Planning Committee

2 May 2025
Agenda item number 11

Landscape Sensitivity Study – minor update

Report by Planning Policy Officer

Summary

The Landscape Sensitivity Study has been updated to clarify the size of turbine that the term 'small' relates to.

Recommendation

That members endorse the update to the Landscape Sensitivity Study as evidence for the Local Plan for the Broads.

1. Landscape Sensitivity Study – minor amendments

1.1. The Landscape Sensitivity Study (LSS) was produced over ten years ago but remains a key resource for helping to determine planning applications for wind turbines and solar farms. Following recent discussions with the authors, Land Use Consultants (LUC), it became apparent that where the current LSS refers to small wind turbines (defined in the original LSS as 0-20m), LUC were actually considering turbines of 15-20m. The Study has been amended to clarify this as well as confirm that micro turbines (0-15m in height) will be judged on a case-by-case basis and the general principles of the LSS will be used in determining applications for micro wind. Please see Appendix 1 and 2.

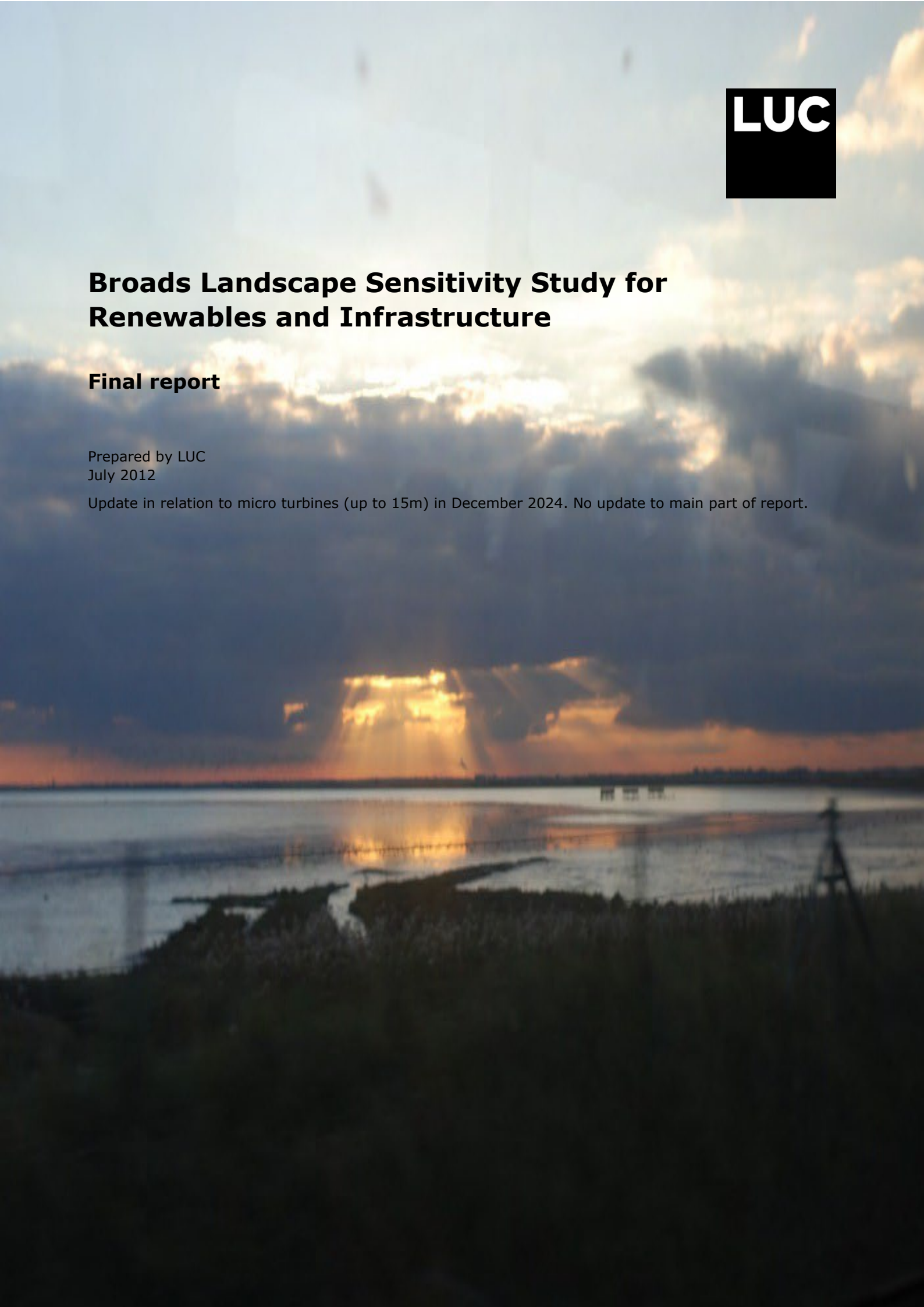
Author: Natalie Beal

Date of report: 3 April 2025

Appendix 1 - Broads Landscape Sensitivity Study for Renewables and Infrastructure (December 2024) Chapters 1-3

The following appendix is available to view on Planning Committee - 2 May 2025 (broads-authority.gov.uk)

Appendix 2 - Broads Landscape Sensitivity Study for Renewables and Infrastructure (December 2024) Chapter 4 Appendices 1-3



Broads Landscape Sensitivity Study for Renewables and Infrastructure

Final report

Prepared by LUC
July 2012

Update in relation to micro turbines (up to 15m) in December 2024. No update to main part of report.

Project Title: Broads Landscape Sensitivity Study for Renewables and Infrastructure

Client: Broads Authority

Version	Date	Version Details	Prepared by	Checked by	Approved by Principal/Director
V1	June 2012	Draft for issue	Andrew Tempany, Fearghus Foyle	Kate Ahern	Kate Ahern
V2	July 2012	Final report	Andrew Tempany, Fearghus Foyle	Kate Ahern	Kate Ahern
V3	December 2024	Minor change to cover micro turbines (up to 15m). No update to other parts of the report.	Nina Gul	Kate Ahern	Kate Ahern

www.landuse.co.uk

Broads Landscape Sensitivity Study for Renewables and Infrastructure

Final report

Prepared by LUC
July 2012, minor update for micro turbines (up to 15m), December 2024

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Land Use Consultants Ltd
Registered in England
Registered number 2549296
Registered office:
250 Waterloo Road
London SE1 8RD

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Contents

1 Introduction

This 2012 report was updated in 2024 to recognise that applications for wind turbines of up to 15m should be considered on a case-by-case basis. A generic sensitivity rating does not apply to micro turbines below 15m.

To clarify, where this report refers to small turbines, it means turbines that are 15 to 20m in height.

The remainder of this report has not been updated. This means some references and background information may no longer be current. The landscape character and judgements remain the same and still stand.

All mapping remains the same and uses the original 2013 OS base mapping. Figure 4.2 only has been updated.

1.1 The nationally designated landscape of the Broads and its environs is faced with a wide range of challenges arising from a changing climate. Balancing the need to make a meaningful contribution towards reducing harmful emissions from our energy use (through cleaner energy production) with the conservation and management of the unique landscape of the Broads is a key challenge.

1.2 The distinctive lowland wetland landscapes of the Broads have a strong sense of place and cultural pattern, reflected in the special qualities underpinning its National Park status. These include its sense of tranquillity, wildness and remoteness, the simplicity of the landscape created by undeveloped big skies, areas of open water, winding waterways, its diversity of riparian and wetland habitats (including habitats unique to the Broads) and the local character of 'beautiful churches, windmills and quiet villages'. The landscape of the Broads is also vitally important to the local economy, in terms of the opportunities afforded for recreation and tourism. As such, the environmental, economic and social value of the Broads is significant.

1.3 Simultaneously the comparatively flat, lowland, coastally influenced landscape of and around the Broads has relatively good conditions to produce wind and solar electricity. The Broads Authority recognises these opportunities and understands the need to maximise renewable energy generation. A key consideration is the impact such proposals have on landscape character and special qualities, whether development is proposed within or adjacent to the Broads Authority Executive Area, or in areas outside the Executive Area but which may form part of its setting.

1.4 In order to provide advice for planners and development management officers in considering planning applications for renewable energy schemes, the Broads Authority has commissioned LUC to undertake an assessment of the sensitivity of the Broads landscape to onshore wind and field-scale solar photovoltaic (PV) development[1], as well as infrastructure associated with offshore wind energy which also has an influence on the character and quality of this landscape. The outputs of the study will help the Broads Authority to make robust, well-informed decisions on the planning applications received for wind and solar PV developments.

1.5 The main aim of this study is:

- To assess the sensitivity of the landscape to wind energy developments and solar PV developments within the Broads Authority Executive Area, with reference both to the special qualities in the Broads Plan and landscape character as defined in the thirty one local landscape character areas.

1.6 This study is designed as a strategic aid to inform determination of planning applications for wind energy and solar PV development at the landscape character scale. This assessment addresses landscape and visual sensitivity only and does not make any judgement regarding cultural heritage or natural environment sensitivities. Decisions regarding wider acceptability of wind

[1] For the purposes of this report, we will use the shorter term 'solar PV development(s)'

energy and solar PV schemes affecting the Broads will need to be made in the context of these (e.g. separate assessments covering nature conservation and cultural heritage) and considered 'in the round' – a balance of issues as part of a planning judgement.

1.7 Landscapes are borne of a complex inter relationship of different elements, all of which may be sensitive to varying degrees and in different ways to renewable energy development. The detailed discussion on landscape sensitivity at **section 4** and **Appendix 3** shows how potential conflicting issues are addressed in the landscape sensitivity assessment.

Definition of landscape sensitivity

1.8 There is policy support for renewable energy through the Climate Change Act (2008) which sets out a statutory target to reduce greenhouse gas emissions in the UK by 80% by 2050. Furthermore, the new National Planning Policy Framework (2012) states at paragraph 97 that local authorities should have a positive strategy to promote renewable and low carbon sources of energy, considering identification of appropriate areas for renewable and low carbon energy, whilst having regard to potential impacts of such schemes.

1.9 The term 'landscape sensitivity' has been defined in various ways in a number of different guidance documents and studies. The current Landscape Character Assessment (LCA) Guidance[2] does not provide a definition of 'landscape sensitivity', although considerations to take into account in assessing landscape sensitivity include professional judgement as to the degree to which the landscape in question can accommodate change without adverse impacts on landscape character. Such judgements involve the making of decisions about whether important aspects of landscape character are liable to loss in light of the change being assessed and whether important aesthetic attributes of character would potentially be altered.

1.10 For the purposes of this study, landscape sensitivity is defined as follows:

Landscape sensitivity is the extent to which the character and quality of the landscape is susceptible to change as a result of wind energy/field-scale solar PV development

Sensitivity or capacity?

1.11 This study does not address landscape capacity for the reason that the term 'capacity' when applied to the landscape is misleading and implies some sort of threshold when in reality consequences will always result. It is also important to recognise that judgements about the acceptability of landscape change can alter over time, not only in terms of our attitudes to a particular landscape but also in terms of our attitudes towards a particular type of change. This suggests that 'capacity' is a subjective term and may vary over time. It is important that any assessment is clear about which elements of it are relatively objective and unlikely to be disputed, and which ones are more subjective and likely to be viewed differently by different stakeholders and potentially by the same stakeholders but at different times.

Structure of this report

1.12 The remainder of this report is set out as follows:

- Section 2: The baseline landscape of the Broads
- Section 3: Method for undertaking the landscape sensitivity assessment
- Section 4: Summary of results

1.13 A Glossary is provided at **Appendix 1**. **Appendix 2** sets out the characteristics of wind energy and solar PV development which have informed this assessment, whilst **Appendix 3** presents the full landscape sensitivity matrices for each of the landscapes in this assessment.

[2] Former Countryside Agency and Scottish Natural Heritage (2002) 'Landscape Character Assessment - Guidance for England and Scotland', prepared by Swanwick C and LUC

2 The baseline landscape of the Broads

The Broads – a nationally designated landscape

2.1 The Broads located in east Norfolk and Suffolk and fringed by the local authorities of North Norfolk District, Broadland District, South Norfolk District, Great Yarmouth Borough and Waveney District, comprise a diverse range of wetland landscapes associated with the Rivers Bure, Yare, Thurne, and Waveney and smaller river valleys such as the Ant and Chet. Much of the landscape was formerly coastal and estuarine, associated with the historic Isles of Flegg and Lothingland and with the great estuaries at Breydon and Lake Lothing. The Broads are the product of many centuries of human intervention. This occurred principally in the form of medieval peat excavation in river valleys and land drainage of estuarine marshes and flats for agriculture, and has resulted in a hugely diverse and dynamic, ever changing landscape, cultural and habitat mosaic. This includes lowland river valleys, freshwater fens, reed beds, areas of regeneration by wet woodland (alder carr), heathlands and coastal and estuarine grazing marsh, as well as areas of traditional vernacular settlement using site specific materials linked with traditional industries such as reed cutting, and servicing trades associated with boating and sailing.

2.2 The past challenges associated with settling and reclaiming areas of the landscape are the very factors which have contributed to its often remote and tranquil character and the wildness associated with its landscape and habitat fabric. It is this tranquil character or the characteristic of the Broads as a 'breathing space for the cure of souls' (Ted Ellis), together with its expansive character of open undeveloped skylines, which are among the primary special qualities underpinning the national designation of the Broads.

2.3 Natural England's 'Making Space for Renewable Energy'[3] suggests that the presence of statutory protected landscapes (England's National Parks and Areas of Outstanding Natural Beauty) will substantially reduce the degree to which wind energy development can be accommodated. It also recognises that, as with sites within protected landscapes, the bar is also higher in the areas outside them which form their setting, stating that "*Natural England regards the settings of protected landscapes as being potentially influential on the conservation of the special qualities of the National Park or AONB concerned*" and "*The potential impact of a wind energy development situated in the setting of a protected landscape on the protected area itself is, however, a material consideration in determining applications. The critical test is, as before, to demonstrate that the development will not compromise the objectives of designation*" (page 17).

Landscape quality baseline: Special qualities identified in the Broads Plan

2.4 The following special qualities underpinning the National Park Designation of the Broads are set out in the Broads Plan 2011[4]: (Noting that these special qualities are updated in the Broads Plan 2022-2027) although are broadly similar.

- Wide, open landscape
- Winding waterways
- Big skies
- Abundance and diversity of nature
- Sense of space, tranquillity and wildness
- Local character of beautiful churches, windmills and quiet villages

[3] Natural England (2010) Making Space for Renewable Energy: Natural England's Approach to Assessing On-Shore Wind Energy Development (Catalogue Code: NE254)
[4] Broads Authority (2011), Broads Plan 2011: A Strategic Plan to Manage the Norfolk and Suffolk Broads

- Opportunities for boating and sailing

2.5 Other characteristics of the landscape are also directly relevant to the special qualities, identified through consultation with the Broads Authority:

- Open Broads
- Presence of dyke patterns
- Wet woodlands and/or reed beds
- Enclosure created by woodlands
- Simplicity of the landscape

2.6 The special qualities, together with landscape character, have informed the sensitivity assessment undertaken and presented in this report. It will be important that any renewable energy development has appropriate regard to these special qualities with regard to design and siting, whether within the Broads or its setting.

2.7 The special qualities that may be specifically affected by wind energy and solar PV development respectively are set out in the tables at **section 3**. Consultation has been undertaken upon the landscape assessment work for the Broads, and these qualities are therefore recognised by local communities.

Landscape character: The Broads Landscape Character Assessment, 2006

2.8 The Broads Landscape Character Assessment (LCA), together with updates and additional information gathered on perceptual character by LUC (2012), forms the other key baseline element for this study.

2.9 The LCA identifies thirty one fine grain local landscape character areas based on distinctions in geology, landscape management and cultural pattern, supported by a series of smaller landscape types within these character areas. The landscape character areas have been used as the basis for this sensitivity study, and are as follows:

- 1: Waveney Valley – Outney Common and Bath Hills
- 2: Waveney Valley – Bungay/Ditchingham to Shipmeadow/Geldeston
- 3: Waveney Valley: Barsham, Gillingham and Beccles
- 4: Waveney Valley: Aldeby to Burgh St Peter
- 5: Waveney Valley – Worlingham Wall to Boundary Dyke Barnby
- 6: Waveney Valley – Boundary Dyke Barnby to the Fleet, Oulton
- 7: Waveney Valley – Burgh St Peter to Haddiscoe Marshes
- 8: Waveney Valley – Flixton to Herringfleet Marshes
- 9: Waveney Valley – St Olaves to Burgh Castle
- 10: Yare Valley – Whitlingham and Country Park
- 11: Yare Valley – Thorpe to Carey's Meadow, Thorpe Island and Marshes, Postwick Grove and Whitlingham Marshes
- 12: Yare Valley – Kirby/Postwick to Rockland/Strumpshaw
- 13: Yare Valley - Claxton to Hardley Marshes
- 14: Yare Valley – Buckenham and Cantley Marshes and Carrs
- 15: Yare Valley – Cantley to Reedham
- 16: Yare/Waveney Valley – Norton Marshes to Haddiscoe dismantled railway
- 17: Chet Valley
- 18: Haddiscoe Island
- 19: Halvergate Marshes (excluding Bure Loop and west of Tunstall Dyke)

- 20: Breydon Water
- 21: Waveney Valley – Church Farm, Burgh Castle, Fisher's and Humberstone Marshes
- 22: Bure Valley – Upstream Wroxham to Horstead
- 23: Bure Valley – Wroxham to Fleet Dyke, South Walsham
- 24: Bure Valley – South Walsham to Acle Marshes and Fens
- 25: Bure Valley – Lower Bure Arable Marshlands
- 26: Muck Fleet Valley and the Trinity Broads
- 27: Ant Valley – Upstream of Wayford Bridge
- 28: Ant Valley – Downstream of Wayford Bridge
- 29: Ant/Bure Valley – Ludham, Horning and Neatishead Grazing Marshes
- 30: Thurne Valley – Upper Thurne Open Marsh, Broads and Fens
- 31: Thurne/Bure Valley – Martham Ferry to Oby

LCA update, 2012

2.10 This study has been informed by the additional gathering of perceptual information in relation to the thirty one local character areas, as part of an update of the LCA undertaken by LUC with the Broads Authority. This involved field survey to capture and add detail to information on the following perceptual aspects of landscape character for each area:

- Special and scenic qualities of the Broads
- Remoteness and tranquillity
- Enclosure and scale
- Light and reflectivity
- Pattern and texture
- Sense of time depth[5]
- Skylines
- Visibility and intervisibility
- Accessibility and experience/recreation

The landscape character areas are shown on **Figure 2.1**, together with the landscape character context of adjacent districts. The LCA descriptions, together with updated information on perceptual character (LUC, 2012) form the primary evidence base for this assessment.

LCA groupings for the sensitivity assessment

2.11 For the purposes of this study, the landscape character areas have been aggregated into the following groups which were defined by the Broads Authority based on their local knowledge and upon common landscape characteristics:

- LCAs 1 and 2
- LCA 3
- LCAs 4, 5 and 6
- LCAs 7 and 16
- LCAs 8 and 9
- LCAs 10 and 11

[5] The imprint of the past and cultural pattern upon a place.

- LCAs 12, 12, 14, 15 and 17
- LCAs 18, 19, 20 and 21
- LCAs 22 and 23
- LCAs 24, 29 and 31
- LCA 25
- LCA 26
- LCAs 27 and 28
- LCA 30

Landscape character of adjacent districts

2.12 The landscape sensitivity assessment considers intervisibility with and relationship to landscape features within district landscape character areas outside of and adjacent to the Executive Area, as appropriate. Accordingly reference has been made to the following landscape character assessments:

- Great Yarmouth Borough Landscape Character Assessment 2008
- North Norfolk District Landscape Character Assessment Supplementary Planning Document (SPD) 2009
- Broadland District Draft Landscape Character Assessment Supplementary Planning Document (SPD) 2010
- South Norfolk District Landscape Character Assessment 2005
- Waveney District Landscape Character Assessment 2008

Note that some of these assessments have since been updated. The information used for the original landscape sensitivity study remains relevant.

Norfolk Historic Landscape Characterisation

2.13 Norfolk's Historic Landscape Characterisation (HLC, 2008) maps historic landscape character types across the county. These Historic Landscape Types (HLTs) are shown on **Figure 2.2**.

Broads Landscape Study

Figure 2.1

Landscape Character

The Broads Authority Boundary

District Boundary

Broads Authority LCA

- 0. Arable areas - outside "Broads" Character refers to Adjacent district Landscape Character Assesment
- 1. Outney Common and Bath Hills
- 2. Bungay/Ditchingham to Shipmeadow/Geldeston
- 3. Barsham, Gillingham and Beccles Marshes
- 4. Aldeby to Burgh St Peter
- 5. Worlingham Wall to Boundary Dyke Barnby
- 6. Boundary Dyke Barnby to the Fleet, Oulton
- 7. Burgh St Peter to Haddiscoe Marshes
- 8. Flixton to Herringfleet Marshes
- 9. St Olaves to Burgh Castle
- 10. Whitlingham Lane and Country Park
- 11. Thope to Cary's Meadow, Thope Island and marshes, Postwick Grove and Whitlingham Marshes
- 12. Kirby/Postwick to Rockland/Strumpshaw
- 13. Claxton to Hardley Marshes
- 14. Buckenham and Cantley Marshes and Carrs
- 15. Cantley to Reedham
- 16. Norton Marshes to Haddiscoe dismantled railway
- 17. Chet Valley
- 18. Haddiscoe Island
- 19. Halvergate Marshes (exc Bure Loop and west of Tunstall Dyke)
- 20. Breydon Water
- 21. Church Farm, Burgh Castle, Fisher's and Humberstone Marshes
- 22. Upstream Wroxham to Horstead
- 23. Wroxham to Fleet Dyke, South Walsham
- 24. South Walsham to Acle Marshes and Fens
- 25. Lower Bure Arable Marshlands
- 26. Muck Fleet Valley and the Trinity Broads
- 27. Upstream of Wayford Bridge
- 28. Downstream of Wayford Bridge
- 29. Ludham, Horning and Neatishead Grazing Marshes
- 30. Upper Thurne Open Marsh, Broads and Fens
- 31. Martham Ferry to Oby

Map Scale @ A3:1:160,000

North Norfolk District

Great Yarmouth Borough

Broadland District

South Norfolk District

Waveney District

0 1.75 3.5 km

LUC LDN 5409-02_15_Fig2_1_Landscape_Character 25/11/2013

Source:

Broads Landscape Study

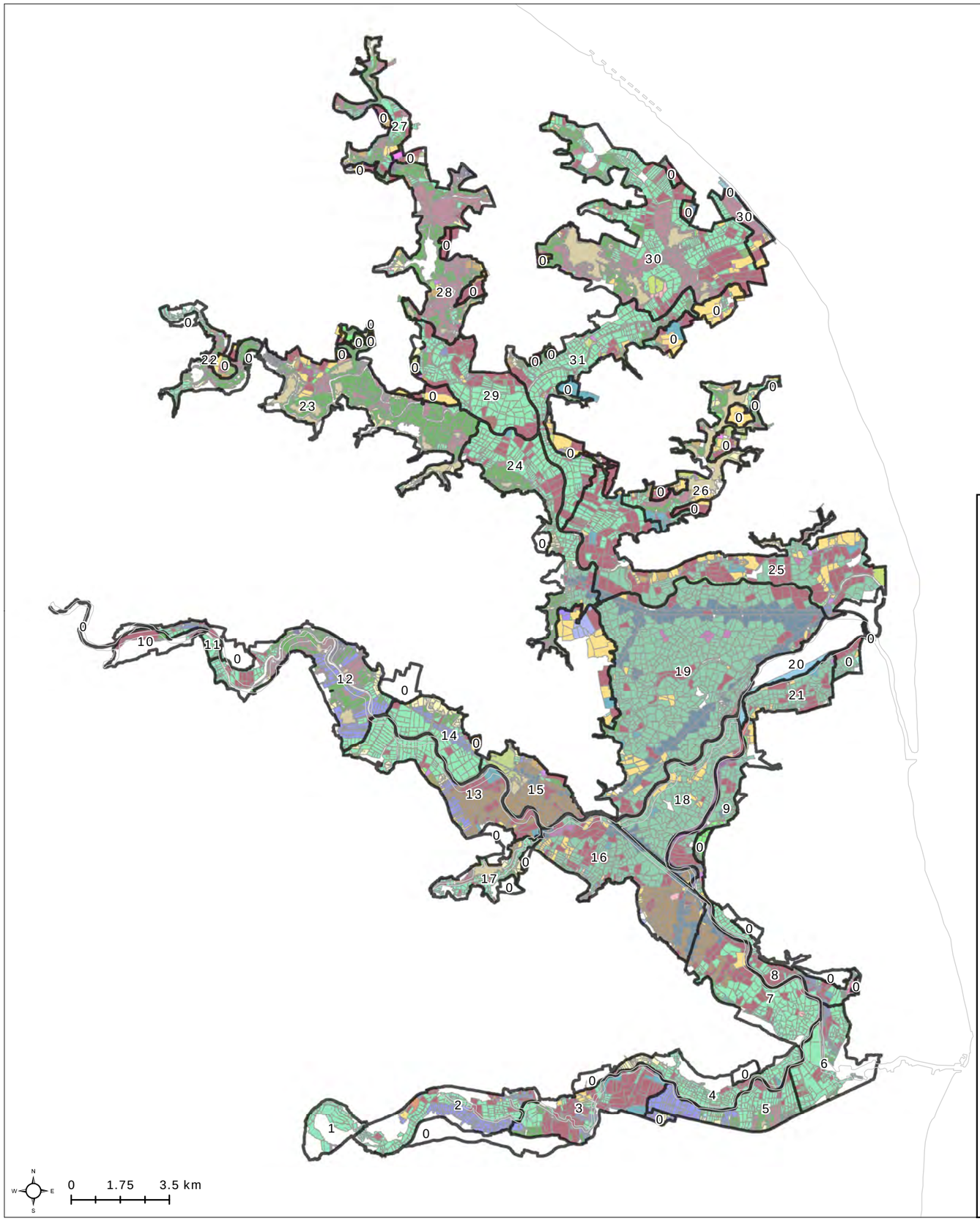
Figure 2.2

Historic Landscape Character

Map Scale @ A3:1:160,000

LUC

Source:



Legend

- Broads Authority LCA

Historic Landscape Character Areas

- 18th-20th century woodland plantation
- 20th century enclosure
- Allotment
- Ancient woodland
- Animal farm
- Boundary loss
- Boundary loss - with relict element
- Built up areas - urban development
- Carr woodland
- Common with an open margin
- Doles - fossilised fen meadows - medieval
- Drained reclamation - curvilinear - pre-18th cent
- Drained reclamation - rectilinear - 19th-20th cent
- Duck decoy pond
- Grazing marsh - curvilinear - anciently enclosed
- Grazing marsh - rectilinear - 17th-19th century
- Grazing marsh - rectilinear - 17th-20th century
- Hall/large house
- Historic earthwork
- Industrial
- Informal parkland
- Interrupted/regular rows of farms/tofts and crofts
- Irregular enclosure
- Later enclosure - piecemeal by agreement
- Leisure/recreation
- Managed wetland
- New enclosure
- New enclosure formed by 18th-19th century communication and transport
- Nucleated clusters - more than 5
- Nursery with glass house
- Orchard
- Piecemeal enclosure by agreement
- Piecemeal style Parliamentary enclosure
- Regenerated alder carr woodland
- Religious institution
- Saltings
- Sea defences
- Settlement on common edge
- Small farm clusters - less than 5
- Streets and rows - linear settlements
- Stud farm
- Unimproved freshwater fen
- Unimproved intertidal
- Unimproved marine marsh or brackish fen
- Unimproved rough pasture
- Water reservoir

3 Method for undertaking the landscape sensitivity assessment

Spatial and descriptive framework

3.1 The local landscape character areas in the Broads, together with their accompanying descriptions and updated information on perceptual character, form the evidence base for the Landscape Sensitivity Assessment. Other key sources of information used to inform the assessment include:

- The Norfolk Historic Landscape Character (HLC) Assessment
- The special qualities of the Broads as expressed in the Broads Plan 2011
- CPRE Tranquillity and Intrusion Mapping[6]
- Ordnance survey base maps (1:250K, 1:50K and 1:25K) and aerial photographs
- Adjacent district LCA information – account has been taken of landscape character areas outside the Broads
- Field survey, to support and verify the assessment

3.2 In addition, Zone of Theoretical Visibility (ZTV) analysis mapping has been used to inform the visual elements of the sensitivity assessment and consideration of intervisibility between character areas. The ZTV mapping is presented at **Figures 3.1 to 3.5**. These sample ZTVs were generated from a range of representative locations within and adjacent to the Broads, including expansive open marshland landscapes, from promoted paths/routes such as the Weavers Way, from sites of visitor focus such as Beauchamp Arms on the Yare and Carlton Marshes within the Waveney Valley. A ZTV was also generated to show potential visual influence of introducing turbines on the type of site which could potentially be of interest for turbines outside the Broads (an old military airfield). The ZTVs were processed using a digital ground model based on Ordnance Survey Landform Panorama contour data and produced using Arc GIS software. For the purposes of this assessment, woodlands (drawn from the National Woodland Inventory data) were modelled to a height of 15m to give an indication of visual barriers. The extent of the ZTV was a 35km radius from a central point on the chosen site. A 35km radius was used as this corresponds to the study area chosen for windfarm LVIAs with reference to published guidance[7]. The ZTVs are based on a viewer eye height of 2m to consider worst case, and also take account of earth curvature.

3.3 ZTVs have been supported by field survey to identify aspects of the adjacent character areas which are sensitive in relation to the Broads, as identified in the matrices at **Appendix 3**.

Development types considered

3.4 In discussion with the Broad Authority, the following renewable energy typologies have been used to inform the analysis, with more information on the characteristics of relevant renewable energy technologies at Appendix 2

Wind turbines and associated infrastructure

3.5 The sensitivity assessment applies to all forms of turbines, although this study is based on the most common three bladed horizontal axis turbines. The assessment considers different turbine heights and cluster sizes, based on bandings that reflect the existing applications submitted to

[6] http://www.cpre.org.uk/resources/countryside/tranquil-places

[7] SNH, 2006 **Visual Representation of Windfarms** Good Practice Guidance. Although produced for Scotland, this is widely accepted technical guidance for the assessment of the impact of windfarms.

The Broads Authority and those most likely to be put forward by developers in the future. In this context, the fine grain, small scale landscape and intricate patterns of the Broads have also been recognised in determining the size and scale of turbines to be considered appropriate for assessment within the study area. The following height and cluster ranges have been used to inform this assessment:

Turbine heights

- 15-20 metres to blade tip
- 20-50 meters to blade tip
- 50-70 meters to blade tip (Relevant areas outside the Broads Authority area only)
- 70 meters and above to blade tip (Relevant areas outside the Broads Authority area only)

3.6 Note that applications for micro turbines up to 15 m will be dealt with on a case by case basis and generic sensitivity judgements do not apply to this scale of development.

3.7 It is considered that 50 metres to blade tip is an appropriate upper threshold for assessment in the Executive Area, as this relates to the maximum height for which applications are currently coming forward (2012), and that turbines of a larger height range in the Executive Area would be fundamentally out of scale with the landscape elements which make up the Broads. However, the largest scale turbines in the above typology have also been assessed for completeness.

Turbine cluster sizes

- Single turbine
- Small scale clusters (up to 5 turbines)
- Medium scale clusters (6-10 turbines – areas outside the Broads Authority only)
- Large scale clusters (11-25 turbines - areas outside the Broads Authority only)
- Very large scale clusters (>26 turbines - areas outside the Broads Authority only)

Associated renewables infrastructure

3.8 Commentary is provided in the assessment in relation to pylons/cabling/landfall/substation infrastructure associated with offshore wind turbines, in applicable character areas, as appropriate.

Solar PV

3.9 The assessment considers the sensitivity of The Broads landscape to field scale solar PV in addition to commentary on domestic roof-mounted solar PV where appropriate, and with consideration of visible parts of adjacent character areas beyond the Executive Area. The most common field scale developments consist of 'arrays' of PV panels, around 3-4 meters in height and mounted on aluminium/stainless steel frames. The following sizes of development have been used to inform the assessment:

- Roof mounted requiring planning permission
- Roof mounted up to 1 hectare area
- Up to 1 hectare area (single field developments)
- 1 to 5 hectares area (Developments encompassing more than one field)

Evaluating landscape sensitivity

3.10 The approach taken in this study builds on current guidance published by the former Countryside Agency and Scottish Natural Heritage including the Landscape Character Assessment Guidance, as well as LUC's considerable experience from previous and on-going studies of a similar nature. The approach taken here accords with more recent updates of guidance on landscape sensitivity, prepared since 2012.

Assessment criteria

3.11 In line with good practice, this landscape sensitivity assessment uses carefully defined criteria. Criteria for determining landscape sensitivity to wind energy and field-scale PV development are based on special qualities and landscape character attributes of the landscape most likely to be affected by each development type. **Table 3.1** sets out the criteria that have been used for the assessment of wind energy development; and **Table 3.2** set out those used for solar PV developments. These have been informed by our experience and knowledge of other studies as well as feedback from the Steering Group. The criteria in these tables have been fed into the sensitivity matrices for each character area group at **Appendix 3**.

Table 3.1: Criteria for Assessing Landscape Sensitivity to Wind Energy Development

1.Scenic and special qualities of the Broads

The special qualities underpinning the national landscape designation of the Broads are in many instances intrinsic to aspects of landscape character which are brought out in other criteria in this table. A number of the special qualities referenced in the Broads Plan are directly relevant to aesthetic, scenic and perceptual aspects of landscape character. This assessment considers the extent to which these special qualities are referenced in each of the landscape character area groupings.

Of the scenic and special qualities, the following would have the highest sensitivity to wind energy development, where present:

- *Wide, open landscapes* and *big skies* (would be affected by presence of taller vertical structures)
- *Sense of space* (would be affected by presence of taller vertical structures and by clusters of these)
- *Sense of tranquillity and wildness* (due to potential of wind energy development to introduce a sense of movement and noise to the landscape)

Information sources: Broads Plan 2011.

Lower sensitivity *Higher sensitivity*

Examples of sensitivity ratings

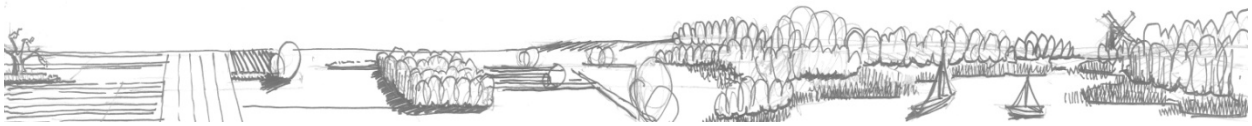
Lower sensitivity		⟷		**Higher sensitivity**
e.g. a landscape with greater presence of elements which impact on special and scenic qualities – landscape may be affected by and intervisible with large scale settlement and/or 'edge' influences/lighting/ transport infrastructure. Very low presence/ distribution of special qualities which may	e.g. a landscape with some presence of elements which impact on special/scenic qualities, or one of medium scenic quality, unlikely to be significantly affected by wind turbine development, or with few special qualities likely to be affected	e.g. a landscape with some evidence of the scenic and special qualities, albeit with a degree of erosion due to modern settlement edges and/or infrastructure. Alternatively the special qualities present are likely to be only moderately affected by wind turbine development	e.g. a landscape with considerable evidence of the scenic/special qualities. Most of the special qualities present are likely to be affected by wind turbine development	e.g. a landscape of very high scenic quality, with most/all of the scenic/special qualities evident and very likely to be affected by wind turbine development

be affected by wind energy development				

2.Enclosure and scale

A simple, open, large scale landscape with no visual boundaries and few features that relate to human scale is likely to be less sensitive to wind energy development than is a landscape of enclosed and small scale character. This is because turbines may appear out of scale, detracting from visually important landscape features which define the landscape scale or appear confusing (due to turbines being at varying heights) in the latter types of landscapes. In this criterion, specific aspects which can affect landscape scale in relation to the Broads can include not just valley sides but elements which punctuate the landscape such as windpumps or winged dykes, whilst, seasonally, sailing craft can also provide human scale elements within the landscape.

Information sources: Key characteristics for the LCA; Ordnance Survey basemaps; Topography data (Ordnance Survey Panorama); fieldwork



Lower sensitivity *Higher sensitivity*

Examples of sensitivity ratings

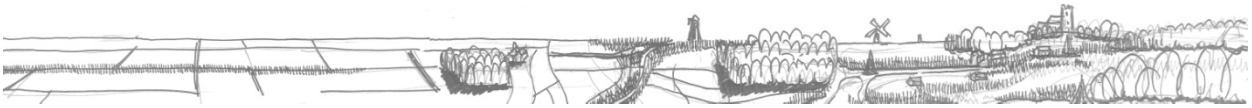
Lower sensitivity		⟷		**Higher sensitivity**
e.g. extensive open landscapes of exposed character, such as arable farmland defined by field boundary loss, and/or a landscape with very few human scale indicators	e.g. a landscape with a limited degree of enclosure, and relatively few field boundary/structural landscape features, and/or a landscape with few human scale indicators	e.g. a medium scale landscape, with a moderate degree of enclosure created by the presence of field boundary features and/or with presence of some human scale indicators	e.g. a landscape with a higher degree of enclosure and containment created by structural landscape features and/or by localised topographic variation, such as river valleys, valley sides and ridges, and with a high presence of human scale indicators	e.g. a landscape with a considerable sense of enclosure and containment. A landscape defined by an intimate spatial scale, whether due to structural vegetation or localised topographic variation (river valleys, valley sides and ridges), and with a high presence of human scale indicators

3.Landscape and land cover pattern

Simple, regular landscapes with extensive areas of consistent ground cover are likely to be less sensitive to wind energy development than landscapes with more complex or irregular land cover patterns, smaller and / or irregular field sizes (note also cross reference to sense of historic character) and landscapes with frequent human scale features that are traditional of the landscape, such as vernacular Broad side/river front dwellings or carr woodlands [8]. This is because large features such as wind turbines may dominate smaller scale traditional features within the landscape.

Within the above, it should be noted that more fine grained landscape patterns such as intricate dyke networks could affect landscape sensitivity where they have particular perceptual or visual expression.

Information sources: Key characteristics for the LCA; Ordnance Survey basemaps; Google Earth (aerial photography); fieldwork.



Lower sensitivity *Higher sensitivity*

Examples of sensitivity ratings

Lower sensitivity		⟷		**Higher sensitivity**
e.g. a very large-scale landscape with simple/uniform landcover pattern, with little variation, and lacking in human scale features	e.g. a landscape with large-scale field patterns and little variety in land cover. Occasional human scale features such as trees and domestic buildings	e.g. a landscape with medium sized fields, some variations in land cover and presence of human scale features such as trees, domestic buildings or where dyke pattern has some visual expression	e.g. a landscape with irregular small-scale fields, variety in land cover/interplay of landcover elements and presence of human scale features such as trees, domestic buildings, or a landscape where dyke pattern is evident	e.g. a landscape with a very strong variety in land cover and small-scale / irregular in appearance. Containing numerous human scale features or a landscape where dyke pattern is particularly evident

4.Skylines

Skylines (that is horizon lines or the extent of visibility defined by the meeting of land/water and sky), of undeveloped character have the highest sensitivity to wind turbine development as turbines may detract from such skyline character. Turbines and other related tall infrastructure such as pylons may also detract from traditional Broads skyline features such as church towers or historic wind pumps. Skylines with a higher distribution of human scale development influences may have proportionally lower sensitivity, although this is to a large extent dependent on the form of development which makes up the skyline, for example modern settlement would be of considerably lower sensitivity than traditional settlement centred on church spires. Skylines defined by large scale development and infrastructure (large urban edges, coastal ports) have the lowest sensitivity. The direction of

[8] Human scale features are aspects of land cover such as hedges or buildings which give a 'human scale' to the landscape

view and associated different skyline elements in relation to character areas have been considered in the sensitivity assessment.

Information sources: Key characteristics for the LCA; fieldwork.

Lower sensitivity *Higher sensitivity*

Examples of sensitivity ratings

Lower sensitivity		⟷		**Higher sensitivity**
e.g. a landscape with skylines defined by large scale modern development (due to urban edge, industry or infrastructure) or where such features form prominent skyline elements	e.g. a landscape with skylines largely defined by human scale settlement influences, or with some large scale modern development/infrastructure (urban edge/industry/infrastructure), or a combination of the above	e.g. a landscape with some presence of distinctive simple Broads skylines, whether expansive marshes or wooded broads, and vernacular features such as wind pumps, but also with human scale settlement influences and edges	e.g. a landscape with skyline character largely uninterrupted by modern development or infrastructure, irrespective of whether skylines are open/expansive or defined by woodland. May also contain areas of localised topographic variation which would render turbines prominent, and some vertical features associated with traditional Broads vernacular such as church towers and wind pumps.	e.g. a landscape whose skylines are entirely uninterrupted by modern development and infrastructure, irrespective of whether skylines are open/expansive or defined by woodland. Likely to also contain areas of topographic variation rendering turbines prominent. Also presence of some vertical features associated with traditional Broads vernacular such as church towers and wind pumps.

5.Perception and experience of the landscape

Landscapes that are relatively remote or tranquil (due to relative freedom from human activity and disturbance or having a strong feel of traditional rurality with few modern human influences) tend to increase levels of sensitivity to wind energy development compared to landscapes that contain signs of modern development (although it is noted that pockets of traditional rural settlement within character areas are unlikely to negatively affect overall sense of remoteness or sensitivity in perceptual terms, as they often fit aesthetic character). This is because modern development will introduce new and uncharacteristic features which may not respond well to landscape context and which may detract from a sense of tranquillity and or remoteness and rural landscape character.

Information sources: Key characteristics for the LCA; CPRE's Tranquillity and Intrusion mapping; Ordnance Survey basemaps (presence / absence of development, settlement, structures); Field survey

Lower sensitivity *Higher sensitivity*

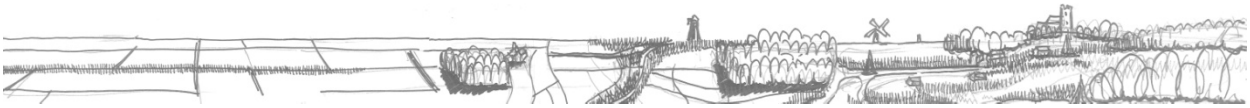
Examples of sensitivity ratings

Lower sensitivity		⟷		**Higher sensitivity**
e.g. a landscape with much human activity and development such as large scale agricultural buildings, modern settlement edges or ports/docks (to coastal/estuarine broads)	e.g. a rural landscape with much human activity and dispersed modern development	e.g. a rural landscape with some presence of modern development and human activity	e.g. a more naturalistic landscape and / or one with little presence of modern human influence and development	e.g. a remote or 'wild' landscape with little or no signs of current human activity and development

6.Historic landscape character

Landscapes comprising medieval features such as broads, associated ancient wet woodlands, and flood meadows are considered to have a higher sensitivity to larger scale wind energy development than landscapes comprising 18th century and later or modern land drainage, reclamation and river works schemes, due to the potential effects of larger scale wind energy development on the coherence of these landscapes and the ability to appreciate them. Historic landscape types of larger scale e.g. 20th century agriculture would be least sensitive. Historic, small scale landscape types such as sinuous co axial field systems have the highest sensitivity to wind turbine development as a result of potential change to the coherence of these historic landscape types, as do landscapes which demonstrate a strong sense of time depth in terms of functional and cultural landscape and settlement relationships. Scale of wind energy development in relation to that of historic landscape features is key to sensitivity, as picked up in specific LCA assessment groupings at Appendix 3.

Information sources: Key characteristics for the LCA; Norfolk HLC.



Lower sensitivity *Higher sensitivity*

Examples of sensitivity ratings

Lower sensitivity		⟷		**Higher sensitivity**
e.g. majority of the landscape covered by least sensitive HLTs and/or a low sense of time depth	e.g. majority of the landscape covered by lower sensitivity HLTs, and with relatively low sense of time depth, but may include some small areas of higher sensitivity	e.g. majority of the landscape covered by medium sensitivity HLTs or a mixture of higher and lower sensitivity HLTs. Some aspects of time depth evident	e.g. majority of the landscape covered by higher sensitivity HLTs and/or generally has a strong sense of time depth, but may include some small areas of lower sensitivity	e.g. the majority of the landscape covered by higher sensitivity HLTs and/or has a very clear/strong sense of time depth

7.Visual sensitivities and intervisibility

Landscapes with a strong sense of intervisibility and of open visual character will have a greater sensitivity to wind energy development than will landscapes of contained visual character. This is because of the greater potential of the former to be influenced in visual terms by wind energy development.

Source: Field survey

Lower sensitivity *Higher sensitivity*

Examples of sensitivity ratings				
Lower sensitivity		⟷		**Higher sensitivity**
e.g. a landscape with a very high level of visual containment and filtering, due to interaction of topographic and structural landscape features	e.g. a landscape with a relatively high degree of visual containment, due to interaction of topographic and structural landscape features	e.g. a landscape with a moderate degree of visual containment, due to interaction of topographic and structural landscape features	e.g. an exposed and open landscape with a relatively high degree of intervisibility with adjacent character areas	e.g. a very exposed and open landscape with a strong sense of intervisibility with adjacent character areas

Table 3.2: Criteria for Assessing Landscape Sensitivity to Field-scale Solar PV Development (commentary also provided for consideration of roof mounted PV under the following criteria which are relevant to this form of solar PV: historic character, visibility/intervisibility and openness/enclosure)

1.Scenic and special qualities of the Broads

The special qualities underpinning the national landscape designation of the Broads are in many instances intrinsic to aspects of landscape character which are brought out in other criteria in this table. A number of the special qualities referenced in the Broads Plan are directly relevant to aesthetic, scenic and perceptual aspects of landscape character. This assessment considers the extent to which these special qualities are referenced in each of the landscape character area groupings.

The following special qualities, where present, would have higher sensitivities to solar PV development:

- The *abundance of nature* (land take required by solar PV schemes could potentially have an effect on habitat and landscape networks which contribute to this quality)
- *Sense of tranquillity and wildness* (due to introduction of structural elements which could interrupt this)
- *Wide, open landscapes and big skies* (would be affected by presence of solar arrays as skyline elements/due to local loss of skylines)
- *Sense of space* (would be affected by presence of solar arrays whose footprint could potentially impinge on this sense of space and openness)

Information sources: Broads Plan, 2011.

Lower sensitivity *Higher sensitivity*

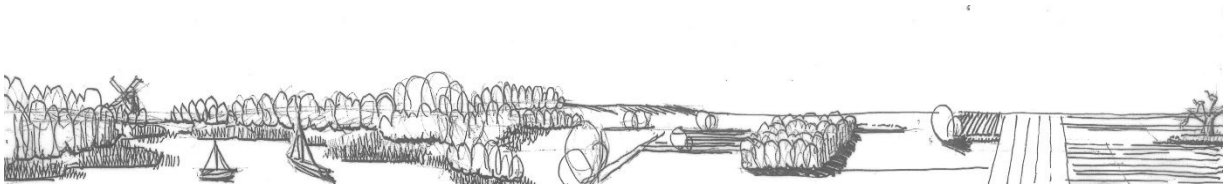
Examples of sensitivity ratings

Lower sensitivity		⟷	**Higher sensitivity**	
e.g. a landscape with greater presence of elements which impact on special and scenic qualities – landscape may be intervisible with large scale settlement and/or 'edge' influences/lighting/ transport infrastructure. Very low presence/distributio n of special qualities which may be affected by solar PV development	e.g. a landscape with some presence of elements which impact on special/scenic qualities, or one which is unlikely to be significantly affected by solar PV development, or with few special qualities likely to be affected	e.g. a landscape with some evidence of the scenic and special qualities, albeit with a degree of erosion due to modern settlement edges and/or infrastructure. Alternatively the special qualities present are likely to be only moderately affected by solar PV development	e.g. a landscape with considerable evidence of the scenic/special qualities. Most of the special qualities present are likely to be affected by solar PV development	e.g. a landscape of very high scenic quality, with most/all of the scenic/special qualities evident and very likely to be affected by solar PV development

2.Sense of openness / enclosure

A landscape with a strong sense of enclosure (e.g. provided by land cover such as woodland or high hedgerows, or by relative variations in topography) is likely to be less sensitive to solar PV development whether field or roof mounted than an open and unenclosed landscape because the development will be less easily perceived, especially at a distance, in an enclosed landscape.

Information sources: Key characteristics for the LCA; Google Earth / aerial photographs; fieldwork.



Lower sensitivity *Higher sensitivity*

Examples of sensitivity ratings

Lower sensitivity		⟷		**Higher sensitivity**
e.g. a very well enclosed landscape – enclosure is perhaps provided by thick, high hedgerows, tree belts and woodland and/or by topographic variation	e.g. relatively high levels of enclosure provided by thick hedgerows with frequent hedgerow trees, and/or by relative topographic variation	e.g. a landscape with some open and some more enclosed areas – likely to be a rural landscape with some hedgerows and tree belts. The landscape may have a degree of topographic variation which could provide localised enclosure	e.g. an open landscape with little sense of enclosure (low, few or no hedgerows, few trees)	e.g. an extremely open landscape such as an unenclosed marsh with no field boundaries or trees

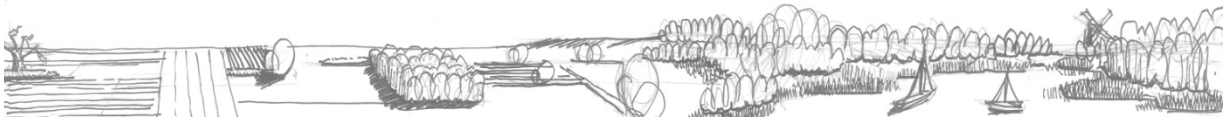
In terms of this criterion, whilst a strong sense of enclosure creates visual containment in relation to solar PV and therefore has the potential to reduce sensitivity in visual terms, the landscape structure of small scale, enclosed landscapes is potentially vulnerable to solar PV development footprints, as described in criterion 3 (Landscape and land cover pattern and scale), overleaf. This is brought out as appropriate in the discussion on landscape sensitivity for the character area groups.

3.Landscape and landcover pattern and scale

Landscapes with small-scale, more irregular field patterns are likely to be more sensitive to the introduction of solar PV development than landscapes with large, regular scale field patterns because of the risk of diluting or masking the characteristic landscape patterns. This would be particularly apparent if development takes place across a number of adjacent fields where the field pattern is small and intricate (bearing in mind that the height of panels could exceed that of a hedge).

Landscapes with a more complex, 'mosaic' landcover pattern, which may often be related to landscape scale, would also have a higher sensitivity to solar PV than those with a simpler land cover pattern e.g. arable agriculture, which is potentially more reflective of the pattern/geometry created by field scale PV.

Information sources: Key characteristics for the LCA; Norfolk Historic Landscape Characterisation; Ordnance survey 1:25K basemap (showing field patterns); Google Earth (aerial photography); fieldwork.



Lower sensitivity *Higher sensitivity*

Examples of sensitivity ratings

Lower sensitivity		⟷	**Higher sensitivity**	
e.g. a landscape with large-scale, regular fields of mainly modern origin, or an arable or 'brownfield' landscape	e.g. a landscape which is mainly defined by large, modern fields, or a largely arable or 'brownfield' landscape with some pasture or semi-natural land cover present	e.g. a landscape with a mixture of large-scale, modern fields and some smaller, more historic enclosure, or a mixed pastoral and arable landscape, perhaps with some brownfield sites and some semi-natural land cover	e.g. a landscape dominated by ancient, small-scale field patterns with a few isolated areas of modern enclosure, or a landscape dominated by permanent pasture (there could be some arable land present), and with areas of semi-natural land cover	e.g. a landscape characterised by small-scale, ancient field patterns, or a landscape dominated by semi-natural land cover, perhaps with some permanent pasture

In terms of this criterion, whilst small scale landscape patterns are potentially vulnerable to solar PV development footprints, they also afford visual containment, reducing sensitivity in visual terms and in relation to criteria 2 (Sense of openness/enclosure) above. This is brought out as appropriate in the discussion on landscape sensitivity for the character area groups.

4.Perception and experience of the landscape

Landscapes that are relatively remote or tranquil (due to freedom from human activity and disturbance and having a strong feel of traditional rurality with few modern human influences) tend to increase levels of sensitivity to solar PV development compared to landscapes that contain signs of modern development. This is because such development will introduce new and uncharacteristic features which may detract from a sense of tranquillity and or remoteness and rural landscape character.

Information sources: Key characteristics for the LCA; CPRE's Tranquillity and Intrusion mapping; Ordnance Survey basemaps (presence / absence of development, settlement, structures): Field survey

Lower sensitivity *Higher sensitivity*

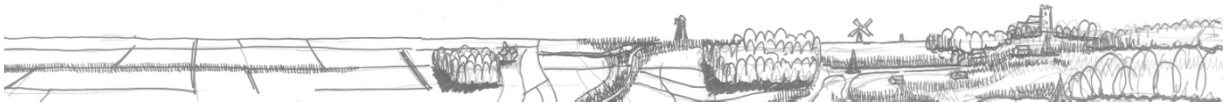
Examples of sensitivity ratings

Lower sensitivity		⟷		**Higher sensitivity**
e.g. a landscape with much human activity and development such as industrial areas or ports/docks (to coastal/estuarine broads)	e.g. a rural landscape with much human activity and dispersed modern development	e.g. a rural landscape with some modern development and human activity	e.g. a more naturalistic landscape and / or one with little modern human influence and development	e.g. a remote or 'wild' landscape with little or no signs of current human activity and modern development

5.Historic Landscape Character

Landscapes comprising medieval features such as broads, associated ancient wet woodlands, and flood meadows are considered to have a higher sensitivity to both field scale and rooftop PV development than landscapes comprising 18th century and later or modern land drainage, reclamation and river works schemes, due to the potential effects of both field and roof mounted solar PV development on the coherence of such landscapes and the ability to perceive and appreciate them. Large scale historic landscape types such as 20th century field systems have lowest sensitivity to solar arrays. Historic, small scale landscape types such as sinuous co axial field systems have the highest sensitivity to solar PV development as a result of potential change to the coherence of these historic landscape types, as do landscapes which demonstrate a strong sense of time depth in terms of functional and cultural landscape and settlement relationships.

Information sources: Key characteristics for the LCA; Norfolk HLC.



Lower sensitivity *Higher sensitivity*

Examples of sensitivity ratings				
Lower sensitivity		⟷	**Higher sensitivity**	
e.g. majority of the landscape covered by least sensitive HLTs and/or a low sense of time depth	e.g. majority of the landscape covered by lower sensitivity HLTs, and with relatively low sense of time depth, but may include some small areas of higher sensitivity	e.g. majority of the landscape covered by medium sensitivity HLTs or a mixture of higher and lower sensitivity HLTs. Some aspects of time depth evident	e.g. majority of the landscape covered by higher sensitivity HLTs and/or generally has a strong sense of time depth, but may include some small areas of lower sensitivity	e.g. the majority of the landscape covered by higher sensitivity HLTs and/or has a very clear/strong sense of time depth

6.Visual sensitivities and intervisibility

Landscapes with a strong sense of openness and intervisibility will have a greater sensitivity to solar PV development than will more visually contained landscapes with denser or more intact landscape structure. This is due to the greater potential for the former to be influenced in visual terms by solar PV development.

Information sources: Field survey.

Lower sensitivity *Higher sensitivity*

Examples of sensitivity ratings				
Lower sensitivity		⟷	**Higher sensitivity**	
e.g. a landscape with a very high level of visual containment and filtering, due to interaction of topographic and structural landscape features	e.g. a landscape with a relatively high degree of visual containment, due to interaction of topographic and structural landscape features	e.g. a landscape with a moderate degree of visual containment, due to interaction of topographic and structural landscape features	e.g. an exposed and open landscape with a relatively high degree of intervisibility with adjacent character areas	e.g. a very exposed and open landscape with a strong sense of intervisibility with adjacent character areas

Discussion on landscape sensitivity

3.12 Once the criteria have been assessed individually, the results are drawn together into a summary discussion on landscape character sensitivity for that landscape character area grouping.

3.13 If one criterion has a particularly strong influence on landscape character this is drawn out in the discussion (an example might be skylines in a landscape character area with open or undeveloped skylines, or perception and experience of the landscape in a particularly remote landscape character area).

3.14 In any given LCA group there may be criteria that produce conflicting results. For example, when considering sensitivity to wind energy development, a settled landscape, while containing greater human influence (indicating a lower sensitivity), will also include more human scale features that could be affected by large-scale wind turbines (indicating a higher sensitivity). Conversely, a more remote landscape will lack the human scale features but may have a higher sensitivity from a perceptual point of view. When considering solar PV development, a landscape with a very small-scale field pattern and with a high sense of enclosure might score lower in terms of sensitivity for 'sense of enclosure/openness' but higher for 'field pattern and scale'. These issues are brought out in the discussion on landscape sensitivity, and a professional judgement is made on overall sensitivity.

Judging landscape sensitivity to different sizes of development

3.15 The next stage of the assessment is to come to a judgement on landscape sensitivity to different sizes/scales of development (height of wind turbines and size of solar PV development). In the case of wind turbines, notes are also provided in relation to sensitivity to different turbine cluster sizes (see matrices at **Appendix 3**). Assumptions concerning the footprints of solar PV schemes are set out in the notes at **Appendix 2**.

3.16 For all the renewables scenarios covered in this study, sensitivity is judged on a five-point scale as shown in **Table 3.3** below. These sensitivity ratings can apply to any landscape in England – they are not specific to the Broads.

Table 3.3: Definition of landscape sensitivity levels

Sensitivity Level	Definition
High (H)	The key characteristics and qualities of the landscape are highly sensitive to change from the type and scale of renewable energy being assessed.
Moderate-High (M-H)	The key characteristics and qualities of the landscape are sensitive to change from the type and scale of renewable energy being assessed.
Moderate (M)	Some of the key characteristics and qualities of the landscape are sensitive to change from the type and scale of renewable energy being assessed.
Low-Moderate (L-M)	Few of the key characteristics and qualities of the landscape are sensitive to change from the type and scale of renewable energy being assessed.
Low (L)	Key characteristics and qualities of the landscape are robust and are less likely to be adversely affected by the type and scale of renewable energy development being assessed.

Presentation of results

3.17 The full landscape sensitivity assessments for each of the grouped/aggregated landscape character areas are presented in tabular format in Appendix 3. The tables provide:

- A summary description of the LCA group against each of the assessment criteria, giving a landscape sensitivity assessment 'score' for each (on the coloured five-point scale as set out in Table 3.3 above)
- An overall discussion on landscape sensitivity for the LCA group
- Commentary on sensitivity for different scales of development (different turbine heights for wind energy development and different areas of panels for solar PV development)
- For wind energy development, a commentary on landscape sensitivity to different cluster sizes.

3.18 A summary of the results of the landscape sensitivity assessment is presented in **Chapter 4** and mapped at **Figures 4.1-4.15**.

Limitations of the landscape sensitivity assessment

3.19 While this Landscape Sensitivity Assessment provides an initial indication of the relative landscape sensitivities of different areas to wind energy and solar PV development, it does not aim to comment on landscape capacity, and should not be interpreted as a definitive statement on the

suitability of a certain location for a particular development. It is not a replacement for detailed studies for specific siting and design and all developments will need to be assessed on their individual merits. It is also unrelated to any Government targets for renewable energy development or studies of technical potential.

3.20 This Landscape Sensitivity Assessment is based on an assessment of landscape character and quality using carefully defined criteria. As with all analyses based upon data and information which is to a greater or lesser extent subjective, some caution is required in its interpretation. This is particularly to avoid the suggestion that certain landscape features or qualities can be absolutely associated with certain sensitivities – the reality is that landscape sensitivity is the result of a complex interplay of often unequally weighted variables (or 'criteria'). We have sought to address this issue in our summary of overall landscape sensitivity given for each LCA group – which considers how the criteria-based assessments combine to give an overall sensitivity result for different scales of development within an LCA group. Because of the complexity of the criteria, and their subtle interrelationships with each other, we have purposefully not used a numeric scoring system in expressing sensitivity. The assessments are based on professional judgement, taking account of the interplay between criteria, as well as those which might be more important [to landscape character] in a particular LCA group.

3.21 It is also worth noting that, whilst the assessment comments on ecological or cultural matters in general terms as they relate to landscape character, it does not cover specific ecological issues associated with nature conservation designations or, in the case of wind turbines, bird flight paths; specific cultural heritage/archaeological issues associated with individual designated heritage assets and their settings; visual amenity issues; or technical issues (such as the fact that trees and woodland can create turbulence making siting of turbines more difficult) - these are all issues that will need to be taken into account in site selection and impacts will need to be reported at the time when individual proposals are being put forward – e.g. through the Environmental Impact Assessment (EIA) process.

Consideration of seascape

3.22 The study area for this assessment includes all onshore areas of the Broads, a small part of which forms a section of the North Norfolk coastline near Winterton. It does not consider offshore wind energy development, other than intervisibility with offshore schemes in general terms or the sensitivity to onshore infrastructure associated with offshore windfarms. Although siting wind and solar PV development on-shore may also have an indirect effect on the perceptual qualities of the seascape off the coast, without defined seascape units and baseline information on seascape character it is not possible for this sensitivity assessment to consider the impact of wind energy development on seascape character. Nevertheless, for Landscape Character Areas with an inherent relationship with the coast and sea, sensitivity of the coastline has been considered through the following criteria:

- Landform and scale (for wind turbines) or landform (for solar PV)
- Skylines (for wind turbines)
- Perceptual qualities
- Scenic quality.

3.23 If, in the future, a seascape character assessment is undertaken for the coast around the Broads, the information in that assessment should be used alongside this study to inform decisions.

Figure 3.1

ZTV Location 1 - South Walsham Marshes

- Location 1 - South Walsham Marshes
- 35km buffer
- Landscape Character Areas
- Woodland (NIWT)
- Zone of theoretical visibility

ZTV Information:
Target height - 50m
Viewer height - 2m
All woodland - 15m
(Woodland taken from Forestry Commission NIWT dataset)

0. Arable areas - outside "Broads" Character refers to Adjacent district Landscape Character Assesment
1. Outney Common and Bath Hills
2. Bungay/Ditchingham to Shipmeadow/Geldeston
3. Barsham, Gillingham and Beccles Marshes
4. Aldeby to Burgh St Peter
5. Worlingham Wall to Boundary Dyke Barnby
6. Boundary Dyke Barnby to the Fleet, Oulton
7. Burgh St Peter to Haddiscoe Marshes
8. Flixton to Herringfleet Marshes
9. St Olaves to Burgh Castle
10. Whitlingham Lane and Country Park
11. Thope to Cary's Meadow, Thope Island and marshes, Postwick Grove and Whitlingham Marshes
12. Kirby/Postwick to Rockland/Strumpshaw
13. Claxton to Hardley Marshes
14. Buckenham and Cantley Marshes and Carrs
15. Cantley to Reedham
16. Norton Marshes to Haddiscoe dismantled railway
17. Chet Valley
18. Haddiscoe Island
19. Halvergate Marshes (exc Bure Loop and west of Tunstall Dyke)
20. Breydon Water
21. Church Farm, Burgh Castle, Fisher's and Humberstone Marshes
22. Upstream Wroxham to Horstead
23. Wroxham to Fleet Dyke, South Walsham
24. South Walsham to Acle Marshes and Fens
25. Lower Bure Arable Marshlands
26. Muck Fleet valley and the Trinity Broads
27. Upstream of Wayford Bridge
28. Downstream of Wayford Bridge
29. Ludham, Horning and Neatishead Grazing Marshes
30. Upper Thurne Open Marsh, Broads and Fens
31. Martham Ferry to Oby

Map Scale @ A3:1:270,000

LUC

Source:

Figure 3.2

ZTV Location 2 - Coltishall Airfield

- Coltishall Airfield
- 35m buffer
- Landscape Character Areas
- Woodland (NIWT)
- Zone of theoretical visibility

ZTV Information:
Target height - 50m
Viewer height - 2m
All woodland - 15m
(Woodland taken from Forestry Commission NIWT dataset)

0. Arable areas - outside "Broads" Character refers to Adjacent district Landscape Character Assesment
1. Outney Common and Bath Hills
2. Bungay/Ditchingham to Shipmeadow/Geldeston
3. Barsham, Gillingham and Beccles Marshes
4. Aldeby to Burgh St Peter
5. Worlingham Wall to Boundary Dyke Barnby
6. Boundary Dyke Barnby to the Fleet, Oulton
7. Burgh St Peter to Haddiscoe Marshes
8. Flixton to Herringfleet Marshes
9. St Olaves to Burgh Castle
10. Whitlingham Lane and Country Park
11. Thope to Cary's Meadow, Thope Island and marshes, Postwick Grove and Whitlingham Marshes
12. Kirby/Postwick to Rockland/Strumpshaw
13. Claxton to Hardley Marshes
14. Buckenham and Cantley Marshes and Carrs
15. Cantley to Reedham
16. Norton Marshes to Haddiscoe dismantled railway
17. Chet Valley
18. Haddiscoe Island
19. Halvergate Marshes (exc Bure Loop and west of Tunstall Dyke)
20. Breydon Water
21. Church Farm, Burgh Castle, Fisher's and Humberstone Marshes
22. Upstream Wroxham to Horstead
23. Wroxham to Fleet Dyke, South Walsham
24. South Walsham to Acle Marshes and Fens
25. Lower Bure Arable Marshlands
26. Muck Fleet valley and the Trinity Broads
27. Upstream of Wayford Bridge
28. Downstream of Wayford Bridge
29. Ludham, Horning and Neatishead Grazing Marshes
30. Upper Thurne Open Marsh, Broads and Fens
31. Martham Ferry to Oby

Map Scale @ A3:1:270,000

LUC

LUC LDN 5409-01_08_ZTV_Cotishall airfield 21/11/2013

Source:

Figure 3.3

ZTV Location 3 -Weaver's Way

- Location 3 - Weaver's Way
- 35km buffer
- Landscape Character Areas
- Woodland (NIWT)
- Zone of theoretical visibility

ZTV Information:
Target height - 50m
Viewer height - 2m
All woodland - 15m
(Woodland taken from Forestry Commission NIWT dataset)

0. Arable areas - outside "Broads" Character refers to Adjacent district Landscape Character Assesment
1. Outney Common and Bath Hills
2. Bungay/Ditchingham to Shipmeadow/Geldeston
3. Barsham, Gillingham and Beccles Marshes
4. Aldeby to Burgh St Peter
5. Worlingham Wall to Boundary Dyke Barnby
6. Boundary Dyke Barnby to the Fleet, Oulton
7. Burgh St Peter to Haddiscoe Marshes
8. Flixton to Herringfleet Marshes
9. St Olaves to Burgh Castle
10. Whitlingham Lane and Country Park
11. Thope to Cary's Meadow, Thope Island and marshes, Postwick Grove and Whitlingham Marshes
12. Kirby/Postwick to Rockland/Strumpshaw
13. Claxton to Hardley Marshes
14. Buckenham and Cantley Marshes and Carrs
15. Cantley to Reedham
16. Norton Marshes to Haddiscoe dismantled railway
17. Chet Valley
18. Haddiscoe Island
19. Halvergate Marshes (exc Bure Loop and west of Tunstall Dyke)
20. Breydon Water
21. Church Farm, Burgh Castle, Fisher's and Humberstone Marshes
22. Upstream Wroxham to Horstead
23. Wroxham to Fleet Dyke, South Walsham
24. South Walsham to Acle Marshes and Fens
25. Lower Bure Arable Marshlands
26. Muck Fleet valley and the Trinity Broads
27. Upstream of Wayford Bridge
28. Downstream of Wayford Bridge
29. Ludham, Horning and Neatishead Grazing Marshes
30. Upper Thurne Open Marsh, Broads and Fens
31. Martham Ferry to Oby

Map Scale @ A3:1:270,000

LUC

Source:

Figure 3.4

ZTV Location 4 - Carlton Marshes

- Carlton Marshes
- 35m buffer
- Landscape Character Areas
- Woodland (NIWT)
- Zone of theoretical visibility

ZTV Information:
Target height - 50m
Viewer height - 2m
All woodland - 15m
(Woodland taken from Forestry Commission NIWT dataset)

0. Arable areas - outside "Broads" Character refers to Adjacent district Landscape Character Assesment
1. Outney Common and Bath Hills
2. Bungay/Ditchingham to Shipmeadow/Geldeston
3. Barsham, Gillingham and Beccles Marshes
4. Aldeby to Burgh St Peter
5. Worlingham Wall to Boundary Dyke Barnby
6. Boundary Dyke Barnby to the Fleet, Oulton
7. Burgh St Peter to Haddiscoe Marshes
8. Flixton to Herringfleet Marshes
9. St Olaves to Burgh Castle
10. Whitlingham Lane and Country Park
11. Thope to Cary's Meadow, Thope Island and marshes, Postwick Grove and Whitlingham Marshes
12. Kirby/Postwick to Rockland/Strumpshaw
13. Claxton to Hardley Marshes
14. Buckenham and Cantley Marshes and Carrs
15. Cantley to Reedham
16. Norton Marshes to Haddiscoe dismantled railway
17. Chet Valley
18. Haddiscoe Island
19. Halvergate Marshes (exc Bure Loop and west of Tunstall Dyke)
20. Breydon Water
21. Church Farm, Burgh Castle, Fisher's and Humberstone Marshes
22. Upstream Wroxham to Horstead
23. Wroxham to Fleet Dyke, South Walsham
24. South Walsham to Acle Marshes and Fens
25. Lower Bure Arable Marshlands
26. Muck Fleet valley and the Trinity Broads
27. Upstream of Wayford Bridge
28. Downstream of Wayford Bridge
29. Ludham, Horning and Neatishead Grazing Marshes
30. Upper Thurne Open Marsh, Broads and Fens
31. Martham Ferry to Oby

Map Scale @ A3:1:270,000

LUC

Source:

Broads Landscape Study

Figure 3.5

ZTV Location 5 - Beauchamp Arms

Beauchamp Arms

35m buffer

Landscape Character Areas

Woodland (NIWT)

Zone of theoretical visibility

ZTV Information:
Target height - 50m
Viewer height - 2m
All woodland - 15m
(Woodland taken from Forestry Commission NIWT dataset)

0. Arable areas - outside "Broads" Character refers to Adjacent district Landscape Character Assesment
1. Outney Common and Bath Hills
2. Bungay/Ditchingham to Shipmeadow/Geldeston
3. Barsham, Gillingham and Beccles Marshes
4. Aldeby to Burgh St Peter
5. Worlingham Wall to Boundary Dyke Barnby
6. Boundary Dyke Barnby to the Fleet, Oulton
7. Burgh St Peter to Haddiscoe Marshes
8. Flixton to Herringfleet Marshes
9. St Olaves to Burgh Castle
10. Whitlingham Lane and Country Park
11. Thope to Cary's Meadow, Thope Island and marshes, Postwick Grove and Whitlingham Marshes
12. Kirby/Postwick to Rockland/Strumpshaw
13. Claxton to Hardley Marshes
14. Buckenham and Cantley Marshes and Carrs
15. Cantley to Reedham
16. Norton Marshes to Haddiscoe dismantled railway
17. Chet Valley
18. Haddiscoe Island
19. Halvergate Marshes (exc Bure Loop and west of Tunstall Dyke)
20. Breydon Water
21. Church Farm, Burgh Castle, Fisher's and Humberstone Marshes
22. Upstream Wroxham to Horstead
23. Wroxham to Fleet Dyke, South Walsham
24. South Walsham to Acle Marshes and Fens
25. Lower Bure Arable Marshlands
26. Muck Fleet valley and the Trinity Broads
27. Upstream of Wayford Bridge
28. Downstream of Wayford Bridge
29. Ludham, Horning and Neatishead Grazing Marshes
30. Upper Thurne Open Marsh, Broads and Fens
31. Martham Ferry to Oby

Map Scale @ A3:1:270,000

LUC

Source: