

ONSHORE WIND ENERGY



**Clackmannanshire
Council**

www.clacksweb.org.uk

Adopted August 2015

CONTENTS

1.0 Introduction and Background 2

Purpose and Objectives of Supplementary Guidance	2
Policy Framework	4

2.0 The Spatial Frameworks for Wind Energy 6

What is a Spatial Framework?	6
The Council's approach to Preparing the Spatial Frameworks	7

3.0 Development Criteria and Requirements 11

Landscape and Visual Impacts	11
Green Belt.	14
Biodiversity	14
Carbon Rich Soils.	16
Water Environment	17
Communities: Settlements and Other Residential Receptors	
▶ Proximity and Visual Impact	18
▶ Noise	18
▶ Shadowflicker	19
Interference with other Communication Systems.	19
Aviation and Radar Issues.	19
Heritage Issues.	20
Tourism and Recreation	20

Additional Guidance;	20
▶ Design	20
▶ Safety	20
▶ Restoration and Decommissioning	21
▶ Grid Connection	21
▶ Community Benefit	21
▶ Transport and Access	22
▶ Mitigation	22

4.0 Smaller Scale Wind Turbine Developments 22

5.0 Submission of a Planning Application 22

Pre-application stage	22
Scope of supporting information	22
Need for Environmental Impact Assessment (EIA)	24

6.0 Further Information 25

Useful Contacts.	25
Bibliography of Sources of Further Information / Guidance	26
Glossary	28

7.0 Appendices 30

1. Clackmannanshire Local Development Plan Policies For Wind Energy Proposals - Policies SC14 (Renewable Energy) and SC15 (Wind Energy Development)	30
2. Methodology for the Preparation of Spatial Frameworks	31
3. Maps Showing Potential Additional constraints.	33
4. Map showing Clackmannanshire Landscape Character Areas	41
5. Landscape Sensitivity Maps and Siting and Design Guidance	42

SUPPLEMENTARY GUIDANCE 2

Introduction and Background

Purpose and Objectives of the Supplementary Guidance (SG)

- 1.1 The main purpose of this SG is to assist in positively planning for wind energy development in Clackmannanshire by providing additional guidance and advice designed to supplement the Spatial Frameworks for Wind Energy and relevant policies contained in the Clackmannanshire Local Development Plan (LDP).
- 1.2 The main objectives of this SG are to
- ▶ set out the Council’s approach to considering or commenting on proposals for wind energy development from large wind farms to single turbines;
 - ▶ identify the main constraints or issues which may have to be addressed at the pre-application or application stage;
 - ▶ explain the information requirements expected as part of the submission of a planning application and provide links to sources of related advice produced by consultees or the Council;
 - ▶ explain in more detail the Council’s approach to preparing its spatial frameworks for wind energy and how they should be applied in relation to any specific proposal (Please note that the Spatial Frameworks in the LDP were based on SPP2, however those in this SG are based on SPP3. The LDP will be updated when it is reviewed); and
 - ▶ help ensure that any potential negative impacts from wind energy developments are avoided or effectively mitigated.

1.3 Table 1 below sets out the relevance of this guidance and the Spatial Frameworks to wind turbine proposals based on their height. The height typologies have been selected by the Council to help assess the impacts of different scales of development and to produce the Spatial Frameworks. Further information is provided in paragraph 1.17.

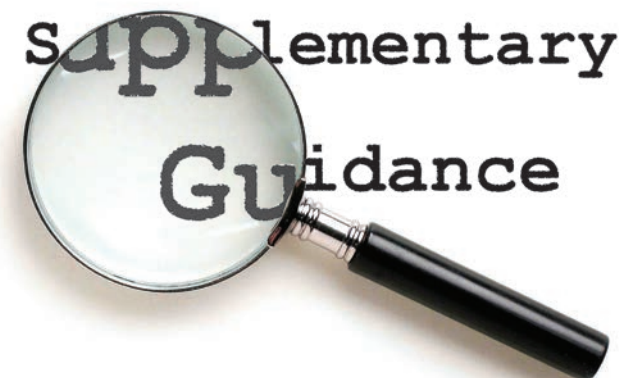


TABLE 1 - Wind Turbine Height Typologies

Height to blade tip (metres)	Typology Name	Covered by Supplementary Guidance	Relevant Spatial Framework (SF)
Below 20 m	Micro	No - due to their more localised impact.	No
20 – 50 m	Small	Yes	Yes See the SF for Small Turbine typologies
51 – 80 m	Medium	Yes	Yes See the SF for Medium and Large Turbine typologies
Above 80 m	Large	Yes	Yes See the SF for Medium and Large Turbine typologies
Applications under the Electricity (Scotland) Act 1989	Likely to comprise large turbines. Only applies to developments where the installed generating capacity would be above 50 Megawatts.	Yes	Yes See the SF for Medium and Large Turbine typologies

SUPPLEMENTARY GUIDANCE 2

1.4 There is widespread recognition that the rise in atmospheric levels of greenhouse gases are contributing to changes in global climate and that these levels must be reduced in order to help mitigate the potential environmental, economic and social impacts of this change. Burning fossil fuels is a significant contributor to greenhouse gas emissions and meeting more of our energy needs from cleaner renewable energy sources is seen as an important part of our response to address climate change.

1.5 Nationally, the Scottish Government is committed to increasing the amount of electricity generated from renewable sources as a key part of the response to tackle climate change. Scottish Ministers have set a target of the equivalent of 100% of the demand for electricity in Scotland to be supplied from renewable sources by 2020. An interim target of 50% by 2015 was set in October 2012. In 2011, approximately 35% of Scotland's electricity demand was met from renewable sources which exceeded the previous interim target of 31% by 2011. The government has also set a target of achieving 500 megawatts (MW) community and locally owned renewable energy by 2020.

1.6 The Renewables Obligation (Scotland) obliges electricity suppliers to increase the proportion of energy produced from renewable energy sources. Feed-in tariffs also continue to drive applications for renewable energy development. The Council expects these factors to result in continued interest in renewable energy development in Clackmannanshire, including wind energy proposals. A register containing details of wind energy applications can be viewed on the Council's website www.clacksweb.org.uk.

1.7 Wind energy can deliver a number of positive impacts including:

- ▶ generating electricity without producing greenhouse gas emissions ;
- ▶ making a direct contribution to meeting greenhouse gas reduction targets;
- ▶ contributing to a more secure and diverse energy supply; and
- ▶ developing the green economy and supporting sustainable economic growth.

However, due to their scale, appearance, design and operation, the inappropriate siting and design of wind turbines has the potential to create a range of environmental and other impacts, either individually and/or cumulatively with other wind energy development, on:

- ▶ landscape and visual amenity;
- ▶ amenity, eg noise and shadow flicker;
- ▶ wildlife and ecology;
- ▶ the water environment; and
- ▶ aviation safety.

1.8 This Supplementary Guidance (SG) has therefore been produced to set out:

- ▶ the planning policy approach to wind energy development as it applies in Clackmannanshire. This seeks to ensure that renewable energy benefits are secured having full regard to valid community concerns and not at the expense of unacceptable environmental impacts and cumulative effects;
- ▶ the methodology and conclusions of the two Spatial Frameworks for Wind Energy. Please note that Scottish Planning Policy 3 (SPP3) (June 2014) updated the criteria for preparing Spatial Frameworks and the methodology contained within this SG is therefore more up to date than that in the Local Development Plan (LDP) which was based on guidance from 2012; and
- ▶ the main issues which may need to be addressed by developers as part of the planning application process.



SUPPLEMENTARY GUIDANCE 2

Policy Framework

National Level

- 1.9 The National Planning Framework 3 seeks to ensure that development facilitates adaptation to climate change, reduces resource consumption and lowers greenhouse gas emissions. Industry estimates are that renewable energy currently supports around 11,000 jobs in Scotland and employment in this sector is expected to grow significantly over the coming years.



- 1.10 Scottish Planning Policy, 2014 (SPP) requires planning authorities to:
- ▶ set out in the development plan a spatial framework identifying those areas that are likely to be most appropriate for onshore wind farms as a guide for developers and communities;
 - ▶ prepare the spatial framework in accordance with the guidance contained in the SPP in order to deliver consistency nationally;
 - ▶ complement the spatial framework with a more detailed and exacting development management process where the merits of an individual proposal will be carefully considered against the full range of environmental, community, and cumulative impacts;
 - ▶ indicate the minimum scale of onshore wind development that their spatial framework is intended to apply to;
 - ▶ set out the criteria that will be considered in deciding all applications for wind farms of different scales, including extensions and re-powering; and
 - ▶ identify where there is strategic capacity for wind farms, and areas with the greatest potential for wind development, considering cross-boundary constraints and opportunities.
- 1.11 The Government has also produced Specific Online Advice relating to onshore wind turbines which has also informed the content of this guidance. These are regularly updated and comprise:
- ▶ **Process for Preparing Spatial Frameworks for Wind Farms** - This provides further advice on applying the methodology referred to in the SPP. This methodology has been followed in preparing the spatial frameworks for the LDP; and
 - ▶ **Onshore Wind Turbines** - This provides more detailed guidance in support of the requirements of SPP.
- 1.12 Scottish Natural Heritage (SNH) is the statutory adviser on landscape and biodiversity matters. SNH has produced a range of guidance and advice on landscape, visual assessment and biodiversity matters in relation to wind energy development. Application submissions will be expected to accord with this guidance and advice. A number of their key documents are listed in the Bibliography.

Local Level

- 1.13 The key local policy context is contained in the Clackmannanshire LDP which contains a number of potentially relevant policies including the following relating to renewable wind energy (please see Appendix 1 for the full text);
- ▶ SC14 (Renewable Energy)
 - ▶ SC15 (Wind Energy Development)
- 1.14 Under the terms of the Town and Country Planning (Scotland) Act 1997, as amended, applications for planning permission have to be determined in accordance with the development plan unless material considerations indicate otherwise. This Guidance as well as the other advice highlighted in this SG will constitute material considerations.
- 1.15 Table 2 provides details of other relevant local policy guidance and legislation which may be relevant in the consideration of proposals.

TABLE 2 - Relevant Local Policy Guidance and Legislation

Local Policy
▶ Clackmannanshire Local Development Plan
▶ Supplementary Guidance
▶ Clackmannanshire Sustainability and Climate Change Strategy
▶ Clackmannanshire Local Biodiversity Action Plan
▶ Clackmannanshire Open Space Strategy
▶ Core Paths Plan
Legislation
▶ Town and Country Planning (Scotland) Act 1997 as amended by the Planning etc (Scotland) Act 2006
▶ Climate Change (Scotland) Act 2009
▶ Environmental Impact Assessment (Scotland) Regulations 2011, as amended.
▶ Electricity Act, 1989
▶ Town and Country Planning (General Permitted Development) (Scotland) Order 1992, as amended.
▶ Water Environment and Water Services (Scotland) Act 2003



SUPPLEMENTARY GUIDANCE 2

1.16 A study of the Sensitivity of the Clackmannanshire Landscape to Wind Turbine Development was commissioned by the Council with the support of SNH. This study has informed the Council's approach to the preparation of the LDP and the guidance contained in this SG. The Study included detailed analysis of the sensitivity of the Clackmannanshire landscape to satisfactorily accommodate different types of wind energy development as well as providing siting and design guidelines for each of the defined Landscape Character Areas (LCA). This information has been included within the SG to help guide development to the most appropriate locations in terms of landscape and visual impacts. The study is also a material consideration in the determination of planning applications. It is available online at www.clacksweb.org.uk.

1.17 In order to assess the landscape capacity to accommodate different scales of wind energy development, the study identified a number of typologies which were considered to best represent the likely types of development. These are based on the height or number of turbines since these factors most closely influence the landscape and visual impact of proposals. These typologies have been used for the purposes of producing the SG and the spatial frameworks and are shown in Table 3.

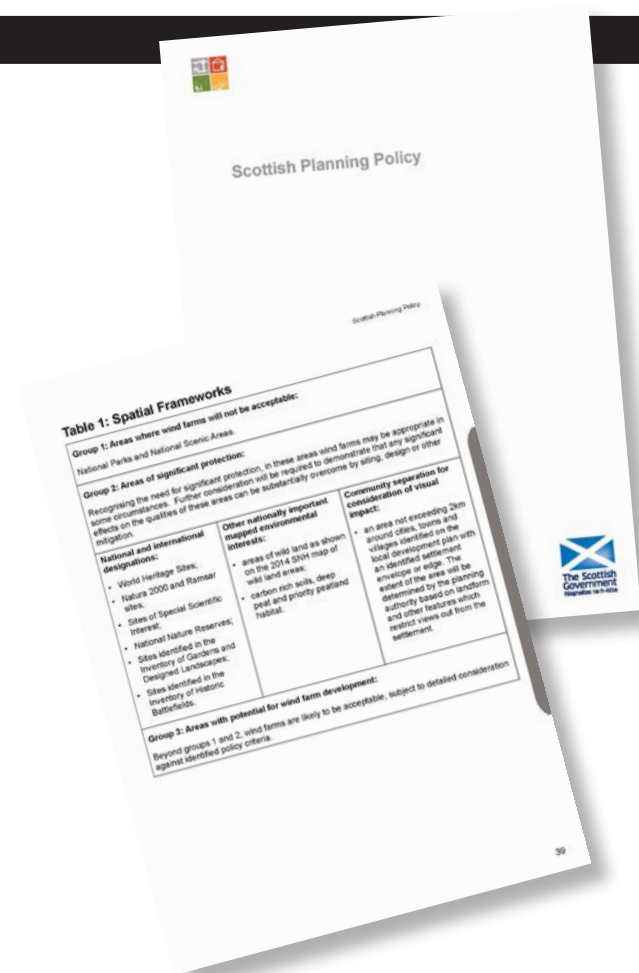
Table 3 - Wind Turbine Development Typologies

	Single Turbine	Cluster (2-5 turbines)	Wind Farm (6+ turbines)
Small Turbine (20-50m to tip)	Single small turbine	Cluster of small turbines	Wind Farm of small turbines
Medium Turbine (51-80m to tip)	Single medium turbine	Cluster of medium turbines	Wind Farm of medium turbines
Large Turbine (over 80m to tip)	Single large turbine	Cluster of large turbines	Wind Farm of large turbines

2.0 The Spatial Frameworks for Wind Energy

What is a Spatial Framework?

2.1 A Spatial Framework is a map based assessment of the potential opportunities for wind energy having regard to a number of planning constraints. A Spatial Framework is intended to apply spatial constraints geographically to help inform developers of the areas that are likely to be most appropriate for onshore wind energy development. However, the presence of constraints affecting a site does not imply an automatic blanket ban on wind energy development. The degree of restriction will vary with the nature and type of constraint and with the proposed design and scale of the development and it will be for developers to satisfy the Council that the development would not result in any unacceptable adverse impact on these constraints or that the impact could be effectively mitigated without damaging the integrity of that constraint.



The Council’s approach to Preparing the Spatial Frameworks

2.2 SPP3 states that planning authorities should set out in their development plan a Spatial Framework for onshore wind farms which should indicate the minimum scale of development that the Spatial Framework is intended to apply to. The Landscape Sensitivity Study (LSS) has provided a detailed analysis to inform the consideration of Spatial Frameworks for small and medium turbines as well as large turbines. It is considered that smaller scale wind turbine development, including clusters or single large turbines, could all result in significant individual or cumulative impacts due to their scale, appearance or operation and that there will be continued demand for wind energy development across a variety of scales as part of the government’s strategy to tackle climate change. This Guidance therefore applies to all wind development from single turbines to large wind farms where the height to the tip of the turbine is more than 20 metres.

2.3 The Council has followed the methodology contained in SPP3 (2014) to produce the Spatial Frameworks contained in this Supplementary Guidance. They are therefore slightly different from those in the LDP, which were prepared using guidance from 2012 and associated Online Advice published by the Scottish Government. It is intended to update the Spatial Frameworks within the LDP to reflect the methodology in SPP3 but this could not be completed concurrently with the SG. This is set out in more detail in Appendix 2 and a summary of the process is contained in Table 4.

TABLE 4 - Spatial Frameworks

<p>Group 1: Areas where wind farms will not be acceptable: National Parks and National Scenic Areas.</p>		
<p>Group 2: Areas of significant protection: Recognising the need for significant protection, in these areas wind farms may be appropriate in some circumstances. Further consideration will be required to demonstrate that any significant effects on the qualities of these areas can be substantially overcome by siting, design or other mitigation.</p>		
<p>National and international designations:</p> <ul style="list-style-type: none"> ▶ World Heritage Sites; ▶ Natura 2000 and Ramsar sites; ▶ Sites of Special Scientific Interest; ▶ National Nature Reserves; ▶ Sites identified in the Inventory of Gardens and Designed Landscapes; ▶ Sites identified in the Inventory of Historic Battlefields. 	<p>Other nationally important mapped environmental interests:</p> <ul style="list-style-type: none"> ▶ areas of wild land as shown on the 2014 SNH map of wild land areas; ▶ carbon rich soils, deep peat and priority peatland habitat. 	<p>Community separation for consideration of visual impact:</p> <ul style="list-style-type: none"> ▶ an area not exceeding 2km around cities, towns and villages identified on the local development plan with an identified settlement envelope or edge. The extent of the area will be determined by the planning authority based on landform and other features which restrict views out from the settlement.
<p>Group 3: Areas with potential for wind farm development: Beyond groups 1 and 2, wind farms are likely to be acceptable, subject to detailed consideration against identified policy criteria.</p>		

Source: Table 1: Spatial Frameworks, Scottish Planning Policy 3 (2014)

SUPPLEMENTARY GUIDANCE 2

2.4 The Spatial Frameworks are created by mapping the constraints for each group collectively to identify any Areas where wind farms will not be acceptable or Areas of significant protection. Any remaining areas not covered by these groups would be defined as Areas with potential for wind energy development. In undertaking this process, it was decided to apply the constraints to all of the turbine typologies in Table 3 but to differentiate where practicable between the three turbine height typologies i.e. large, medium and small. It was concluded that the same constraints should be applied to both large and medium height turbines due to the relative similarity of impact that turbines in either of these typologies could have, having regard to the findings of the LSS. The LSS concluded that there was higher landscape sensitivity across the majority of the landscape character areas for most of the typologies for large and medium turbine heights. For small turbine height typologies, the same constraints were applied in each stage, except Group 2 where a separation distance of 1km around settlements was applied rather than 2km.

2.5 Given the results of the above approach, two Spatial Frameworks were produced (see maps 1 and 2); one which applies to both large and medium height turbine typologies and the other which applies to small height turbine typologies showing Areas of significant protection and Areas with potential for wind energy development for each typology.

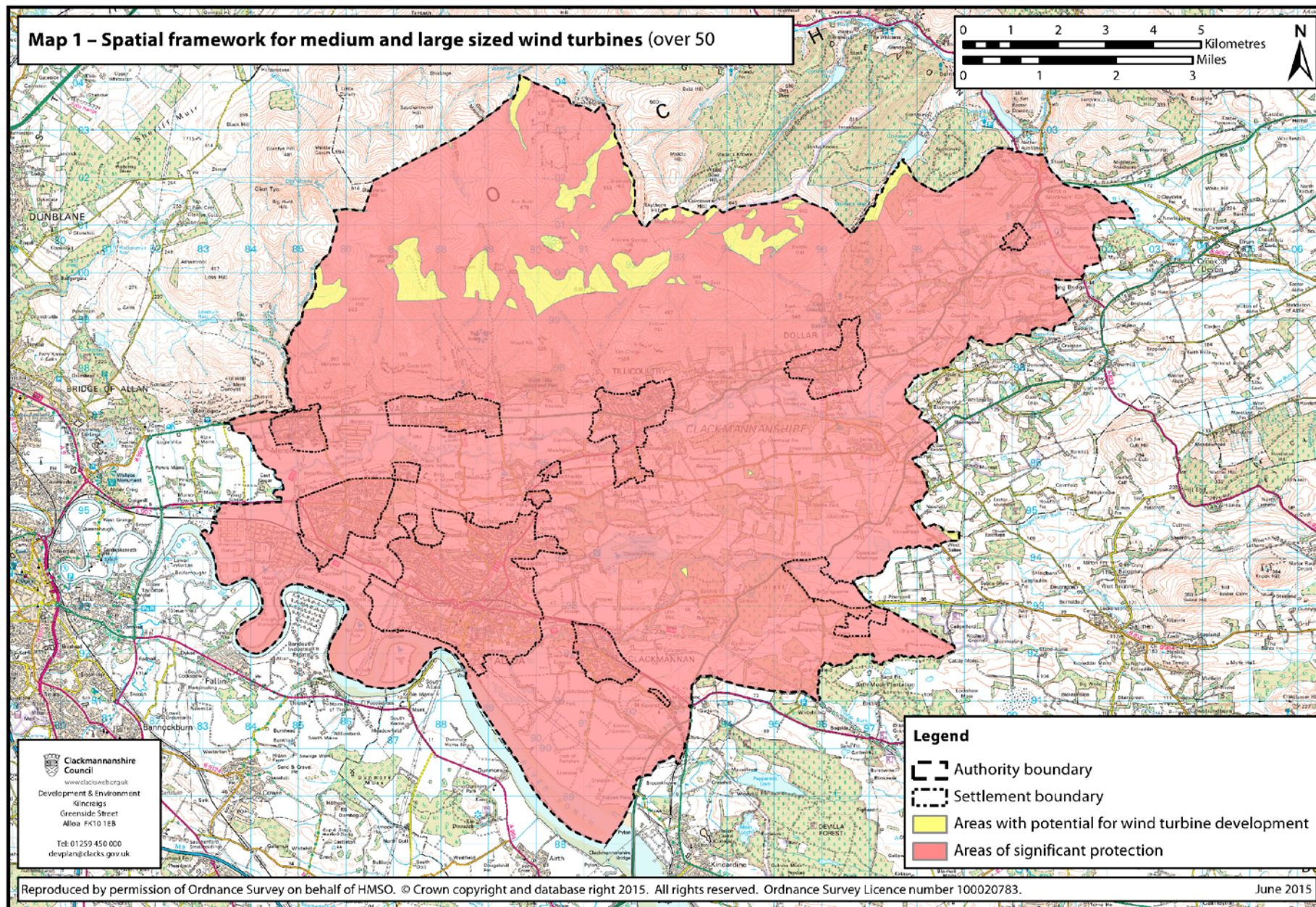
2.6 Areas of of significant protection do not equate to a blanket restriction on wind turbine development in these areas but it will be for developers to demonstrate that any significant effects on the qualities of these areas can be substantially overcome when assessed against the criteria contained in LDP Policies SC14 and SC15, the guidance in Section 3.0 below and the relevant siting and design guidance in the LSS. Conversely, areas identified as having potential for wind energy development do not imply a presumption in favour of granting planning permission for development in these areas but recognises that they contain the least constraints and to accommodate this wind turbine development.

2.7 The resulting boundaries of the “Areas” are essentially broad brush in nature and it is recognised that a more detailed landscape assessment may demonstrate where opportunities may or may not exist to accommodate wind turbine development, subject to satisfying any other relevant constraints. The LSS includes a more detailed analysis of the relative sensitivity of each of the LCAs, including those containing designated landscapes, to wind turbine development and includes siting and design guidelines for the various wind turbine typologies. This should guide developers to those areas which are likely to be more suitable for wind energy development.

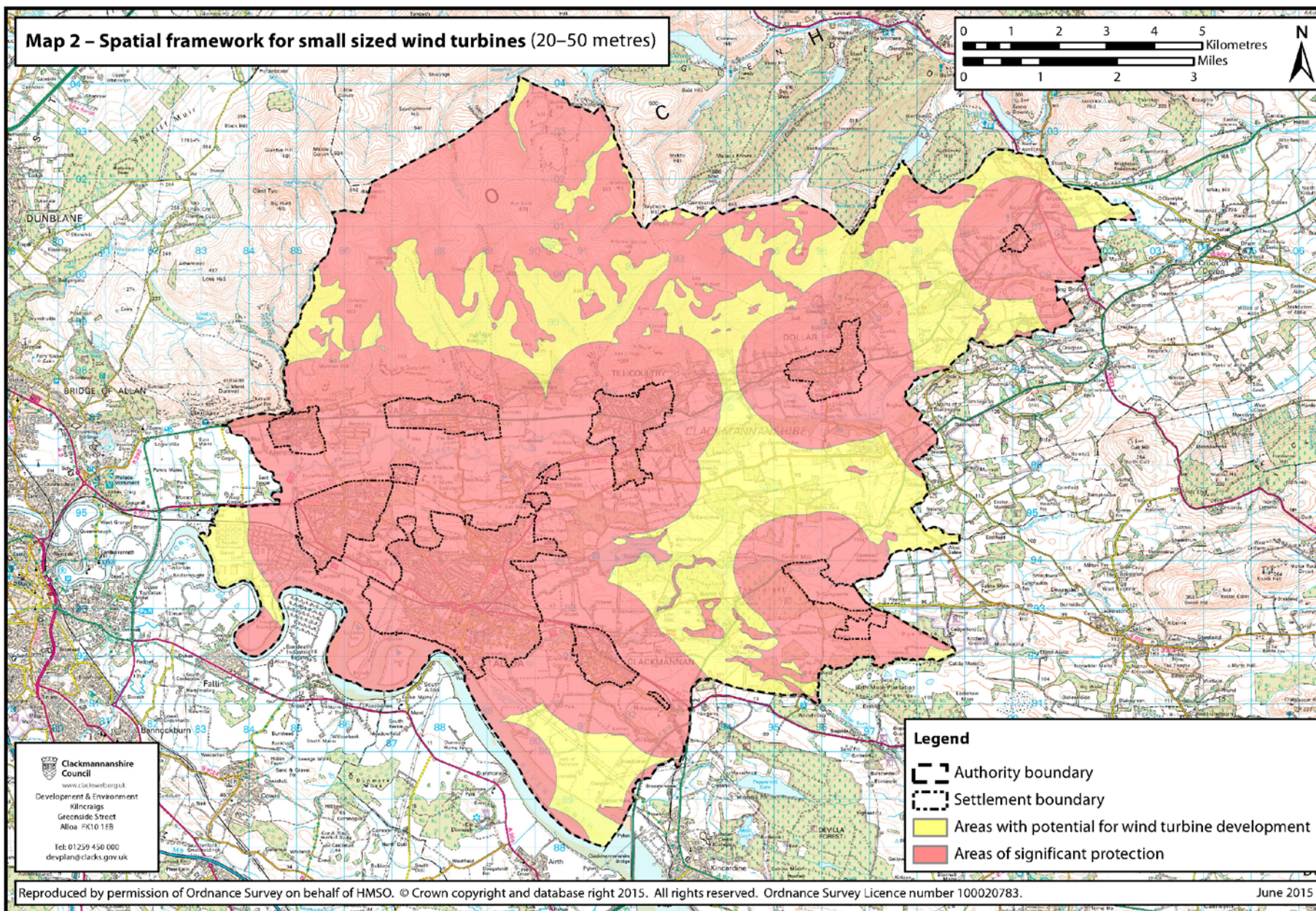
2.8 The Spatial Frameworks have been produced to help guide developers to the most appropriate locations and to spatially define the potential constraints to wind energy development identified in SPP3. Developers can identify which constraints may affect a particular site by reference to the Maps in Appendix 2. Wind energy proposals within Areas of significant protection are unlikely to be able to be satisfactorily accommodated. The two Spatial Frameworks are set out on the following pages.



SUPPLEMENTARY GUIDANCE 2



SUPPLEMENTARY GUIDANCE 2



3.0 Development Constraints and Requirements

3.1 This section provides further advice on the information and requirements that will usually be required in relation to any proposals for the turbine typologies contained in Table 3. These relate to key constraints, including those that were applied as part of the Spatial Framework process or referred to in the relevant LDP Policies related to wind energy development. The level of information required will vary depending on the scale of the development, the sensitivity of the location and the issues to be considered. Applicants should also have regard to the advice in Sections 4.0 and 5.0 below. Some of the advice may be applicable to turbine proposals below 20 metres in height. The section:

- provides a brief explanation of the nature of the constraint;
- identifies the main issues which developers need to address in applications;
- provides information on the criteria that the Council will normally apply to proposals and outlines any relevant policies in the LDP; and
- identifies other key advice or guidance published by relevant agencies. These are listed in the Bibliography by constraint type.

3.2 Landscape And Visual Impacts

3.2.1 Wind turbines can have significant landscape and/or visual impacts due to their design, scale, layout and motion. While research suggests there is a degree of subjectivity about whether these impacts are considered to be either positive or negative, it is undoubtedly the case that wind turbines have the potential to result in significant impacts on the landscape character or visual amenity of an area.

3.2.2 Landscape impacts are defined as changes in the fabric, character and quality of the landscape as a result of the development. Visual impacts relate solely to changes in available views of the landscape, and the effects of those changes on people. This includes the impact on visual amenity as enjoyed or experienced by receptors.

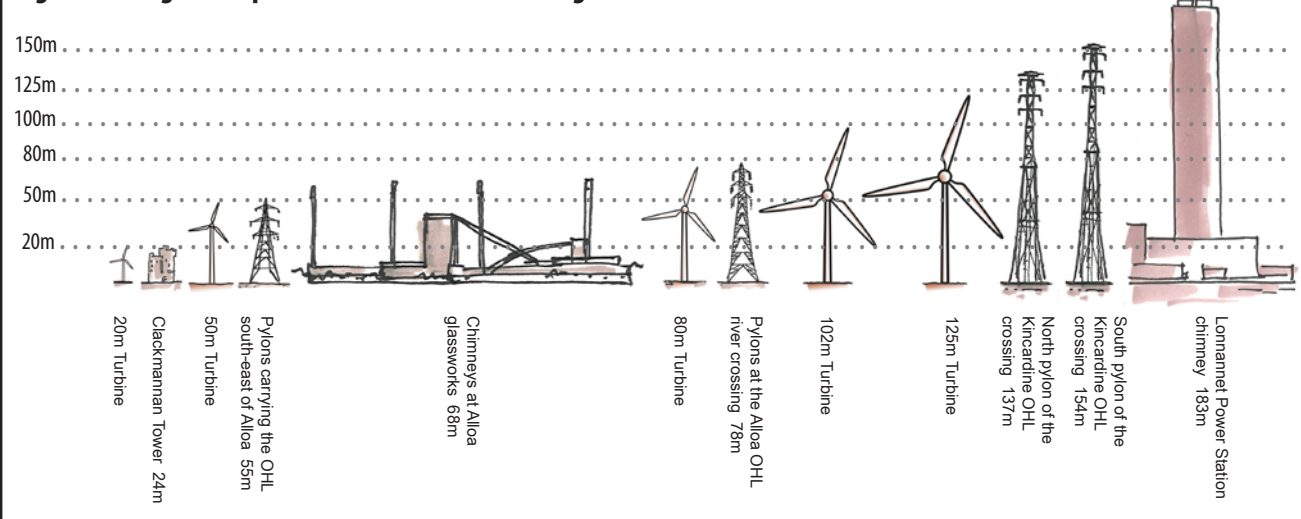
3.2.3 Any proposal for a wind energy development will be assessed to establish if it would result in an unacceptable significant adverse impact, either individually or cumulatively, on:

- local landscape character, as defined by the Landscape Character Assessment for Clackmannanshire;
- the visual amenity of the area;
- any Special Landscape Area defined in the LDP; and
- important viewpoints (including from settlements, public roads, cycle routes and core paths, popular viewpoints, tourist routes or visitor attractions).

3.2.4 The Clackmannanshire Landscape Sensitivity Study (LSS) was produced to help guide developers to the most appropriate locations in terms of landscape and visual impact. The Study was carried out in 2012, in accordance with the guidance in SPP (2010) and the Specific Advice on Preparing Spatial Frameworks which was relevant at the time. This has now been replaced by SPP (2014), although many of the findings of the study remain relevant and should be applied in relation to the newest SPP guidance. The advice was formulated following an assessment of the key characteristics of the component landscape character areas (LCAs) and their sensitivity to different scales of wind energy development. The Study identified seven landscape character areas which were derived from those defined in the Landscape Character Assessment. These are illustrated on the map in Appendix 4. The Study contains advice on the relative sensitivity of the landscape areas to wind turbine development and provides siting and design guidelines relating to the development typologies set out in Table 3. Where a proposal is for an extension to an existing development, the typology will be applied to the group as a whole.

SUPPLEMENTARY GUIDANCE 2

Figure 1 - Height Comparison Between Turbine Heights and Local Man Made Landmarks.



3.2.5 Figure 1 provides a comparative illustration of these different heights in relation to existing tall vertical features within and around Clackmannanshire.

3.2.6 The sensitivity of each landscape character area to the various development typologies has been considered and defined as having either;

- ▶ lower sensitivity,
- ▶ moderate sensitivity, or
- ▶ higher sensitivity.

The full results are illustrated in Appendix 5.

The table in Appendix 5 also provides siting and design guidance for wind energy development within each of the landscape character areas. In general, the advice indicates that:

- ▶ all of Clackmannanshire has higher sensitivity to new windfarm development for the three height typologies;
- ▶ there is only one LCA which has lower sensitivity to wind turbine development and this only applies to the small (single) turbine typology;
- ▶ there is moderate or higher sensitivity to all of the other typologies comprising clusters or single turbines; and
- ▶ the relative sensitivity of the landscape to the various typologies is generally consistent with the Spatial Frameworks. However, the siting and design guidelines in the Study does provide more detailed advice on where the sensitivity within each area may be lower for certain typologies.

3.2.7 It should be noted that this advice is based on landscape and visual impact issues only and these areas may be subject to other constraints. The advice should inform developers at the pre-application stage of the likely significance of landscape and visual impact issues in relation to their proposal. Sufficient information will have to be submitted with an application to demonstrate to the Council's satisfaction that the landscape and visual impacts would be acceptable. Applications will be expected to accord with the relevant guidance contained in the documents listed in the Bibliography in Section 6.0 below. A full landscape assessment will normally be expected for large turbine typologies and may be required for medium turbine height typologies. The Council can advise at the pre-application stage.

This would usually include:

- ▶ a Zone of Theoretical Visibility (ZTV) map(s) showing where the turbines could be seen from;
- ▶ viewpoint analysis from key locations, agreed in advance with the Council and SNH;
- ▶ computer generated wireline diagrams and /or photo montages to illustrate visual impact;
- ▶ details of the design of turbines and colour as well as other associated works such as access tracks, electricity connections, buildings and construction related works; and
- ▶ an assessment of the proposals conformity with the LSS, any relevant Landscape Character Assessments and any landscape designations which may be affected by the development.

SUPPLEMENTARY GUIDANCE 2

3.2.8 For small turbine typologies, a simplified assessment will normally be suitable which is appropriate for the scale of the development and the sensitivity of the location. This may still require a ZTV map covering a study area of at least 15km radius and photomontages or wirelines from a number of key viewpoints.

3.2.9 Wind turbines or wind farms can also have cumulative landscape and visual impacts. Cumulative effects can be expressed as follows:

- ▶ **In combination** - two or more turbines or groups of turbines which are seen by the observer from the same viewpoint at the same time;
- ▶ **Successive** - two or more turbines or wind farms are seen by an observer from the same viewpoint but only by turning to look in a different direction;
- ▶ **Sequential** - two or more turbines or wind farms are seen by an observer whilst travelling along a route, where no more than one may usually be seen at the time;
- ▶ **Wind Farm Landscape** - repeated views of wind farms can give travellers along a route the impression that it is now a wind farm landscape.

3.2.10 The potential cumulative landscape and visual impacts of proposed wind energy also have to be carefully considered. The analysis will usually include developments in association with existing, consented or proposals at application stage. The Council will normally expect all applications for wind farms or comprising large turbine typologies to contain a cumulative impact assessment. These issues could also be relevant in relation to smaller scale proposals where they may result in a number of turbines within the same typology within a LCA or where they may be a mix of turbines of differing sizes. In such circumstances, the Council may request that the developer submit a cumulative impact assessment. An assessment should consider;

- ▶ what the key cumulative impacts are likely to be in determining the application, and focus on those rather than identify every potential cumulative impact;
- ▶ the number and sensitivity of key visual receptors from which the turbine(s) are visible together or sequentially;
- ▶ the duration, frequency and nature of combined and sequential views on key routes or sensitive receptors;
- ▶ the relative impact of each wind farm with regard to landscape character and visual amenity; and
- ▶ the existing pattern of development.

3.2.11 The Government's Online Advice for Onshore Turbines states that "In areas approaching their carrying capacity the assessment of cumulative effect is likely to become more pertinent in considering new wind turbines, either as stand alone groups or extensions to existing wind farms..." and "In assessing cumulative landscape and visual impacts, the scale and pattern of the turbines plus the tracks, power lines and ancillary equipment will be relevant considerations. It will also be necessary to consider the significance of the landscape and the views, proximity and intervisibility and the sensitivity of visual receptors". Cumulative impacts could be a significant consideration in some areas. One such area is the Ochil Hills where there are a number of wind farm developments or applications within or near to this area, including the wind farm at Burnfoot Hill, within Clackmannanshire.



SUPPLEMENTARY GUIDANCE 2

3.3 Biodiversity

3.3.1 Wind energy development can impact on biodiversity interests in a variety of ways such as:

- ▶ loss or damage of habitat through the construction of turbines and associated infrastructure, e.g. access tracks, grid connection;
- ▶ disturbance of wildlife during construction or operation of the turbines;
- ▶ pollution risk during the construction process;
- ▶ bird strike during the operational phase; and
- ▶ whether these impacts can be significant either individually or cumulatively with other wind energy development in the area.

3.3.2 While renewable energy developments can help to tackle the causes of climate change and help reduce the impacts on existing biodiversity, any development should ensure that:

- ▶ it does not result in an unacceptable adverse effect on biodiversity and nature conservation;
- ▶ where a significant impact could occur, satisfactory mitigation or compensation would be provided to offset the impact;
- ▶ where appropriate, measures are included to enhance the existing biodiversity value of the site and its environs;
- ▶ where required, timeous surveys have been carried out to provide information on the ecological value of the site such as bird usage of the site for breeding, feeding, roosting or migration. These may require to be carried out well in advance of submission of the application; and
- ▶ the development accords with the relevant policy guidance in the LDP.

3.3.3 Clackmannanshire contains a number of internationally and nationally designated nature conservation sites. These comprise:

International Sites	National Sites
▶ Firth of Forth SPA	▶ Craigleith and Myreton SSSI, by Alva
▶ Firth of Forth Ramsar site	▶ Mill Glen SSSI, Tillicoultry
	▶ Damhead Wood SSSI, Dollar
	▶ Dollar Glen SSSI
	▶ Devon Gorge SSSI
	▶ Black Burn Wood and Meadows SSSI, Muckhart
	▶ Craigmad Wood SSSI, Clackmannan
	▶ Linn Mill SSSI, Clackmannan
	▶ Gartmorn Dam SSSI, Sauchie
	▶ Firth of Forth (Alloa Inches and Kennet Pans) SSSI



- 3.3.4 Due to the importance of these sites, they are defined as “Areas Of Significant Protection” in the Spatial Framework where proposals will be required to demonstrate that any significant effects on the qualities of these areas can be substantially overcome by siting, design or other mitigation. The areas are shown on Map 3 in Appendix 2. It should also be noted that development located outwith these designated areas could still impact on their habitat value or on the qualifying species of these areas. Advice is available from SNH on this issue, including their guidance titled “Assessing Connectivity with Special Protection Areas”, SNH, 2012. This provides advice on whether there could be connectivity between the proposal and dispersal and foraging or roosting distances by qualifying species.
- 3.3.5 Proposals which could affect the qualifying interests of internationally designated sites may require an Appropriate Assessment under the Habitats Directive. SNH will usually provide advice at the pre-application stage on whether Appropriate Assessment is required. The Bibliography contains details of some of the key documents which are available.
- 3.3.6 It will also be necessary to establish whether any European Protected Species (as defined by Annex IV of the Habitats Directive, 1994 as amended) are on the site and what impact the development would have on them before the planning authority can approve an application. This is likely to include an assessment of impacts on species such as bats, otter or great crested newts.

- 3.3.7 The **Clackmannanshire Local Biodiversity Action Plan** provides information on protected and priority species and habitats. Developers should also make reference to this plan at the scoping and application stages.
- 3.3.8 The provision of mitigatory or compensatory measures may be provided on or off site depending on the circumstances. Measures may be secured or managed through legal agreement with the Council. The appointment of a suitably qualified and experienced Ecological Clerk of Works to conduct and oversee pre-construction surveys, construction operations, agreed species and habitat mitigation measures, monitoring and decommissioning works will normally be required for larger scale developments or where there are significant nature conservation issues. SNH and RSPB have produced guidance on bird species distribution to assist developers in the design and scoping stage of any proposal. Links to this advice and other guidance on best or good practice are provided in the Bibliography.

3.4 Carbon Rich Soils

- 3.4.1 Wind energy developments can have significant impacts when built on areas with carbon rich soils (e.g. peat). The impacts can comprise:
- ▶ the damage or loss of important or sensitive habitat or species;
 - ▶ habitat loss due to changes to hydrology caused by the turbines and the associated infrastructure;
 - ▶ the release of carbon stored in the peat, reducing the carbon saving benefits of the renewable energy development; and
 - ▶ the generation of a waste product from surplus extracted peat, which has to be disposed of in an acceptable manner.



SUPPLEMENTARY GUIDANCE 2

3.4.2 Due to the current or potential value of these areas in terms of carbon storage and as habitat they have been identified as within “Areas of Significant Protection” in the Spatial Framework. The areas are shown in Map 5 in Appendix 2. Where proposed sites contain areas of carbon rich soil and the development could impact on the habitat value or levels of carbon storage, developers will be expected to provide sufficient information to demonstrate that the following issues have been satisfactorily addressed;

- ▶ the risk of degradation to the resource and the scope to enhance or restore the value of the habitat or a suitably sized area nearby. This may require a suitable Construction and Environmental Management Plan incorporating a Peat Management Plan;
- ▶ the risk of peat slide hazard due to the development. The Scottish Government has published guidance on how to assess this impact;
- ▶ what the predicted carbon impact associated with the development would be. This should be calculated using the methodology published by the Scottish Government;
- ▶ the disturbance of peat has been kept to the minimum practicably necessary and its re-use follows best practice. SEPA has published guidance on this issue; and
- ▶ the proposal satisfies the requirements of LDP Policies SC14 and EA13.

3.4.3 Early discussion with the Scottish Environment Protection Agency (SEPA) and SNH is recommended where developments are likely to affect peat land or mire systems. Developers will be expected to comply with the relevant guidance including that published by SEPA and SNH. The Bibliography highlights some of the key documents.

3.5 Water Environment

3.5.1 The construction of turbines and associated works such as access roads and underground cabling have the potential to impact on the water environment e.g. watercourses, lochs, wetlands, ground water and riparian areas. These impacts may occur for a temporary period such as during the construction phase or permanently, once the site is operational. The development may impact on the hydrology and / or the hydrogeology of the area and the types of impacts can include;

- ▶ wetland degradation;
- ▶ pollution of watercourses;
- ▶ degradation of public or private drinking water supplies;
- ▶ drainage impacts;
- ▶ increase of flood risk; and
- ▶ reducing the ecological status of the water body.

3.5.2 Developers will be expected to satisfactorily demonstrate that the development would not have any permanent adverse impacts on the water environment. Where temporary impacts cannot be avoided, developers will be expected to provide sufficient information to demonstrate how these impacts will be satisfactorily mitigated. The level of information will largely depend on the potential scale of any impact and the characteristics of the site.

3.5.3 The Water Framework Directive requires maintenance of the good ecological status of water bodies and consideration of any impacts on the hydromorphological and hydrological processes. Since these matters may be a constraint to wind energy development, developers should ensure that they are considered early in the development process.

3.5.4 Specific advice has been published by SEPA, who also have a regulatory role over these issues. Guidance can also be obtained in the Council’s SG on Water. Activities which may impact on wetland sites protected for nature conservation are primarily dealt with by SNH. Developers will be expected to comply with relevant guidance including that published by SEPA and SNH. The Bibliography highlights some of the key documents.

3.6 Communities: Settlements and Other Residential Receptors

- 3.6.1 Wind energy development can result in a number of impacts at the construction or operational phases which can affect residential amenity including:
- visual impact;
 - noise;
 - shadowflicker; and
 - construction related traffic
- 3.6.2 Developers will have to demonstrate that their proposal would not unacceptably affect the amenity of neighbouring communities or of individual or groups of houses having regard to impacts from visual and landscape impact, views, noise, public safety and shadowflicker. The Bibliography highlights some of the key advice and documents which applications should comply with.



Proximity and Visual Impact

- 3.6.3 The considerations relating to proximity are discussed in paragraph 1.5 in Appendix 2. The Council has applied a 2km separation distance from the edge of settlements to large and medium height turbine typologies and a 1 km separation distance from small height turbines. Land within the separation distances have been defined in SPP3 as Areas of significant protection. The separation distances should not be interpreted as an absolute constraint and national and local policy guidance does not recommend a minimum distance between turbines and residential properties or other sensitive uses for visual amenity reasons. Deciding on an acceptable distance may depend on a number of factors, including turbine height, layout, topography, the screening effect of other buildings or vegetation, the extent of visibility within a given field of view, and whether the occupants have an interest in the development. Other factors such as noise impact or shadowflicker may also be relevant. Consequently, a minimum separation distance has not been specified in this SG.

Noise

- 3.6.4 The key noise sensitive receptor will normally be nearby residential properties but locations such as workplaces, educational establishments and visitor attractions or recreational routes should also be treated as noise sensitive. Development which would have significant long term detrimental noise impacts are unlikely to be approved.

- 3.6.5 There are two main types of noise sources from a wind turbine;

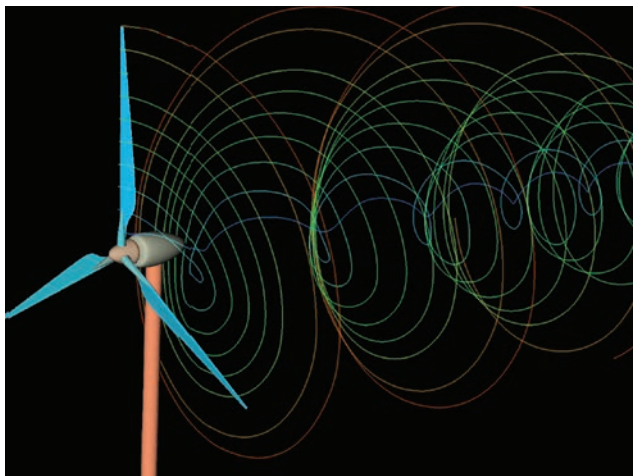
- the mechanical noise produced by the gearbox and generator, and
- the aerodynamic noise produced by the passage of the blades through the air. Aerodynamic noise can vary according to wind speed and location.

Noise impact is dependant on factors such as the turbine model, local topography and land cover and the climate conditions. Scottish Government guidance expects planning authorities to assess and rate the noise from wind farm development based on the framework “*The Assessment and Rating of Noise from the Wind Farms (Final Report, 1996, DTI), (ETSU-R-97)*”, until such time as an update is available. It should be noted that this approach is based on indicative noise levels thought to offer a reasonable degree of protection to wind farm neighbours, without placing unreasonable burdens on wind farm developers, and suggests appropriate noise conditions. The Council will also have regard to Planning Advice Note (PAN) 1/2011 which provides advice on the role of the planning system in helping to limit the adverse effects of noise. The PAN also states that the associated Technical Advice Note should be used to assess new potentially noisy development. The Note contains a methodology to use in making an assessment of the significance of impact. Further advice is contained in the IOA’s report titled “*A Good Practice Guide For the Assessment and Rating of Wind Turbine Noise*” (May 2013).

SUPPLEMENTARY GUIDANCE 2

3.7.6 In view of the number of factors to be considered in assessing likely noise impact, the scope of the noise assessment in support of any application will be considered on a case by case basis. Site specific noise assessment will normally be required to enable the Council to establish whether the impact on the nearest sensitive receptors would be acceptable or could be satisfactorily mitigated. Further advice on the scope of the noise assessment for a particular proposal can be obtained from the Council.

3.7.7 Certain elements of noise impact, comprising low frequency noise and Amplitude Modulation (“blade swish”), have been the subject of research in response to concerns about their impact. The Scottish Government’s Specific Online Advice highlights that the research has not produced evidence of significant adverse health effects arising from these elements. On the basis of this advice, the Council will continue to consider these issues as part of the overall assessment of noise impact.



Shadowflicker

3.6.8 Under certain combinations of geographical position, time of day and time of year, the sun may pass behind the rotor and cast a shadow over neighbouring properties. When the blades rotate, the shadow flicks on and off, creating “shadowflicker”. It only occurs within buildings where flicker appears through a window opening. The Council will normally require turbines to be sited to avoid creating the effect.

3.6.9 The Scottish Government online advice states that in most cases, where separation is provided between turbines and residential or other sensitive properties of at least 10 times the rotor blade diameter, the effect should not be a problem. Where this separation would not be achieved, or the Council consider that the effect could be a problem, developers should provide calculations to quantify the effect. The developer will be required to demonstrate that the impact would be acceptable and the Council will normally ensure that appropriate mitigation measures are put in place. This could include regulating the operation of the turbine(s) to avoid the effect.

Interference with other Communication Systems

3.6.10 The siting of wind turbines must have regard to radio, TV, telecoms and other communication systems. Developers should make direct contact with the relevant authorities or bodies which may be affected, including the local emergency services. Ofcom is responsible for protecting the wireless spectrum from interference and they can provide advice of the operators that developers should contact. The Joint Radio Company can undertake joint screening for telemetry or microwave links used by energy utilities. Developers will be expected to resolve any potential issue with the relevant operators or, in the case of interference with TV signal, with individual occupiers. Contact details have been provided in Section 6.0 below.

3.7 Green Belt

3.7.1 The purpose of the Green Belt is to:

- ▶ direct planned growth to the most appropriate locations and support regeneration;
- ▶ protect and enhance the quality, character, landscape setting and identity of settlements; and
- ▶ protect and give access to open space within and around settlements.

3.7.2 Wind energy development has the potential to adversely impact on these objectives, particularly in terms of protection or enhancement of the character, landscape setting and identity of settlements. The areas of Green Belt are shown on Map 7 in Appendix 3.

3.7.3 Proposals should not adversely affect the objectives of the Green Belt having regard to the requirements of LDP Policies SC14, SC15 and EA8. Where the Council is satisfied that a proposal would not adversely affect the objectives of the Green Belt and would comply with the relevant LDP policies, development will be expected to include measures which would make a significant contribution to the improvement of the character and quality of the Green Belt and contribute to the Green Infrastructure objectives as required by LDP Policy EA8 (Green Belt). This approach will apply to all turbine proposals. However, for small single turbines, consideration will be given to the potential impact on the objectives of the Green Belt designation and the sensitivity of the surrounding landscape to accommodate the development.

3.8 Aviation and Radar Issues

3.8.1 Due to their height and operation, wind turbines can affect aviation interests either as a physical obstruction in airspace or affecting radar and communication systems. These potential impacts need to be evaluated as part of the planning process in consultation with the appropriate civil and military authorities. Proposals which will have an adverse impact on aircraft safety or navigation and other related radar installations and for which there is no reasonable prospect of satisfactory mitigation, will normally not be supported. This approach is reflected in LDP Policy SC14.



3.8.2 Developers should discuss these matters with the relevant bodies at the pre-application stage so that any issues have been identified and any necessary mitigation has been agreed with the relevant body. The Bibliography refers to useful guidance. The main issues affecting Clackmannanshire are:

- ▶ the safeguarding zones for Edinburgh and Glasgow airports. The whole of the Council area falls within one of these airport consultation zones and a central area falls within both zones. These areas are shown in Map 10 in Appendix 3;
- ▶ the operation of air traffic control services in controlled airspace. This is operated by National Air Traffic Services (NATS) (En Route) Plc (NERL). NATS provide a pre-planning service to highlight any potential issues on their website. They will be consulted on most wind energy applications;
- ▶ the Civil Aviation Authority (CAA) which is responsible for providing advice about aviation safety. This advice is set out in its policy CAP 764. It no longer deals with individual pre-planning consultations and has produced a guidance document (CAA Advice for Pre-Planning 2010) which sets out what is expected of developers;
- ▶ the Ministry of Defence. Although the area is not identified as being part of an area of tactical training, parts are within its Low Flying Area. The MoD require to be consulted where a proposal is 11 metres to blade tip or taller, or has a rotor diameter of 2 metres or more; and
- ▶ the safeguarding zone for Munduff Hill meteorological radar located near Kinross. which is operated by the Ministry of Defence. The zone includes a small area in the north east of Clackmannanshire.

SUPPLEMENTARY GUIDANCE 2

3.9 Heritage Issues

3.9.1 Developers will have to demonstrate how the development can be accommodated without directly or indirectly harming the character, landscape setting and context of historic environment assets including:

- ▶ Inventory of Gardens and Designed Landscape sites;
- ▶ listed buildings and their settings;
- ▶ scheduled ancient monuments and their settings;
- ▶ Conservation Areas, especially where the reasons for designation would be affected;
- ▶ archaeological sites on the Sites and Monuments Record (of regional or local importance); and
- ▶ Inventory of Historic Battlefields sites.

3.9.2 Sites identified in the Inventory of Gardens and Designed Landscapes have been included as a constraint in identifying the Areas of significant protection in the Spatial Framework in the LDP (see Map 6, Appendix 3). The LDP Policies relating to built heritage will also be relevant to the consideration of any impacts on heritage interests. In order to assess impacts on archaeological interests, developers should undertake an initial desk-based study. This will inform whether further assessment is required. Further advice can be obtained from the Regional Archaeologist. Applications will be expected to accord with the relevant advice set out in the Bibliography.

3.10 Tourism and Recreation

3.10.1 The assessment of any adverse impact on tourism and recreation interests is one of the criteria contained in LDP Policy SC14 which will be applied to any wind energy application. Where considered necessary, the Council may request that an application include an assessment of the potential impact on specified tourism and/or recreation interests in order to demonstrate that if approved, the development would not result in an unacceptable adverse impact or that measures could be provided by the developer to satisfactorily mitigate the impact. This could include impacts on activities associated with outdoor access as well as visitor related facilities. While the key impacts are likely to relate to landscape and visual issues, the issues of noise, construction work on or near routes and cumulative impact may also be relevant.

3.10.2 Important recreational assets include Gartmorn Dam Country Park, the Woodland Park, Alva and the Ochil Hills. They are also recognised for their tourism value which is linked to the landscape quality of this area. Developers should also consider the potential impacts on other visitor routes and attractions, national cycle routes, core paths and routes enjoyed by recreational users under the Land Reform Act where relevant. Developers are also encouraged to consider whether the development could have positive impacts on tourism or recreation as part of the proposals or as proposed mitigation. These impacts comprise one of the criteria contained in LDP Policy SC14.

3.11 Additional Guidance

Design

3.11.1 Design is a material consideration in the planning process and good siting and design of wind energy development is important to help deliver the renewable targets in a manner which satisfactorily addresses environmental and cumulative impacts. Although development of over 20MW capacity must contain a Design Statement, it is recommended that one is prepared for any wind energy applications comprising medium or large turbines. This should include a description and analysis of the design process, including what alternative design and layouts were considered and what other locations were considered.

Safety

3.11.2 Safety issues must be considered in the siting and design of proposals. The scale of the potential risks may depend on the proximity of the development to sensitive locations and the applicant will be expected to demonstrate the following requirements:

- ▶ **Ice throw** - include details of the evaluation of the safety hazard and measures to mitigate the risk from icing on turbine blades;
- ▶ **Structural Damage** - turbines should be at least the height to blade tip plus 10% from neighbouring land, public roads, railway lines, gas transmission underground pipelines and high voltage overhead power lines. Pre- application consultation should be undertaken with any relevant operator to clarify whether the development may effect the infrastructure or what mitigation may be required.

Restoration and Decommissioning

3.11.3 Applications should include details of the proposed arrangements to satisfactorily restore the site following construction work and after decommissioning as required by LDP Policy SC14. The scale and scope of these works will largely depend on the scale of the development. Restoration works will be expected to enhance the pre-development environmental quality or value of the site. Developers will have to provide details of the arrangements to decommission and restore the site, including the turbines and any other associated infrastructure at the end of the lifespan of the development. Where an application is approved, the Council will usually impose a condition requiring the decommissioning, restoration and aftercare of the site at the expiry of the lifespan of the development or in the event of the development ceasing to operate for a specified period.

3.11.4 The Council will also normally seek to ensure that, when granting permission, arrangements are in place to ensure the development can be decommissioned and the site satisfactorily restored including aftercare in the event that the developer or landowner cannot do so. An index linked financial guarantee will normally be required for development consisting of either medium or large turbine clusters or wind farms. Permission will not normally be granted until a bond of caution (Bond) or irrevocable letter of credit from an appropriate bank has been received.

Grid Connection

3.11.5 Applications should include details of the proposed design and route of the connection to the grid and, where considered appropriate, an assessment of their potential environmental impacts whether the applicant will be responsible for installation of the connection or not. Routes should be selected to avoid visually or ecologically sensitive areas and consideration should be given to underground grid connections where possible. The Council will treat the potential impact of the grid connection as a material consideration in the determination of an application.

Community Benefit

3.11.6 Developers are expected to work closely with local communities to explore how wind energy schemes can enhance or benefit community interests in response to their use of the local resource and for the disruption that may occur during the construction and operation of the development. It is likely that the scope or level of funding or benefit will be dependent on the scale of the development and may not be viable for a small scale development. The Scottish Government has published a database online of the type and scale of community benefit from wind energy development nationally which should provide useful information for developers in considering the potential for their development. However, the planning authority can only treat the offer of such benefits as a material consideration in the determination of the application if it meets all of the tests set out in paragraphs 14 to 25 of Circular 3/2012 (Planning Obligations and Good Neighbour Agreements).



SUPPLEMENTARY GUIDANCE 2

Transport and Access

3.11.7 Applicants must ensure at an early stage in the process that the site access and site accessibility arrangements will be acceptable to the Council's Roads Section and the Trunks Roads Authority in terms of any abnormal load impact on public roads or from other construction related traffic. Developers may be required to submit a Traffic Management Plan or Transport Assessment depending on the scale of the development and associated traffic impacts. Developers should liaise with the Roads Service at the pre-application stage to agree the extent and nature of mitigation measures such as improvements, strengthening or repair. Developers should include measures to reduce the impacts of construction related traffic on the road network and communities where practicable and suitable, such as the use of on-site borrow pits and on-site concrete batching.

Mitigation

3.11.8 Where mitigation is proposed by developers to address adverse impacts of the development, the Council will require to be satisfied that the mitigation will be effective throughout the lifetime of the development. The Council will secure mitigation using planning conditions and/or a legal agreement. Developers should consider at an early stage the scope for either on-site or off-site mitigation having regard to land ownership interests.

4.0 Smaller Scale Wind Turbine Applications

4.1.1 The guidance contained in this SG and the Spatial Frameworks in the LDP applies to all of the typologies in Table 3 on page 6. However, it is recognised that the content and scope of information or the analysis of issues will be partly dependent on the proposed height and scale of the development. The Council will try to ensure that its information requirements are proportionate to the scale of the potential impacts. SNH has published guidance titled "Assessing the impact of small-scale wind energy proposals on the natural heritage", February 2012, which should be used by applicants to inform the scope of information to be included in their application.

5.0 Submission of a Planning Application

Pre-application stage

5.1.1 While developments classified as Major Development are required by statute to be subject to pre-application consultation with the local community and other interests, community engagement is encouraged for all wind energy development covered by this SG. The scope of engagement will be dependent on the scale and extent of any potential impacts. The Council recommends that developers contact the Development Quality team to seek pre-application advice.

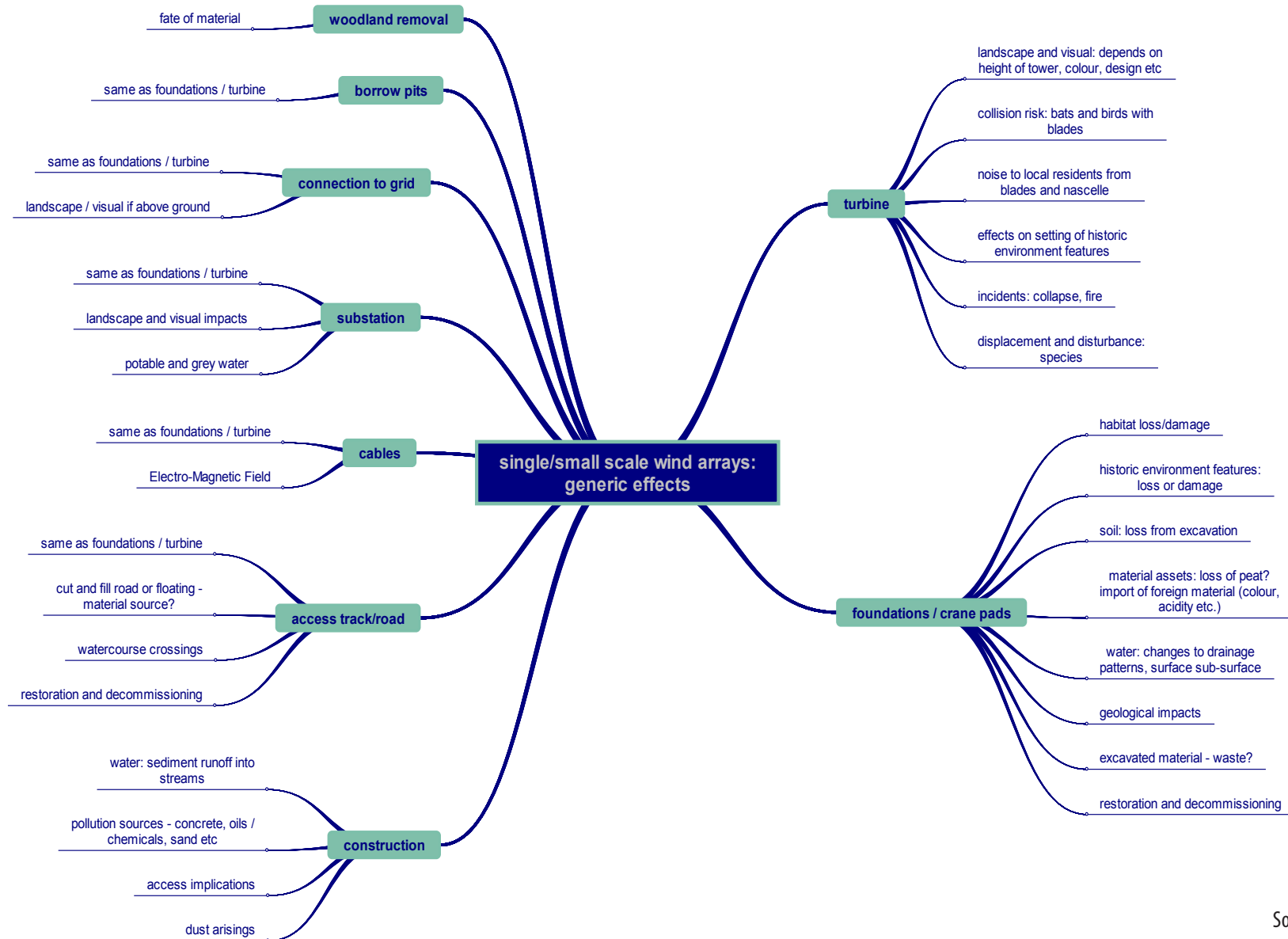
Scope of Supporting Information

5.1.2 The main issues which are likely to need to be addressed in a planning application for wind energy development are;

- ▶ landscape and visual impacts
- ▶ biodiversity and geodiversity
- ▶ the water environment
- ▶ communities and residential interests
- ▶ noise
- ▶ aviation and defence interests
- ▶ shadowflicker
- ▶ communications
- ▶ cumulative impacts
- ▶ heritage issues
- ▶ access and transport

5.1.3 Developers should be aware that even for smaller scale developments, sufficient information is required in order to be able to properly assess the potential impacts. Figure 2 provides a useful guide to some of the issues that are associated with most wind energy development typologies and that may need to be addressed. The Bibliography contains details of some of the guidance published relating to these issues.

Figure 2 - Potential Planning issues which may need to be addressed as part of a wind turbine development.



Source : Scottish Government advice on EIA

SUPPLEMENTARY GUIDANCE 2

5.1.4 If there is insufficient or inadequate information with an application this will at best lead to delay or at worst contribute to the refusal of the application.

The scope of any application should therefore be discussed with the Council having regard to the advice contained or referred to in this document. The scope of the information may depend on the specific circumstances of the proposal or the sensitivity of the location of the site. The Council can also request further information be provided once the application has been submitted. The following information will normally be required:

- ▶ accurate location plan;
- ▶ full drawing elevations;
- ▶ external finishes and materials;
- ▶ construction and access details;
- ▶ adequate landscape and visual impact information - see section 3.2 above. The scope of the information will be dependent on the height of the turbines and the sensitivity of the location;
- ▶ details of noise impact and mitigation measures;
- ▶ depending on location, an assessment of potential impact on biodiversity interests including protected species and habitats.

Need for Environmental Impact Assessment

5.1.5 Under the provisions of Schedule 2 of the Environmental Impact Assessment (Scotland) Regulations 2011, the Council is required to consider whether an Environmental Impact Assessment (EIA) is also required to accompany a planning application where there are more than 2 turbines or where the hub height of any turbine exceeds 15 metres. In such cases the Council has to determine whether the proposal is likely to have significant impacts on the environment by virtue of factors such as its size, nature and location. Developers can seek a screening opinion from the Council prior to the submission of an application to establish as to whether an EIA is required. The Government has published a [screening checklist](#) on its website to help developers and planning authorities undertake this process. If EIA is required, the developer is encouraged to seek a scoping opinion from the Council which will identify the key issues which should be covered in the EIA. Further guidance can be obtained in PAN 1/2013 'Environmental Impact Assessment' - EIA. EIA is likely to be required for larger scale developments and less likely to be required for single small or medium single turbines but it will ultimately depend on the above test of likely significance.



6.0 Further Information

6.1 Useful Contacts

Organisation	Contact	Email	Telephone
Clackmannanshire Council Development Quality:	Keith Johnstone, Principal Planner	development_services@clacks.gov.uk	01259 452614
Clackmannanshire Council Sustainability:	Gordon Roger, Planning Officer	Sustainability@clacks.gov.uk	01259 452638
Clackmannanshire Council Environmental Health:	Suzanne McIntyre, Environmental Health Officer	ehealth@clacks.gov.uk	01259 450000
Clackmannanshire Council Roads and Transportation:	Stuart Cullen, Roads Development Officer	scullen@clacks.gov.uk	01259 452593
Clackmannanshire Council Regional Archaeologist:	Murray Cook, Planning Officer,(Archaeology)	cookm@stirling.gov.uk	01786 442752
Scottish Natural Heritage	Renewable Energy Casework Officer	FORTH@snh.gov.uk	01786 450362
SEPA	SEPA Planning Service	planning.se@sepa.org.uk	01738 627989
NATS		NATSwindfarms@nats.co.uk	
Ministry of Defence		DIO-Safeguarding-Wind@mod.uk	0121 311 3847
Glasgow Airport	Kirsteen MacDonald, Safeguarding Manager	GLAsafeguarding@glasgowairport.com	0141 842 7960
Edinburgh Airport	Iain Coutts, Safeguarding and Assurance Officer	edicommunications@edinburghairport.com	0131 333 3360
Ofcom		Spectrum.Licensing@ofcom.org.uk	020 7981 3040
Joint Radio Company		windfarms@jrc.co.uk	020 7706 5199

SUPPLEMENTARY GUIDANCE 2

6.2 Bibliography of Sources of Further Information/ Guidance

General

- ▶ Scottish Planning Policy (SPP) (2014);
- ▶ Scottish Government Online Advice - Onshore Wind Turbines, Process For Preparing Spatial Frameworks For Wind Farms;
- ▶ SEPA LUPS - Guidance Note 4 - Planning Guidance on Windfarm Developments, SEPA (2012). This includes a useful checklist of issues to consider in Table 1;
- ▶ Natural Heritage assessment of smallscale wind energy projects which do not require formal EIA, SNH (2008);
- ▶ Assessing the impact of smallscale wind energy proposals on the natural heritage, SNH, (2012);
- ▶ PAN 1/2013 'Environmental Impact Assessment':
- ▶ Circular 3/2011: The Town and Country Planning (EIA) (Scotland) Regulations 2011;
- ▶ Easy Read Guide to 2011 EIA Regulations, Scottish Government;
- ▶ Scottish Government online advice on EIA issues (www.scotland.gov.uk/Topics/Built-Environment/planning/National-Planning-Policy/themes/enviro-assessment/eia);
- ▶ Guidelines on the Environmental Impacts of Windfarms and Smallscale Hydroelectric Scheme, SNH (2002);
- ▶ Good Practice During Wind Farm Construction, SNH, SEPA, FC and Scottish Renewables (2010);
- ▶ Constructed Tracks in the Scottish Uplands, SNH (2013)

Landscape and Visual Impact

- ▶ Strategic Locational Guidance for Onshore Wind Farms in respect of the National Heritage, SNH;
- ▶ Siting and Designing Wind Farms in the Landscape, SNH (2009);
- ▶ Good Practice During Wind Farm Construction (2010);
- ▶ Assessing the Impact of Small - Scale Wind Energy Proposals on the Natural Heritage, SNH (2012);
- ▶ Siting and Design of Small Scale Wind Turbines of Between 15 and 50 metres in height, SNH (2012);
- ▶ Visual representation of wind farms - Good Practice Guidance, SNH (2007);
- ▶ Assessing the Cumulative Impact of Onshore Wind Energy Development, SNH, (2012);
- ▶ Sensitivity of the Clackmannanshire Landscape to Wind Turbine Development, LUC 2012, on behalf of Clackmannanshire Council.

Biodiversity

- ▶ Onshore Wind Energy Home Page, SNH website, including;
- ▶ Assessing the impact of small-scale wind energy proposals on the natural heritage, SNH, (2012);
- ▶ Survey methods for assessing the Impacts of Onshore Wind Farms on bird communities, SNH (2005 Revised 2010);
- ▶ Natural Heritage Assessment of Small Scale wind Energy Projects Which Do Not Require Formal Environmental Impact Assessment, SNH (2008);
- ▶ What to Consider and Include in Habitat Management Plans, Draft, SNH (2012);
- ▶ Bats - Guidance on potential impacts, survey requirements and further information on possible mitigation techniques, relating to wind energy developments, SNH (2012);
- ▶ Bird Sensitivity Map and Report to Provide Locational Guidance for Onshore Wind farms in Scotland, RSPB (2006), www.rspb.org.uk;
- ▶ Bats and Wind Turbines, SNH (2012)



Carbon Rich Soils

- ▶ Calculating Carbon Savings from Wind Farms on Scottish Peat Lands - A New Approach, Version 2, Scottish Government (2011);
- ▶ Calculating Potential Carbon Losses and Savings From Wind Farms on Scottish Peat lands - Technical Note, Scottish Government (2011);
- ▶ Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste, SEPA and Scottish Renewables (2012);
- ▶ Peat Landslide Hazard and Risk Assessment: Best Practice Guide for Proposed Electricity Generation Developments, Scottish Government (2007);
- ▶ SEPA Regulatory Position Statement - Development on Peat (2010);
- ▶ SEPA LUPS - Guidance Note 4 - Planning Guidance on Windfarm Developments, SEPA (2012);
- ▶ Developments on Peatland: Site Surveys and Best Practice, SNH, SEPA, Scottish Government (2011);
- ▶ Good Practice During Windfarm Construction, SEPA, SNH, FC and Scottish Renewables (2010)

Water Environment

- ▶ Good Practice During Windfarm Construction, SEPA, SNH, FC and Scottish Renewables (2010);
- ▶ SEPA LUPS - Guidance Note 4 - Planning Guidance on Windfarm Developments, SEPA (2012)

Communities and Other Residential Receptors

- ▶ "The Assessment and Rating of Noise from Wind Farms" (Final Report, 1996, DTI) (ETSU-R-97);
- ▶ Planning Advice Note 1/2011-Planning and Noise and Technical Advice Note;
- ▶ Scottish Government Online Advice - Onshore Wind Turbines (Aug 2012);
- ▶ The Salford University Report to Aerodynamic Modulation of Wind Turbine Noise" last modified September 27th, 2011;
- ▶ "Update of UK Shadow Flicker Evidence Base" Dept of Energy and Climate Change (March 2011);
- ▶ Tall Structures and their Impact on Broadcast and Other Wireless Services, Ofcom (Aug 2009)
- ▶ Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise, IOA (2013)



Aviation and Radar Issues

- ▶ Policy and Guidelines on Wind Turbines, CAP 764, CAA (Jan 2012);
- ▶ CAA Pre-Planning Guidance (www.caa.co.uk);
- ▶ Scottish Government Planning Circular 2/2003 - Arrangements for Safeguarding Aerodromes, Technical Sites and Military Explosives Storage Areas;
- ▶ Guidance on Dealing With Aviation Objections and Associated Negative Conditions in Wind Turbine Consents, Scottish Government, (2012);
- ▶ NATs Pre-Planning Assessment (www.nats.co.uk);
- ▶ MoD Safeguarding advice (www.mod.uk/DefenceInternet/Microsite/DIO/WhatWeDo/Operations/MoDSafeguarding.htm);
- ▶ RESTATS website, Dept of Energy and Climate Change

Heritage Issues

- ▶ Scotland's Historic Environment Policy (SHEP), Historic Environment Scotland;
- ▶ PAN 2/ 2011 – Planning and Archaeology;
- ▶ Managing Change in the Historic Environment Guidance Note – Setting, Historic Environment Scotland, (2010)

SUPPLEMENTARY GUIDANCE 2

6.3 Glossary

Areas of Special Landscape Control : a regional designation of areas considered to be of the highest landscape value which require protection from inappropriate development. Their landscape features and qualities make particular areas distinctive and create a sense of place.

Appropriate Assessment : An Appropriate Assessment is the term used to describe an assessment of the implications of a plan or project on a Natura (European) site (either a Special Protection Area or Special Area of Conservation). This assessment is required where the project affecting a Natura site is not connected with the management of the site for nature conservation, and is likely to have a significant effect on the site (either alone or in combination with other plans or projects). The whole process is known as Habitats Regulations Appraisal and is required under the European Habitats Directive 1992 as transposed in UK law by the Conservation (Natural Habitats, Etc) Regulations 1994. A Special Protection Area is designated under the Birds Directive for their ornithological importance. A Special Area of Conservation is designated under the Habitats Directive and contains rare or endangered species or habitats.

Ancient Woodland : Land that is currently wooded and has been continuously wooded, at least since 1750. The Ancient Woodland Inventory is a provisional guide to their location and contains three main categories of woodland. SPP identifies it as an important and irreplaceable resource.

Carbon Rich Soil : These areas comprise soils in Map Units 3 - 6 defined in the document "Identification of Carbon Rich Soil Mapping Units, Information Notice 318, SNH, 2012". This is derived from the soil mapping units in the Soil Survey of Scotland.

Cumulative Impacts : These are the combined effects of more than one turbine or more than one wind turbine development being constructed and is the combined effect(s) of all of the development taken together. This could be in terms of their effect on issues including landscape and visual amenity, bird populations, other wildlife, residential amenity.

Design Statement : A document which records the design process that is undertaken for a development.

Environmental Impact Assessment (EIA) : this is the statutory process which the identification, prediction and evaluation of the key environmental effects of a development are undertaken, and by which the information gathered is used to reduce likely negative effects during the design of the project and then to inform the decision making process.

Landscape Sensitivity : The extent to which the character and qualities of the landscape are affected by specific types of development and land use change. Sensitivity depends upon the type, nature and magnitude of the proposed change as well as the characteristics of the host landscape. High sensitivity indicates landscapes are vulnerable to change, low sensitivity that they are more able to accommodate the change and that the key characteristics of that landscape will essentially remain unaltered.

Landscape Character Assessment : The process of describing, analysing and evaluating the landscape character of an area in order to identify, classify and understand its character.

Landscape Character Areas : Unique geographic areas of a particular landscape character type. They take on the name of particular places e.g. Ochil Hills and Carse of Forth.

Landscape and Visual Impact Assessment : a standard process for assessing the landscape and visual effects of a development. It is used to help locate and design the proposed change, so that the negative landscape effects are avoided, reduced or offset. The two aspects of the assessment - landscape visual effects - are independent but related. "Guidelines for Landscape and Visual Impact Assessment (3rd Edition)" is the most recognised methodology and is recommended as good practice by all relevant professional institutes.

Landscape Character : The distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape.

Photomontage : A visualisation of the proposed development which contains an accurate image of the proposed turbine(s) shown on a baseline panorama created from photographs of the view.

Planning Advice Note (PAN) : Statements produced by the Scottish Government to give clarity and further advice and guidance on Scottish Planning Policy.

Ramsar Sites : Wetlands of international importance designated under the Ramsar Convention 1971, which requires signatory countries to protect international important wetlands, especially those used by migratory water birds, and to use wetlands wisely.

Sites of Special Scientific Interest (SSSI) : Important areas of conservation and wildlife importance, due to the value of the plants, animals, habitats or rock formations that they contain. They are designated by Scottish Natural Heritage under the provisions of the Wildlife and Countryside Act 1981.

Scottish Planning Policy : Statement of the Scottish Government’s policy on nationally important land use and other planning matters.

Shadowflicker : Under certain combinations of geographical position and time of day, the sun may pass behind the rotor of a wind turbine and cast a shadow over neighbouring properties. When the blades rotate, the shadow flicks on and off an effect known as shadowflicker. It only occurs inside buildings where the flicker appears through a narrow window opening. The effect can be quantified using calculations.

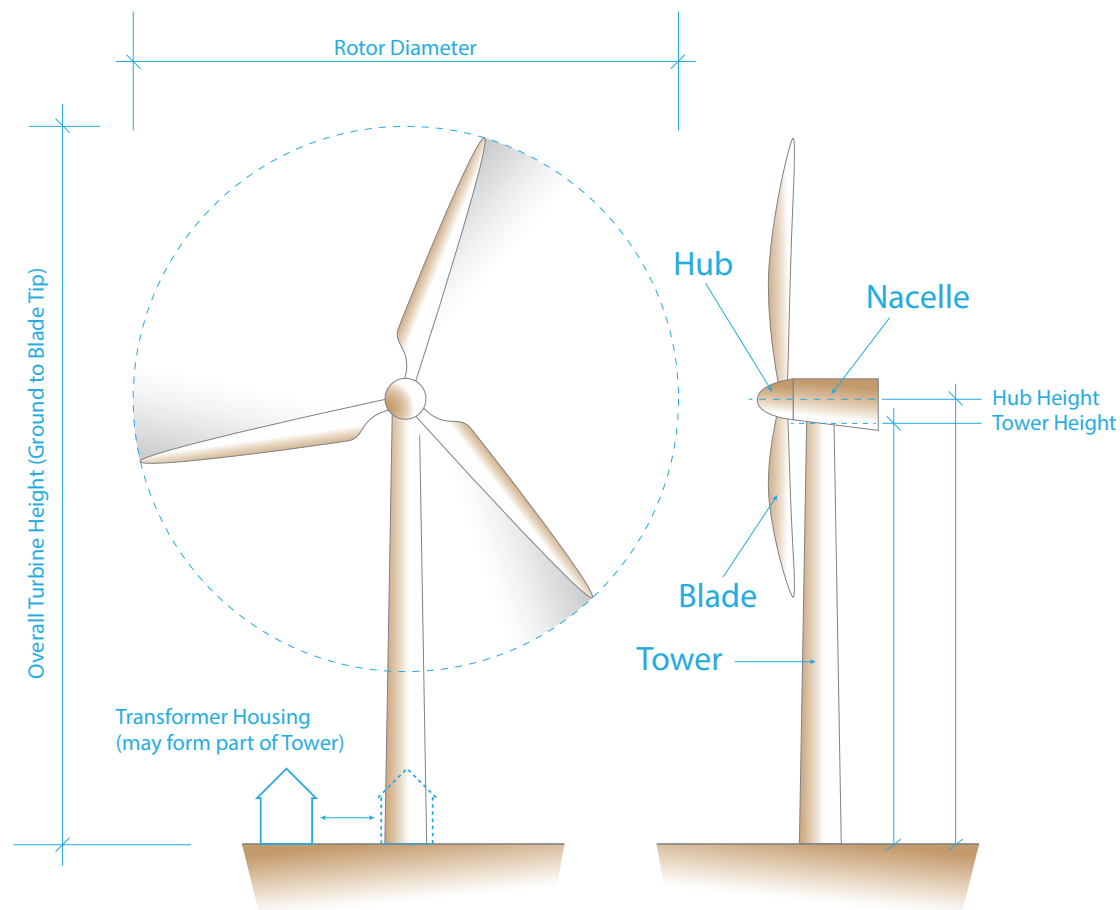
Specific On-line Advice : Current advice which has replaced some Planning Advice Notes and is produced by the Scottish Government to give clarity and further advice and guidance on Scottish Planning Policy.

Visual Impact : The changes in the appearance or perceptions of a particular area or view as a result of development or other change. Visual impacts can be negative or positive.

Zone of Theoretical Visibility (ZTV) : The area over which a development can theoretically be seen; they are calculated using software and usually based on a Digital Terrain Model (DTM) and overlaid on a map base. The map represents where a development may be theoretically be seen as it may not be visible in reality due to localised screening which is not represented by the DTM. The map indicates potential visibility only and does not convey the nature or magnitude of visual impacts.

Wirelines : These are computer generated line drawings, based on Digital Terrain Modelling that indicate the three dimensional shape of the landscape in combination with the proposed wind turbine elements.

Diagram - Key Elements of a Wind Turbine



Key:

Nacelle - Mounted on the tower which encloses the the generator and other equipment associated with the generation of electricity.

Hub Height - The distance from the base of the turbine at ground level to the centre point of the turbine rotor hub.

Rotor diameter - The distance between the swept area of the blade tips.

Ground to blade Tip height - The distance from the base of the turbine at ground level to the tip of the blade at its highest point from the ground.

APPENDIX 1

Clackmannanshire Local Development Plan Policies For Wind Energy Proposals - Policies SC14 and SC15

Policy SC14 - Renewable Energy

Policy SC14 aims to encourage the incorporation and use of renewable energy technology.

Proposals for all renewable or low carbon energy generation and associated transmission infrastructure, including any mitigation measures proposed, will normally be supported, where they meet all of the following criteria:

- (1) The development would satisfy relevant national planning policy guidance, including SPP and online Specific Advice Sheets.
- (2) The development would be appropriate in terms of its design, scale and layout to its surroundings.
- (3) The development would not have a significant adverse impact on the quality and distinctive character of the local or wider landscape.
- (4) The development would not have a significant adverse impact on the natural and built environment, including designated areas of nature conservation value, the water environment, the carbon stocks in carbon rich soils, listed buildings, Conservation Areas, historic and designed landscapes, and sites of archaeological or historic importance.
- (5) The development would not impact upon the integrity of the Firth of Forth SPA or River Teith SAC either alone or in combination with other projects and plans.
- (6) The development would not result in any adverse impact on aviation, defence or telecommunications interests.

- (7) The development would not have a significant adverse impact on the amenity or health and safety of nearby settlements, individual houses or other sensitive establishments.
- (8) There would be no significant adverse impact on the operation of tourism or recreation interests, including the amenity of users of public outdoor access routes.
- (9) They would not result in any significant adverse amenity, landscape or ecological impacts as a result of the cumulative impacts associated with existing sites, extensions and undeveloped sites with planning permission. The potential impact from other proposals at the same stage of the planning process will be a material consideration.
- (10) The Council is satisfied with measures to manage impacts during construction, operation and, where relevant, decommissioning and to ensure the satisfactory restoration of the site, whenever the permission expires or the use ceases to operate for a specified period. The Council will normally require the appointment of a suitable Ecological Clerk of Works for the duration of these works and may require a bond to ensure sufficient finance is available to restore the site.
- (11) The development would accord with the relevant specific policy guidance in Policies EA13 and SC14-SC18.

See also: EA13, SC14-SC18 - Environmental Implications

Policy SC15 - Wind Energy Development

Policy SC15 aims to provide details of areas where wind energy development proposals will be likely to be most acceptable.

Proposals for wind energy development, including associated infrastructure, will normally only be supported where the proposal:

- (1) satisfies the criteria contained in Policy SC14 'Renewable Energy'
- (2) accords with the guidance contained in the Wind Energy SG and any relevant development guidelines; and
- (3) will not have adverse effects on the integrity of the Firth of Forth SPA, either alone or in combination with other projects and plans.
- (4) has regard to the provisions of Policy EA13 – Significant Soil Resources."

Proposals will be assessed against the relevant locational guidance contained in the spatial frameworks for wind turbines, and on landscape sensitivity contained in the report titled 'Sensitivity of the Clackmannanshire Landscape to Wind Turbine Development', June 2012.

Proposals within Areas of Search are likely to be supported subject to detailed consideration against identified criteria in the Onshore Wind Energy SG.

Proposals within Areas requiring Significant Protection (see Figures SC1 and SC2) are unlikely to be considered favourably, unless it can be demonstrated that the proposal would not have an unacceptable adverse impact on the relevant features of the Area that justify its status; would meet the requirements of SPP; and accords with the objectives of the LDP.

Proposals within Areas With Potential Constraint will be judged on their individual merits against the criteria set out in the relevant policies and the guidance in the Onshore Wind Energy SG.

See also: SC13 - Environmental Implications

APPENDIX 2 - Methodology for Preparation of the Spatial Frameworks

- 1.1 The Council has followed the approach for preparing a spatial framework to identify areas likely to be most appropriate for onshore wind energy developments contained in Scottish Planning Policy (SPP3) (2014). This approach is shown in Table 4. The purpose of this appendix is to provide a more detailed explanation of the application of the three stages and the results of each stage. The maps show the areas affected by each constraint as applied by the Council for each of the stages. The maps also show the designations in neighbouring authorities adjacent to Clackmannanshire which may be impacted by wind energy development within Clackmannanshire's boundaries, depending on the scale of the proposals.
- 1.2 The Spatial Frameworks are created by mapping the constraints for each stage collectively to identify any Areas of significant protection and areas with potential for wind energy development. Section 2.0 of this Guidance contains the maps showing the Spatial Frameworks. In accordance with the guidance in SPP (2014), additional constraints have not been applied at this stage. The spatial framework is complemented by a more detailed and exacting development management process where the merits of an individual proposal will be carefully considered against a wider range of environmental, community, and cumulative impacts (see paragraph 1.7 of this Appendix). Some of these additional constraints have been mapped in Appendix 3 to help inform interested parties.

- 1.3 While the SPP refers to "wind farms", following the work carried out in the report into the "Sensitivity of the Clackmannanshire Landscape to Wind Turbine Development" (June 2012), and having regard to the guidance in paragraph 161 of the SPP (2014), Clackmannanshire's Spatial Framework relates to single turbines, clusters and wind farms. Two frameworks have been prepared for different heights of turbines.

Group 1: Areas where wind farms will not be acceptable

- 1.4 SPP (2014) states that National Parks and National Scenic Areas are areas where wind farms will not be acceptable, however there are no such designated areas within Clackmannanshire.

TABLE 4 - Spatial Framework

Group 1: Areas where wind farms will not be acceptable: National Parks and National Scenic Areas.		
Group 2: Areas of significant protection: Recognising the need for significant protection, in these areas wind farms may be appropriate in some circumstances. Further consideration will be required to demonstrate that any significant effects on the qualities of these areas can be substantially overcome by siting, design or other mitigation.		
National and international designations:	Other nationally important mapped environmental interests:	Community separation for consideration of visual impact:
<ul style="list-style-type: none"> ▶ World Heritage Sites; ▶ Natura 2000 and Ramsar sites; ▶ Sites of Special Scientific Interest; ▶ National Nature Reserves; ▶ Sites identified in the Inventory of Gardens and Designed Landscapes; ▶ Sites identified in the Inventory of Historic Battlefields. 	<ul style="list-style-type: none"> ▶ areas of wild land as shown on the 2014 SNH map of wild land areas; ▶ carbon rich soils, deep peat and priority peatland habitat. 	<ul style="list-style-type: none"> ▶ an area not exceeding 2km around cities, towns and villages identified on the local development plan with an identified settlement envelope or edge. The extent of the area will be determined by the planning authority based on landform and other features which restrict views out from the settlement.
Group 3: Areas with potential for wind farm development: Beyond groups 1 and 2, wind farms are likely to be acceptable, subject to detailed consideration against identified policy criteria.		

SUPPLEMENTARY GUIDANCE 2

Group 2: Areas of significant protection

- 1.5 Areas of significant protection are the second group identified in the SPP (2014), although again, not all of the designations are found in Clackmannanshire. Those which have been mapped to identify areas of significant protection in Clackmannanshire. The area covered by each of the defined constraints is shown on the respective maps;
- ▶ Natura 2000 and Ramsar sites - Within Clackmannanshire these comprise the Firth of Forth Special Protection Area (SPA) and Ramsar Sites, which cover the same area. These are shown on Map 3 of this Appendix.
 - ▶ Sites of Special Scientific Interest - There are ten Sites of Special Scientific Interest within Clackmannanshire. These areas are shown on Map 3 of this Appendix.
 - ▶ Sites identified in the Inventory of Gardens and Designed Landscapes - There are two such sites in Clackmannanshire at Castle Campbell near Dollar and the Japanese-Style Garden at Cowden. These areas are shown on Map 4 of this Appendix.
 - ▶ carbon rich soils, deep peat and priority peatland habitat - These are mainly found in the Ochil Hills and in small pockets in the east of Clackmannanshire. They are shown on Map 5 of this Appendix.
 - ▶ Community separation for consideration of visual impact - an area not exceeding 2km around cities, towns and villages identified on the local development plan with an identified settlement envelope or edge - The SPP states that the extent of the area will be determined by the planning authority based on landform and other features which restrict views out from the settlement. The Council consider that the 2km separation distance should be applied to all of the typologies apart from the Small Turbine typology for which a 1 km separation distance has been applied which should still ensure that visual impact is reasonably safeguarded. The application of the separation distances should not be interpreted as an absolute constraint and these have been used to inform the identification of areas with potential for wind energy development. The sensitivity will vary according to the height of the turbines and the intervening topography and landscape character of the affected area. The two separation distances around settlements are shown on Map 6 of this Appendix.

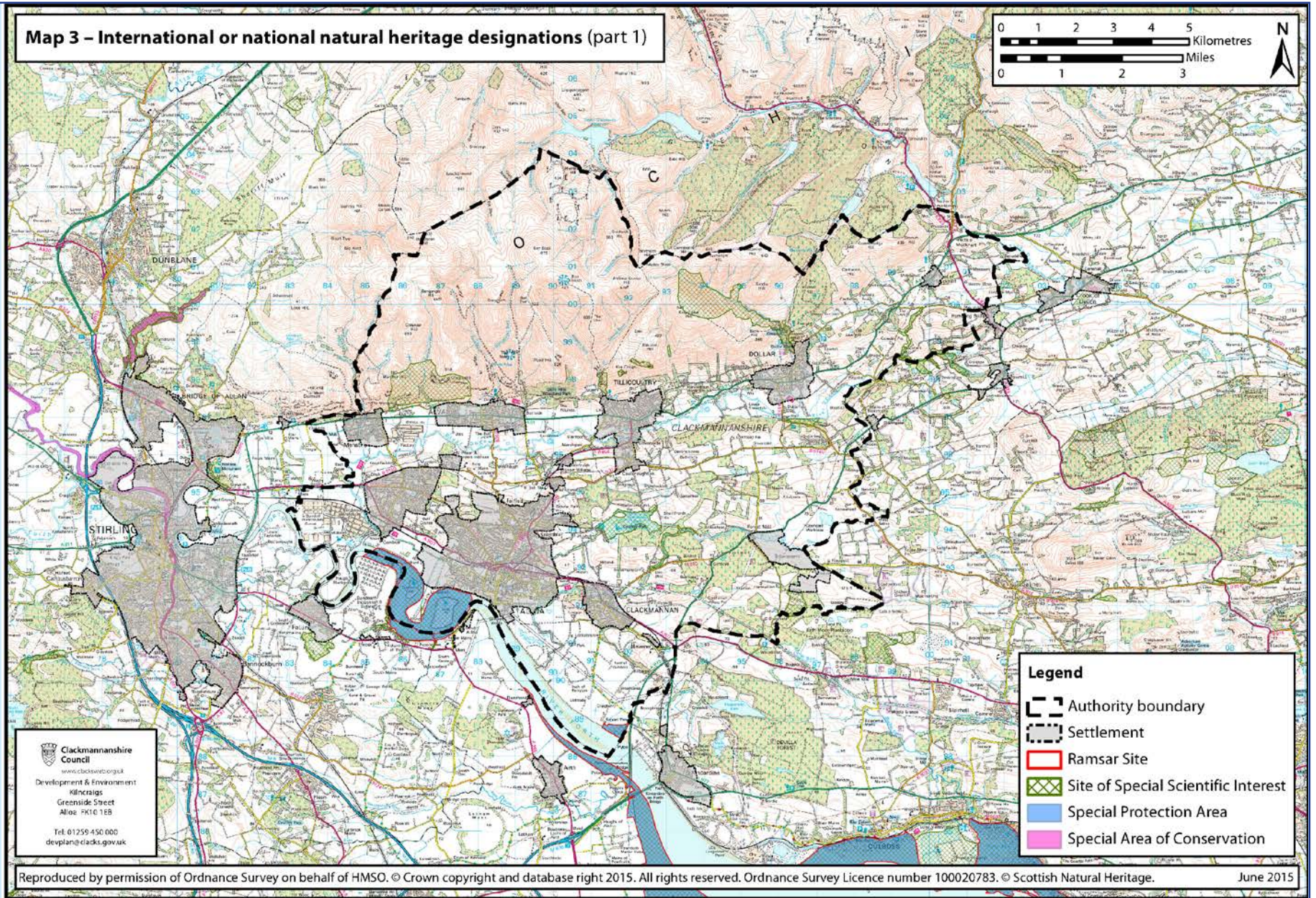
Group 3: Areas with potential for wind farm development

- 1.6 The final stage is to map the remaining areas not covered in Groups 1 and 2 which are identified as Areas with potential for wind farm development.
- 1.7 These are where there would be greatest scope to consider the type of wind energy development to which the spatial framework relates, subject to consideration against defined policy criteria and local considerations such as:
- ▶ regional and local landscape and natural heritage designations;
 - ▶ visual impacts;
 - ▶ residential amenity, including noise and shadow flicker;
 - ▶ areas of green belt;
 - ▶ the historic environment;
 - ▶ tourism, recreational and public access interests;
 - ▶ aviation and radar interests;
 - ▶ telecommunications and broadcasting installations;
 - ▶ road safety; and
 - ▶ the consideration of cumulative impacts.
- 1.8 The results of the group approach have been used to produce two spatial frameworks. There were similar results for both large and medium turbine height typologies, therefore a single spatial framework has been produced covering the typologies for these turbine heights as shown on Map 1. A separate spatial framework has been produced for small turbine height typologies as shown on Map 2. The conclusions of this process are discussed in paragraph 2.4 of the guidance.



APPENDIX 2

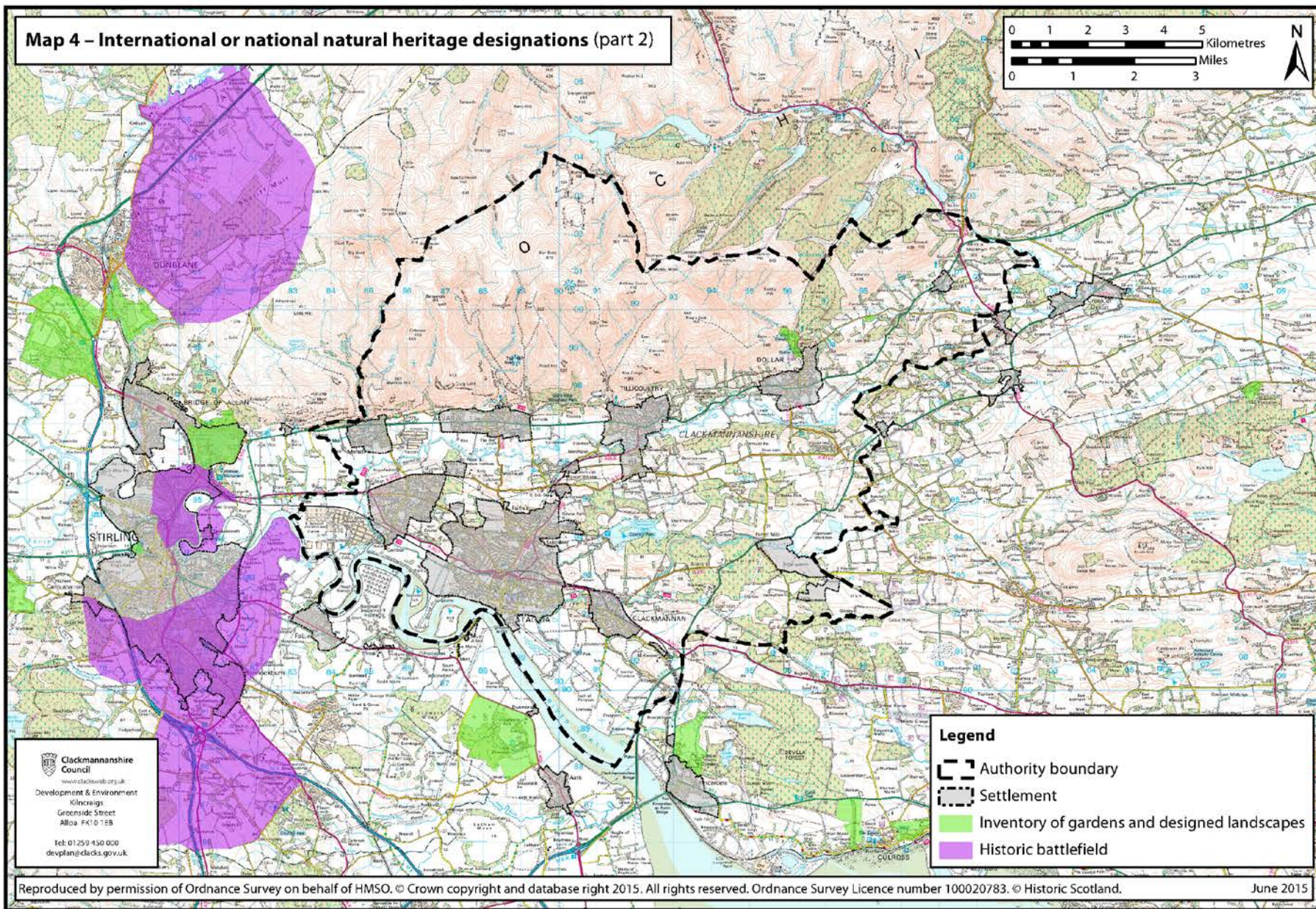
Map 3 – International or national natural heritage designations (part 1)



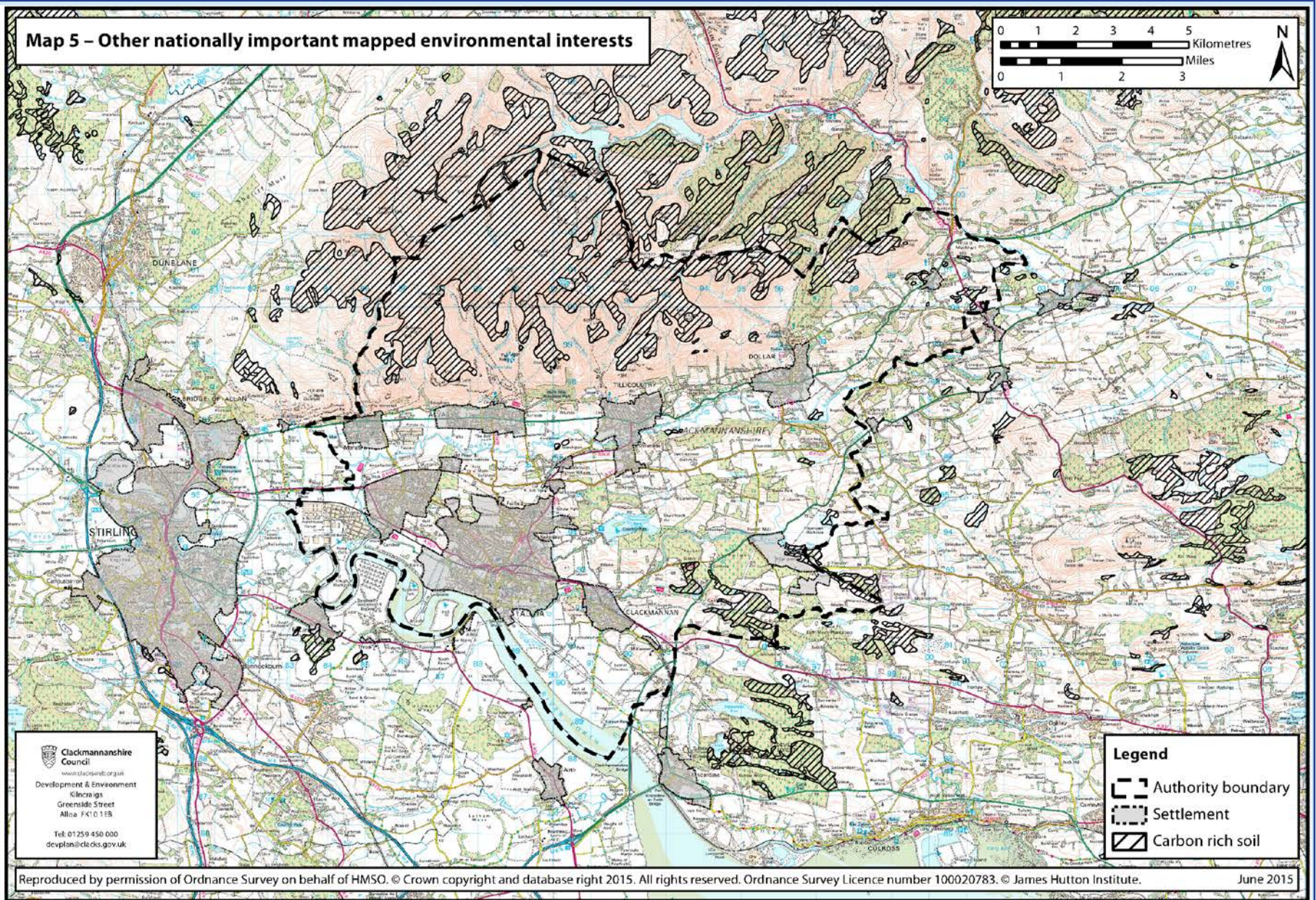
SUPPLEMENTARY GUIDANCE 2

APPENDIX 2

Map 4 – International or national natural heritage designations (part 2)



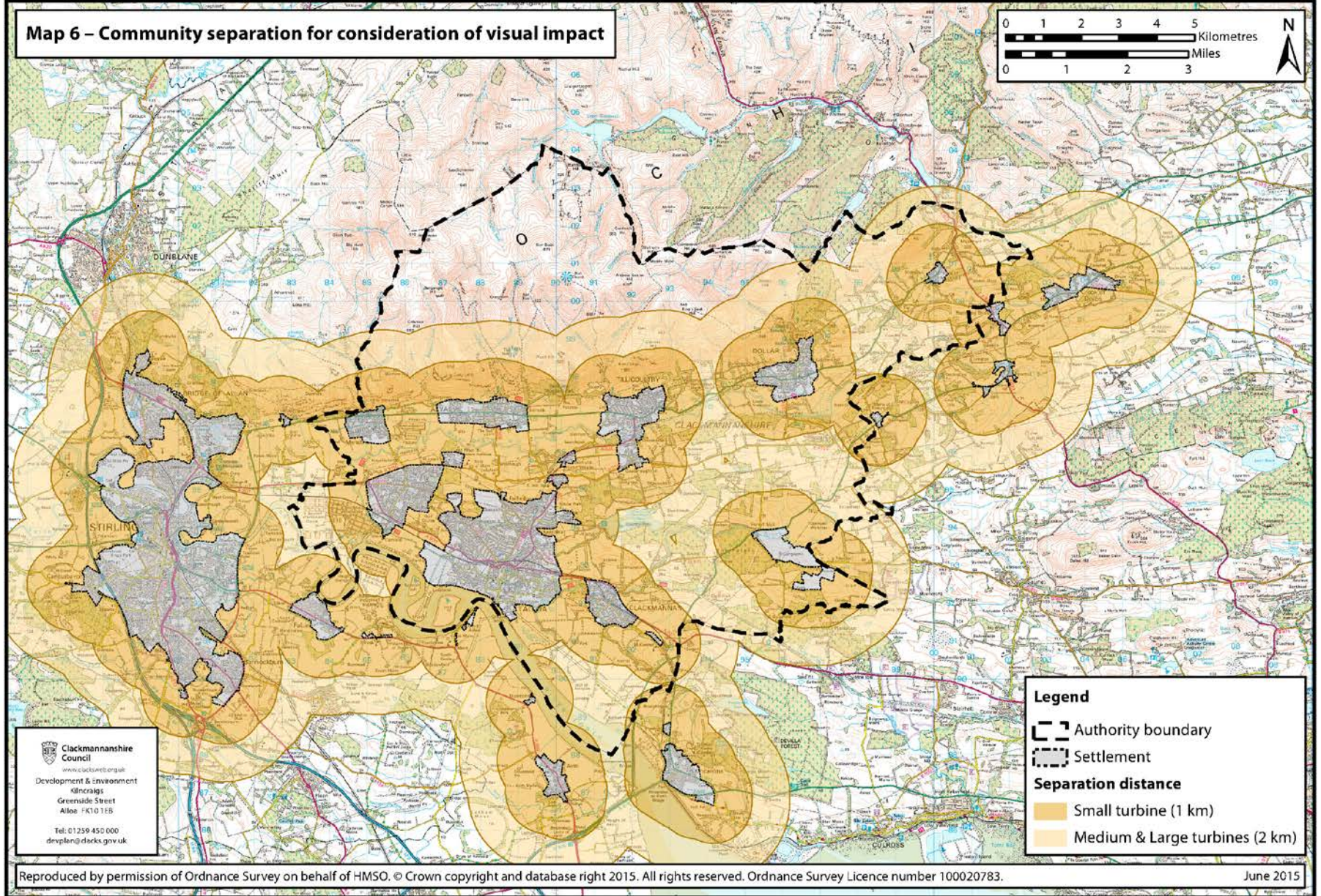
APPENDIX 2



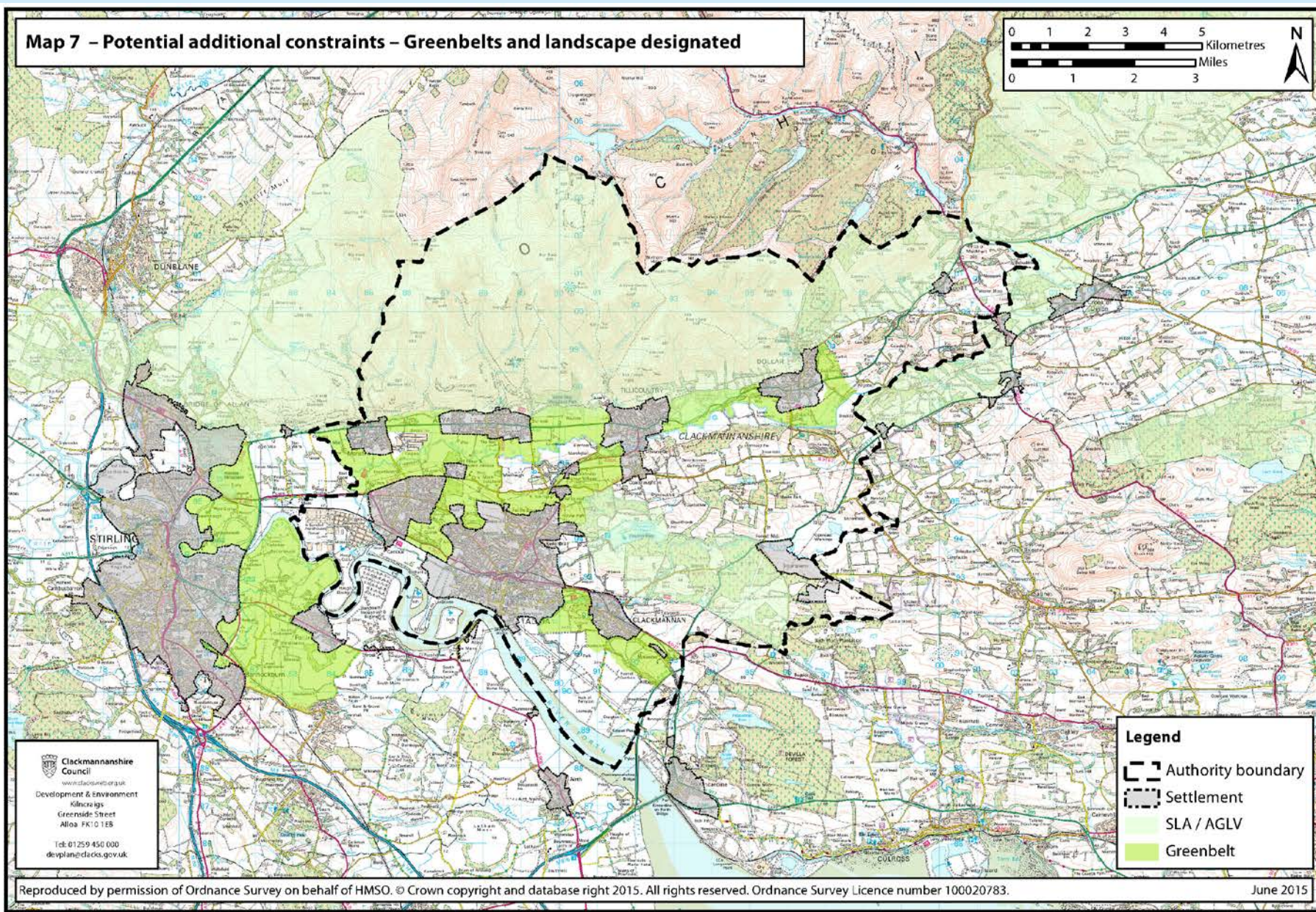
SUPPLEMENTARY GUIDANCE 2

APPENDIX 2

Map 6 – Community separation for consideration of visual impact



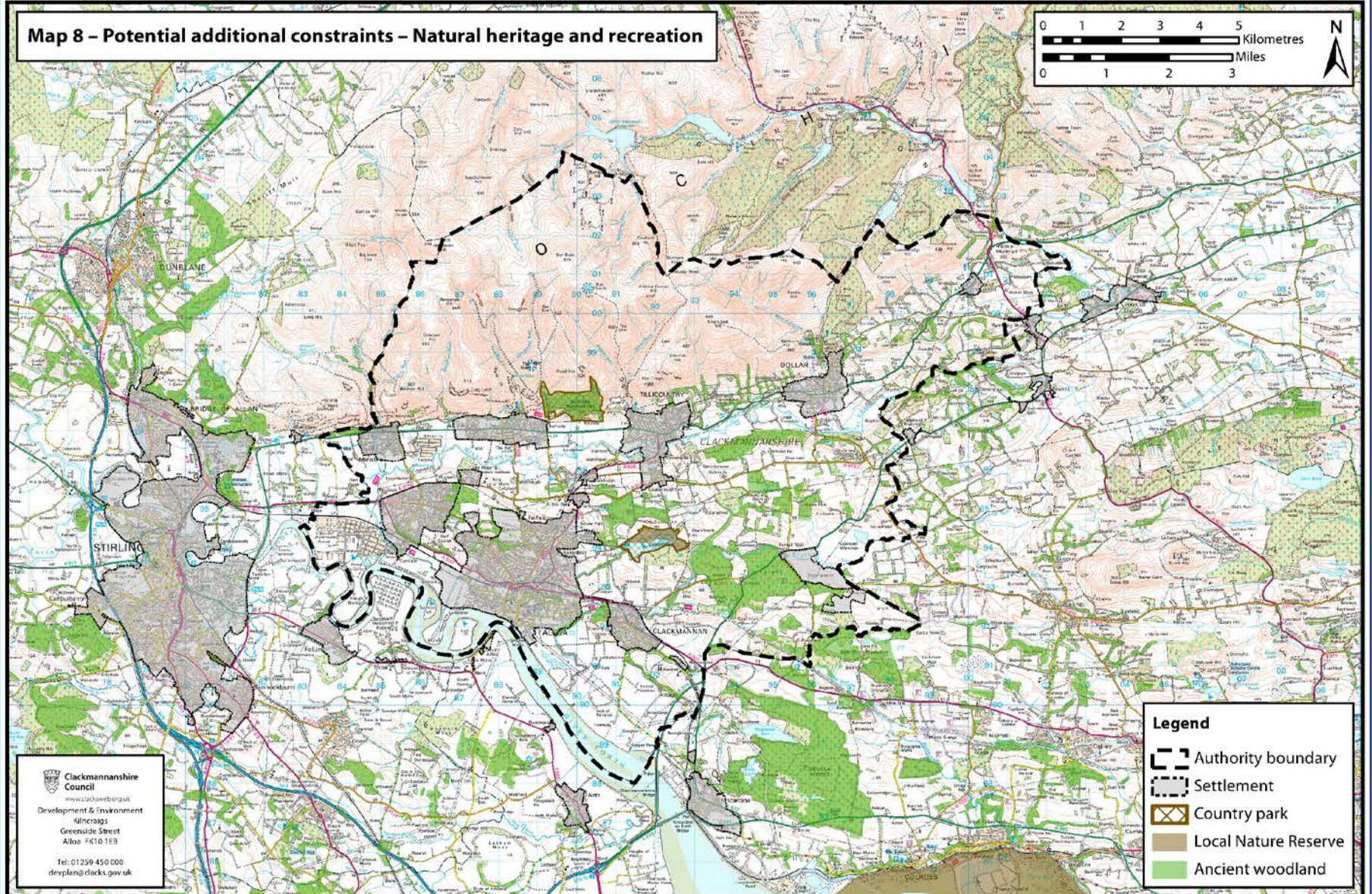
APPENDIX 3



SUPPLEMENTARY GUIDANCE 2

APPENDIX 3

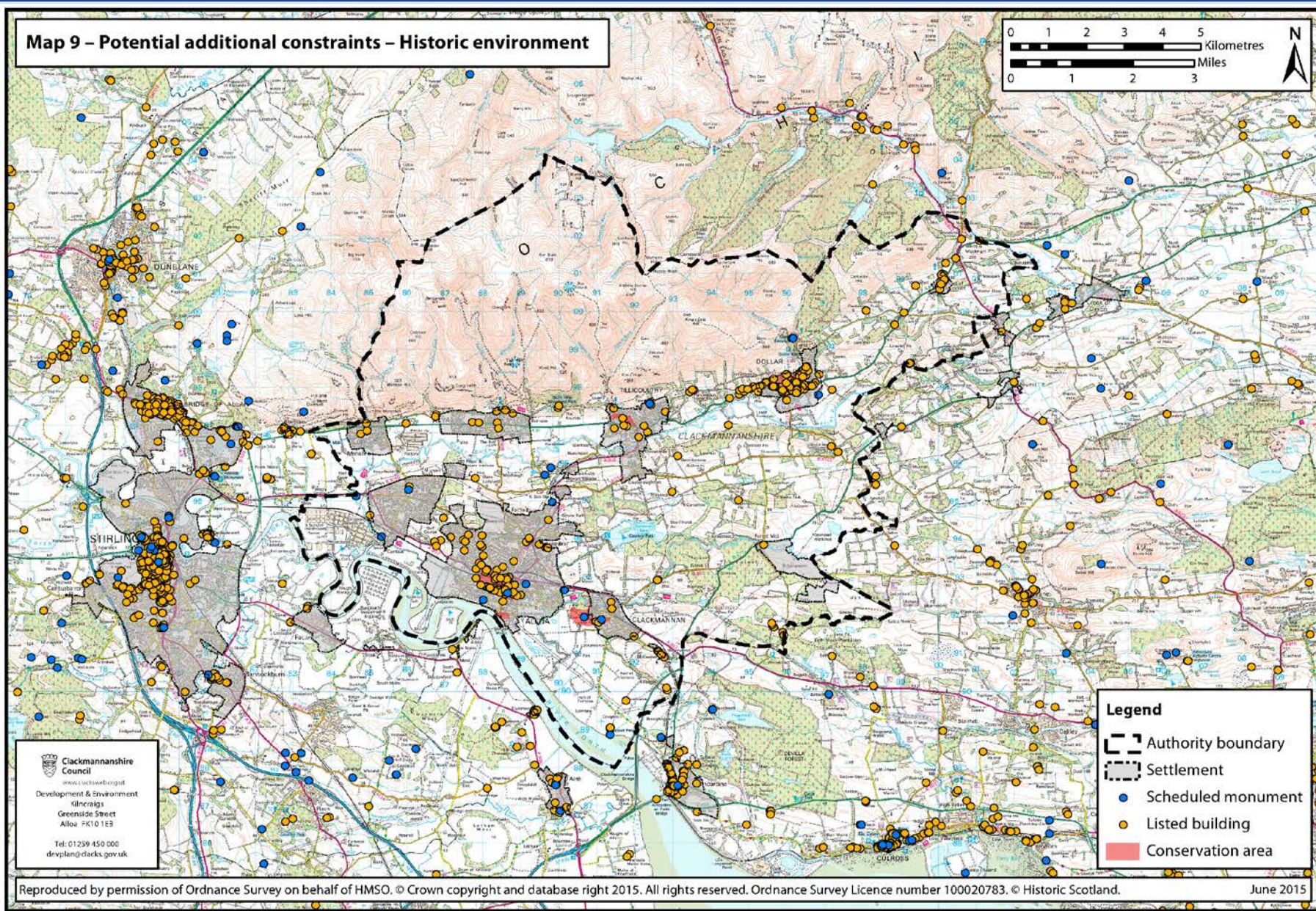
Map 8 – Potential additional constraints – Natural heritage and recreation



Reproduced by permission of Ordnance Survey on behalf of HMSO. © Crown copyright and database right 2015. All rights reserved. Ordnance Survey Licence number 100020783. © Scottish Natural Heritage.

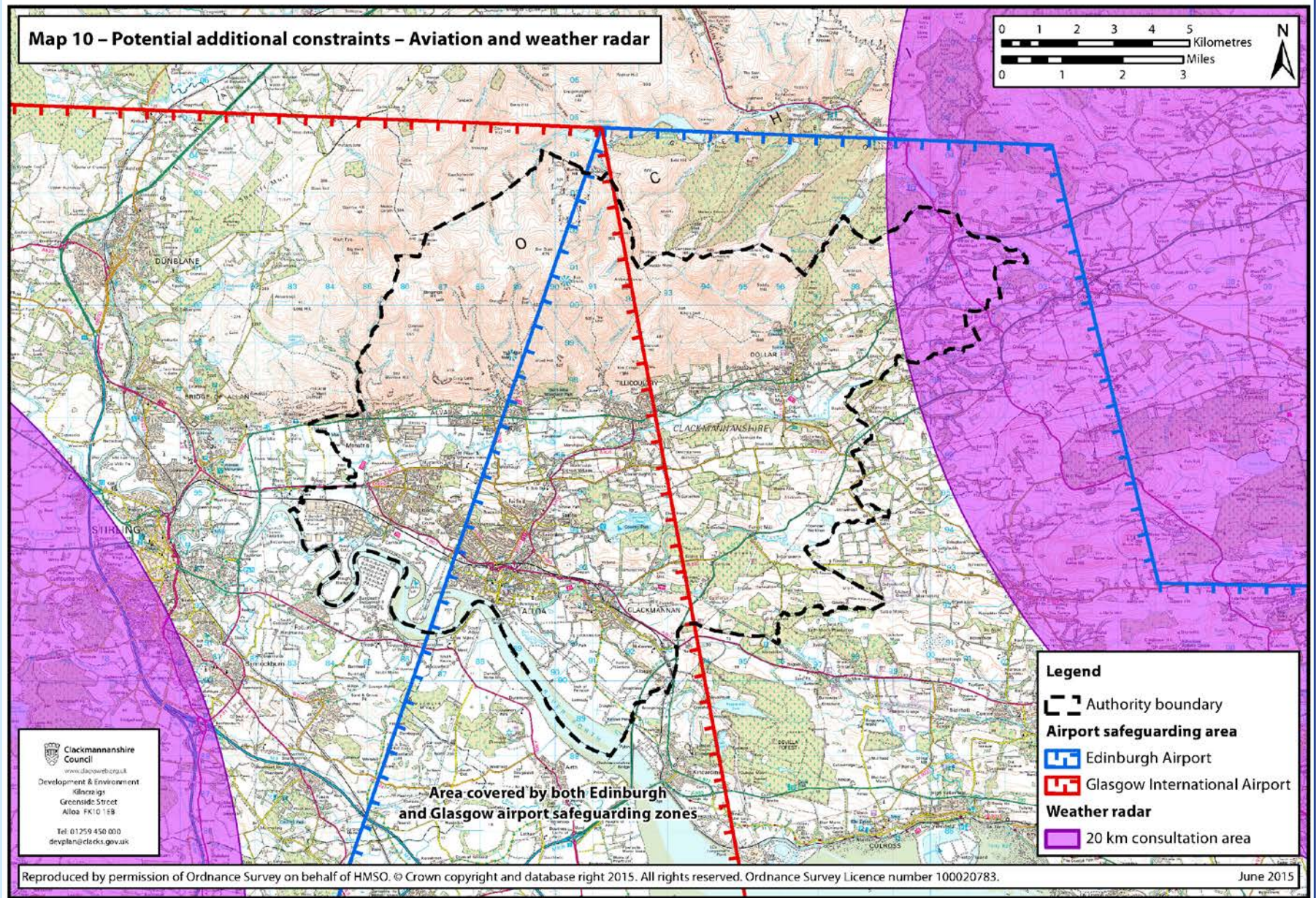
June 2015

APPENDIX 3



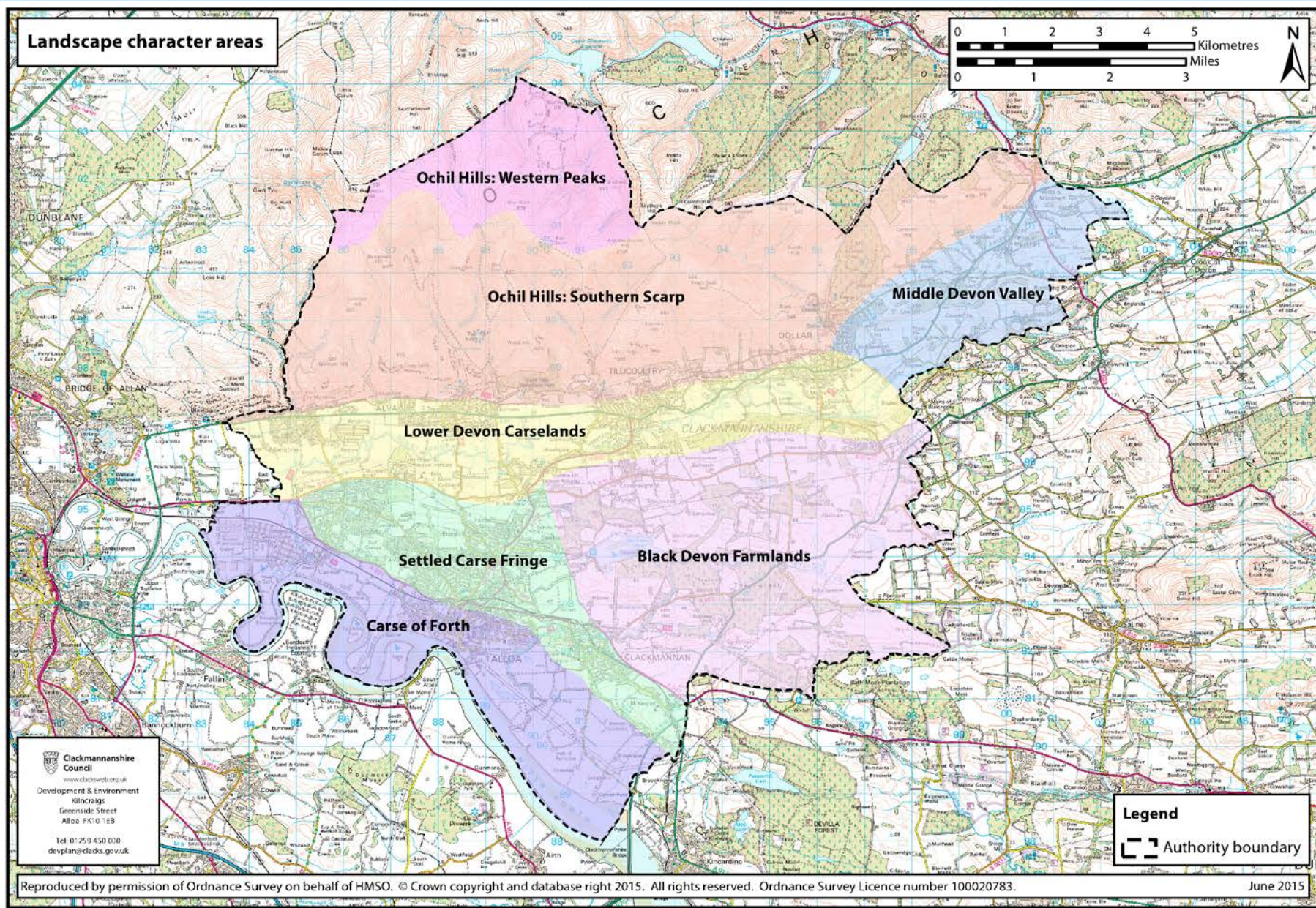
SUPPLEMENTARY GUIDANCE 2

APPENDIX 3



SUPPLEMENTARY GUIDANCE 2

APPENDIX 4



SUPPLEMENTARY GUIDANCE 2

APPENDIX 5

Landscape Sensitivity Maps

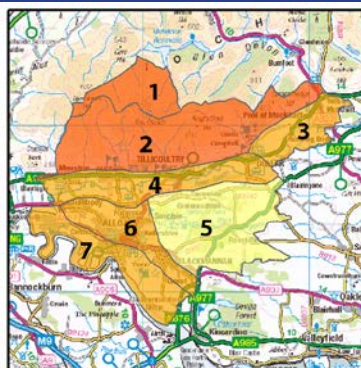
Landscape Character Areas

1. Ochil Hills: Western Peaks
2. Ochil Hills: Southern Scarp
3. Middle Devon Valley
4. Lower Devon Carselands
5. Black Devon Farmlands
6. Settled Carse Fringe
7. Carse of Forth

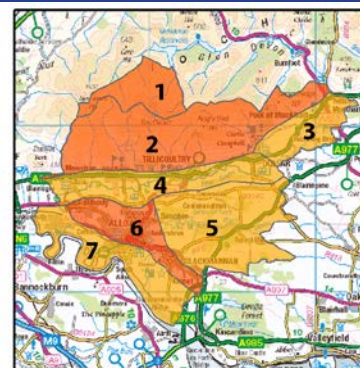
- Higher sensitivity
- Moderate sensitivity
- Lower sensitivity

The boundaries of the Landscape Character Areas are shown at a larger scale on the map in Appendix 4.

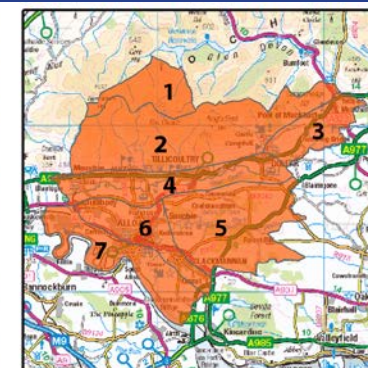
Small turbine typologies
(20 m to 50 m to tip)



Single turbine

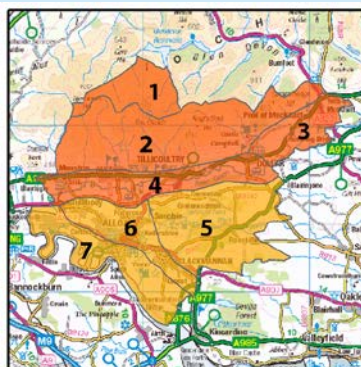


Cluster (2 to 5 turbines)

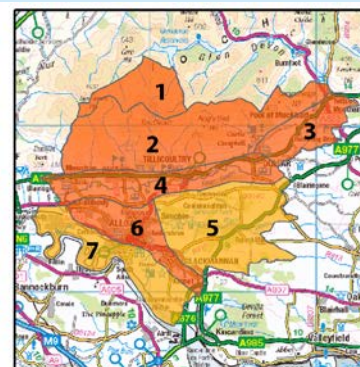


Windfarm (6+ turbines)

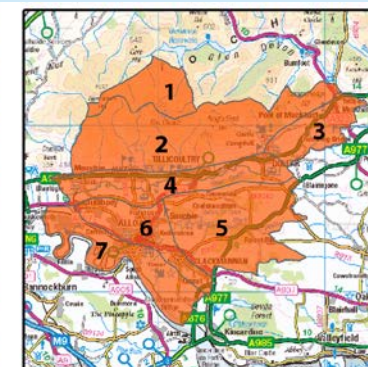
Medium turbine typologies
(51 m to 80 m to tip)



Single turbine

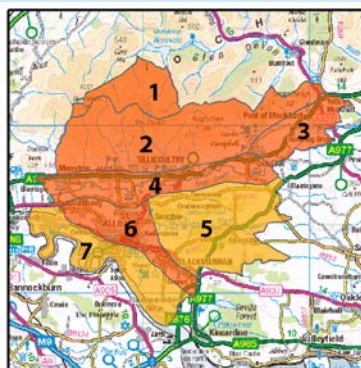


Cluster (2 to 5 turbines)

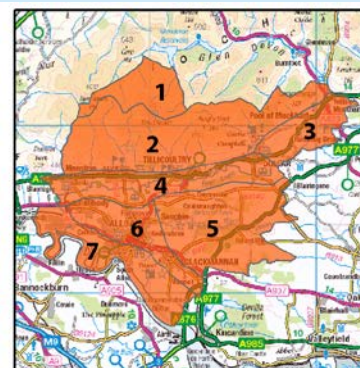


Windfarm (6+ turbines)

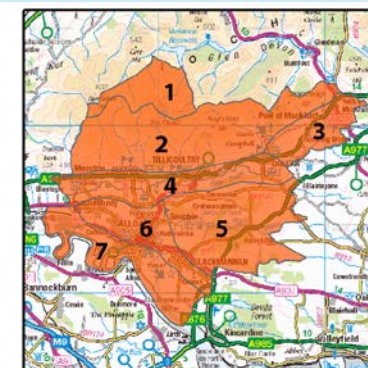
Large turbine typologies
(over 80 m to tip)



Single turbine



Cluster (2 to 5 turbines)



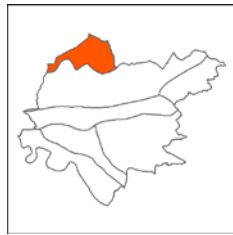
Windfarm (6+ turbines)

Siting and Design Guidance for Wind Turbine Development For Each Landscape Character Area (LCA) (Extracted from Report titled *Sensitivity of the Clackmannshire Landscape to Wind Turbine Development, 2012*, commissioned by the Council and SNH).

1. Ochil Hills: Western Peaks LCA

Sensitivity

- 1.1 Overall the Ochil Hills: Western Peaks is assessed as having a higher sensitivity to wind turbine development. It is a large-scale, simple landscape, with convex skylines, all of which indicate lower sensitivity, but the high level of recreational use of the landscape suggest higher sensitivity. The widely visible nature of this landscape, particularly from areas to the north, also indicate higher sensitivity to wind turbines.
- 1.2 The presence of Burnfoot Hill has an effect on the sensitivity of this landscape to further wind farm development. In some respects, the turbines have the effect of reducing apparent sensitivity against certain criteria, as noted in the table above. Their presence as man-made features in the landscape cannot be ignored, and they are now a landmark feature in their own right. At the same time, the presence of Burnfoot Hill is also a limiting factor on further development, in terms of cumulative issues. This is particularly the case when the area is set within the context of other wind farms visible in views of the Ochils from the north and in views from the highest summits of the Ochils.



Siting and Design Guidelines

- 1.3 It is important that any potential turbines should be sited well away from the highest ground of this area, which comprises the main ridge of the Ochils. Locating turbines on higher ground would extend their visibility to areas to the south of the hills. Such turbines would appear to overtop the Ochils, particularly from the south where they would have an overbearing appearance on the southern escarpment as a whole. Siting of turbines should make use of this high ground as 'cover', screening views to the south. Careful consideration of ZTV maps would be required to ensure that turbine tips were not visible over the top of the hills.
- 1.4 Wind farm layout should be simple, relating to the simplicity of the landscape. Layouts which respond to the shallow curves of the ridge lines are least likely to result in adverse landscape and visual impacts.
- 1.5 Cumulative issues are a key consideration, with Burnfoot Hill within the area, and with other existing schemes within and near to the Ochils. Any proposals in this area must be carefully considered in terms of their cumulative effects including:

- ▶ effects on the landscape character of the area, and whether wind turbines would become a key characteristic of the local landscape. At present, turbines are not a key characteristic, but the Environmental Statement for the proposed Rhodders Wind Farm concludes that construction of this and other proposed wind farms adjacent to Burnfoot Hill would result in wind turbines becoming a key characteristic of the landscape;
- ▶ compatibility of visual image of wind farms, in terms of site layout, turbine height and turbine form;
- ▶ cumulative effects on views from the Ochil summits within and beyond Clackmannanshire, where Burnfoot Hill and Greenknowes are already visible;
- ▶ cumulative effects on longer-distance views of the Ochils, in which Burnfoot Hill, Greenknowes and Lochelbank wind farms are seen as discrete developments along the hill range, separated by large gaps. Introduction of further wind farms would have the effect of narrowing, and potentially closing, these gaps;
- ▶ in addition to the above, there are wider cumulative issues where wind farms on the Ochils are seen from the north in combination with Braes of Doune and the two schemes on the Campsie Fells; and
- ▶ the expansion of existing wind farms, where these would be seen as part of a single and coherent entity within the landscape context, are likely to have less cumulative effect on these views than introduction of new, separate schemes, or extension proposals which would not be viewed as part of a single and coherent entity.

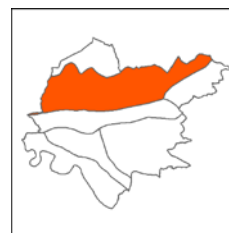
SUPPLEMENTARY GUIDANCE 2

- 1.6 Burnfoot Hill comprises turbines of 102 m to tip, and the turbines proposed at Rhodders Farm and Frandy Hill would be of the same height. Within this relatively small area of landscape, it would not be appropriate to introduce greatly varying turbine heights as this would cause a visually confused image, with distortion of perspective. Small and medium turbines should therefore be discouraged in this area. Proposals with a similar layout and design to those already in place would be least likely to create adverse conflicts of scale or form. This includes turbine size, turbine form (as regards nacelle shape and transformers) and overall project design (in terms of layout, track configurations and construction).
- 1.7 Similarly, the introduction of single turbines and small clusters discrete from Burnfoot should also be discouraged, as this may create visual confusion when seen with the existing wind farms.
- 1.8 In conclusion, it would be very difficult to accommodate new wind turbine development in the Ochils due to the likely cumulative landscape and visual effects. Modest extensions of existing wind farms are more likely to be accommodated, provided that the unity and scale of the present wind farm in relation to landscape context is maintained

2. Ochil Hills - Southern Scarp LCA

Sensitivity

- 2.1 Overall the Ochil Hills: Southern Scarp is assessed as having a higher sensitivity to wind turbines. There are few features which indicate any reduced sensitivity within this landscape. The scarp is a prominent feature seen from a large area of central Scotland; from Stirling, Falkirk and West Lothian, and from the M9 and the Edinburgh-Glasgow railway line. The remarkable steepness and ruggedness of the scarp, combined with its wide visibility and location adjacent to populated areas, gives it a unique character within Scotland, and it is highly valued both locally and in the wider area.



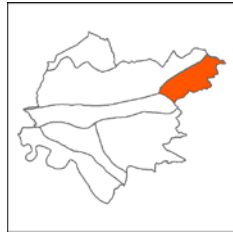
Siting and Design Guidelines

- 2.2 The southern slopes of the Ochils are generally very steep. It is unlikely that there are significant areas where the installation of wind turbines is technically feasible. This study focuses on the potential landscape and visual issues which would be raised should any sites be identified.
- 2.3 The vertical scale of the Ochil scarp is emphasised by the sharpness of the slope, and by the juxtaposition of the scarp and the Devon carselands. The hills are not of great elevation, the scarp itself rising to around 500 m, but this is contrasted with the human scale of the villages at its base. Development of wind turbines which would alter this visual relationship should be strongly resisted.
- 2.4 Siting of wind turbines on the upper parts of the hills would place them in a potentially overbearing position in relation to the scarp, particularly if located close to the edge of the scarp. Wind turbines atop the Ochils would interrupt the distinctive skyline.
- 2.5 Location of turbines at the foot of the slope would similarly affect this perception of scale, particularly large turbines which would appear to reach up the scarp when viewed from the south. Turbines in this location would also appear prominent since, due to the wide visibility of the hills, they would almost always be seen backclothed against the scarp slope.
- 2.6 This landscape is highly sensitive to wind turbine development, and all types of development should be discouraged within this area. Small single turbines, very carefully sited, would be least likely to give rise to the potential impacts identified above.

3. Middle Devon LCA

Sensitivity

- 3.1 Overall the Middle Devon is assessed as being of higher sensitivity to turbine development. The scale and complexity of both landform and land cover indicate higher sensitivity, and the area has an important relationship with the Ochils to the north. Only the limited remoteness indicates reduced sensitivity.



Siting and Design Guidelines

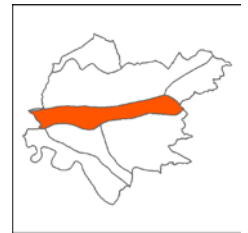
- 3.2 The small scale of this landscape indicates that small turbines are most likely to be accommodated. Large turbines would appear to dominate this landscape, overtopping the low hills and other scale indicators.
- 3.3 There are large farm buildings within this agricultural landscape. Placement of turbines in association with existing farm development would establish a logical connection between energy generation and usage. Turbines are likely to appear least incongruous in the landscape when sited close to other farm development.

- 3.4 Siting of turbines close to the incised watercourses would affect the perceived scale of these features, and turbines may appear overbearing if viewed from within the valleys. More open, sloping hillsides offer greater potential.
- 3.5 Along the north-west edge of the character area, introduction of turbines may affect views of the Ochil escarpment. Although in this area the landscape tends to be more open and evenly sloping, which might suggest reduced sensitivity, the proximity of the Ochil backdrop is a more important consideration. Turbines in this area would appear against the escarpment in local and longer-distance views. Larger machines have the potential to affect the perception of scale of the scarp, which in this location only rises 200-300 m above the adjacent farmland.

4. Lower Devon Carseland LCA

Sensitivity

- 4.1 Whereas the strong human influence, high levels of movement, and simple landcover indicate reduced landscape sensitivity to development, the area is much more sensitive from a visual perspective. There are high numbers of receptors, and a very strong visual relationship between the settled carse and the steep rugged southern scarp of the Ochils.



Siting and Design Guidelines

- 4.2 The impact on the appreciation of the scarp must be a key consideration for any proposal in this area. Turbines in this part of the Devon valley would appear against the escarpment in local and longer-distance views. The placement of large turbines against the scarp would offer a distinct scale feature, which may serve to diminish the apparent height of the scarp, which rises to around 500 m in this location.

SUPPLEMENTARY GUIDANCE 2

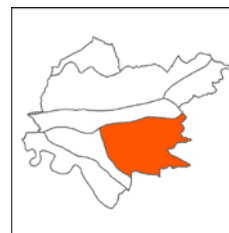
- 4.3 If located too close to the scarp, turbines would almost always be seen against the hillside. Locating turbines at the southern edge of the carse would reduce the visual interaction of turbine and scarp. The southern part of the carse is also more removed from the main settlements. However, larger machines which are more widely visible would still be seen with the scarp as a backdrop in longer views from the south, potentially including views from the Forth Valley.
- 4.4 An important feature of this landscape is the relationship of the Hillfoots Villages with the scarp. It is possible to stand within the village centres and look up over the buildings to the tops of the Ochils. Even modestly sized structures, if inappropriately placed, could interrupt this key relationship.
- 4.5 Long views along the valley are a key characteristic, with the Wallace Monument providing the 'eye-catcher' at the end of this vista. Turbines which compete with the monument in key views, such as from the A91, should be discouraged.
- 4.6 There are a number of large industrial and agricultural structures within this landscape. Placement of turbines in association with these existing developments would establish a logical connection between energy generation and usage. However, the visual considerations outlined above should still be applied.

- 4.7 Linear views are also a principal consideration in terms of cumulative impacts. The valley is open and many points offer views along the whole area. Multiple turbines sited along the valley may begin to 'stack up' in such views. Sequential effects on the A91 should be given consideration.
- 4.8 Overall, small turbines, sited in the southern part of the valley, are least likely to give rise to scale conflicts and visual impacts within this landscape.

5. Black Devon Farmlands LCA

Sensitivity

- 5.1 In this relatively varied landscape, sensitivity varies with the overall scale, from higher in the west to lower in the more plateau-like areas in the east. Away from the recreational landscapes of Gartmorn Dam and The Forest, the eastern area also has fewer receptors. There are locally sensitive landforms such as the Black Devon valley.



Siting and design guidelines

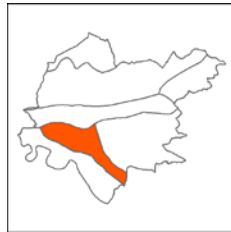
- 5.2 The larger plateau areas to the east of this character area would be most likely to accommodate wind turbines. These areas are larger in scale, relatively simple in landform, and have existing human features including pylons and opencast mineral workings. This area also has the fewest receptors, though the planned settlement expansion at Forest Mill must be borne in mind.
- 5.3 In northern parts of this area, the visual interaction between proposed turbines and the Ochil scarp will be a consideration. Turbines positioned either side of the B9140 would be seen against the hills in views from the south. For smaller turbines, these views are likely to be less extensive, but larger machines may be visible from wide areas to the south. This area has a less direct relationship with the scarp than the Devon valley, and the potential for turbines to diminish the perceived scale of the hills is reduced.
- 5.4 Recreational interests are likely to be the key visual receptors in this more sparsely populated area. Gartmorn Dam and The Forest are well used for outdoor access, and the attractive nature of this part of the countryside is recognised in AGLV status. Within the AGLV are the most distinctive parts of the character area, including the incised gorge of the Black Devon, and the wooded valley at Brucefield.
- 5.5 The consideration of cumulative effects should include potential sequential effects on users of the A977 and B9140.

5.6 Overall, the open larger-scale area to east is most likely to be able to accommodate wind turbines. This area is small in extent, and wind farms are unlikely to be suitable, though there may be scope for clusters. The other parts of this character area are more likely to accept small or medium turbines only. The smallest-scale areas such as the Devon Valley and Brucefield are unlikely to accommodate any development.

6. Settled Carse Fringe LCA

Sensitivity

6.1 The Settled Carse Fringe is a complex, small scale landscape, extensively developed for housing. It is an extensively human-influenced landscape in which turbines would not have adverse effects on wildness, but where local landform and residential views are an important consideration. To the south-east, the more visible raised beach area is of higher sensitivity.



Siting and Design Guidelines

6.2 This area is the most densely settled part of Clackmannanshire. The extent of development suggests lower sensitivity to further human intervention, but also higher numbers of potential receptors.

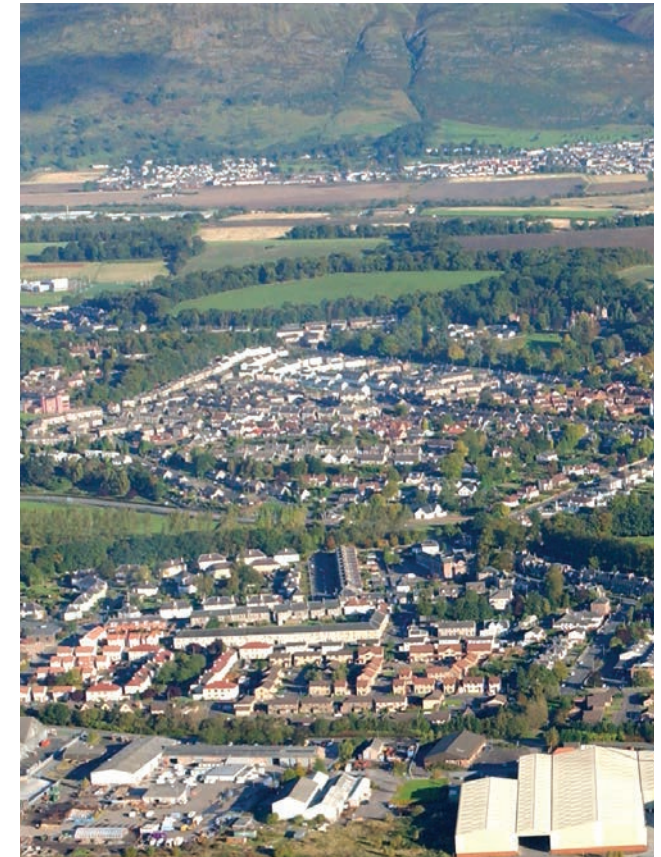
6.3 Siting of turbines within or close to settlements has been achieved elsewhere, such as at FMC Technologies in Fife. However, there are a wide range of potential issues, most importantly proximity to dwellings and residential viewers. Less sensitive locations are likely to be associated with larger industrial and commercial areas, which tend to be restricted within this character area.

6.4 The wooded landscape between Tullibody and Alloa is an important area of Green Belt, preserving the separate identities of these settlements. This is a relatively complex landscape where turbines would not be readily accommodated. Introduction of turbines may also have the effect of further eroding perceived separation, particularly if such a structure was visible from both settlements.

6.5 The more open farmland to the east of Alloa is considered to be less sensitive in terms of landscape considerations, but is overlooked from Gartmorn Dam.

6.6 To the south-east, the ridge between Clackmannan Tower and Kennet is highly visible from the carse to the south, and acts as a strong visual backdrop to the flat floodplain. Clackmannan Tower is a key landmark, visible from the Clackmannanshire Bridge. Turbines sited along this ridge are likely to be prominent, and would potentially compete with the tower, distracting attention away from the landmark. In longer views from the south, the Ochils rear up behind this ridge, and these views should also be considered for any proposals on the ridge.

6.7 Based on the relatively small scale of landform in this character area, and the density of human-scale features, it is unlikely to be able to accommodate large or medium turbines. Small turbines are more likely to be accommodated in parts of the area.

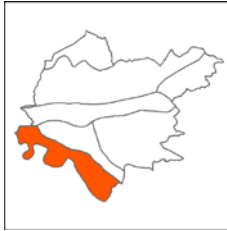


SUPPLEMENTARY GUIDANCE 2

7. Carse of Forth LCA

Sensitivity

- 7.1 Overall, the flat open landscape and strong human influence suggests reduced sensitivity, though the area is more visually sensitive in terms of local receptors and as part of the wider Forth Valley. Within the Carse of Forth character area, a number of sub-areas were identified in the field, which indicate differences in sensitivity to turbines. These are discussed from west to east.
- 7.2 West of the River Devon, bonded warehouses are a key characteristic, often fringed by coniferous screen woodland. Strong human influence pervades this area, with some landscape elements in marginal condition at the fringes of the warehouse compounds. It nevertheless forms part of the wider Forth Valley landscape, visible from key points including the Wallace Monument.
- 7.3 Between the Devon at Cambus and Alloa is a more wooded area, which has a more enclosed, smaller-scale character. Small pastoral and arable fields occupy the narrower carse. Scrubby woodland, notably along the railway line and the Devon, as well as more mature trees around Orchard Farm, break up the open exposed character experienced elsewhere. Sensitivity is increased by the smaller scale and more complex land cover.



7.4 The lower part of Alloa lies within this character area, including industrial, commercial and residential areas centred on the Old Town. There are several vertical structures within this area, suggesting reduced sensitivity, but this is countered by close proximity to residential areas and the importance of cultural heritage features such as Alloa Tower and the Old Alloa conservation area.

7.5 The remaining part of the character area lies south-east of Alloa, and is very flat, open and exposed. It comprises large arable fields and is crossed by twin overhead power lines. The large scale and presence of infrastructure indicate lower sensitivity. This wide flat area is overlooked from the raised beach to the north (Settled Carse Fringe), which is a more sensitive landscape, and from locations across the river to the south. It forms part of the wider Forth Valley landscape, linking south and east to the coastal flats around Skinflats and Longannet.

Siting and Design Guidelines

7.6 The presence of vertical features across much of this landscape may indicate reduced sensitivity to the introduction of further vertical features. The pylons which cross the south-east of the area appear very tall in relation to the flat carse, but at 55 m they are at the upper limit of the small turbine typology (Table 2). Introduction of large or even medium turbines would set up a strong scale contrast, emphasising the height of the turbines in relation to the pylons and the flat landscape.

7.7 Turbines sited close to the raised beach which forms the northern edge of this character area would emphasise the low elevation of the ridge: King's Seat Hill at Clackmannan appears prominent but is only 60 m above the carse.

7.8 Key views across the carse must be considered for any proposed wind turbines. These include local views from landmarks such as Clackmannan and Alloa Towers, as well as longer views over the Forth Valley from the Clackmannanshire Bridge and from Stirling. These longer views from the south incorporate three distinct 'layers': the carse itself as foreground; the low-lying ridge behind; and the Ochils forming a distant backdrop. Turbines on the carse are likely to cut across these three layers, rendering them less distinctive.

7.9 It is unlikely that there is scope to accommodate large numbers of turbines within this landscape. Development of wind farms, or numerous clusters or single turbines, would present visual interruptions in longer views over the carse.

7.10 The openness and intervisibility would allow any turbine to be visible across most of the area, and cumulative impacts must be a key consideration. Visual interactions between different proposals will be apparent, and strong contrasts of turbine height and form should be discouraged. Issues to consider include number of blades and type of tower structures for smaller turbines.

7.11 Small turbines could be placed in arrangements which relate to the linear and rectilinear elements of this landscape, including the river, railways or field boundaries. With increasing turbine size, such relationships become less apparent to the viewer, and in all cases, visual relationships with other vertical as well as horizontal features must be considered.

7.12 As noted above, sensitivity varies across this character area. Smaller-scale areas, such as around Orchard Farm, are unlikely to be able to accommodate large or medium turbines, while within the developed areas single turbines may potentially be accommodated, subject to consideration of residential views. Clusters are more likely to be accommodated in the wider open carse to the south of Alloa.



**Clackmannanshire
Council**

www.clacksweb.org.uk