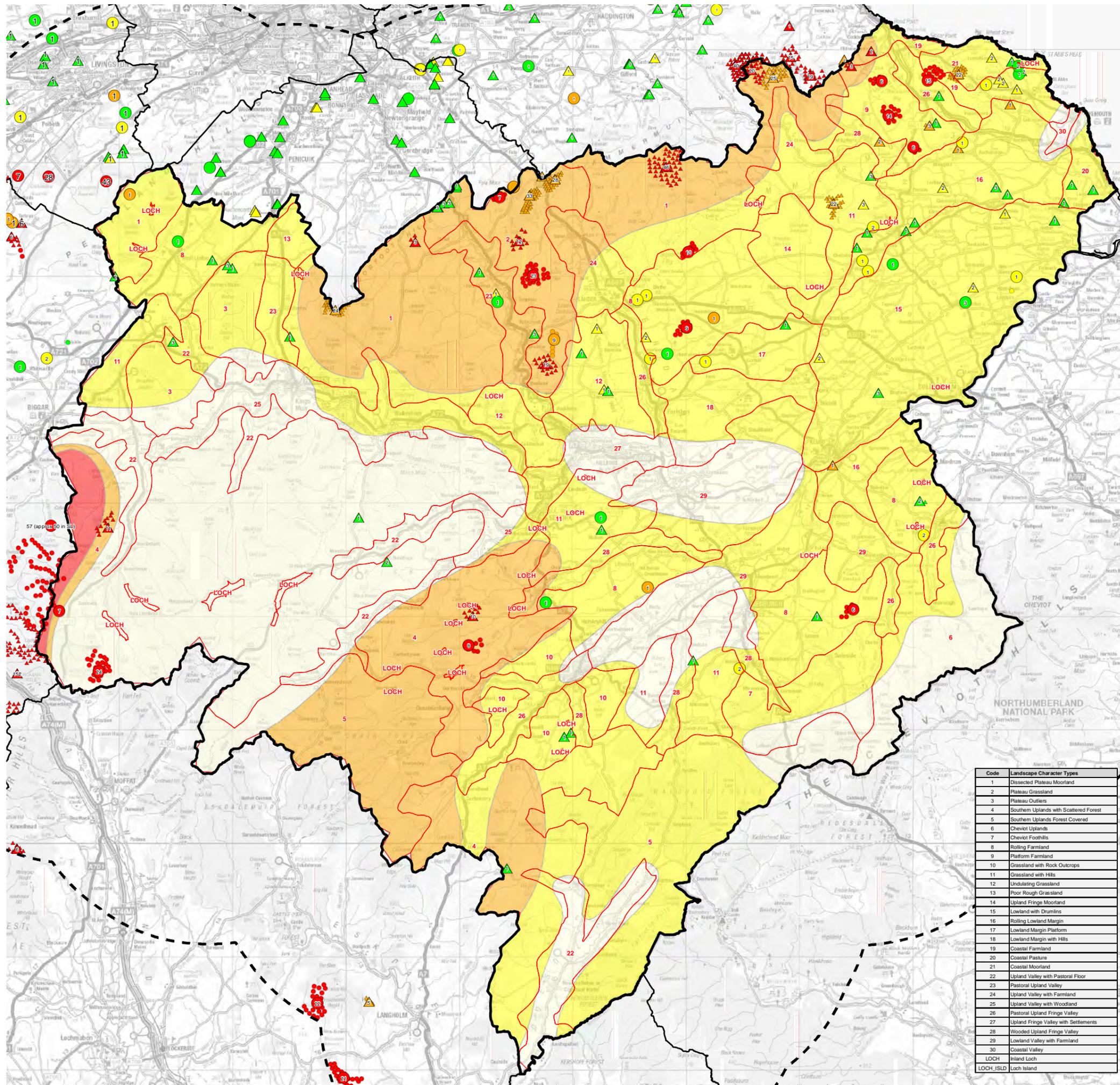
Code	Landscape Character Types
1	Dissected Plateau Moorland
2	Plateau Grassland
3	Plateau Outliers
4	Southern Uplands with Scattered Forest
5	Southern Uplands Forest Covered
6	Cheviot Uplands
7	Cheviot Foothills
8	Rolling Farmland
9	Platform Farmland
10	Grassland with Rock Outcrops
11	Grassland with Hills
12	Undulating Grassland
13	Foor Rough Grassland
14	Upland Fringe Moorland
15	Lowland with Drumlins
16	Rolling Lowland Margin
17	Lowland Margin Platform
18	Lowland Margin with Hills
19	Coastal Farmland
20	Coastal Pasture
21	Coastal Moorland
22	Upland Valley with Pastoral Floor
23	Pastoral Upland Valley
24	Upland Valley with Farmland
25	Upland Valley with Woodland
26	Pastoral Upland Fringe Valley
27	Upland Fringe Valley with Settlements
28	Wooded Upland Fringe Valley
29	Lowland Valley with Farmland
30	Coastal Valley
LOCH	Inland Loch
LOCH_ISLD	Loch Island

**Figure 6.2**  
Current Wind Turbine  
Landscape Typology:  
Operational & Consented Windfarms



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**Legend**

- SBC Local Authority Boundary
- Local Authority Boundary 15km Buffer
- Other Local Authority Boundaries
- SNH Landscape Character Areas

**Windfarms: Status, Height Category**

- Existing / Consented, 0 to <25m
- Existing / Consented, 25 to <50m
- Existing / Consented, 50 to <100m
- Existing / Consented, +100m
- Application, 0 to <25m
- Application, 25 to <50m
- Application, 50 to <100m
- Application, +100m
- Application, Unknown Height

**Maximum Development Capacity**

- Wind Turbine Landscape
- Landscape with Wind Turbines
- Landscape with Occasional Wind Turbines
- Landscape with No Wind Turbines

Code	Landscape Character Types
1	Dissected Plateau Moorland
2	Plateau Grassland
3	Plateau Outliers
4	Southern Uplands with Scattered Forest
5	Southern Uplands Forest Covered
6	Cheviot Uplands
7	Cheviot Foothills
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9	Platform Farmland
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27	Upland Fringe Valley with Settlements
28	Wooded Upland Fringe Valley
29	Lowland Valley with Farmland
30	Coastal Valley
LOCH	Inland Loch
LOCH_ISLD	Loch Island

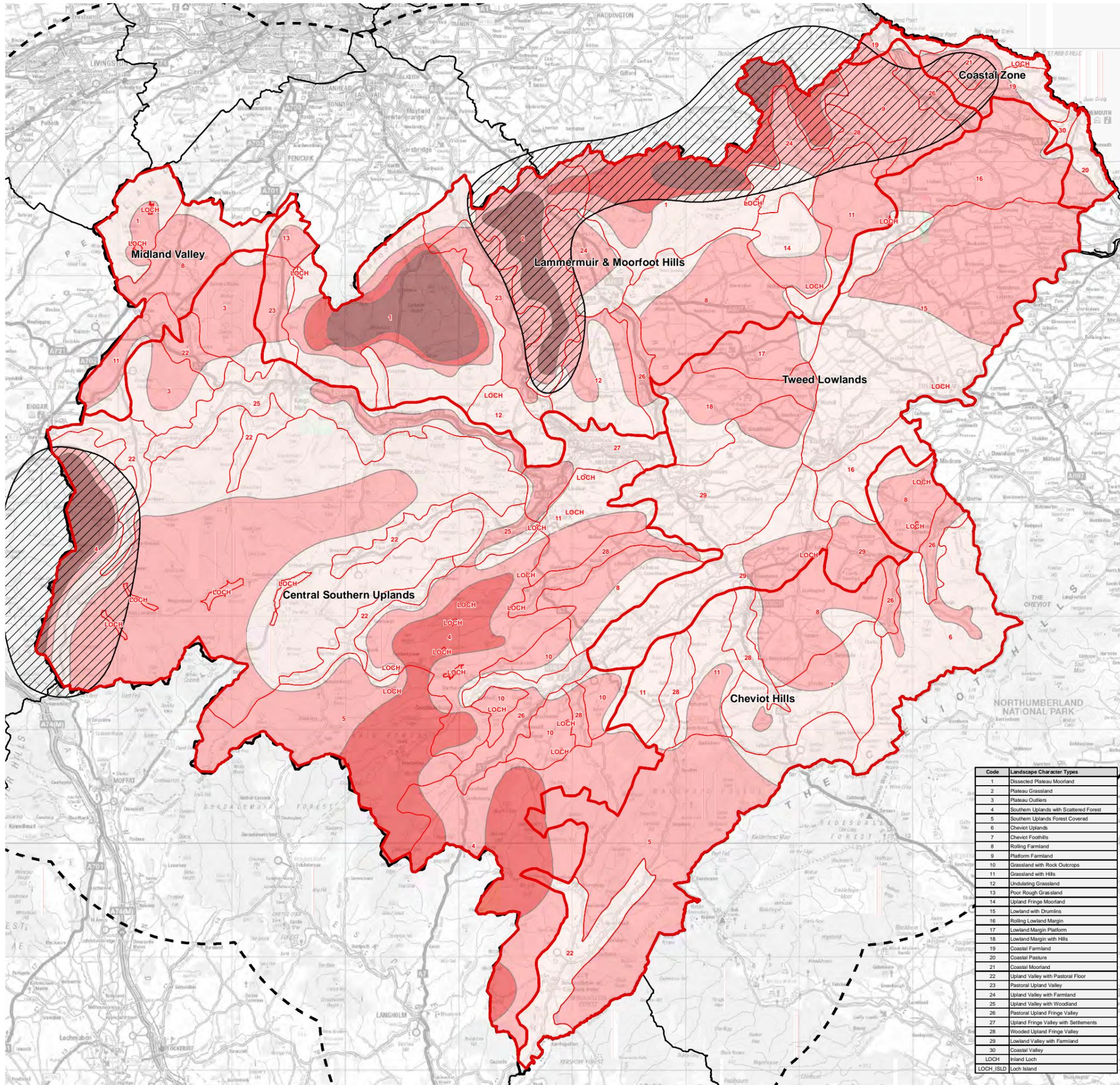
**Figure 6.3**

**Wind Turbine Landscape Typology:  
Proposed Maximum  
Development Capacity**



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### Legend

- Regional Landscape Areas
- SBC Local Authority Boundary
- Local Authority Boundary 15km Buffer
- Other Local Authority Boundaries
- Areas where cumulative impacts limit development
- Landscape Character Areas

### Capacity

- Areas with Highest Capacity
- Areas with Limited Capacity
- Areas with Very Limited Capacity
- Areas with No Capacity

Code	Landscape Character Types
1	Dissected Plateau Moorland
2	Plateau Grassland
3	Plateau Outliers
4	Southern Uplands with Scattered Forest
5	Southern Uplands Forest Covered
6	Cheviot Uplands
7	Cheviot Foothills
8	Rolling Farmland
9	Platform Farmland
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27	Upland Fringe Valley with Settlements
28	Wooded Upland Fringe Valley
29	Lowland Valley with Farmland
30	Coastal Valley
LOCH	Inland Loch
LOCH_ISLD	Loch Island

**Figure 6.4**  
Wind Turbine Development  
Opportunities and Constraints



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## 7.0 SUMMARY AND CONCLUSIONS

This study has considered the capacity of the Scottish Borders landscape to accommodate wind turbine development. The landscape capacity assessment is based on an assessment of landscape sensitivity and value of the different landscape character types and areas in Scottish Borders. This has involved a staged process:

- 1) Firstly to identify the capacity of the Scottish Borders landscape to accommodate wind turbine development;
- 2) Secondly, to assess the degree of cumulative change resulting from the operating and consented wind turbines in the study area;
- 3) Thirdly, to assess the level of further cumulative development that could be acceptably accommodated within areas of Scottish Borders. This includes, where appropriate, commentary on the likely acceptability of currently proposed wind turbines.

The study is based on the premise that it is accepted, given current renewable energy targets, that there will be a level of landscape change and visual impact resulting from wind energy development that will require careful management. It also takes account of stakeholder opinions in the two parallel public opinion and economic surveys carried out under this commission. In applying the assessment process, the study has addressed a number of concepts and issues that affect the perceived significance and acceptability of cumulative changes caused by multiple wind turbines and windfarms in the landscape.

The landscape of the Scottish Borders is highly varied and complex, consisting of a wide range of landscape typologies similar to many other parts of Scotland. It is a unique and complex blend of upland, Upland Fringe, lowland and coastal landscapes. The main population centres within the Scottish Borders are concentrated throughout the more sheltered agricultural lowlands and within the main river valleys where key infrastructure routes take advantage of natural routes through upland areas. There are large areas of Uplands that have little or no settlement or human development. These Upland areas have the suitable characteristics of scale and simplicity of landform that tend to have the highest capacity for turbine developments (Development in these areas reflects the current pattern of Scottish windfarm development).

The assessment has determined that there are large areas suitable for turbine and windfarm development in the Scottish Borders. These are located in the Upland Regional Landscape Character Type of the *Dissected Plateau Moorland; Moorfoot Plateau and Lammermuir Hills*, the *Plateau Grassland; Lauder Common*, the western area of the Central Southern Upland Regional Landscape Character Type *Southern Uplands with Scattered Forest; Broadlaw Group LCA* west of the strong topographic feature of the Tweed Valley and A701. There is also limited capacity in the Central areas of the Central Southern Uplands Regional Landscape Character Type *Southern Uplands with Scattered Forest; Dun Knowe Group* extending south into the *Southern Uplands Forest Covered; Craik* as well as small areas of the Grasslands with Rock Outcrops; Allan Water extending south into the *Southern Uplands with Scattered Forest; Cauldcleuch Head Group* to the border with Dumfries and Galloway Council. There is also a small area with the Cheviot Hills Regional Landscape Character Type *Southern Uplands with Scattered Forest; Wauchope Newcastleton LCA* that has limited capacity for turbine development. These

areas represent the larger scale landscapes that can accommodate large features such as wind turbines. These areas also have less complex landscapes with more simple landscape processes, landforms and features and contain local and national landscape designations located within the Scottish Borders and surrounding local authorities.

Current operational and consented wind turbine development in Scottish Borders comprises a total of 316no. turbines over 25m high (with 66no. turbines under 25m tall). The majority of these consented and operational turbines are Large (162no. 50-100m high) and very large turbines (132no. over 100m high) there are also 22no. medium sized turbines (25m-50m high). The majority of turbines in the Scottish Borders are located within windfarms north of the River Tweed in the *Lammermuir and Moorfoot Hills Regional Landscape Area* with small groups and individual turbines in the agricultural Lowlands and River Valleys.

The largest windfarm fully within the Scottish Borders is at Dun Law and consists of 61no. large turbines. Crystal Rig/ Aikengall is significantly larger but is partially located in Esat Lothian. There are only two existing small - medium sized windfarms in the Southern Uplands to the south of the River Tweed consisting of 11no. and 10no. very large turbines respectfully.

The assessment of the cumulative effects of current operational and consented development indicates that there is remaining capacity for further larger sized turbine development in the Lammermuir and Moorfoot Regional Landscape Area Uplands Landscape Character Type *Dissected Plateau Moorlands, Moorfoot Plateau and Lammermuir Hills*, the *Plateau Grassland, Lauder Common*. There is capacity within the Regional Landscape Area Central Southern Uplands, Upland Landscape Character Type *Southern Uplands with Scattered Forest, Broadlaw Group, Dun Knowe Group* and within the *Cauldcleuch Head Group*. There is also capacity within the *Southern Uplands with Scattered Forest, Cauldcleuch Head* and small areas of capacity in *Grassland with Rock Outcrops, Allan Water and Midgard*. There are also smaller areas of capacity within the Cheviot Hills Regional Landscape Area *Southern Uplands Forest Covered, Wauchope/ Newcastleton LCA* Nevertheless there are limits on cumulative development in these and other areas if unacceptable levels of landscape change are to be avoided.

Current applications for wind turbines total 15no. medium sized turbines, 12no. large sized turbines and 142no very large turbines. These are generally located on *Upland* landscape types and *Upland Fringe* landscape types. This includes the cluster of 5no. applications all for very large turbines located east of the Lammermuir Hills between the existing Akingall/ Crystal Rig cluster and the existing Drone Hill windfarm within the Upland Fringe landscape character type *Platform Farmland, Eye Water Platform and Coastal Moorland, Coldingham Moor* and the *Pastoral Upland Fringe Valley, Eye Water*. When these proposals are considered with those recently consented the maximum development scenario would lead to cumulative effects that would exceed an acceptable level of cumulative development.



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