NORTH NORFOLK DISTRICT COUNCIL

Norfolk Boreas Offshore Wind Farm

LOCAL IMPACT REPORT

NORTH NORFOLK DISTRICT COUNCIL
(INTERESTED PARTY REF: 20022969)

10 DEC 2019

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1. Introduction

1.1. This report sets out North Norfolk District Council's (NNDC) position in relation to the Development Consent Order (DCO) application for Norfolk Boreas offshore wind farm made under Section 56 of the Planning Act (2008).

1.2. NNDC is an Interested Party to this Nationally Significant Infrastructure Project (NSIP) with offshore cables reaching landfall south of Happisburgh and the onshore cable corridor passing through the District.

1.3. In responding to this NSIP application, the District Council has drawn from, amongst other things, internal expertise in relation to:

- Coastal Processes
- Landscape and Visual Impacts
- Ecology
- Environmental Protection
- Economic Development

1.4. Were NNDC assessing the application under its functions as a Local Planning Authority, it would normally seek advice from external partners including Norfolk County Council who undertake a number of functions including as Highway Authority, Public Rights of Way and Lead Local Flood Authority. As the County Council is also an Interested Party, where stated within this report, NNDC will defer matters for consideration or comment of the County Council, given their statutory roles and considered knowledge and expertise.

2. Description of North Norfolk

2.1. NNDC's jurisdiction extends inland from the Mean Low-Water mark along the coastline. The proposal would affect land within NNDC stretching from the intertidal area at Happisburgh and inland along the proposed cable route and 40m wide working corridor until it passes out of the district into Broadland District Council near to Aylsham.

2.2. North Norfolk District covers an area of 87,040 hectares (340 square miles) (excluding the Broads Authority Executive Area), with a 73km (45 mile) North Sea coastline. A significant proportion of the District is included within the nationally designated Norfolk Coast Area of Outstanding Natural Beauty (AONB) and the North Norfolk Heritage Coast. The eastern end of the District also adjoins The Broads, which has the status of a National Park.

2.3. The main settlements in the District comprise seven towns (Cromer, Fakenham, Holt, North Walsham, Sheringham, Stalham and Wells-next-the-Sea) and three large villages (Briston / Melton Constable, Hoveton & Mundesley), which accommodate approximately half of the District's population (101,149 at the 2011 Census).

2.4. The District's main road network comprises the A140 (Cromer to Norwich), the A148 (Cromer to King's Lynn - via Holt and Fakenham) and the A1065 (Fakenham to Mildenhall), as well as the more minor A1067, A149 and A1151. There is only one public rail service in the District, comprising the 'Bittern Line' linking Sheringham with Norwich (with stops between including the settlements of Cromer and North Walsham).

2.5. The District has a strongly rural character with agriculture, in particular arable farmland, comprising by far the largest component of land use. The District contains a large number of agricultural holdings which are predominantly arable in nature and which include areas containing some of the best and most versatile agricultural land.

2.6. A network of Rights of Way crosses open fields, heathlands and woodlands. Many of the large areas of coastline, heathland and woodland have open access. The Norfolk Coast Path National Trail follows the entirety of the District's coastline, linking with the Peddars Way in the west and the Paston Way in the east.

2.7. There are many positive aspects of the North Norfolk environment such as:

- The stunning landscape of the North Norfolk Coast AONB, carefully managed by the Norfolk Coast Partnership to ensure it can be enjoyed by generations to come.
- The large number of internationally and nationally designated sites and nature reserves, home to many rare and protected species and landscapes.
- The wealth of archaeological and historic environment sites throughout the district, from the prehistoric to the Cold War.
- The rare arable plants thriving in pockets of North Norfolk farmland.
- The conservation groups, organisations and individuals working hard to record, protect and enhance the natural environment of North Norfolk.

2.8. The District also has a significant tourism economy supporting 11,461 jobs (29% of total employment in North Norfolk) in 2018 with a total tourism value of £511m. The North Norfolk Core Strategy recognises the importance of tourism to the district. The strategic vision for North Norfolk in section 2 of the Core Strategy includes at paragraph 2.1.4:

> "**Sustainable tourism**, building on the unique natural assets of the countryside and coast, will be a major source of local income and employment and will be supported by an enhanced network of long-distance paths and cycle routes such as the North Norfolk Coastal Path and Weavers Way."

3. Principle of Renewable Energy

3.1. NNDC is fully supportive of the principle of renewable energy development in helping to tackle the challenges faced by climate change.

3.2. On 24 April 2019, NNDC's Full Council agreed a motion declaring a Climate Emergency. With the motion the Council acknowledged:

- The devastating impacts that climate change and global temperature increases will have on the lives and livelihoods of people around the world, including on the health, safety and wellbeing of North Norfolk residents;
- The urgent need for action to be taken fast enough for there to be a chance of further climate change being limited to avoid the worst impacts of drought, floods and extreme heat;
- The opportunity for individuals and organisations at all levels to take action on reducing carbon emissions, from both production and consumption;
- The need to enable low carbon living across society through changes to laws, taxation, infrastructure, policies and plans;
- The Council's responsibility to help secure an environmentally sustainable future for our residents and in relation to the global effects of climate change.

3.3. The Council resolved to;

1. Declare a Climate Emergency;
2. Engage and work in partnership with our partners in the public, private and community sectors, including central government to facilitate bold action to ensure North Norfolk is able to play its role in helping the UK to deliver against the commitments made nationally and internationally at the 2015 Paris Summit;
3. Prepare an Environmental Sustainability & Climate Change Strategy in line with this pledge, and, with our partners across the community, to

develop an action plan and 'route map' to a sustainable, low carbon future for our community;

4. Launch engagement with the public to:
    - Improve "carbon literacy" of all citizens;
    - Encourage and support leadership on this issue in all sectors of society;
    - Obtain meaningful public input into the North Norfolk Environmental Sustainability & Climate Change Strategy and action planning;
    - Facilitate wide community engagement and behavioural change.

3.4. The Declaration of a Climate Emergency has set the Council on a pathway towards doing all that it reasonably can to address the impacts of climate change. This will undoubtedly include continuing to support renewable energy National Significant Infrastructure Project proposals and working with applicants to deliver these projects in a way that minimises any adverse impacts.

3.5. The District Council recognises the national importance of having a balanced supply of electrical generation including increasing renewable energy supplies from offshore turbines in helping decarbonise the UK's energy sector. Accordingly, the project's contribution to renewable energy is a significant **positive impact**.

3.6. The Council has already played an active part in a number of Nationally Significant Infrastructure Projects (NSIP) including:

- Ørsted Hornsea Project Three (2.4GW) offshore windfarm; and
- Vattenfall Norfolk Vanguard (1.8GW) offshore windfarm

All of these schemes reach landfall on the North Norfolk coast with associated cable corridors and booster stations (Ørsted Hornsea Project Three) running through the District. These schemes alone (together with Vattenfall Norfolk Boreas (1.8GW) offshore windfarm) would, once built, provide enough

electricity combined to power in excess of 4.5 million homes (more than 15% of total UK households). This would make a significant contribution towards the UK's commitment towards 'net zero' greenhouse gases to be delivered by 2050 through the duty in section 1(1) of the Climate Change Act (as amended by the Climate Change Act 2008 (2050 Target Amendment) Order 2019). It is also in line with the Climate Change Committee's recommendation in its Net Zero Report that the UK pursue a large increase in offshore wind (May 2019 pgs 23, 37, 191, 215, 254).

3.7. At a local level, the District Council has made a significant contribution of its own through, amongst other things, the grant of planning permission for in excess of 150MW capacity of solar farms, with electrical output capable of powering over 40,000 homes, in North Norfolk. This has been delivered without significant adverse impacts on the wider landscape (including development within and/or adjacent to the Norfolk Coast Area of Outstanding Natural Beauty) through, amongst other things, careful siting and design.

3.8. The onshore element of Norfolk Boreas passes through some sensitive and valued landscapes and this emphasises the importance of key design considerations which will help to reduce overall impacts, both short, medium and long-term.

4. Choice of Transmission System

4.1. NNDC welcomes the decision of Vattenfall to commit to the use of high voltage direct current (HVDC) transmission for both the Norfolk Vanguard and Norfolk Boreas projects. This decision was made following the Preliminary Environmental Information Report (PEIR) stage for Norfolk Vanguard at which the District Council and many local residents/business and other consultees raised concerns about the potential adverse impacts from the onshore cable relay stations needed for the high voltage alternating current (HVAC) transmission system in the East Ruston / Ridlington area of North Norfolk.

4.2. NNDC supports the choice of HVDC for two reasons, which are interconnected:

- As a matter of principle: NNDC understands that HVDC is a more energy efficient manner than HVAC of transmitting energy from offshore wind turbines sited a significant distance offshore. During the examination of Norfolk Vanguard, the Applicant accepted and confirmed during Issue Specific Hearing (ISH) 3 that this understanding is correct. Given that these infrastructure projects are aimed at securing renewable energy because of the acknowledged national need for such energy, particularly in light of the UK's climate change commitments, as a matter of principle the choice of HVDC is preferable in order to maximise the benefits of the Norfolk Boreas and Norfolk Vanguard schemes;
- In light of reduced onshore impacts: this is emphasised in the Outline Landscape and Ecological Management Strategy (OLEM) Version 2 – (REP1-020) page 8. The reduction in impacts is significant, given that HVDC requires a narrower cable corridor than HVAC and fewer onshore buildings. NNDC considers the physical onshore impact of HVDC to be significantly less and, for that reason considerably more acceptable.

4.3. Given the importance of HVDC to maximising the benefits and minimising the impacts of the project, NNDC considers it important to secure HVDC as the method of transmission in the DCO. NNDC is sensitive to the need to ensure that those cables which are required to be HVAC (both at the turbine point and where the energy is fed into the National Grid) are not via a drafting slip required to be HVDC. Accordingly, NNDC does not suggest changes to any of the technical or detailed elements of the works, nor is a general requirement proposed in the draft DCO (dDCO).

4.4. Instead, NNDC suggests two amendments to Article 2 of the dDCO:

- Add the definition: "HVDC" means high voltage direct current;
- Amend the definition of "authorised development" to mean "the development and associated development described in Part 1 of **Schedule 1**, which includes deployment of an HVDC export system (authorised development) and any other development authorised by this Order, which is development within the meaning of section 32 of the 2008 Act".

4.5. This wording was based on the description of HVDC as the "export system" throughout the ES, and the use of the word "includes" ensures that any necessary HVAC cable requirements outside of the HVDC export system are not prohibited.

4.6. NNDC also proposes a fallback position if the Examining Authority considers that it is not proper or necessary to secure the choice of HVDC in the DCO. Should that be the case, NNDC requests that the Examining Authority record within its Report that a change to HVAC would necessarily be a material amendment.

4.7. The Examining Authority may feel it sensible to record those matters in the Report even if HVDC is secured through the DCO.

5. Marine Processes

5.1. NNDC's jurisdiction extends inland from the Mean Low-Water mark. This means that an element of the marine processes falls within the consideration of the District Council at the point where offshore cables come onshore.

5.2. The main area of interest for the District Council is in relation to the method of bringing offshore cables onshore in the Happisburgh area including the potential impact of works on nearshore coastal processes. NNDC welcome the position set out by Vattenfall at paragraph 402 of Chapter 8 of the Environmental Statement which states:

> 'The HDD will be designed to be sufficiently far below the cliff base (including a significant margin for safety) to have no effect on the natural erosion of the cliff. The HDD will be secured beneath the surface of the shore platform and the base of the cliff, drilled from a location greater than 150m landward of the cliff edge. The material through which the HDD will pass, and through which the cables will ultimately be located, is consolidated and will have sufficient strength to maintain its integrity during the construction process and during operation. Also, the cable will be located at sufficient depth to account for shore platform steepening (downcutting) as cliff erosion progresses, and so will not become exposed during the design life of the project (approximately 30 years). Hence, the continued integrity of the geological materials and the continued depth of burial of the cables mean that they will have no impact on coastal erosion during both construction and operation'.

<u>Coastal Erosion – Requirement Relating to Monitoring</u>

5.3. During the examination of the Norfolk Vanguard wind farm, issues relating to Landfall, the Cart Gap and Coastal Erosion formed part of discussions at ISH1 and ISH 4 with submissions made by NNDC at Deadlines 3 and 6.

5.4. During Norfolk Vanguard ISH1, discussions focussed on the rate of coastal erosion at the landfall location with Happisburgh renowned for its high rate of coastal change resulting from, inter alia, coastal events such as high tides and storm surges. During those discussions the Applicant stated that they were conscious that coastal erosion is slightly more episodic at the moment rather than it being gradual erosion with periods of extreme erosion. The Applicant suggested that this was a function of a failure of sea defences that have exacerbated the situation. The Applicant went on to set out that they are aware of the episodic change but are also looking at longer-term change which will reach more of an equilibrium rather than as a period of catching up following failure of sea defences.

5.5. NNDC clarified in paragraph 6.2 of its Norfolk Vanguard Deadline 3 submission that the 'failed' sea defences referred to by the applicant consisted of timber revetment and groynes constructed between Ostend and Cart Gap in the period from 1959. In 1991, following storm damage, a 300m section of unsafe revetment was removed south of Happisburgh. Twenty-eight years have elapsed since the removal of these revetments and NNDC considered it perhaps misleading of the applicant to imply this is a recent 'failure' of sea defences. Whilst the initial rapid erosion was likely to be due to the loss of the revetments, the current ongoing erosion is a result of coastal processes and low beach levels. A timeline of Happisburgh Sea Defences covering a period of 1959 to 2015 is attached at **Appendix A.**

5.6. The Council is aware of research that has observed a phenomenon in this location known as 'coastal catch-up' and 'coastal overshoot'. This is the effect whereby historic sea defences have been removed resulting in rapid coastal erosion potentially extending beyond indicative erosion if sea defences were never constructed. Whilst the Council has adopted a Shoreline Management Plan (SMP) which indicates a 100-year erosion area, this is indicative and the rate or erosion could be greater or lesser than predicted in the SMP. The presumption by the applicant that coastal erosion equilibrium will be reached in the future is possible but is for them to consider in relation to the location

and resilience of their assets for their designed life. It is understood that the assets to be placed within the 100-year coastal erosion zone would be the cables that are to be routed below the predicted level of beaches.

5.7. The key issue for NNDC is ensuring that that the landfall location remains resilient from the effects of coastal erosion for its anticipated lifetime.

5.8. As a direct result of the discussions between the Applicant and NNDC during the examination of Norfolk Vanguard, both parties agreed that it would be appropriate to include a requirement to monitor the landfall site within the DCO. As a result, the scope of Requirement 17 of the DCO relating to a Landfall Method Statement was extended to include a monitoring requirement and remedial works if the rate and extent of landfall erosion was to extend beyond that predicted by the applicant. NNDC note that this requirement is included with the Norfolk Boreas dDCO (also Requirement 17) and this approach is supported by NNDC.

<u>Potential options for re-using clean spoil at Cart Gap to assist coastal defence</u>

5.9. In respect of potential options for re-using clean spoil at Cart Gap to assist coastal defence, this matter was discussed in detail between the Applicant and NNDC during the examination of Norfolk Vanguard with joint/mirrored submissions at Deadline 6. The position agreed between the parties was that the use of clean spoil from the project in relation to coastal defence matters at Cart Gap can be explored further outside of the DCO process.

5.10. In coming to this view the parties recognised that there are a range of factors that will need to be considered in taking this separate project forward outside of the DCO process. These include, amongst other things, understanding:

- how much clean spoil is likely to be generated;
- how much traffic this will take off the wider network (in terms of delivering positive benefits)
- how or where the soil will be deposited;
- how access will be gained to cliffs;

- how damage to cliffs will be minimised; and
- any EIA/Habitats Regulations issues from these activities, which would need to form the basis of any separate application/consent or licence.

5.11. Discussions centred on understanding the types of materials likely to arise from the Vanguard project that could be re-used, including options to capture material within 'geobags' or 'geocubes' to increase its effectiveness for coastal applications. The Applicant agreed to provide estimates of volumes and materials to NNDC. These discussions will also now need to consider materials arising from the Boreas project.

5.12. A future application for consent will be explored between both parties and relevant landowners, at the appropriate time outside of the DCO process. Both parties recognise there are benefits in exploring this project further: for the Applicant in reducing the cost of transporting and disposing of materials off site and for NNDC through reducing traffic movements and allowing clean spoil to be used for coastal defence purposes. However, these benefits are not necessary to address any of the impacts of the Norfolk Vanguard or Norfolk Boreas DCO applications. In essence, it may provide additional benefit, but it is not a matter which the ExA can or should factor into its decision-making.

5.13. The Applicant and NNDC agreed that the Cart Gap project is also not necessary to address coastal erosion (although it is hoped it would provide a sensible additional benefit, with the aim of reducing coastal erosion). The parties agree that this, combined with a monitoring requirement, adequately addresses the issue of coastal erosion.

5.14. NNDC agree the proposal is unlikely to be adversely affected by the now completed Bacton sand engine coastal protection scheme north of the site at Bacton Gas Terminal and along the coast towards Bacton and Walcott.

5.15. In the likely event of the DCO being granted, NNDC would not expect that any subsequent changes from the 'long' HDD option to bring cables onshore to the use of open cut trenching could be permitted within the scope of a 'non-material' amendment as this would take the proposal outside the scope of the Environmental Statement. 'Open cut trenching' would represent the very worst option for NNDC, hence why there is strong support for 'long' HDD.

6. Ground Conditions and Contamination

6.1. Environmental Statement Chapter 19.5.3 [APP-232] sets out the assumptions and limitations associated with the data sources used to inform the report. NNDC cannot reasonably consider at this stage that sufficient survey data has been collected to undertake the assessment. Whilst proposed construction activities are predominantly taking place in agricultural fields where the risk of contamination is likely to be low, contaminated land could be discovered at any point along the proposed works, especially where human activity has occurred. The assessment cannot therefore rule out the potential for unknown contamination to be identified during the construction phase. The key factor is to ensure there is an appropriate strategy in place to deal with contamination should it arise and NNDC will work with the Applicant to help deliver an acceptable strategy.

6.2. The Applicant has proposed to address contamination as part of the Code of Construction Practice under Requirement 20 and as set out currently in the Outline Code of Construction Practice (OCoCP) (Version 2). NNDC agreed a similar Requirement as part of the Norfolk Vanguard DCO. Subject to agreement of final wording for the associated OCoCP to reflect the most up to date position, NNDC consider that the mitigation of impacts associated with ground conditions and contamination are appropriate and adequate.

7. Water Resources and Flood Risk

7.1. In respect of the impact of the project on water resources and flood risk within NNDC jurisdiction, NNDC defer to the expert advice of the Environment Agency in respect of the strategic overview of the management of all sources of flooding and coastal erosion, and to the advice of Norfolk County Council Lead Local Flood Authority in respect of developing, maintaining and applying a strategy for local flood risk management in this area and for maintaining a register of flood risk assets. NNDC also defer to the advice of Norfolk Rivers Internal Drainage Board who manage assets within/along/near the route of the proposed onshore cable corridor.

8. Land Use and Agriculture

8.1. NNDC consider that the primary consideration for land use and agriculture relates to the timing of works (such as avoiding taking agricultural land out of production for long periods of time) how works are undertaken (to be agreed within the OCoCP) including the method for handling/storing soils. The commitments made by Vattenfall through use of HVDC with a smaller working corridor, the commitment to ducting both Norfolk Vanguard and Norfolk Boreas at the same time all contribute to reducing the Rochdale envelope of the project. As such the significance of any impacts are dependent on the requirements to be agreed within the DCO.

8.2. NNDC welcome the suggested embedded mitigation and additional mitigation committed to within the OCoCP and secured through Requirement 20.

9. Onshore Ecology and Onshore Ornithology

9.1. Vattenfall have undertaken desktop studies and Extended Phase 1 Habitat Surveys together with site specific surveys in accordance with best practice recommendations in order to inform the baseline data which underpin Environmental Statement Volume 1 Chapter 22 – Onshore Ecology [APP-235] and Volume 1 Chapter 23 Onshore Ornithology [APP-236]. Statutory and Non-Statutory designated sites are recognised within Figures 22.2 and 22.3. However, the ES recognises that not all areas have been surveyed in setting out potential impacts and cumulative impacts and therefore any assumptions about the proposal need to take account of this. Similar issues were raised by NNDC in relation to Norfolk Vanguard.

9.2. NNDC are supportive of proposed DCO Requirement 24 'Ecological Management Plan' subject to agreement to the final Outline Landscape and Ecological Management Strategy (OLEMS) document which underpins the requirement and which should ensure key ecological objectives are met.

10. Traffic and Transport

10.1. NNDC do not wish to comment on traffic and transport matters and defer such matters of consideration to Norfolk County Council, who are the Highway Authority covering North Norfolk and who are the technical experts who would normally give highway advice to the District Council.

11. Noise, Vibration and Air Quality

11.1. NNDC consider that the measures set out in the draft DCO (Requirement 20 - Code of Construction Practice and Requirement 26 – Construction Hours) provide an effective way to help to minimise any adverse impacts to noise and vibration during the construction phase. These requirements reflect the progress made by the Applicant working with NNDC and other Local Authorities during the Norfolk Vanguard examination.

11.2. However, the ExA should be aware of the extensive discussions that took place between the Applicant and NNDC during the Norfolk Vanguard examination, including numerous written submissions. These matters included:

- Consideration of potential impacts related to continuous periods of operation;
- Construction noise (including at Little London and Happisburgh);
- Traffic/HGV Movements (including Little London and Happisburgh)
- Fencing to compounds at Happisburgh and MA8 near Holly Farm Barningham.

11.3. NNDC will continue to work with the applicant to ensure the DCO requirements and underpinning OCoCP documents continue to deliver their intended purpose. Where gaps in information remain or where issues raised during the Norfolk Vanguard examination can be captured within a single submission for ease of understanding by the ExA then NNDC is happy to work with the Applicant to deliver this so as to aid discussions at the next Issue Specific Hearing on 21 January 2020.

12. Onshore Archaeology and Cultural Heritage

12.1. NNDC consider that the commitment by Vattenfall to use HVDC transmission has, amongst other things, negated the need for onshore cable relay stations and has narrowed the width of the cable corridor. This means that, whilst there will be some impacts to heritage assets and their settings, this impact will occur primarily at construction stage and are therefore of a temporary nature.

12.2. NNDC consider that these impacts are all on the 'less than substantial' scale and the operational phase of the windfarm is considered unlikely to result in unacceptable impacts. On this basis, the considerable public benefits associated with the windfarm would more than outweigh the 'less than substantial' harm to heritage assets within North Norfolk.

12.3. In respect of archaeology, NNDC defers to the advice of Norfolk County Council Historic Environment Service who provide advice to NNDC in relation to all matters of archaeological heritage.

13. Landscape and Visual Impact Assessment

13.1. NNDC consider that Vattenfall have given appropriate regard within Chapter 29 of the ES [APP- 242] to relevant national policy and relevant Local Policy and material planning considerations including the NNDC revised 2018 Landscape Character Assessment and new Landscape Sensitivity Assessment (with particularly reference to renewable energy and low carbon development)

13.2. NNDC consider that there will be some residual landscape and visual effects after the construction phase associated with tree and hedgerow removal. It is noted that the onshore cable route easement would prevent replacement trees being planted and this will require careful consideration with regard to mitigation planting.

13.3. Landscaping matters formed a regular topic of discussion during the Norfolk Vanguard examination with submissions from NNDC at Deadlines 3, 4, 6, 7 and 8. The key landscape issues being raised by NNDC relate to:

(1) **The need for a 10-Year Replacement Planting Period rather than 5 years under DCO Requirement 19 (2)**; and

(2) **Replacement Tree Planting within the NNDC area**.

The need for a 10-Year Replacement Planting Period under DCO Requirement 19 (2)

13.4. During the examination of Norfolk Vanguard, NNDC set out the evidential basis as to why a 10-year replacement planting period should be applied within its area of jurisdiction given that plants take longer to reach a point of establishment. Whilst the ExA for Norfolk Vanguard indicated they were minded to agree with the ten-year replacement planting period proposed by NNDC as evidenced in the ExA draft DCO schedule of changes published 09 May 2019, the final Norfolk Vanguard DCO decision is awaited and the Applicants for Norfolk Boreas have not proposed a 10-year replacement

period within their latest draft DCO (Version 3). NNDC therefore resubmits the relevant evidence again below for the ExA to consider.

13.5. The Norfolk Vanguard NSIP decision and requirements within it in relation to landscape matters will become a material planning consideration of substantial weight in the determination of the Norfolk Boreas NSIP. The ExA will also be aware of the impending decision of the Secretary of State for the Ørsted Hornsea Project Three NSIP scheme which will also carry significant weight in the determination of Norfolk Boreas, particularly with regard to whether a ten-year replacement planting period is reasonable and proportionate.

13.6. NNDC's evidence is partly based on the Forestry Commission Ecological Site Classification Decision Support System (ESC-DSS). This is a PC-based system to help guide forest managers and planners to select ecologically suited species to sites, instead of selecting a species and trying to modify the site to suit. The system is designed to match key site factors with the ecological requirements of different tree species and woodland communities, as defined in the National Vegetation Classification (NVC) for Great Britain.

13.7. Results from two sample sites along the cable route have been included at **Appendix B**, using the Establishment Management Information System (EMIS) decision tool option to demonstrate that the prevailing site conditions will result in slow establishment. The following data was required to be inputted:

Grid references and soil types:

- Cable route location North of Felmingham (Vernon Wood) (Grid ref: TG 243 306); and
- Cable route location West of Whimpwell Green (Grid ref: TG 373 300)

13.8. The sample sheets indicate there are limited species that are suitable for the site conditions and, given the site conditions, yields are not expected to be

high. A copy of the Ecological Site Classification Manual is attached at **Appendix C**.

13.9. NNDC are aware that the Forestry Commission specify a standard 10-year replacement period for all new planting that is subject to a Replanting Notice.

13.10. A period of 10 years of aftercare and replacement provides for greater formal protection when establishing tree stock. At 10 years of growth, a tree will have reached a size where it would be subject to Forestry Commission Felling Licence Regulations (i.e. 8cm girth at 1.3m above ground level). After only 5 years, as proposed by the Applicant, trees would not have reached sufficient maturity to be protected by these Regulations and so could be removed without requiring formal consent.

13.11. Other than in the main river valleys, the Boreas onshore cable is to be routed through freely draining, slightly acid, loamy soils. The principle characteristics of this soil type relate to a free-draining nature and a low fertility as they are vulnerable to the leaching of nutrients. These principle soil characteristics will have a negative impact on vegetation establishment and will require additional and longer term maintenance to ensure that planting receives sufficient nutrients to thrive and outcompete other undesirable vegetation and does not succumb to drought conditions. The local soil characteristics together with the local climatic stresses (salt tolerance, wind exposure and drought) placed on any new planting in the District means that the additional care and longer term maintenance is crucial to the success of the planting. Soil data for the District has been derived from Cranfield University's free to use Soilscapes dataset, available at https://www.cranfield.ac.uk/themes/environment-and-agrifood/landis/soilscapes. (Not able to provide dataset as a physical print copy – see Soilscapes Brochure at **Appendix D**)

13.12. In respect of landscaping schemes, it is standard practice within NNDC to impose a ten-year replacement planting period condition on major developments where landscape planting is an important element of the

proposal. Examples of a number of planning decisions in which NNDC has imposed a 10-year period is enclosed at **Appendix E** including for a number of onshore solar farms (50MW). Copies of the actual decision notices can be provided if necessary for the ExA.

Replacement Tree Planting within the NNDC area

13.13. During the examination of Norfolk Vanguard, NNDC expressed within the Statement of Common Ground submitted at Deadline 4 (REP4-016) disappointment that:

> 'the applicant considers no replacement trees are to be provided within the NNDC authority area. In respect of replacement planting, it is the expectation of NNDC that where trees are to be removed along the cable route (for example, where removal cannot reasonably be avoided), these should be replaced within reasonable proximity as part of the Provision of Landscaping (DCO Requirement 18) and appropriately managed as part of the Implementation and Maintenance of Landscaping (DCO Requirement 19) for a period of ten years after planting'.

13.14. Following Norfolk Vanguard Issue Specific Hearings 4 and 5, NNDC discussed a range of issues with the Applicant including matters relating to Replacement Landscaping. In particular, discussions focussed on trees that may be lost along the route of the onshore cable which cannot be avoided through micro-siting and which cannot be avoided through use of HDD. The Applicant indicated that the use of HDD will not be likely to avoid single trees and this raised the possibility of a net loss of biodiversity where trees are not to be replaced.

13.15. NNDC asked the Applicant to confirm the maximum number of trees with the potential to be lost along the cable route with the potential to explore whether replacement planting can be secured within 'temporary' rather than 'permanent' land take areas or with agreement of landowners outside of the DCO area. It was NNDC's position that the DCO should not result in a net loss

of trees within hedgerows which are an important landscape characteristic in this area.

13.16. The Applicant provided further information concerning trees which will be affected within North Norfolk. In the Applicant's view, one hedgerow which has significant susceptibility from a landscape character perspective will be impacted, with the loss of 3-4 trees. Other hedgerows with trees will be crossed where tree losses will amount to approximately 36 trees in the worst case. The Applicant indicated further micrositing would be undertaken following the Arboricultural survey to reduce this number, where possible.

13.17. The Applicant identified key locations along the onshore cable corridor where a significant effect would occur in relation to loss of trees, referring to Norfolk Vanguard ES Chapter 29, Table 29.10 (APP-353). Within North Norfolk District, one of these key locations is alongside Colby Road, north of Banningham where roadside trees are identified as being most susceptible to the project. The same information appears in Chapter 29 of the Boreas ES, Table 29.11

13.18. In this location the road is characterised by a row of trees of varying age along both sides of the road forming a continuous canopy (See photos at **Appendix F** submitted as part of Norfolk Vanguard examination). Loss of any trees here would have a significant effect, as agreed within the Applicant's LVIA and it is considered that there is little scope for replacement tree planting within the immediate vicinity.

13.19. NNDC concluded that, in this location, cabling should be installed via trenchless installation techniques so as to avoid the loss of the 3-4 trees identified. NNDC strongly recommended that this location, known as Colby Road (Church Road), north of Banningham (See Plan and photographs at **Appendix F**) should be added to the list of trenchless crossings set out within the draft Vanguard DCO Requirement 16 (17).

13.20. NNDC were concerned about the lack of clarity within the Environmental Statement about the other 36 trees that the Applicant has indicated could be removed within North Norfolk. In its drafting at Norfolk Vanguard Deadline 7, DCO Requirement 8 did not make provision for the written landscape plans to include details of those trees to be removed. This information was considered important by NNDC in order to be able to agree appropriate mitigation and to identify where it can be accommodated.

13.21. It is NNDC's position that hedgerow replacement alone cannot compensate for the loss of hedgerow trees resulting from this development. The DCO should not result in a net loss of trees within hedgerows which are an important landscape characteristic in this area. The concern about loss of trees in North Norfolk is not addressed by the Applicant securing no overall net loss of trees over the whole project, through tree planting in other areas, such as around the substation in Necton. While tree planting is of course welcome, and it is right to ensure no overall net tree loss over the whole project, the issue within the North Norfolk district is that trees within hedgerows are an important landscape characteristic. The Updated North Norfolk Landscape Character Assessment (2018) lists the "Valued Features and Qualities" of the Low Plains Farmland character type (through which the cable route passes), and lists as third out of eight "woodlands, hedgerows and hedgerow trees". A net loss of trees within hedgerows will thus have a negative impact.

13.22. In light of concerns about potential tree loss, NNDC have discussed with the Applicant whether replacement planting can be secured within 'temporary' rather than 'permanent' land take areas or with agreement of landowners outside of the DCO area (as has been secured within the Hornsea Project Three scheme). This is a matter where discussions will likely continue with the Applicant in order to identify an agreed way forward for Norfolk Boreas.

13.23. As a result of the above, NNDC proposed amendments to Vanguard DCO Requirement 18 to add (d) details of existing trees to be removed.

13.24. This additional text at new (d) enables a better understanding of the extent of tree and hedge removal being proposed and enable a clearer appreciation of the compensation and mitigation planting considered necessary to be secured under this Requirement.

13.25. NNDC welcome the position of the Applicant with regard to Requirement 18(d) of the Norfolk Boreas draft DCO (Version 3) subject to agreement to the final Outline Landscape and Ecological Management Strategy (OLEMS) document which underpins the requirement.

14. Tourism, Recreation and Socio-Economics

14.1. NNDC notes the information contained within Chapter 30 of the ES [APP-243]. During the examination of the Norfolk Vanguard NSIP, NNDC made numerous submissions concerning the impact of the proposed windfarm construction activities on tourism within North Norfolk, arising from direct impacts and from the impacts of negative perceptions caused by awareness of the construction activity taking place. NNDC have concerns that the impact of the project on tourism is again being downplayed by the Applicant. Because of the high level of dependence of the North Norfolk economy on tourism (£511m total tourism value, 11,461 jobs (29% of total employment) in 2018) any impact upon that sector will have a disproportionately high impact upon the overall economy of the District. (Source: Economic Impact of Tourism – North Norfolk 2018 produced by Destination Research/Sergi Jarques – Copy attached at **Appendix G** and 2017 report attached at **Appendix H**).

14.2. In respect of the baseline environment set out in ES Chapter 30 NNDC would challenge the assumption set out at paragraph 259 that *'Outside of The Norfolk Coast AONB, the countryside of North Norfolk and Breckland is not regarded as a direct draw for tourism although it is well regarded by local recreational users and an intrinsic aspect of the visitor's experience'*.

14.3. Due to high quality landscapes and the existence of many important heritage assets, tourism benefits are not just limited to areas within the Norfolk Coast AONB or coastal resorts. Many popular cycle and walking routes are located outside of the AONB.

14.4. In respect of the ES assessment findings, NNDC consider that the onshore cable route goes through some attractive and sensitive parts of North Norfolk District, especially between Happisburgh and North Walsham and this area is attractive to tourists throughout the year and host to visitor accommodation, facilities and some attractions including walking and cycling.

14.5. In this regard, whilst NNDC believes the long-term impacts of the cable route on the tourism economy will be benign, the Council has very significant concerns that during the cable corridor construction phase there will be serious impacts on local tourism businesses such that the construction works will have a substantial impact on the income of tourism businesses in the Happisburgh to North Walsham area, which needs greater recognition by Vattenfall.

14.6. During the Norfolk Vanguard examination, NNDC made representations in its Deadline 3 submission in respect of the report by Biggar Economics *Wind Farms and Tourism Trends in Scotland* (July 2016) referred to by the Appellant within ES Chapter 30.

14.7. NNDC invited the Examining Authority to place little weight on this report, for the following three reasons:

- The focus of the report, and the research it cites in section 3, concerns onshore wind farms, not on the construction impacts of large offshore wind farms. Indeed, "construction impacts" are not considered at all;
- The report and the underlying research on which it was based concerned visual impact of onshore turbines or wind farms, not disruption impact experienced during the construction period of very large offshore projects;
- The report concerns Scotland and examines the relationship "between the development of onshore wind energy and the sustainable tourism sector in Scotland" (pg 1). "Sustainable tourism" has a definition specific to Scotland, which is referenced but not set out in footnote 4 on pg 6. It is therefore not relevant to general tourism impact in North Norfolk.

14.8. Within its Deadline 3 submission for Norfolk Vanguard, NNDC also included a report by Destination Research entitled *Economic Impacts of Tourism 2017.*

This showed the value of the tourism economy to NNDC and that seasonality is levelling out. A copy of this report is attached at **Appendix H**. The 2018 report by Destination Research entitled *Economic Impacts of Tourism* has also been published which shows an increase in total tourism value, an increase in the number of tourism jobs and an increase in the percentage of tourism jobs as a percentage of total employment. A copy is attached at **Appendix G**.

14.9. At Deadline 4 of the Norfolk Vanguard examination NNDC expressed concern within the Norfolk Vanguard Statement of Common Ground that:

> 'The applicant does not appear to recognise…[the]…potential impact on small tourism businesses nor has an appropriate mitigation strategy been proposed. Whilst the impact on local tourism may not be considered 'significant' at a regional level, at a local level the impacts have the potential to be lasting and, in some cases could be permanent if businesses are forced to close due to loss of trade attributable to the impact of construction activities affecting tourism draw, no matter how well managed or controlled. The applicant needs to go further to identify mitigation to help tourism (and related) businesses adversely affected by construction activities including how smaller businesses can be compensated so as to avoid their permanent loss/closure'.

14.10. NNDC considered that addressing the impacts on tourism and related businesses needed to be included within the DCO Requirements and, at Norfolk Vanguard Deadline 6, put forward wording for a new Requirement concerning Tourism and Associated Business.

14.11. Following this the Applicant and NNDC met to discuss potential tourism impacts and agreed that they would undertake further work together with a view to formulating some sensible joint actions for assuaging the concerns of local tourism-reliant businesses. NNDC welcomed and supported this collaborative approach.

14.12. By Deadline 7 of the Norfolk Vanguard examination, there remained a substantive disagreement between the parties – the Applicant disagreed that there will be significant local tourism impacts within NNDC's boundaries and emphasised that the construction time within the area will be short. What was considered to be missing in the Applicant's analysis is the perception impact, which is different from the Applicant's fine and precise understanding of the construction process. NNDC's position is that short-term impacts do not necessarily translate into short-term perception of tourists about where they will visit and stay. Evidence attached in **Appendix I** shows perception impact on tourism which NNDC has experienced in other comparable circumstances (this evidence was also provided to the Norfolk Vanguard examination.

14.13. As a result, NNDC's view remained that the Applicant has, in the ES and its later analysis, underestimated the significance of the impact on tourism. Accordingly, in order to make the development acceptable in planning terms, a requirement mitigating tourism impact was considered necessary.

14.14. Such a requirement is supported in policy terms. The Overarching National Policy Statement for Energy (EN-1) requires applicants to assess relevant socio-economic impacts, including effects on tourism (§5.12.3). NNDC's Core Strategy sets out the importance of tourism to the economy of North Norfolk: see §§2.7.19. The Core Strategy also acknowledges that "the main tourism appeal in North Norfolk is based on the unique natural environmental assets", so "it is important to protect these". Accordingly, policy SS5 on the economy provides that the tourism industry will be supported and that proposals should not have a detrimental environmental impact which in turn might negatively impact tourism.

14.15. NNDC has, since its Norfolk Vanguard Local Impact Report, challenged the Applicant's assumption that the countryside of North Norfolk is not a direct draw for tourism, outside of the Norfolk Coats AONB. The onshore cable route goes through attractive and sensitive parts of North Norfolk district, especially between Happisburgh and North Walsham. Figure 7 in the Core Strategy, entitled "Tourism Asset Zones" (pg 96), identifies Happisburgh as a "coastal

service village" asset, and §3.4.28 identifies North Walsham as part of a "rural" asset zone.

14.16. The NPPF also recognises the importance of tourism to rural economies (such as North Norfolk) and paragraph 83 requires that decisions should enable "sustainable rural tourism" which "respects the character of the countryside". Plainly for this policy to achieve its aim, it requires both positive support for rural tourism businesses and, more relevant for present purposes, it requires mitigation of potential negative impacts from non-tourism development on sustainable rural tourism.

14.17. NNDC in its Norfolk Vanguard Deadline 6 submissions proposed the text of a draft requirement. The Applicant challenged the appropriateness and necessity of the requirement based on the ES. As set out above, the ES does not adequately address the tourism impact. If the Examining Authority accepts that the Applicant has underestimated this impact and accepts that there is the potential for substantial negative impact on tourism, then in order for permission to be granted that impact must either be mitigated by a requirement, or the Examining Authority must set out how the benefits of the proposal outweigh the negative impacts on tourism. In NNDC's submission, the Applicant has not provided any evidence that such a balancing exercise favours making the DCO despite the negative impacts on tourism. NNDC's evidence all points to the need for a requirement to be imposed.

14.18. As a matter of principle, a negatively worded requirement can require a mitigation strategy that envisages payment by the Applicant of a contribution to address an impact – see paragraph 005 of the PPG on the Use of Planning Conditions ("**the Conditions PPG**"). Furthermore, paragraph 011 of the Conditions PPG states that, where a condition or a section 106 agreement could be used to overcome a planning objection to a development, then a condition should preferably be imposed.

14.19. The requirement proposed by NNDC at Norfolk Vanguard Deadline 6 envisaged a mitigation scheme which addresses tourism impact in two ways:

- Via the payment of a contribution out of which compensation can be awarded to local tourism and associated businesses impacted by the development; and
- Via marketing activity to combat negative perception and to assist with generating tourist footfall and spend.

14.20. The Appellant in discussions raised concerns about the practicality of linking the payment of the contribution to compensation to local tourism and associated business. Although NNDC considers that such a scheme could be workable, it recognises the need for the Applicant to be confident in what is being proposed. Accordingly, NNDC suggested a different destination for the payment of the contribution: it could be paid to existing Tourism Information Centres and to Visit North Norfolk and/or Visit Norfolk, both organisations with which NNDC works closely. **Appendix J** provides further information about Visit North Norfolk (including the pages on areas relevant to the DCO and the "About" page of the organisation) and **Appendix K** provides further information about Visit Norfolk. Appendix K and L were provided to the Examining Authority for Norfolk Vanguard

14.21. NNDC therefore proposes the following amended wording to the draft DCO requirement:

Tourism and Associated Businesses

X.- (1) No part of Works No. 4C or Work No. 5 within the District of North Norfolk may commence until such time as a tourism and associated business impact mitigation strategy has been submitted to and approved in writing by NNDC.

(2) The tourism and associated business impact mitigation strategy referred to in sub-paragraph (1) must include:

(a) Details of a contribution to be paid by the undertaker to Tourism Information Centres, Visit North Norfolk, Visit Norfolk and any other relevant organisations supporting and promoting tourism in North Norfolk;

(b) Details of a method by which the contribution by the undertaker in (a) will be apportioned to the above organisations;

(c) Details of who will administer the strategy;

(d) Details of how the strategy will be funded including the cost of administration;

(e) Details of how any monies unspent are to be returned to the undertaker;

(f) Details of marketing campaigns (including funding) to be run in order to market North Norfolk in advance of, during and after construction works have been completed for Norfolk Vanguard for the purpose of generating tourist footfall and spend.

(3) The tourism and associated business impact mitigation strategy must be implemented as approved.

14.22. The payment of a contribution to improve and support tourism services like information centres or such as Visit North Norfolk and payment of a contribution to develop and run a targeted marketing campaign are well-trodden ways of mitigating negative impacts of development on tourism. A mitigation strategy incorporating these measures would be reasonable and enforceable, and the detailed scheme would be precise. Accordingly, the proposed requirement would meet all the tests in paragraph 55 of the NPPF and paragraph 3 of the Conditions PPG.

14.23. NNDC welcomed the subsequent Norfolk Vanguard Examining Authority schedule of changes to the draft Development Consent Order (Issued 09 May 2019) and the proposed inclusion of new Requirement 34 (tourism and associated business impact mitigation strategy) which address concerns raised by NNDC at Deadline 7. A copy of Requirement 34 set out by the Norfolk Vanguard ExA is attached at **Appendix L**.

Evidence of Perception Impact

14.24. At Norfolk Vanguard Deadline 8, the Appellant provided a Position Statement on NNDC's Request to Address Perceived Tourism Impacts [REP8-071]. This document challenged the evidence provided by NNDC at Deadline 7

concerning the tourism impact of negative perceptions in relation to particular areas. The Applicant also made submissions concerning the lawfulness of the proposed tourism requirement.

14.25. It should be noted that in these submissions the Applicant's use of "perceived tourism impact" is a misnomer – it is not the tourism impact that is "perceived". The impact arises from negative perceptions. A better description would be "Actual Tourism Impact of Negative Perceptions".

14.26. In essence, the Applicant challenged NNDC's Norfolk Vanguard Deadline 7 evidence, provided by NNDC's specialist officer with significant experience of tourism matters in general and tourism in NNDC in particular, on the basis that it would have been preferable to address the perception impact from the construction of the Dudgeon Offshore Wind Farm (onshore construction 2015/2016) and the Sheringham Shoal Offshore Wind Farm (onshore construction 2010/2011). The Applicant asserted, based on the statistics from NNDC's Norfolk Vanguard Deadline 6 evidence showing overall growth in tourism over the period 2013-2017, that there was no adverse perception impact on tourism as a result of the construction of the other off-shore windfarms.

14.27. NNDC considered that the Applicant's approach belied its lack of expertise in assessing tourism impact. The statistics at §17 of the Applicant's Position Paper were district-wide statistics. In other words, they were at a macro level, not a micro level. They did not show anything about tourism impact in the particular areas where Dudgeon and Sheringham Shoal made landfall and where construction took place. They certainly did not undermine NNDC's evidence concerning coastal erosion perception impacts, which was based on micro-level impact at particular places when perception of those areas changed. NNDC's choice of comparator was the correct choice.

14.28. Furthermore, the overall district-wide levels of tourism are contingent on a wide number of factors, including the weather and the exchange rate, which

again showed why those statistics cannot be assumed to show a lack of tourism impact from the Dudgeon or Sheringham Shoal schemes.

14.29. The Applicant also relied on the approach taken by the Hornsea 3 Examining Authority. NNDC did not, during that examination, propose the type of Requirement now under consideration in relation to the Norfolk Vanguard project. NNDC therefore wrote to the Hornsea 3 Examining Authority and the Secretary of State, bringing their attention to the approach of the Norfolk Vanguard Examining Authority and inviting them to take a similar approach.

Lawfulness of the Proposed Requirement

14.30. The Applicant contested the lawfulness of the proposed requirement on two bases. The first is that it is not necessary or directly related to the proposed development because the tourism impact from negative perception has not been evidenced, relying again on the fact that tourism "steadily increased" following the onshore construction periods of the last two offshore wind farms (§§22-23). For the reasons given above, this was a misunderstanding of what the tourism statistics show. NNDC relies on its evidence, provided at both Norfolk Vanguard Deadline 6 and Deadline 7, that the proposed requirement was necessary and directly related to the development.

14.31. The second basis on which the Applicant contested the lawfulness of the proposed requirement is that it will not be fairly and reasonably related in kind and scale to the development because there is no "mechanism", either in policy or currently agreed with the Applicant, to assess the requisite level of financial contribution.

14.32. However, there is nothing in the case law concerning conditions, or in the PPG, that suggests a requirement for financial contributions will fail the test if there is no mechanism in an SPD or similar policy document for its calculation. The proposed requirement envisages the Applicant producing a mitigation strategy for submission and approval by NNDC. That will ensure that NNDC and the Applicant agree suitable figures for the requisite contributions. As

NNDC submitted at Norfolk Vanguard Deadline 7, this is a well-trodden way of mitigating negative impacts of development on tourism. A mitigation strategy incorporating these measures would be reasonable and enforceable, and the detailed scheme would be precise. Accordingly, the proposed requirement would meet all the tests in paragraph 55 of the NPPF and paragraph 3 of the Conditions PPG.

14.33. NNDC's position in light of what is set out above is that the Norfolk Boreas DCO should include a requirement for a tourism and associated business impact mitigation strategy to address the likely adverse impacts on the tourism sector within North Norfolk.

15. Statement of Common Ground

15.1. At the time of submission of this Local Impact Report (Deadline 2 – 10 Dec 2019), NNDC and Vattenfall have been working together to produce a Statement of Common Ground.

15.2. This will ensure that ahead of the Issues Specific Hearings in January 2020, there will be a clear understanding of the areas of agreement and areas of disagreement to enable focussed discussion at the Issue Specific Hearings.

15.3. Vattenfall have confirmed that they will submit the latest iteration of the draft/interim Statement of Common Ground to the Planning Inspectorate.

15.4. Many of the issues raised within the Statement of Common Ground are captured within this Local Impact Report.

16. Conclusions

16.1. NNDC welcome and support the principle of renewable energy development to help meet the challenges of climate change and support the development of stronger and resilient electricity networks capable of reducing reliance on fossil fuels and to reduce the need to import electricity from outside of UK waters.

16.2. NNDC welcome the commitments made by Vattenfall including the use of HVDC transmission and the commitment to bring cables on shore via the 'long' HDD option. These are all factors which have helped to reduce the potential adverse impacts of the project.

16.3. Nonetheless, the proposed Norfolk Vanguard project has the potential to result in some impacts across North Norfolk District, particularly during construction and it is important that those adverse impacts are reduced as much as possible and appropriate mitigation provided. Many of the potential impacts are or can be made acceptable through the drafting of the Development Consent Order.

16.4. However, there remain some areas of disagreement between the parties in relation to the impacts associated with Norfolk Boreas and Norfolk Vanguard including impacts on:

- Tourism (requiring specific mitigation set out and evidenced by NNDC);
- Landscape (requiring longer periods of replacement planting as set out and evidenced by NNDC);
- Residential amenity during construction including:
    - Consideration of potential impacts related to continuous periods of operation;
    - Construction noise (including at Little London and Happisburgh);
    - Traffic/HGV Movements (including Little London and Happisburgh)

- Fencing to compounds at Happisburgh and MA8 near Holly Farm Barningham.

The majority of matters or issues are capable of being resolved either through existing proposed requirements within the draft DCO, amendments to specific requirements in the draft DCO, introduction of new requirements or clarifications to Outline documents supporting specific requirements.

16.5. NNDC will continue to work with Vattenfall to resolve outstanding matters and to ensure that the maximum amount of community benefits can be secured both through the Development Consent Order process and through individual negotiation for the wider benefit of North Norfolk.

Appendix A - A timeline of Happisburgh Sea Defences covering a period of 1959 to 2015

Happisburgh Defences - History to December 2001

1959-1961	Timber revetment and groynes constructed between Ostend and Cart Gap
1968	Beach Road groynes constructed
1982	Partial reconstruction of damaged revetment and groynes
1986	cart Gap Seawall Constructed & old revetment partially removed leaving cill
1989	Need for major investment in new defences identified
1991	Following storm damage, unsafe section of revetment (300m long) removed to south of village. Consultants Halcrow are commissioned to consider defence options for Happisburgh
1992	Halcrow report. A scheme is designed and advertised, receiving four objections. Meetings held with objectors. The objections cannot be resolved and the scheme stalled.
1994	Shoreline Management Plan commenced.
1995	Revised scheme prepared, but fails to meet MAFF economic criteria.
1996	Shoreline Management Plan completed. Hold the Line policy adopted. Storm damage results in the loss of a further 400m of revetment and the end of beach road. Halcrow commissioned to carry out 2nd study integrating scheme with Environment Agency works to the south. Visit to Happisburgh by Junior Agriculture Minister, Tim Boswell MP.
1997	Revised defence scheme advertised. Two irreconcilable objections received. MAFF introduces Priority Score that the scheme fails to meet. Scheme stalled. No immediate prospect of further scheme and Council asks MAFF to fund design work to date. Coast Protection Sub-Committee informed 29 Oct 1997 and 7 Jan 1998 (Note: Vice Chairman, Cllr Benstead, in Chair; Chairman, Cllr Will, absent 29 Oct 1997 to 24 June 1998)
1998	Visits to Happisburgh by the Junior Agriculture Minister, Elliot Morley MP and the House of Commons Agriculture Select Committee.
1999	MAFF grant aids preliminary design work carried out to date. This brings all previous and current schemes to a close. Coastal Concern Action Group formed in April, followed by public meeting in May
2000	MAFF agrees to fund a Strategy Study of the coast between Ostend and Cart Gap. Consultants HR Wallingford are appointed. MAFF amends Priority Score to place greater emphasis on river defence schemes.
2001	HR Wallingford report and scheme is advertised December 2001.

Happisburgh Defences - History of Scheme from January to December 2002

2002

January	Two objections received in response to public advertisement of scheme 28th December 2001.
Jan - March	Negotiations with objectors
March	Defra announces new priority scoring system to be effective from 2003/04.
April	Notification to objectors of NNDC's intention to refer to Minister.
May	NNDC Executive Committee approves referral of objections to Defra
May	Objections referred to Defra.
June	Defra Regional Engineer seeks clarification of technical points - referred to consultants.
July	Technical response sent to Defra.
July	English Nature raises concerns over a prehistoric axe that we are not supposed to know about.
July	Verbal request from regional office that NNDC needs to submit a formal application to Defra for approval of the scheme and grant aid before Defra will consider the objections.
July	Application submitted to Defra. Full supporting documentation not available at the time.
August	Details of BCR sent to Defra Regional Engineer.
August	Correspondence with Norfolk Landscape Archaeology re axe. Agreement reached.
September	Defra and HR in correspondence re financial justifications
September	Verbal advice from Defra that we need Planning and landowner consents <u>before</u> Defra will hear the objections.
September	Planning application submitted.
October	Defra formally advise NNDC that planning and land owner consents are needed. Further clarification of English Nature's position also required.
October	NNDC Executive Committee resolved <u>not</u> to implement any emergency work.
October	English Nature position clarified. Brief Environmental Statement submitted to EN. Acceptable.
October	English Heritage raises concerns over the axe; resolved.
October	Emergency evacuation plan set up.

October	Defra advised that planning consent in place.
Nov 6	NNDC commission Halcrow to review scheme.
Nov 11	E Couzens as landowner confirms refusal.
Nov 12	Defra Regional Engineer seeks confirmation that the scheme still meets the basic technical, environmental and economic criteria.
Nov 13	NNDC seeks Counsels' opinion on claims by Mr Couzens.
Nov 20	Halcrow conclude scheme no longer meets the Defra criteria.
Nov 21	Defra advised that NNDC is considering emergency works.
Nov 25	Defra (London) set hearing date for 16 December (By e-mail).
Nov 27	Internal Defra Regional Engineers report received for information. NNDC resolves at Special Executive Committee to undertake emergency works.
Nov 28	Defra advised of decision to carry out emergency works and withdrawal of scheme previously submitted.
December	Emergency works commence. Informal indications from Defra are that Priority Score threshold for 2003/4 is to be set at the maximum score of 44; i.e. no new schemes in 2003/04. Happisburgh RNLI access ramp lost due to undermining as a result of beach loss. Work commences on review of Shoreline Management Plan.

Happisburgh Defences - History of Scheme from January 2003

2003

January	Emergency works completed. Public meeting held in St. Mary's Church.
February	Plans drawn for construction of temporary pedestrian access steps near destroyed access point.
February	Defra notifies councils that the threshold score for 2003/04 is 22. Happisburgh scores 5.
March	Additional rock (supplied by EA) placed on beach.
April	Access steps to west of ramp constructed
May	Meeting with Parliamentary Elliot Morley. Coastal Group Chairmen present case for amendments to Defra Priority Score system.
June	New Councillors visit Happisburgh. H & S work undertaken.
August	Meeting with Defra Regional Engineer More EA rock placed on beach.
October	Visit to Brussels by Norman Lamb, MP, P Frew, M Kerby NNDC Executive Committee considers report on future options and resolves not to promote capital scheme without assurances of Government funding.

	Resolves to lobby for funds and changes to the rules.
November	Further lobbying by Coastal Group Chairmen. Public meeting in St Mary's church.
December	Minor surge and storm causes Cart Gap wall to be outflanked. Council considers use of emergency powers and relevant notifications are made.

2004

January	Council appoints St La Haye Ltd to consider consequences of not implementing works at Cart Gap.
	Complaint by Mr Hayward received from Local Ombudsman.
February	Repairs to timber revetment.
	Report submitted to Ombudsman.
March	Council resolves not to proceed with works at Cart Gap as it would not be able to recover costs in the form of grant aid. (See below for predicted erosion and 2006 measurements. Breach point at year 48.)
	Proposal from British Museum for excavation on Happisburgh beach
	Container purchased for use of residents for furniture storage. Placed on car park
	Asbestos removed from garages to rear of Beach Road properties.
May	Garages demolished.
June	Archaeological excavations on Happisburgh beach by Natural History and British Museums.
September	Some rocks relocated.
October	Further report submitted to Ombudsman.
November	Ombudsman finds in favour of the Council.
December	Draft SMP published.

2005

June	2nd archaeological excavation
December	New emergency plan issued.

2006

December	Council approves additional expenditure to fund programme of works to "buy time". CP Act notices served on Defra and NE

2007

February	Work commences to augment existing rock berm.
April	Enlarged rock berm completed. Natural England assent to the emergency works
August	3rd archaeological excavation
August	Visit by Defra Minister Ian Pearson, MP
September	Village planning workshop
November	Meeting with Natural England about works in the Site of Special Scientific Interest

2008

January	Visit by East of England Minister Barbara Follett MP
August	4th archaeological excavation
June	Visit by Defra Minister Phil Woolas, MP

2009

January	4-5,000 tonne of surplus / out of specification rock delivered week commencing 26th January to Decca Field area
January 5th	Visit by Royal Commission on Environmental Pollution
August	CP Act notice published for construction of rock revetment at Decca Field.
December	Pathfinder planning started

2010

March	Decca Field rock scheme completed. Rock moved into Happisburgh
May	5th Archaeological dig - 31st May to 18th June
October	Council approves methodology for acquisition of Beach Road houses. Offers made to purchase. 1st offer accepted

2011

February	Planning application submitted for car park, toilets and ramp
March	Completion of first house purchase.

2012	April	9 cliff top properties demolished and area landscaped
August		Completion of new car park and toilets, transferred operations to Parish Council
September		Happisburgh steps are removed but put into local storage.

2013	February	Installation of short section of Rock bund to provide some protection to the new ramp.
2014	April	Caravan Park refused planning consent to roll back to alternative site.
2015	May	Caravan park wins planning appeal for the rolling back of the park.
	June	New play space built next to new car park as a community initiative
	October	Rolling back of Rock sill and removal of further beach debris between the new ramp and old lifeboat slipway.
	December	Release of second Pathfinder Evaluation from DEFRA.

Appendix B - Examples from Establishment Management Information System (EMIS) decision tool

Grid Ref: TG 243 306 North of Felmingham, Vernon Wood

Ecological Site Classification Report

Eastings(m)	Northings(m)	Grid Reference	Climate Scenario	Site Class	Filter	Brash	Drainage	Fertiliser/Nurse
624300	330600	TG243306	Medium-High 2050 (A1b/3q0)	Very warm - Moderately exposed - Moderately dry	All species	No brash present	No drainage installed	No fertiliser

Site Description and Variables

The site has a very warm, moderately exposed and moderately dry climate. The soils are fresh moisture status and medium nutrient status.

Modifications	AT	CT	DAMS	MD	SMR	SNR
Default	2691.0	10.0	13.0	279.0	5.0(Fresh)	3.0(Medium)
Final	2691.0	10.0	13.0	279.0	5.0(Fresh)	3.0(Medium)

Species	Abbr.	Suit(Ecol)	Suit(Timber)	Yield	Limiting	AT	CT	DAMS	MD	SMR	SNR	Version
Lodgepole pine	LP	●	▲	7	MD	●	●	●	●	●	●	3.1(A)
Scots pine	SP	●	●	8	MD	●	●	●	●	●	●	3.3(A)
Norway spruce	NS	●	●	2	MD	●	●	●	●	●	●	3.3(A)
Sitka spruce	SS	●	●	0	MD	●	●	●	●	●	●	3.4(A)
Douglas fir	DF	●	●	4	MD	●	●	●	●	●	●	3.1(A)
Hybrid larch	HL	●	●	0	MD	●	●	●	●	●	●	3(A)
Japanese larch	JL	●	●	0	MD	●	●	●	●	●	●	3(A)
European larch	EL	●	●	0	MD	●	●	●	●	●	●	3(A)
Grand fir	GF	●	●	0	MD	●	●	●	●	●	●	3(A)
Noble Fir	NF	●	●	0	AT5	●	●	●	●	●	●	3(A)
Downy birch	PBI	●	●	0	MD	▲	●	●	●	●	●	3.2(A)
Silver birch	SBI	●	●	1	MD	●	●	●	●	●	●	3.2(A)
Sycamore	SY	●	●	2	MD	●	●	●	●	●	●	3.3(A)
Pedunculate oak	POK	▲	▲	3	MD	●	●	●	▲	●	●	3.1(A)
Sessile oak	SOK	●	●	1	MD	●	●	●	●	●	●	3.2(A)
Aspen	ASP	▲	●	2	MD	●	●	●	▲	●	●	3.2(A)

Grid ref: TG373300 West of Whimpwell Green

Ecological Site Classification Report

Eastings(m)	Northings(m)	Grid Reference	Climate Scenario	Site Class	Filter	Brash	Drainage	Fertiliser/Nurse
637300	330000	TG373300	Medium-High 2050 (A1b/3q0)	Very warm - Moderately exposed - Moderately dry	All species	No brash present	No drainage installed	No fertiliser

Site Description and Variables

The site has a very warm, moderately exposed and moderately dry climate. The area is coastal (within 3km of sea) so certain species may experience saltburn, a protective belt comprising one or more of Sycamore, Sitka spruce or Lodgepole pine may mitigate those effects. The soils are fresh moisture status and medium nutrient status.

Modifications	AT	CT	DAMS	MD	SMR	SNR
Default	2711.0	10.0	13.0	285.0	5.0(Fresh)	3.0(Medium)
Final	2711.0	10.0	13.0	285.0	5.0(Fresh)	3.0(Medium)

Species	Abbr.	Suit(Ecol)	Suit(Timber)	Yield	Limiting	AT	CT	DAMS	MD	SMR	SNR	Version
Lodgepole pine	LP	●	▲	6	MD	●	●	●	●	●	●	3.1(A)
Scots pine	SP	●	●	7	MD	●	●	●	●	●	●	3.3(A)
Norway spruce	NS	■	■	1	MD	●	●	●	■	●	●	3.3(A)
Sitka spruce	SS	■	■	0	MD	●	●	●	■	●	●	3.4(A)
Douglas fir	DF	■	■	1	MD	●	●	●	■	●	●	3.1(A)
Hybrid larch	HL	■	■	0	MD	●	●	●	■	●	●	3(A)
Japanese larch	JL	■	■	0	MD	●	●	●	■	●	●	3(A)
European larch	EL	■	■	0	MD	●	●	●	■	●	●	3(A)
Grand fir	GF	■	■	0	MD	●	●	●	■	●	●	3(A)
Noble Fir	NF	■	■	0	AT5	■	●	●	■	●	●	3(A)
Downy birch	PBI	■	■	0	MD	▲	●	●	■	●	●	3.2(A)
Silver birch	SBI	■	■	1	MD	●	●	●	■	●	●	3.2(A)
Sycamore	SY	■	■	1	MD	●	●	●	■	●	●	3.3(A)
Pedunculate oak	POK	▲	■	2	MD	●	●	●	▲	●	●	3.1(A)
Sessile oak	SOK	■	■	1	MD	●	●	●	■	●	●	3.2(A)
Aspen	ASP	■	■	2	MD	●	●	●	■	●	●	3.2(A)

Appendix C - Ecological Site Classification Manual

Ecological Site Classification Version 4

Draft Quickstart Guidance for Site Assessment

1 Overview

The current system is structured to provide an interface organised as follows :

Quick navigation	Resource links Tool selector *Changing the option will change the contents of the tool options window.*
Tool options	Map view + legend
Results window	

- Resource links – the terms of use, update history, case studies, manual, contact email.
- Quick navigation – enter a six figure Ordnance Survey GB grid reference, the map will zoom into the region of interest.
- Tool selector – Ecological Site Classification and related decision support tools can be selected from a list.
- Maps of species suitability alongside climatic and topographic data can be accessed using Forest Maps.
- Tree species suitability can be evaluated using Ecological Site Classification (Tree Species).
- Native Woodland suitability can be evaluated using Ecological Site Classification (NVC Woodland).
- If ESC base data is required for sample sites, this can be obtained by uploading a file containing a list of Ordnance Survey GB grid references (i.e. two letters followed by six digits e.g. NT090950), this will return a common separated value file containing the four ESC climate variables and the modelled soil properties for the given site.
- Data is entered via the Tool Options window pane (e.g. soil properties and management options).
- The outcomes of an analysis are displayed in the Results Window, alongside options to save the data where applicable as a csv or pdf file.

2 Forest Maps Data Browser Options

The Forest Maps data browser contains folders which can be expanded by clicking on them to reveal a number of datasets. Clicking on the map will reveal metadata about the map currently being viewed alongside the option to download the data as a file (usually a geotiff).

a) Climatic Data

This option contains the baseline climatic data (accumulated temperature, continentality, dams (exposure) and moisture deficit for the period 1961-1990 at a resolution of 250 metres. Rainfall is provided at 5km resolution for the same period.

b) Topographic Data

These are data derived from 250m Ordnance Survey open data digital elevation models and publicly available methods for calculating topographic shelter (topex) and topographic wetness (compound topographic index). Aspect and slope where derived from models in QGIS.

c) Broadleaf Species

Climatic timber suitability maps for a range of broadleaved species.

d) Conifer Species

Climatic timber suitability maps for a range of conifer species. In some cases such as Douglas fir, Scots pine and Sitka spruce additional information is available on provenance and soils suitability.

The species climatic suitability maps show the theoretical maximum planting extent of a selected species assuming optimal soil (edaphic) conditions within GB. However in practice the range will be considerably reduced due other factors, particularly the site soil type. Like many aspects of decision support tools the maps are intended to complement site level assessments, expert judgement and local knowledge.

e) Native woodland maps (Baseline)

Native woodland maps combine the **climatic** species suitability of the main component species with the **climatic** NVC suitability guidelines published in Ecological Site Classification Bulletin 124. Information on soil type will inform the actual NVC woodland type suitable for a given location.

f) Climate Zones and Modelled Soil Data

These are the broad ESC climate zones for GB alongside ESC soil properties data (SMR/SNR) which has been modelled to 250x250 metre pixel resolution based on FC soil maps and national scale data. While the soil data indicates trends it is not intended for site level planning, users are recommended to use their own data in site analyses if possible.

g) Establishment

Maps are included for bareroot planting windows according FC Bulletin 121 and GB Seed Zones.

h) In Development

Those are provided for evaluation and are part of ongoing work which is yet to be finalised. A map is included that provides an estimate of site fertility according to underlying solid geology (based on an old, and now superseded BGS 1:625k dataset).

In addition two new maps are in development that describe the climatic potential of broadleaved or conifer species according to the potential of various key species. Those climatic zone maps are intended to help users quickly identify the species and objectives that are likely to be supported in a given location.

For the broadleaved map the key is as follows:

Zone	Interpretation
OK/BE/SY/WCH	The site is climatically very suitable for one or more of Oak, Beech, Sycamore or Wild Cherry.
PBI/SBI	The site is climatically very suitable for Birch, or suitable for other broadleaved species. Good production is still possible.
OK/SY/Native	The site is climatically suitable for Birch, Oak and Sycamore, though there may be climatic constraints. Site may also be suitable for other native woodland (NVC) types where production is not an objective.
PBI/SBI	The site is only suitable for Birch, as a low yield species.
PBI/ROW	The site is possibly suitable for Birch and Rowan as native woodland habitat.

3 Map View

The map displays the dataset currently selected. The following actions are available

a) zoom in/out using mouse wheel or the +/- control on the map. Pinch to zoom may work on devices with touch interfaces.

b) pan by holding mouse down and dragging the map

c) zoom to region of interest by holding down shift key then pressing left mouse button to draw a box, on release of the mouse button the system zooms in to the selected region.

d) click to analyse – if the left mouse button is clicked the system analyses the site with the user selected (or default) site variables and query parameters.

4 Site and Query Parameters

The input panel for Ecological Site Classification includes the options to amend site level data on soil type, operations and query parameters.

a) Soil Moisture Regime
Select the appropriate soil moisture regime for the site. We assume that this data is obtained through a formal soil survey.

b) Soil Nutrient Regime
Select the appropriate soil moisture regime for the site. We assume that this data is obtained through a formal soil survey. Note there are now three categories of very poor site (VP1, VP2 and VP3). VP1 is the most impoverished (e.g. FC deep peat soil type 10a), VP2 the intermediate grade (e.g. FC deep peat soil type 11a) and VP3 is the richest (e.g. FC podzolic peaty gley soil type 6z).

Soil data for common FC soil types are included in appendix A.

c) Brash Management
If new planting ignore this option. If restock indicate if the site will replanted quickly to take advantage of nutrients from decomposing brash.

d) Drainage
Wet sites (soil moisture regimes very wet, wet, very moist and moist) can benefit from drainage, which has the effect of drying the site and slightly improving the nutrient availability on very poor sites.

e) Fertiliser/Nursing mixture
The application of fertiliser can raise the site nutrient regime, however this is only warranted on very poor and occasionally poor soil nutrient regimes. Depending upon the site type some species may require several applications and/or a unique fertiliser prescription based upon specific site/species issues (e.g. imbalance in NPK ratios).

There is evidence that pines planted in mixture with other species can ameliorate nitrogen deficiencies on certain sites, but not PK or other limitations. The favoured mixture species for use with Sitka spruce is Alaskan Lodgepole pine, as this will grow more slowly and the stand is therefore more likely to self thin.

Larch, birch and alder may also confer nurse benefits though they may not be suitable in some situations due to site requirements, or their tendency on exposed sites to damage leaders of adjacent trees through crown whipping.

f) Results Filter
This list provides options to constrain the results list to suitable species only, native only and so on. When looking at native woodland creation remember that NVC types have different niches to the suitability ranges of component species. For example Scots Pine is suitable on a wide range of soil types (very poor to rich), but the related W18 native woodland only tends to occur where the soil nutrient regime is very poor or poor (see pages 48-49 of bulletin 124).

g) Climate Scenarios
The ESC model can be run against different climate scenarios. For current operational use we recommend the baseline scenario with some thought given to the consequences for selected species should the site become drier in the future.

h) Update button
Assuming a site has been identified on the map, the update button allows the same site to be re-analysed but with different soil or management options.

5 Results View

a) Site Data

The first table lists all the site data and the user inputs. Sometimes SMR and SNR will be amended according to the impact of a site operation (e.g. drainage).

b) Results

Species suitability results are displayed for all 57 species available unless the user subsets the list via option 4(f). Suitability scores are presented in the classic coloured chart on the right hand side and complemented with the underlying model outputs on the left hand side.

There is a link at the top of the table that allows the results to be saved in CSV or PDF format.

ESC Score	Description	Interpretation
0.75+	Very suitable	Factors will not significantly constrain growth
0.5 – 0.74	Suitable	Some impact upon growth, for example lower yielding Sitka spruce on a peaty gley (YC 14-16).
0.3 – 0.49	Marginal	Species in this category may have significantly reduced growth, high risk of check or absolute failure. Examples -Sitka spruce on certain deep peats without fertiliser exhibiting wide variation in growth rates(YC 0-10). -Downy birch on very poor sites forming a scrub woodland .
0 – 0.29	Unsuitable	In this category the species will usually fail to establish extensive tree cover.

The species suitability scores operate on the basis that a higher value means a particular factor (AT, SMR etc) is unlikely to prevent tree growth. Values above 0.75 are very suitable and have the lowest risk, but the incidence of failure or significantly reduced growth is usually much higher when one or more factors is below 0.5.

The numeric outputs give a little more information about how marginal or suitable a species may be on a given site. For example a species with a suitability score of 0.50 in reality may be close in performance to another with a score of 0.49.

ESC Species Symptoms by Climatic/Edaphic(Soil) Variables and Suitability Classes

Variable	Suitability Class	Effects
Accumulated Temperature (AT)	Unsuitable	- High mortality due to winter cold. - Very slow growth. - Potentially death at any age.
	Marginal	- Significantly reduced growth rate.
	Suitable	- Growth reduction of 25-50%
	Very Suitable	- No warmth constraints
Continentality	Unsuitable	
	Marginal	
	Suitable	
	Very Suitable	
DAMS	Unsuitable	- High mortality due to wind exposure
	Marginal	- Significantly reduced growth rate. - Severe stem form problems
	Suitable	- Possible stem form problems
	Very Suitable	- No exposure constraints
Moisture deficit	Unsuitable	- High mortality due to drought. - Limited growth due to excessive rainfall
	Marginal	- Severe growth constraints - Stem damage risk from drought cracks
	Suitable	- Some growth constraints - Possible drought cracks(Grand/Noble fir)
	Very Suitable	- No constraints
Soil Moisture Regime	Unsuitable	- Mortality due to anaerobic conditions (wet sites) - Mortality due to dry conditions (very dry sites)
	Marginal	- Severe growth constraints due to limited rooting in wet soil. - Difficulty sustaining growth of larger trees due to limited water availability on dry soils.
	Suitable	- Some growth constraints due to limited water availability on dry soils. - Wet conditions inhibit update of nutrients.
	Very Suitable	- No constraints
Soil Nutrient Regime	Unsuitable	- High mortality due to acid soil conditions. - Check, trees unable to grow due to

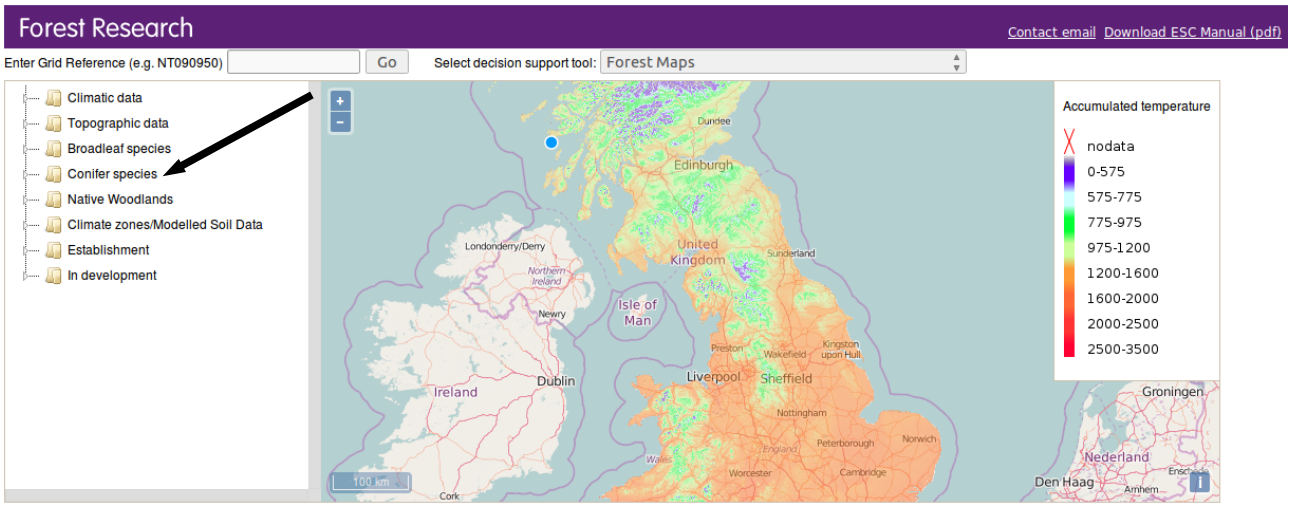
		nutrient deficiencies. - Mortality associated with carbonate soils.
	Marginal	- Uneven and limited growth due to lack of nutrients. - Stunted stems.
	Suitable	- Some reduction in growth potential.
	Very Suitable	- Good growth. - Coarse branching on richer soils (Scots pine, birch)

6. ESC Examples

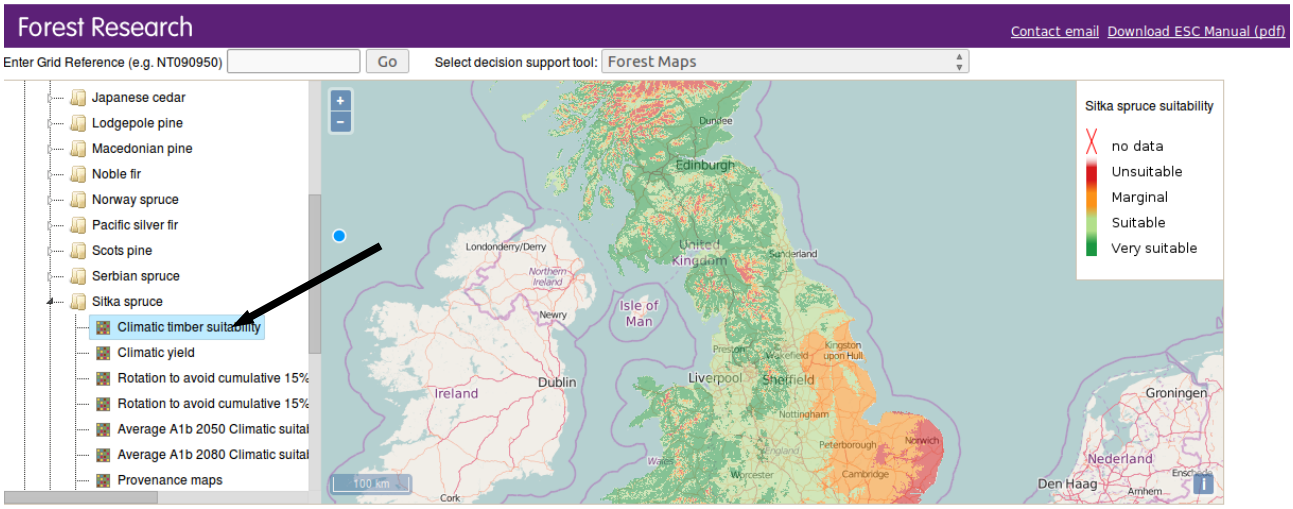
Case Study One – Restock of poor wet site type with Sitka spruce.

1. On the layer view expand the conifer species folder by clicking on it

This will allow you to select the map for the species of interest.



2. Select the map for climatic suitability of Sitka spruce in baseline climates

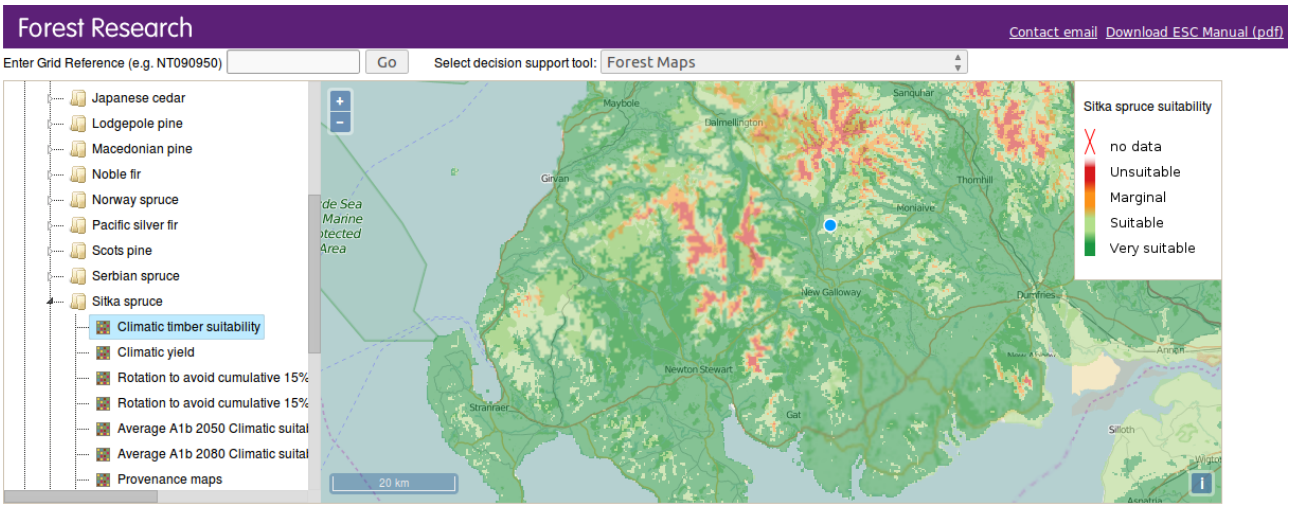


This map gives an overview of yield potential for the selected species, considering ESC climatic factors only (i.e. AT, CT, DAMS and MD). Darker green indicates increasing suitability while regions in red are unsuitable.

ESC assumes adverse climatic factors cannot be compensated by ideal soil conditions, so those maps can be viewed as the maximum areas of land suitable for a given species. However there is evidence that some climatic constraints can be compensated by local site properties, for example high climatic moisture deficits/dry regions may be offset by wet soils. Those issues require foresters to make on the ground adjustments based on their own experience and history of the site.

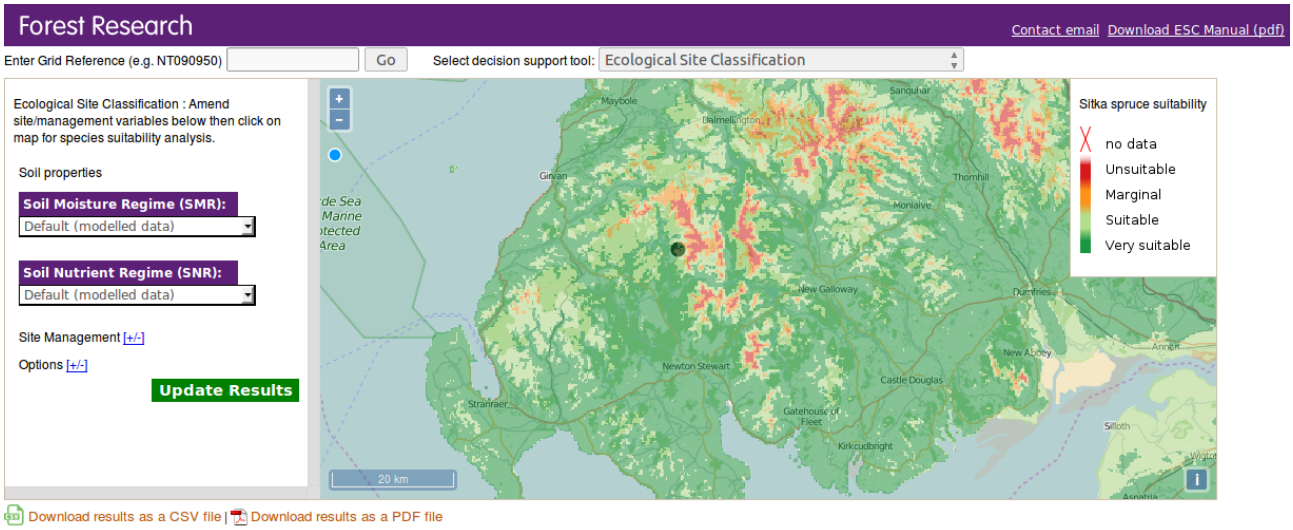
3. Locate Site of interest

The map has various functions such as pan/zoom. Use those to locate the site of interest. In this example we have zoomed into Galloway.



Now to obtain a site assessment from ESC we simply select Ecological Site Classification in the drop down menu and click on the site of interest indicated by the cursor (blue dot). A set of results is added below the map and a black circle indicates the location.

4. Initial Results



Adjustments	Eastings(m)	Northings(m)	Site Grid Reference	Climate Scenario	Site Class	Filter	Brash	Drainage	Fertiliser
Site defaults	238745	584975	NX387849	Baseline climate 1961-1990	Cool - Moderately exposed - Wet	All species	No brash present	No drainage installed	No fertiliser

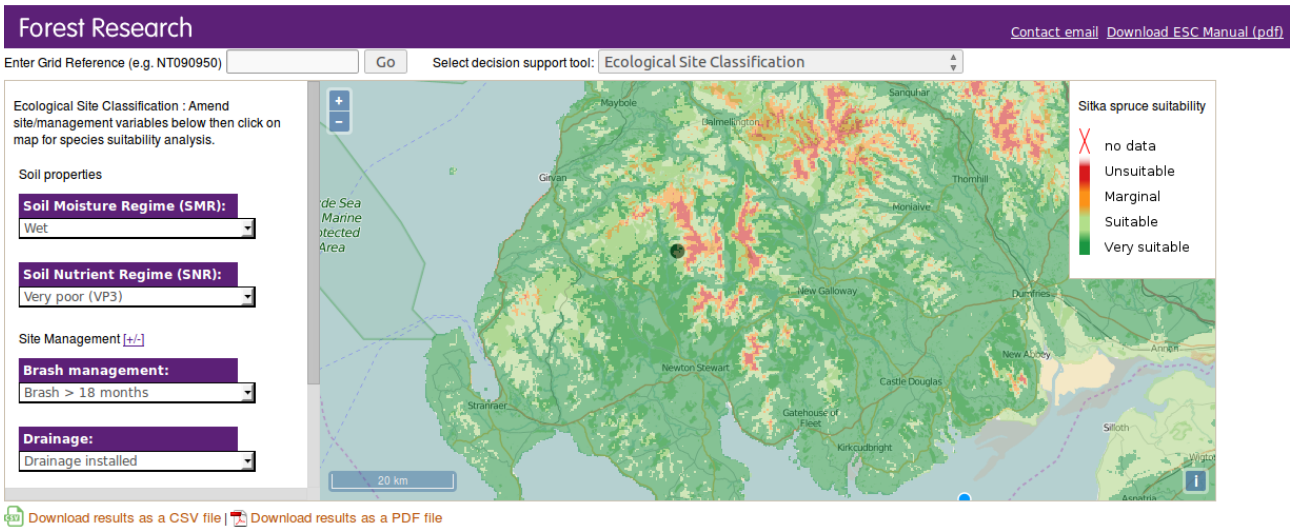
Modifications	Accumulated Temperature(AT)	Continentality(CT)	Exposure(DAMS)	Moisture Deficit (MD)	Soil Moisture Regime (SMR)	Soil Nutrient Regime(SNR)
None	1102	6	15	62	2(Wet)	0.5(VP2 Very poor)

The analysis at this is stage is based upon default settings, such as a soil type of SMR Wet and SNR VP2 Very poor.

The site we wish to test is a restocking site with soil conditions SMR=Wet, SNR=VP3 determined by a site visit. Brash will be retained on the site but it will not be restocked

for 4 years after felling due to the risk of damage from *hylobius*. To minimise site costs we wish to avoid the investment in fertiliser if possible.

5. Site Data Input

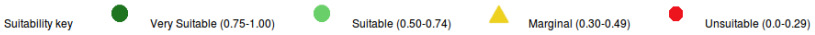


Adjustments	Eastings(m)	Northings(m)	Site Grid Reference	Climate Scenario	Site Class	Filter	Brash	Drainage	Fertiliser
Site defaults	238745	584975	NX387849	Baseline climate 1961-1990	Cool - Moderately exposed - Wet	All species	Brash older than 18 months	Drainage installed	No fertiliser

Modifications	Accumulated Temperature(AT)	Continentality(CT)	Exposure(DAMS)	Moisture Deficit (MD)	Soil Moisture Regime (SMR)	Soil Nutrient Regime(SNR)
None	1102	6	15	62	2(Wet)	1(VP3 Very poor)
Drainage					1	0.5
Final	1102	6	15	62	3(Very moist)	1.5(Very poor-poor)

The site data is amended using the drop down options on the right hand side. Click update results to change the site analysis to reflect the new data. Drainage has altered the soil wetness class from wet to very moist and improved the site soil nutrient regime by half a class.

6. Results



Common name	Species Code	Suitability		YC	Lim	AT	CT	DAMS	MD	SMR	SNR	Suit.	AT	CT	DAMS	MD	SMR	SNR	Version (Rating)	Suit. Charts
		Ecological	Timber																	
Corsican pine	CP	0.49	0.33	7	AT5	0.49	1	0.78	0.97	0.75	0.67								3.3(A)	download chart(csv)
Lodgepole pine	LP	0.67	0.62	9	SNR	0.92	1	0.89	0.72	1	0.67								3.1(A)	download chart(csv)
Macedonian pine	MCP	0.64	0.64	9	MD	1	1	0.87	0.64	1	0.67								3.1(C)	download chart(csv)
Maritime pine	MAP	0.18	0.07	1	MD	0.37	1	0.61	0.18	0.35	0.67								3.1(C)	download chart(csv)
Monterey/Radiata pine	RAP	0	0	0	MD	0.21	0.83	0.85	0	0.58	0.72								3(C)	download chart(csv)
Scots pine	SP	0.63	0.61	8	SMR	0.96	1	0.77	0.98	0.63	0.67								3.3(A)	download chart(csv)
Weymouth pine	WEP	0	0	0	SMR	0.78	0.74	0.6	0.94	0	0.47								3(B)	download chart(csv)
Norway spruce	NS	0.56	0.51	12	SNR	0.91	1	0.62	0.93	0.82	0.56								3.1(A)	download chart(csv)
Oriental spruce	ORS	0.25	0.15	3	SNR	0.62	0.87	0.59	0.49	0.6	0.25								3(C)	download chart(csv)
Serbian spruce	OMS	0.46	0.4	9	SNR	0.88	0.9	0.64	0.49	0.8	0.46								3(B)	download chart(csv)
Sitka spruce	SS	0.53	0.45	13	SNR	0.86	1	0.87	1	0.99	0.53								3.1(A)	download chart(csv)
Sitka spruce(VP)	VPSS	0.53	0.45	14	SNR	0.86	1	0.87	1	0.99	0.53								3.1(A)	download chart(csv)
Douglas fir	DF	0	0	0	SMR	0.74	1	0.49	0.66	0	0.46								3.1(A)	download chart(csv)

The results for Sitka spruce are highlighted. For discussion the results are tabulated below.

Field	Value	Explanation
Common Name	Sitka spruce	
Species Code	SS	
Ecological suitability	0.53	The ecological suitability based on the most limiting factor, in this case SNR. Indicates suitable.
Timber suitability	0.45	The timber suitability based on AT and SNR in this case, the growth potential is just below 50% of potential. Indicates marginal.
Yield Class	13	The predicted yield class. YC = ATFactor * LimitingFactor *Species Max YC in GB 0.86*0.53*28 = 13
Limiting factor	SNR	The factor with the lowest response.
AT	0.86	AT value (1099) Very Suitable (>=0.75)
CT	1	CT value (6) Very Suitable (>=0.75)
DAMS	0.87	DAMS value (16) Very Suitable (>=0.75)
MD	1	MD value (61) Very Suitable (>=0.75)
SMR	0.99	SMR value (3/Very moist) Very Suitable (>=0.75)
SNR	0.53	SNR value (1.5/Very Poor-Poor) Suitable (>=0.5 and <0.75)

So currently the site is predicted to be suitable ecologically and therefore likely to

establish. Sitka Spruce has the potential to achieve YC 13.

The conclusion of the ESC analysis is that the site is suited for restocking with Sitka Spruce provided drainage operations can improve soil conditions. Without drainage operations Lodgepole pine may be a better option for lower yield timber production or Downy birch for native woodland habitat.

7. Other ESC Terms

Suitability

Ecological Site Classification uses the term suitability to describe the likely success of a particular tree species establishing and growing to maturity on a given site. There are two measures of suitability, one broadly considers timber in terms in yield potential, the other the ecological suitability of the site. It is possible for situations to arise where a species is ecologically suited to a given site despite being unsuitable for timber production.

Timber Suitability

In ESC4 the definition of very suitable is the potential to achieve 75% or more of the maximum general yield class for the given species in British conditions. The threshold for suitable is 50% or more and marginal is 30% or more. Unsuitable conditions for timber production are defined as those where the predicted yield is less than 30% of the maximum possible in British conditions.

Marginally suitable species are usually only recommended where no other options exist or when production goals are of lesser importance as a site objective.

Ecological Suitability

The ecological suitability of a site describes the suitability of a species in terms of the most limiting factor. A species is ecologically suited to a site if the species response to each of the climatic and edaphic(soil) variables is greater than 0.5.

Note it is possible for a species to be suitable for a site ecologically, but unsuitable for timber production. This reflects the distribution of some native species and the occurrence of low density woodlands.

In most cases productive goals are met when a species is a least suitable for timber production and is ecologically suitable for a given site. When woodland habitat is an objective an ecological suitable or marginal species may be a valid option, assuming that establishment goals (e.g. stocking density can be achieved).

Model Version

ESC models are assigned a version. Models are revised and tested as the system changes to ensure consistent outputs. The 3.1 series models onwards are revisions associated with the introduction of additional classes of very poor soil nutrient regime.

Model Class

Species suitability models are assigned a class according to the amount of evidence available to support the model.

Class A – the species is well understood in British conditions, with widespread historical

planting and trials.
Class B – the species has been trialled in British conditions on a limited scale.
Class C – the species has very limited or no trials in British conditions, e.g. individual planting or experimental use in limited geographic extents.

Therefore a species recommended as suitable in class B is a safer option than an equivalent species in class C.

Appendix A

1. The ESC Soil properties of common Forestry Commission Soil Types

The ESC properties for the main Forestry Commission soil types are tabulated below. The values applied are typical observed mean attributes, and it is common for soil moisture and nutrient regime values to vary depending upon local factors. For example mineral soils in higher rainfall areas are more likely to be wetter and soils overlying richer bedrock may be more fertile.

Soil Moisture Regime (SMR) and Soil Nutrient Regime (SNR) are modelled as continuous variables though for convenience they are often referred to as the following classes described in tables A.1 and A.2 respectively.

Soil Moisture Regime	Numeric value	Example
Very wet (VW)	1	Deep peat
Wet (W)	2	Peaty gley
Very moist (VM)	3	Surface water gley
Moist (M)	4	Gleyed brown earth
Fresh (F)	5	Freely draining mineral soil
Slightly dry (SD)	6	Sandy mineral soil
Moderately dry (MD)	7	Shallow sandy mineral soil
Very dry (VD)	8	Rankers, shingle, rendzinas

Table A.1: Soil Moisture Regimes

Soil Nutrient Regime	Numeric value	Example
Very poor (VP1)	0	Unflushed deep peat
Very poor (VP2)	0.5	Podzols
Very poor (VP3)	1.0	Podzolic ironpans
Very poor-Poor (VP-P)	1.5	Ironpans
Poor (P)	2.0	Peaty gleys, upland brown earth
Medium (M)	3	Brown earth and surface water gleys
Rich (R)	4	Brown earths with high base status
Very rich (VR)	5	Calcareous brown earths
Carbonate	6	Rendzinas

Table A.2: Soil Nutrient Regimes

When using ESC the following tables allow users to enter default values for common soil types as described by the Forestry Commission Soil Classification. The table is not exhaustive because many mineral/organo mineral soils have a wide range of potential phase interactions.

2. ESC Properties of Mineral and Organo-Mineral Soils

Tables A.3 and A.4 describe the default ESC properties of the most common mineral and organo-mineral forest soil types according to the Forestry Commission soil classification system. Note that significant variation around the default properties can be expected due to local factors such as underlying geology.

In the case of Ironpan soils two sets of information are provided, one assumes establishment will occur with the pan unbroken; the other assumes site preparation techniques will break the pan and drain the perched water table.

FC Soil Code	Description	Soil Moisture Regime (SMR)		Soil Nutrient Regime (SNR)	
		Text	Value	Text	Value
1	Typical brown earth	Fresh	5	Medium	3
1u	Upland brown earth	Fresh	5	Poor	2
1z	Podzolic brown earth	Fresh	5	Poor	2
3	Podzol	Fresh	5	Very poor (VP2)	0.5
5	Ground water gley	Very moist	3	Rich	4
6	Peaty gley	Wet	2	Poor	2
6l	Peaty gley (loamy)	Very moist	3	Poor	2
6z	Podzolic Peaty gley	Very moist	2	Very poor(VP3)	1
7	Surface water gley	Very moist	3	Medium	3
7z	Podzolic Surface water gley	Very moist	3	Poor	2

Table A.3: Mineral and organo-mineral soil properties without perched water tables.

FC Soil Code	Description	Soil Moisture Regime (SMR)		Soil Nutrient Regime (SNR)	
		Text	Value	Text	Value
4*	Ironpan	Very moist	3	Very poor (VP3)	1
4z*	Podzolic Ironpan	Very moist	3	Very poor (VP2)	0.5
4	Ironpan	Fresh	5	Very poor-Poor	1.5
4z	Podzolic Ironpan	Fresh	5	Very poor (VP3)	1
4b	Ironpan intergrade	Fresh	5	Poor	2

Table A.4: Mineral soil properties with perched water tables . *=assumes the ironpan is not broken through ground preparation

3. Organic soils

Table A.5 describes the properties of deep peats according to the FC soil classification system and ESC. Many of those soils would have been afforested with the assistance of drainage systems which may need to be maintained if such sites are to be restocked.

FC Soil Code	Description	Soil Moisture Regime (SMR)		Soil Nutrient Regime (SNR)	
		Text	Value	Text	Value
8a	Phragmites fen	Very wet	1	Rich	4
8b	Juncus articulatus/acutifloris	Very wet	1	Medium	3
8c	Juncus effusus	Very wet	1	Medium	3
8d	Carex	Very wet	1	Rich	4
9a	Molinia, Myrica,Salix	Very wet	1	Medium	3
9b	Tussocky Molinia/Calluna	Very wet	1	Poor	2
9c	Tussocky Molinia Eriophorum vaginatum	Wet	2	Poor	2
9d	Non Tussocky Molinia, Eriophorum vaginatum, Trichophorum	Very wet	1	Very poor (VP3)	1
9e	Trichophorum, Calluna, Molinia	Wet	2	Very poor (VP2)	0.5
10a	Lowland Sphagnum	Very wet	1	Very poor (VP1)	0
10b	Upland Sphagnum	Very wet	1	Very poor (VP1)	0
11a	Calluna	Very moist	3	Very poor (VP2)	0.5
11b	Calluna, Eriophorum vaginatum	Wet	2	Very poor (VP2)	0.5
11c	Trichophorum, Calluna	Wet	2	Very poor (VP1)	0
11d	Eriophorum	Wet	2	Very poor (VP1)	0

Table A.5: Properties associated with organic soils.

Document Change History

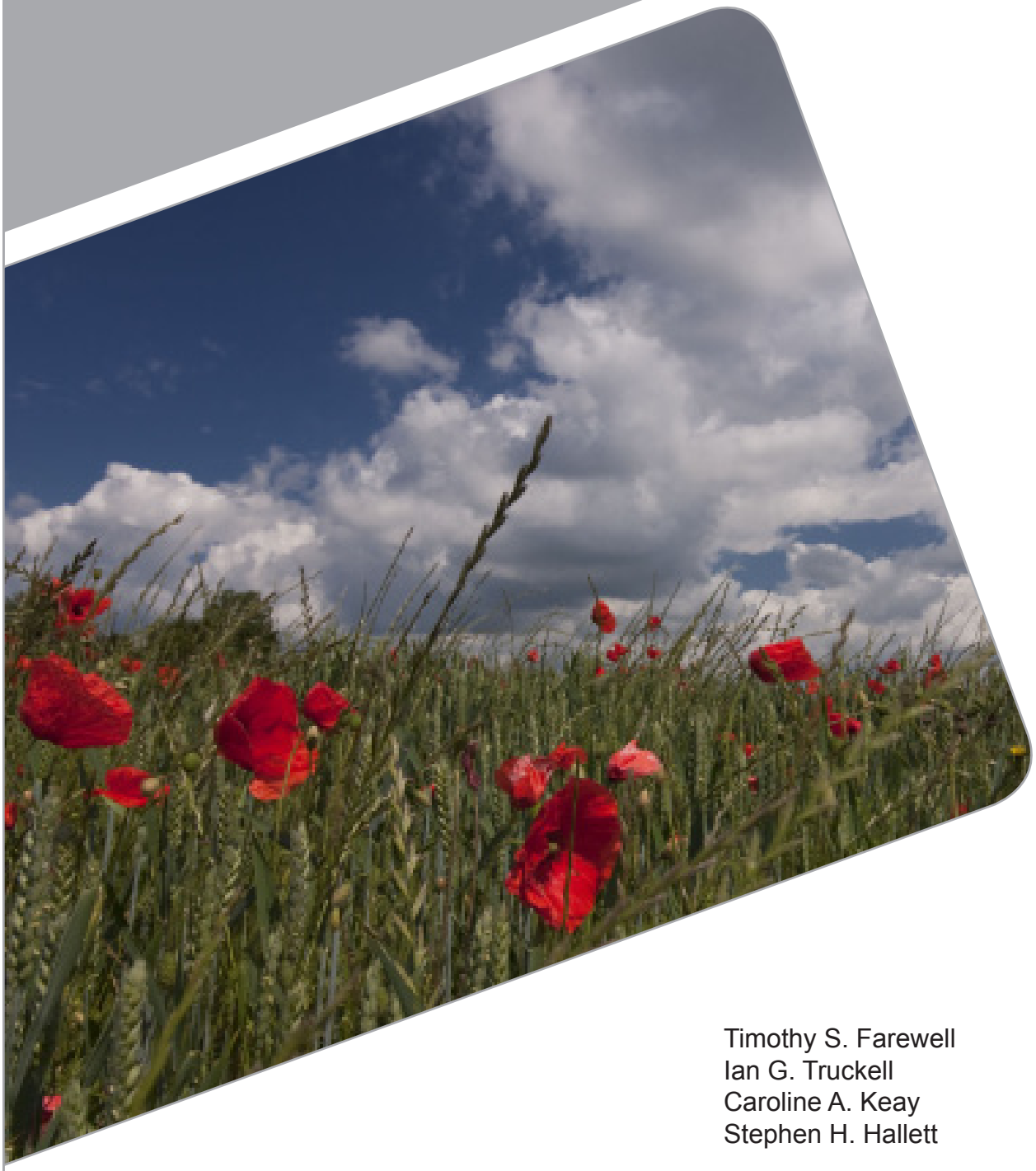
Version	Date Changed	Changed By	Comments
4.2	23 May 2016	Stephen Bathgate	Revised introduction to match latest user interface. Minor text edits to table labelling. Revised text describing of suitability. Corrected case study to indicate use of drainage.
4.1	15 April 2016	Stephen Bathgate	Included default soil properties as appendix.

Appendix D – Soilscapes Brochure

Cranfield UNIVERSITY

The use and applications of the Soilscapes datasets

National Soil Resources Institute



Timothy S. Farewell
Ian G. Truckell
Caroline A. Keay
Stephen H. Hallett

July 2011

The Soilscapes Dataset

Edition 1
July 2011

cite as:

Farewell, T.S., Truckell, I.G., Keay, C.A. Hallett, S.H (2011) *Use and applications of the Soilscapes datasets*, Cranfield University

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National Soil Resources Institute
Cranfield University
Cranfield, Bedfordshire
England
MK43 0AL

or alternatively:

nsridata@cranfield.ac.uk

Limitations

The properties of soil are spatially variable, even over short distances. Soilscapes is a generalised dataset, and so users should be aware that variation of soil properties is to be expected within the delineated polygons. Soilscapes is not intended as a means for supporting detailed assessments, such as planning applications or site investigations. More detailed datasets are available for lease from NSRI.

Soilscapes

Soilscapes Dataset

Soilscapes is one of the most popular datasets available from NSRI. It strips away confusing terminology and enables informed decision making by non-soil scientists who require an understanding of soil and how it affects the landscape. With Soilscapes, decision makers will gain a working knowledge of many fundamental soil-landscape processes for any region across England and Wales.

Simple, interpreted soil information

Soilscapes is a simplified version of the 1:250,000 scale Digital National Soil Map for England and Wales, and has been tailored to provide extensive, understandable and useful interpreted soil data for the non-soil specialist. Soilscapes defines 27 soil map units, each fully described with a range of valuable attributes. The aim of this reclassification and simplification is to provide applicable, understandable and therefore, useful, soil information.

What's included in the dataset?

Soilscapes has been designed, primarily, to aid professionals understand how the soil affects habitat, fertility, landuse and drainage. Descriptive fields are provided for each of these topics. A simple description of the soil and is also provided as the primary attribution for the Soilscapes dataset.

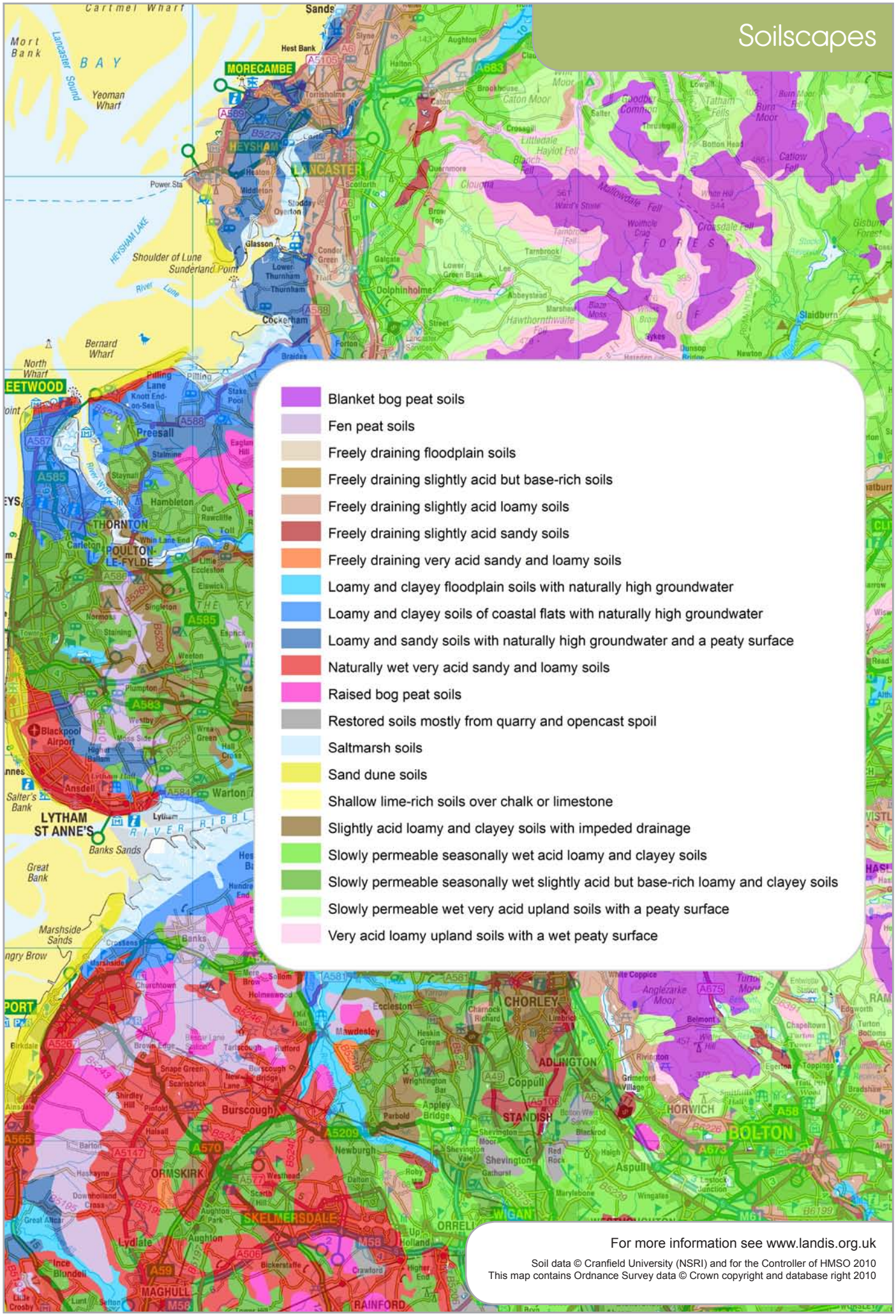
How to use this dataset

Soilscapes can be used to clearly and concisely communicate a wealth of information pertaining to the landscape character, and how this is influenced by soil. This dataset can be used to instantly characterise a site prior to field work, assess large suites of land quickly or provide informative customised mapping for strategy documents.

The Soilscapes dataset in use

Soilscapes has been used in a wide variety of contexts, by a broad range of users. Soilscapes is used extensively by local governments, charities, universities and environmental consultants. It has also been used by Natural England to assist Catchment Sensitive Farming officers with targeted soils advice for farmers.

Soilscapes



For more information see www.landis.org.uk

Soilscapes Metadata

These pages contain more detailed descriptions of this dataset. Formal ISO19115 and ISO19139 metadata is also available from www.landis.org.uk

Scale	1:250,000
Number of Classes	27 soil classes, plus water etc.
Created (updated)	2003 (2010)
Data Format	Shapefile
Derived from	NATMAPvector, the Digital National Soil Map
Coverage	England and Wales
Limitations	The properties of soil are spatially variable, even over short distances. Soilscapes is a generalised dataset, and so users should be aware that variation of soil properties is to be expected within the delineated polygons. Soilscapes is not intended as a means for supporting detailed assessments, such as planning applications or site investigations. More detailed datasets are available for lease from NSRI.

Dates of Field Mapping	The field work for the National Soil Map was carried out by a team of surveyors between 1979 and 1982, however areas that had been mapped previously were not necessarily remapped.
Purpose of use	NATMAPsoilscapes was designed to provide a simple and easily understood soil map of England and Wales.
Use / Access Constraints	The information contained in LandIS is copyright and its use is therefore subject to a specific licensing agreement between NSRI and the user. Depending on the status of the user, the cost can vary from a fully commercial charge for data lease to being royalty free with a small charge for extraction and preparation of the data to meet the user's needs.
Who created this data?	Alongside colleagues at the National Soil Resources Institute of Cranfield University, Dick Thompson and John Hollis were particularly instrumental in the creation of the Soilscapes dataset.
Map copyright statement?	Soilscapes data © Cranfield University and for the Controller of HMSO, 2011
More detailed dataset:	NATMAPvector with full legend description
Cite as	Farewell, T.S., Truckell, I.G., Keay, C.A., Hallett, S.H (2011) The derivation and application of Soilscapes: soil and environmental datasets from the National Soil Resources Institute, Cranfield University

For more information or to access this data, please contact us:
The National Soil Resources Institute, Cranfield University, Bedfordshire, UK, MK430AL
nsridata@cranfield.ac.uk +44 (0) 1234 75 2978 www.landis.org.uk

Soilscapes Dataset Information, Version 1.1
Timothy Farewell, March 2011

Drainage

Soilscapes Drainage Dataset

Soil drainage is a natural process by which water moves through and out of the soil as a result of the force of gravity. The Soilscapes Drainage dataset describes this fundamental soil property that influences the water that supports stream base flow and aquifer recharge. Soil water drainage exhibits an enormous influence on the natural environment.

Simple, understandable soil drainage information

This drainage dataset provides users with a general description of the soil hydrology, which influences surface runoff, water-logging, leaching and flood response times. Surface drainage diverts excess water from the soil surface directly to streams, thereby reducing the amount of water that will move into and through the soil. Subsurface drainage, provided by ditches and drain pipes, collects and diverts water from within the soil directly to streams. This dataset describes the drainage characteristics of each of the 27 'Soilscape' classes.

What's included with the dataset?

The drainage dataset is packaged with the habitat, fertility, landuse, texture and descriptive components of the Soilscapes suite. Soilscapes is a simplified version of the 1:250,000 scale Digital National Soil Map and has been tailored to provide extensive, understandable and useful interpreted soil data for the non-soil specialist.

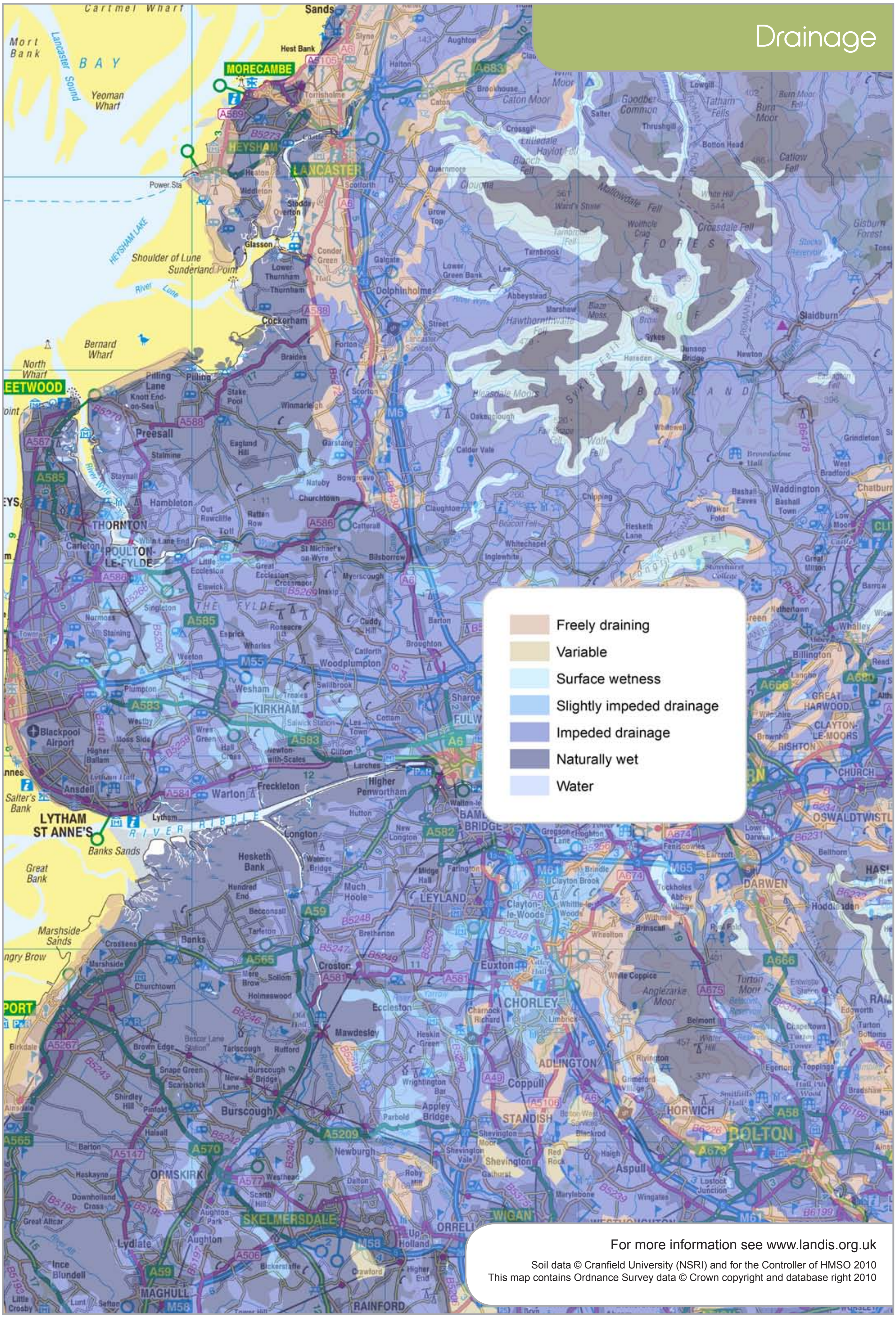
How to use this dataset

From flood risk management to horticulture, and agronomy to combatting diffuse pollution, Soilscapes Drainage can provide fundamental soil information for environmental professionals. Soil drainage is relevant to river basin management plans, farm operations such as ease of cultivation and pollution prevention policies. The dataset can also be used to predict how soils may respond to future rainfall events. For users requiring extensive knowledge of soil hydrology, more detailed datasets are also available from NSRI.

The Soilscapes Drainage dataset in use

The drainage data has been used in a wide variety of contexts, by a range of users, including local governments, engineers, agronomists and environmental consultants.

Drainage



For more information see www.landis.org.uk

Drainage

Drainage Metadata

These pages contain more detailed descriptions of this dataset. Formal ISO19115 and ISO19139 metadata is also available from www.landis.org.uk

Scale	1:250,000
Number of Classes	6 drainage classes, plus water etc.
Created (updated)	2003 (2010)
Data Format	Shapefile
Derived from	NATMAPvector, the Digital National Soil Map
Coverage	England and Wales
Limitations	The properties of soil are spatially variable, even over short distances. Soilscapes is a generalised dataset, and so users should be aware that variation of soil properties is to be expected within the delineated polygons. Soilscapes is not intended as a means for supporting detailed assessments, such as planning applications or site investigations. More detailed datasets are available for lease from NSRI.

Dates of Field Mapping	The field work for the National Soil Map was carried out by a team of surveyors between 1979 and 1982, however areas that had been mapped previously were not necessarily remapped.
Purpose of use	This drainage component of NATMAPsoilscapes was designed to provide a simple indication of typical drainage patterns across England and Wales. More detailed descriptions of soil drainage are provided in the Hydrology of Soil Type (HOST) dataset.
Use / Access Constraints	The information contained in LandIS is copyright and its use is therefore subject to a specific licensing agreement between NSRI and the user. Depending on the status of the user, the cost can vary from a fully commercial charge for data lease to being royalty free with a small charge for extraction and preparation of the data to meet the user's needs.
Who created this data?	Alongside colleagues at the National Soil Resources Institute of Cranfield University, Dick Thompson and John Hollis were particularly instrumental in the creation of the Soilscapes dataset.
Map copyright statement?	Soilscapes drainage data © Cranfield University and for the Controller of HMSO, 2011
More detailed dataset:	NATMAPvector, combined with HOST (Hydrology of soil type) classification.
Cite as	Farewell, T.S., Truckell, I.G., Keay, C.A., Hallett, S.H (2011) The derivation and application of Soilscapes: soil and environmental datasets from the National Soil Resources Institute, Cranfield University

For more information or to access this data, please contact us:
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Soilscapes Drainage Dataset Information, Version 1.1
Timothy Farewell, March 2011

Landcover

Soilscapes Landcover Dataset

Landcover represents the physical material at the surface of the earth, and landcover types across the country are strongly influenced by the underlying soils. The Soilscapes Landcover dataset describes the relationship between soil, landscapes and typical landcover, and provides an overview of the patterns that exist.

Simple Landcover Information

This landcover dataset provides users with a general description of the landcover types associated with particular soils during the survey period in the 1980s. Soils and plant communities are inexorably linked and the data shows the structure and make up of the landscape of England and Wales. The landcover dataset describes the typical landcover that is found on each of the 27 'Soilscape' classes.

What's included with the dataset?

Soilscapes is a simplified version of the 1:250,000 scale Digital National Soil Map and has been tailored to provide extensive, understandable and useful interpreted soil data for the non-soil specialist. Soilscapes has been primarily designed to aid professionals understand how the soil effects habitat, fertility, landuse and more.

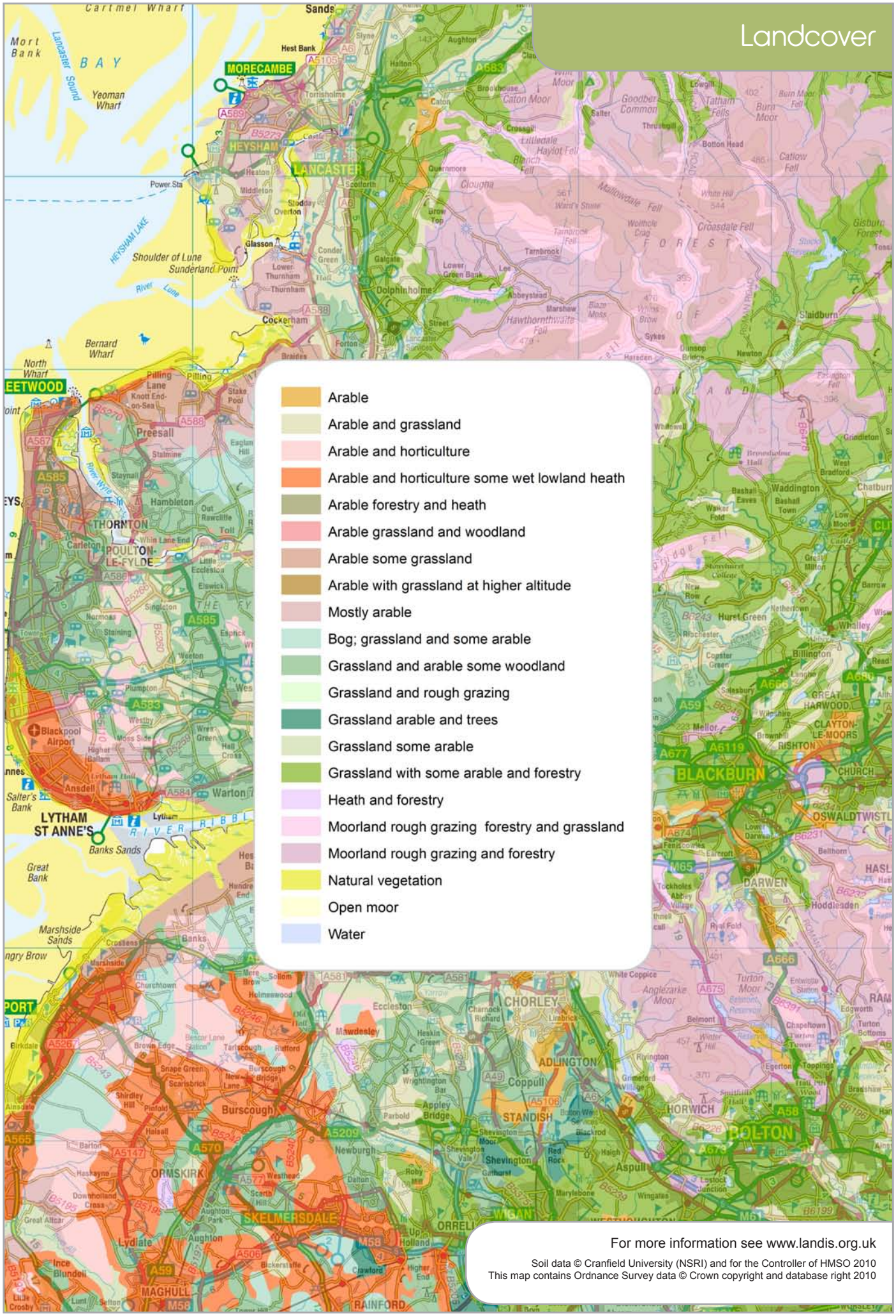
How to use this dataset

For policy-related, commercial or academic interests, this landcover map layer can help improve awareness of the natural environment. Spatial data on land cover can show the inter-connectivity of landscape features, their immediate context and the wider neighbourhood in which environmental influences operate. The dataset can be used for various modelling purposes, such as the relationship between land use and biodiversity and also to assess habitat creation and restoration. Please note, while the vast majority of the landcover is unchanged, this dataset does not necessarily display the current landcover, but what was typical for these soils when the survey was undertaken.

Soilscapes Landcover Dataset in use

The landcover data has been used extensively by local government and environmental consultants to understand the regional relationships between habitats, land cover and soil types. Academics have used this dataset to support a wide variety of research projects.

Landcover



For more information see www.landis.org.uk

Landcover Metadata

These pages contain more detailed descriptions of this dataset. Formal ISO19115 and ISO19139 metadata is also available from www.landis.org.uk

Scale	1:250,000
Number of Classes	20 landcover classes, plus water.
Created (updated)	2003 (2010)
Data Format	Shapefile
Derived from	NATMAPvector, the Digital National Soil Map
Coverage	England and Wales
Limitations	The properties of soil are spatially variable, even over short distances. Soilscapes is a generalised dataset, and so users should be aware that variation of soil properties is to be expected within the delineated polygons. Soilscapes is not intended as a means for supporting detailed assessments, such as planning applications or site investigations. More detailed datasets are available for lease from NSRI.

Dates of Field Mapping	The field work for the National Soil Map was carried out by a team of surveyors between 1979 and 1982, however areas that had been mapped previously were not necessarily remapped.
Purpose of use	The landcover component of the Soilscapes dataset was designed to provide a general overview of the typical landcover types associated with particular soils.
Use / Access Constraints	The information contained in LandIS is copyright and its use is therefore subject to a specific licensing agreement between NSRI and the user. Depending on the status of the user, the cost can vary from a fully commercial charge for data lease to being royalty free with a small charge for extraction and preparation of the data to meet the user's needs.
Who created this data?	Alongside colleagues at the National Soil Resources Institute of Cranfield University, Dick Thompson and John Hollis were particularly instrumental in the creation of the Soilscapes dataset.
Map copyright statement?	Soilscapes landcover data © Cranfield University and for the Controller of HMSO, 2011
More detailed dataset:	NATMAPvector with full legend description
Cite as	Farewell, T.S., Truckell, I.G., Keay, C.A., Hallett, S.H (2011) The derivation and application of Soilscapes: soil and environmental datasets from the National Soil Resources Institute, Cranfield University

For more information or to access this data, please contact us:
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nsridata@cranfield.ac.uk +44 (0) 1234 75 2978 www.landis.org.uk

Soilscapes Landcover Dataset Information, Version 1.1
Timothy Farewell, March 2011

Habitats

Soilscapes Habitats Dataset

Habitats are strongly influenced by the underlying soils, so soils are an important consideration for all habitat projects. The Soilscapes Habitats dataset describes this intimate relationship between habitats, landscapes and soils, facilitating appropriate decision-making on a range of biodiversity issues.

Simple, interpreted soil information for habitat creation and restoration

The Habitats dataset provides users with a general indication of the natural plant communities and habitats with which the soils are associated. Soils and plant and animal communities are inexorably linked. Therefore, the vegetation or species diversity in one area provides an excellent indication of particularly suitable habitats in other geographic areas with similar soils, were land management strategies modified. The Habitats dataset describes the actual or potential semi-natural vegetation that is found on each of the 27 'Soilscape' classes.

What's included in the dataset?

Soilscapes is a simplified version of the 1:250,000 scale Digital National Soil Map and has been tailored to provide extensive, understandable and useful interpreted soil data for the non-soil specialist.

How to use this dataset

From habitat creation to restoration, Soilscapes Habitats can identify the most appropriate areas to target resources and ensure maximum impact. The dataset can also be used to identify the best locations for linkages and buffering between important biodiversity sites and to predict and encourage the habitat development.

Soilscapes Habitat Dataset in use

The habitats data has been used in a wide variety of contexts, by a range of users and extensively by local governments, charities, universities and environmental consultants. Bedfordshire and Luton Biodiversity Recording and Monitoring Centre (BRMC) used Soilscapes as a tool for conservation planning and practice. Areas suggested for habitat creation/recreation around existing reserves were analysed to see if they were on appropriate soil types. Soilscapes was also used to advise the Wildlife Trust in purchasing land. The dataset enabled a quick overview of the area under consideration, outlining which soil types covered the area and indicating which habitats best suited these soils. It also helped reveal where linkages between reserves could be made, based on soil associated habitat.

Habitats

For more information see www.landis.org.uk

Habitats Metadata

These pages contain more detailed descriptions of this dataset. Formal ISO19115 and ISO19139 metadata is also available from www.landis.org.uk

Scale	1:250,000
Number of Classes	26 actual and potential habitats are described, plus water
Created (updated)	2003 (2010)
Data Format	Shapefile
Derived from	NATMAPvector, the Digital National Soil Map
Coverage	England and Wales
Limitations	The properties of soil are spatially variable, even over short distances. Soilscapes is a generalised dataset, and so users should be aware that variation of soil properties is to be expected within the delineated polygons. Soilscapes is not intended as a means for supporting detailed assessments, such as planning applications or site investigations. More detailed datasets are available for lease from NSRI.

Dates of Field Mapping	The field work for the National Soil Map was carried out by a team of surveyors between 1979 and 1982, however areas that had been mapped previously were not necessarily remapped.
Purpose of use	The habitats component of the Soilscapes dataset was designed to provide a general overview of the typical habitat types associated with particular soils. As this is a simplified dataset, it may or may not represent the present day habitat at any given location.
Use / Access Constraints	The information contained in LandIS is copyright and its use is therefore subject to a specific licensing agreement between NSRI and the user. Depending on the status of the user, the cost can vary from a fully commercial charge for data lease to being royalty free with a small charge for extraction and preparation of the data to meet the user's needs.
Who created this data?	Alongside colleagues at the National Soil Resources Institute of Cranfield University, Dick Thompson and John Hollis were particularly instrumental in the creation of the Soilscapes dataset.
Map copyright statement?	Soilscapes habitat data © Cranfield University and for the Controller of HMSO, 2011
More detailed dataset:	NATMAPvector with full legend description will provide more linework, but less explicit detail on habitat types
Cite as	Farewell, T.S., Truckell, I.G., Keay, C.A., Hallett, S.H (2011) The derivation and application of Soilscapes: soil and environmental datasets from the National Soil Resources Institute, Cranfield University

For more information or to access this data, please contact us:
The National Soil Resources Institute, Cranfield University, Bedfordshire, UK, MK430AL
nsridata@cranfield.ac.uk +44 (0) 1234 75 2978 www.landis.org.uk

Soilscapes Habitats Dataset Information, Version 1.1
Timothy Farewell, March 2011

Fertility

Soilscapes Fertility Dataset

Soil fertility depends on soil acidity, drainage, texture and nutrient availability. The Soilscapes Fertility dataset describes this fundamental soil property that governs the ability of the soil to support plant growth.

Simple, understandable soil fertility information

The soil fertility dataset provides users with a general description of the fertility of the soils across England and Wales. The fertility of the soil is a fundamental control of plant growth and strongly influences nutrient management. Nutrient management includes ways to recycle nutrients, replace lost nutrients with external inputs, and improve the inherent fertility of soils (e.g., by increasing organic matter and the availability of nutrients such as phosphorus). This dataset describes the natural fertility that is characteristic of each of the 27 'Soilscape' classes.

What's included with this dataset?

Soilscapes is a simplified version of the 1:250,000 scale Digital National Soil Map and has been tailored to provide extensive, understandable and useful interpreted soil data for the non-soil specialist. Soilscapes has been primarily designed to aid professionals understand how the soil effects habitat, fertility, drainage, landuse and more.

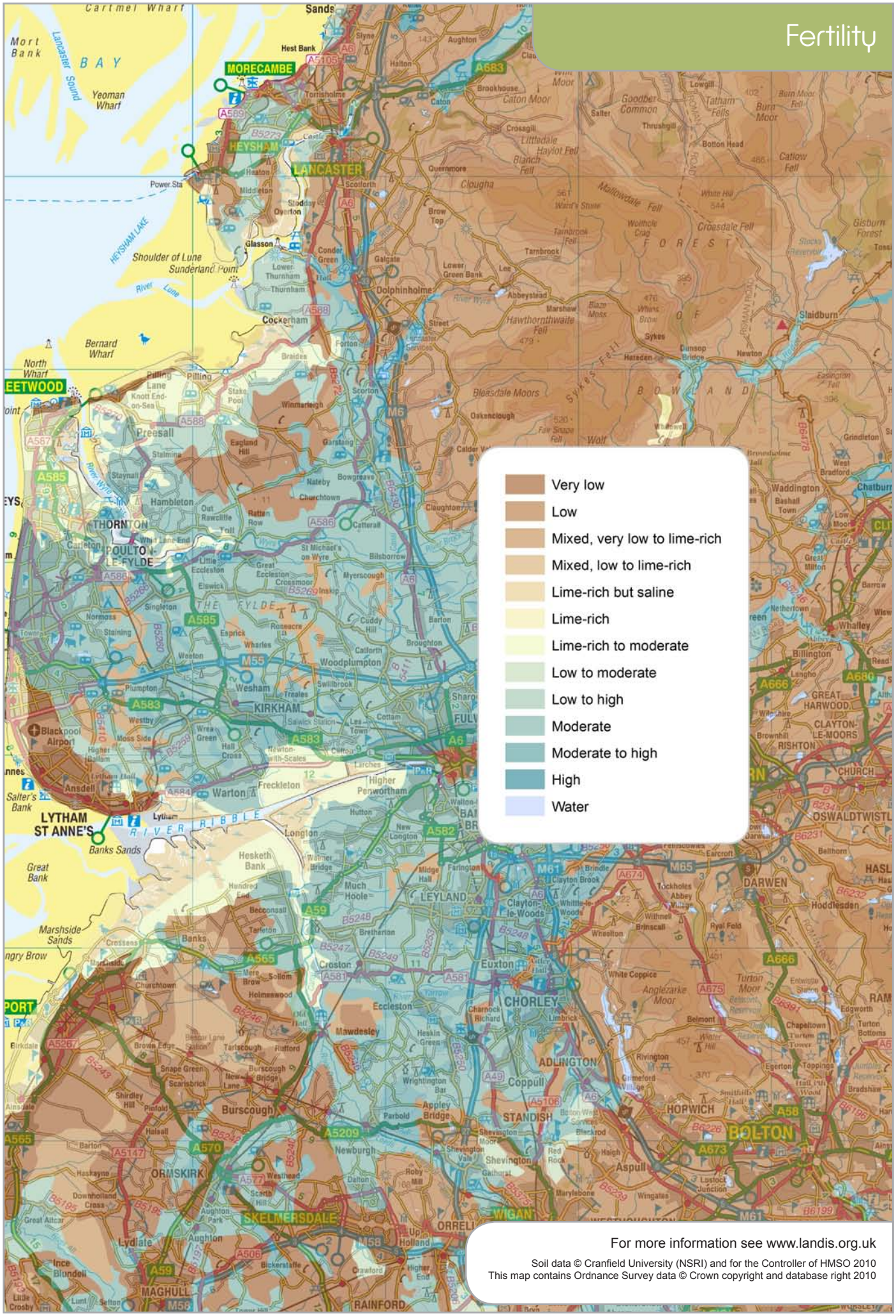
How to use this dataset

From government policy makers to allotment owners, Soilscapes Fertility can identify the most appropriate areas for food production and help ensure yields are maximised, and the best use made of land. The dataset can also be used to identify areas where careful nutrient management is necessary to improve agricultural and horticultural production. Technical users are alerted the existence of more detailed datasets describing nutrient levels, and the range of crop suitability models also available from NSRI.

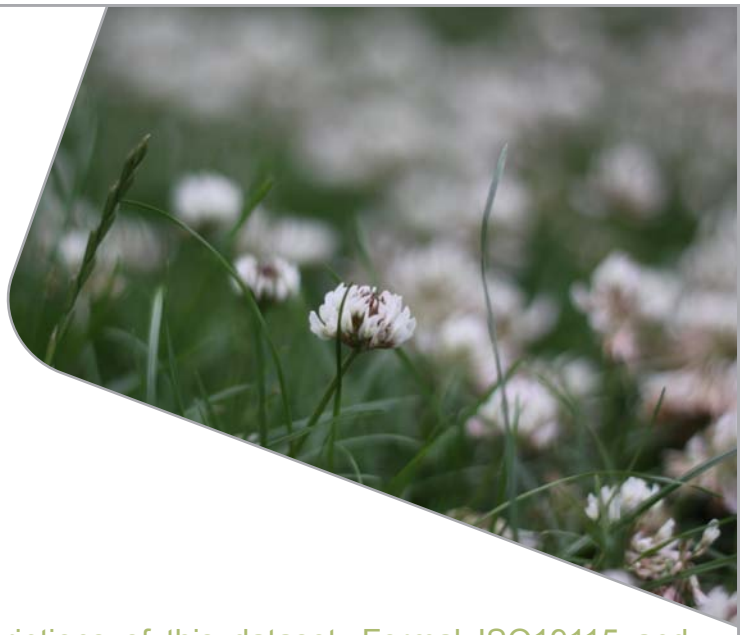
Soilscapes Fertility Dataset in use

The fertility data has been used for a number of purposes, by a range of users and extensively by governments, land agents, archaeologists, education providers and environmental consultants.

Fertility



For more information see www.landis.org.uk



Fertility Metadata

These pages contain more detailed descriptions of this dataset. Formal ISO19115 and ISO19139 metadata is also available from www.landis.org.uk

Scale	1:250,000
Number of Classes	12 descriptions of natural fertility, plus water.
Created (updated)	2003 (2010)
Data Format	Shapefile
Derived from	NATMAPvector, the Digital National Soil Map
Coverage	England and Wales
Limitations	The properties of soil are spatially variable, even over short distances. Soilscapes is a generalised dataset, and so users should be aware that variation of soil properties is to be expected within the delineated polygons. Soilscapes is not intended as a means for supporting detailed assessments, such as planning applications or site investigations. More detailed datasets are available for lease from NSRI.

Dates of Field Mapping	The field work for the National Soil Map was carried out by a team of surveyors between 1979 and 1982, however areas that had been mapped previously were not necessarily remapped.
Purpose of use	The fertility component of the NATMAPsoilscapes dataset seeks to provide a general indication of the range of natural soil fertility found across England and Wales.
Use / Access Constraints	The information contained in LandIS is copyright and its use is therefore subject to a specific licensing agreement between NSRI and the user. Depending on the status of the user, the cost can vary from a fully commercial charge for data lease to being royalty free with a small charge for extraction and preparation of the data to meet the user's needs.
Who created this data?	Alongside colleagues at the National Soil Resources Institute of Cranfield University, Dick Thompson and John Hollis were particularly instrumental in the creation of the Soilscapes dataset.
Map copyright statement?	Soilscapes fertility data © Cranfield University and for the Controller of HMSO, 2011
More detailed dataset:	NATMAPvector with full legend description will provide more detailed linework, but this does not contain a statement of natural fertility. Specific maps are available detailing the suitibiltity under different climatic conditions for a range of crop, tree and plant species.
Cite as	Farewell, T.S., Truckell, I.G., Keay, C.A., Hallett, S.H (2011) The derivation and application of Soilscapes: soil and environmental datasets from the National Soil Resources Institute, Cranfield University

For more information or to access this data, please contact us:
The National Soil Resources Institute, Cranfield University, Bedfordshire, UK, MK430AL
nsridata@cranfield.ac.uk +44 (0) 1234 75 2978 www.landis.org.uk

Soilscapes Fertility Dataset Information, Version 1.1
Timothy Farewell, March 2011

Appendix E - Examples of Planning Applications in North Norfolk where a Ten Year replacement planting condition has been applied

Examples of Planning Applications in North Norfolk where a Ten Year replacement planting condition has been applied

Application Number	Proposal	Location	Relevant Condition Number	Comments
PF/13/0007	Erection of 123 dwellings with public park and open space and associated landscaping, drainage and highway infrastructure	Land off Two Furlong Hill and Market Lane, Wells-next-the-Sea	Condition 17	Site located with Norfolk Coast AONB
PF/13/0168	Construction of 20 mw solar photovoltaic farm with associated works including inverter housing	Land at North Creake Airfield, Egmere, Walsingham	Condition 7	Site located near to Norfolk Coast AONB
PF/13/1166	Installation of 49.9MW solar farm with plant housing and perimeter fence	Former Airfield, West Raynham	Condition 7	Large scale solar farm
PF/14/1334	Installation and operation of a ground mounted solar photo voltaic array to generate electricity of up to 50MW capacity comprising photo voltaic panels, inverters, security fencing, cameras and other association infrastructure	Former RAF Coltishall, Lamas Road, Scottow NR10 5LR	Condition 9	Large scale solar farm
PF/14/1559	Demolition of buildings and erection of forty dwellings, refurbishment of existing dwelling, contouring site, alterations of the existing access and off-site highway improvements	Former Cherryridge Poultry Site, Church Street, Northrepps, Cromer, NR27 0AA	Condition 14	Site Located in Norfolk Coast AONB

Appendix F - COLBY ROAD (CHURCH ROAD), NORTH OF BANNINGHAM - SITE PLAN AND PHOTOGRAPHS

621500 622000 622500

330500

330000

N

Colby Road

0 100 200 m

Legend:

- Norfolk Vanguard onshore red line boundary

Onshore cable route

- Onshore cable route
- Trenchless crossing zone (e.g. HDD)

Access

- Construction access
- Operation access
- Footpath [2]
- Areas of potential vegetation removal

[1] SUSTRANS, 2017 [2] Ordnance Survey 1:25000 map

Project:	Report:
Norfolk Vanguard	Examination: For Information Only

Title: ExA; ISH;10.D31I
Colby Road (Church Road), north of Banningham (map 1 of 9)
Potential Tree Removal

Figure: 1 | Drawing No: ExA; ISH;10.D31I

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
01	12/02/2019	TH	JP	A3	1:5,000
02	13/02/2019	TH	JP	A3	1:5,000

Co-ordinate system: British National Grid **EPSG:** 27700

VATTENFALL

Royal HaskoningDHV
Enhancing Society Together

Colby Road (Church Road) North of Banningham -
View looking North.
Image Courtesy of Google

Colby Road (Church Road) North of Banningham
View looking South.
Image Courtesy of Google

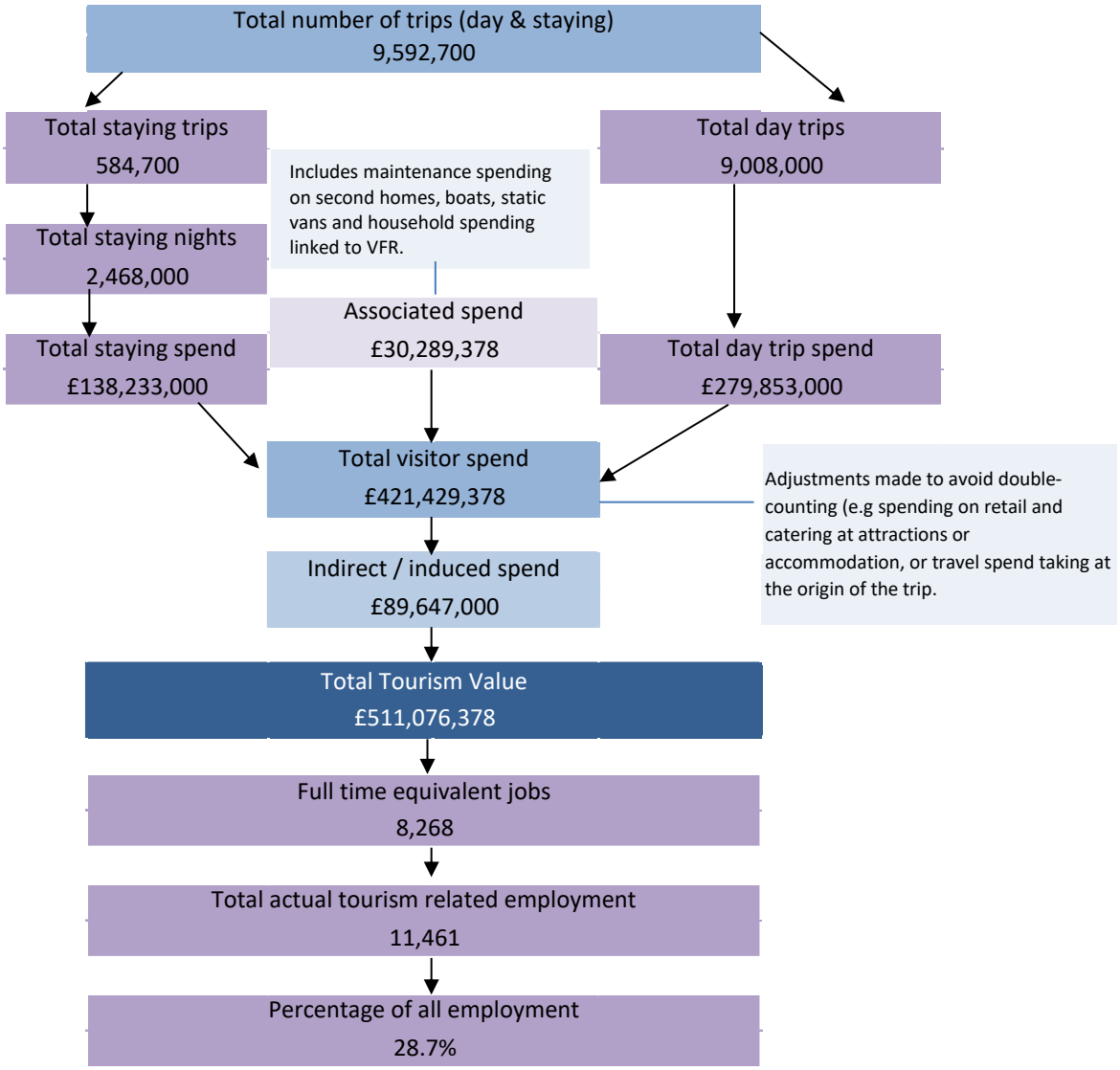
Appendix G - Economic Impact of Tourism – North Norfolk 2018 produced by Destination Research/Sergi Jarques

destinationresearch
delivering results : measuring what matters

Economic Impact of Tourism

North Norfolk - 2018

Economic Impact of Tourism – Headline Figures North Norfolk - 2018

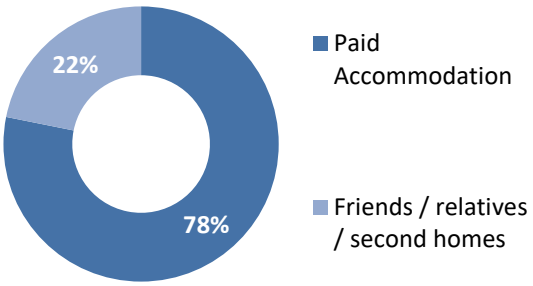


Economic Impact of Tourism – Year on year comparisons

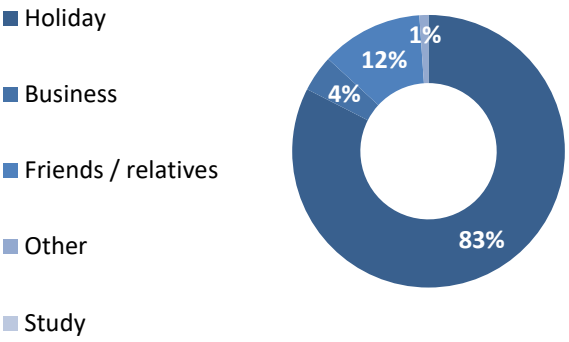
Day Trips	2017	2018	Annual variation
Day trips Volume	8,207,000	9,008,000	10%
Day trips Value	£268,710,000	£279,853,000	4%
Overnight trips			
Number of trip	620,700	584,700	-6%
Number of nights	2,644,000	2,468,000	-7%
Trip value	£145,523,000	£138,233,000	-5%
Total Value	**£505,109,250**	**£511,076,378**	**1%**
Actual Jobs	**11,352**	**11,461**	**1%**

		2017		2018	Variation
Average length stay (nights x trip)		4.26		4.22	-0.9%
Spend x overnight trip	£	234.34	£	236.30	0.8%
Spend x night	£	55.04	£	56.01	1.8%
Spend x day trip	£	32.74	£	31.07	-5.1%

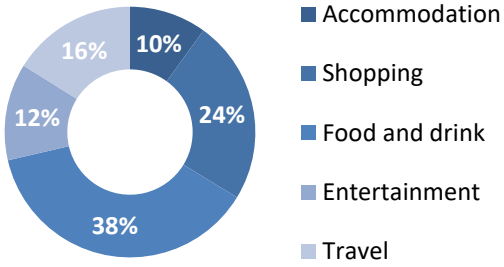
Type of Accommodation



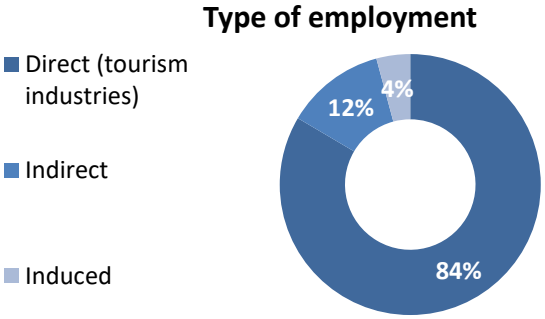
Trips by Purpose



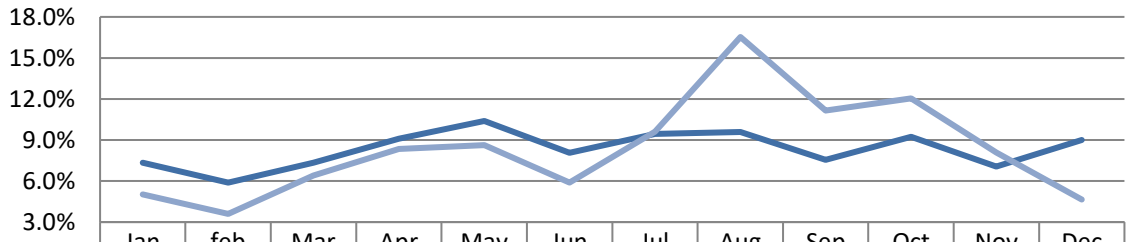
Breakdown of expenditure



Type of employment

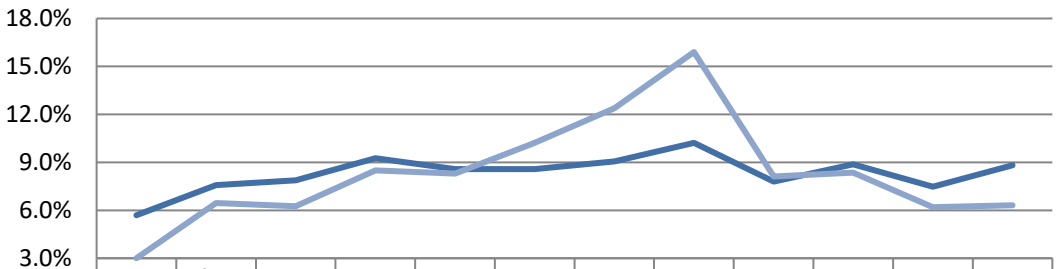


Seasonality - Day visitors (East of England)



	Jan	feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Day trips	7.3%	5.9%	7.3%	9.1%	10.4%	8.1%	9.4%	9.6%	7.6%	9.2%	7.0%	9.0%
Day spend	5.0%	3.6%	6.4%	8.4%	8.6%	5.9%	9.6%	16.5%	11.2%	12.0%	8.1%	4.7%

Seasonality - Overnight visitors (East of England)



	Jan	feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Overnight trips	5.7%	7.6%	7.9%	9.3%	8.6%	8.6%	9.1%	10.2%	7.8%	8.9%	7.5%	8.8%
Overnight spend	3.0%	6.4%	6.3%	8.5%	8.3%	10.2%	12.4%	15.9%	8.1%	8.4%	6.2%	6.3%

Contextual analysis

INTRODUCTION

This report examines the volume and value of tourism and the impact of visitor expenditure on the local economy in 2018 and provides comparative data against previously published data. The results are derived using the Cambridge Economic Impact Model under licence by Destination Research Ltd based on the latest data from national tourism surveys and regionally/locally based data.

CONTEXTUAL ANALYSIS

The three key surveys used to measure volume and expenditure from tourism trips are the GB Tourism Survey (for domestic overnight trips), the International Passenger Survey (IPS) for visits from overseas, and the BG Day Visitor Survey (GBDVS), which measures tourism day visits.

Domestic tourism

National Performance

In 2018, British residents took 97.4 million overnight trips in England, totalling 296 million nights away from home and expenditure of £19 billion, with an average trip length of 3 nights. The number of domestic trips to England was 3% lower than in 2017. Holiday Trips in England in 2018 decreased by 4% compared to 2017, with 45.2 million trips recorded.

Regional performance

The East of England region experienced a 12% drop in overnight trips during 2018. Bednights were down by 14% on 2017 and expenditure was also down by 8%. However, these results are on the back of a positive 2017 when the region experienced a 3% increase in overnight trips on the previous year. Bednights were up by 13% on 2016 and expenditure was also up by 13%.

The average spend per night in 2018 was £55.97 (up from £52.5 in 2017) and the spend per trip was £179.51 (up from £172.58 in 2017). The region received less visitors in 2018 than in the previous year. But importantly, their length of stay was unchanged from 2017 and spent more money during their visit, compared average expenditure levels in 2017.

The GB Tourism Survey data is a key driver for the Cambridge model. However, it is not specifically designed to produce highly accurate results at sub-regional level. In order to improve the accuracy of results we have applied a 3-year rolling average to this data to help smooth out short term market fluctuations and highlight longer-term trends. As such, county and district level results relating to 2018 are an average of 2016, 2017 and 2018.

Visits from overseas

National Performance

The number of visits in 2018 fell 3% (from the 2017 record) to 37.9 million, after several years of growth since 2010. The value of spending also decreased by 7% (compared to 2017) to £22.90 billion. Average spend per visit was £604 in 2018, down from £625 per visit in 2017. The number of visitor nights spent in the UK fell by 7% in 2018 to 266 million, with the average number of nights per visit declining to 7.0 (from 7.3 in 2017).

Regional performance

The number of Overseas trips to the East of England in 2018 was down 9% at 2.2 million overnight trips (2.4 million in 2017). The total number of nights was down by 14% to 13.9 million. Spend was down by 13.6% to £704 million in 2018 (£815.2 million in 2017).

The International Passenger Survey (IPS) data is a key driver for the Cambridge model. However, as with the GBTS, it is not specifically designed to produce highly accurate results at sub-regional level. In order to improve the accuracy of results we have applied a 3-year rolling average to this data to help smooth out short term market fluctuations and highlight longer-term trends.

Tourism Day Visits

National Performance

During 2017, UK residents took a total of 1,703 million Tourism Day Visits (down from 1,793 in 2017). Around £63.8 billion was spent during these trips, about 2.2% up on 2017.

The largest proportion of visits were taken to destinations in England (1,431 million visits or 84% of the total). The distribution of expenditure during visits broadly reflects this pattern, with a total value of day trips to England totalling £53.04 billion (83% of the total for GB).

Regional performance

During 2018, the volume tourism day visits in the East of England increased by 3.5% to 137.4 million. Spend was also up by 31% to £5.04 billion.

The Day Visitor Suvey (GBDVS) data is a key driver for the Cambridge model. However, as with the GBTS and IPS, it is not specifically designed to produce highly accurate results at sub-regional level. In order to improve the accuracy of results we have applied a 3-year rolling average to this data to help smooth out short term market fluctuations and highlight longer-term trends.

Volume of Tourism

Staying Visitors - Accommodation Type

Trips by Accommodation

	UK		Overseas		Total	
Serviced	89,000	16%	1,600	6%	90,600	15%
Self catering	98,000	18%	3,800	14%	101,800	17%
Camping	68,000	12%	1,400	5%	69,400	12%
Static caravans	111,000	20%	600	2%	111,600	19%
Group/campus	32,000	6%	4,100	15%	36,100	6%
Paying guest	0	0%	0	0%	0	0%
Second homes	32,000	6%	1,400	5%	33,400	6%
Boat moorings	18,000	3%	0	0%	18,000	3%
Other	17,000	3%	1,200	4%	18,200	3%
Friends & relatives	94,000	17%	12,600	47%	106,600	18%
Total 2018	**558,000**		**27,000**		**585,000**	
Comparison 2017	**592,000**		**29,000**		**621,000**	
Difference	**-6%**		**-7%**		**-6%**	

Nights by Accommodation

	UK		Overseas		Total	
Serviced	242,000	11%	7,000	3%	249,000	10%
Self catering	363,000	16%	79,000	30%	442,000	18%
Camping	319,000	14%	6,000	2%	325,000	13%
Static caravans	577,000	26%	2,000	1%	579,000	23%
Group/campus	78,000	4%	71,000	27%	149,000	6%
Paying guest	0	0%	0	0%	0	0%
Second homes	132,000	6%	8,000	3%	140,000	6%
Boat moorings	82,000	4%	0	0%	82,000	3%
Other	102,000	5%	3,000	1%	105,000	4%
Friends & relatives	312,000	14%	86,000	33%	398,000	16%
Total 2018	**2,208,000**		**260,000**		**2,468,000**	
Comparison 2017	**2,348,000**		**296,000**		**2,644,000**	
Difference	**-6%**		**-12%**		**-7%**	

Spend by Accommodation Type

	UK		Overseas		Total	
Serviced	£24,895,000	20%	£604,000	4%	£25,499,000	18%
Self catering	£24,774,000	20%	£4,980,000	33%	£29,754,000	22%
Camping	£22,083,000	18%	£296,000	2%	£22,379,000	16%
Static caravans	£26,802,000	22%	£170,000	1%	£26,972,000	20%
Group/campus	£5,203,000	4%	£4,051,000	27%	£9,254,000	7%
Paying guest	£0	0%	£0	0%	£0	0%
Second homes	£2,876,000	2%	£729,000	5%	£3,605,000	3%
Boat moorings	£3,108,000	3%	£0	0%	£3,108,000	2%
Other	£5,449,000	4%	£157,000	1%	£5,606,000	4%
Friends & relatives	£8,093,000	7%	£3,965,000	27%	£12,058,000	9%
Total 2018	**£123,283,000**		**£14,950,000**		**£138,233,000**	
Comparison 2017	**£128,362,000**		**£17,161,000**		**£145,523,000**	
Difference	**-4%**		**-13%**		**-5%**	

Serviced accommodation includes hotels, guesthouses, inns, B&B and serviced farmhouse accommodation. Paying guest refers to overseas visitors staying in private houses, primarily language school students. Other trips includes nights spent in transit, in lorry cabs and other temporary accommodation.

Staying Visitors - Purpose of Trip

Trips by Purpose

		UK		Overseas		Total	
Holiday		471,000	84%	12,300	46%	483,300	83%
Business		24,000	4%	1,300	5%	25,300	4%
Friends & relatives		59,000	11%	11,800	44%	70,800	12%
Other		5,000	1%	1,300	5%	6,300	1%
Study		0	0%	0	0%	0	0%
Total	**2018**	**558,000**		**26,700**		**584,700**	
Comparison	**2017**	**592,000**		**28,700**		**620,700**	
Difference		**-6%**		**-7%**		**-6%**	

Nights by Purpose

		UK		Overseas		Total	
Holiday		1,882,000	85%	101,000	39%	1,983,000	80%
Business		75,000	3%	10,000	4%	85,000	3%
Friends & relatives		237,000	11%	138,000	53%	375,000	15%
Other		14,000	1%	12,000	5%	26,000	1%
Study		0	0%	0	0%	0	0%
Total	**2018**	**2,208,000**		**260,000**		**2,468,000**	
Comparison	**2017**	**2,348,000**		**296,000**		**2,644,000**	
Difference		**-6%**		**-12%**		**-7%**	

Spend by Purpose

		UK		Overseas		Total	
Holiday		£107,487,000	87%	£7,064,000	47%	£114,551,000	83%
Business		£6,418,000	5%	£732,000	5%	£7,150,000	5%
Friends & relatives		£8,083,000	7%	£6,396,000	43%	£14,479,000	10%
Other		£1,295,000	1%	£758,000	5%	£2,053,000	1%
Study		£0	0%	£0	0%	£0	0%
Total	**2018**	**£123,283,000**		**£14,950,000**		**£138,233,000**	
Comparison	**2017**	**£128,362,000**		**£17,161,000**		**£145,523,000**	
Difference		**-4%**		**-13%**		**-5%**	

Day Visitors

Trips and Spend by Urban, Rural and Coastal Area

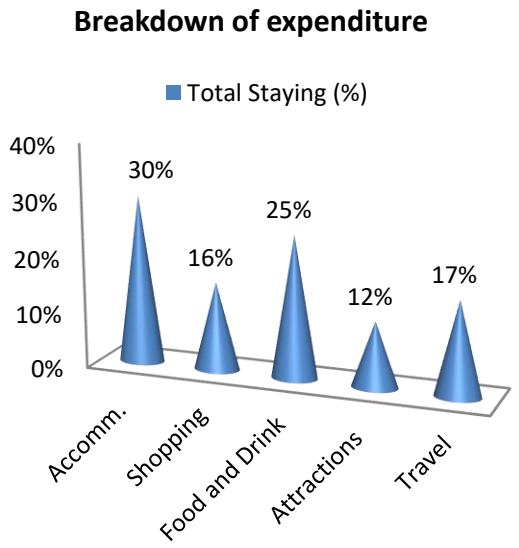
		Trips	Spend
Urban visits		3,302,000	£118,421,000
Countryside visits		3,489,000	£103,036,000
Coastal visits		2,217,000	£58,396,000
Total	**2018**	**9,008,000**	**£279,853,000**
Comparison	**2017**	**8,207,000**	**£268,710,000**
Difference		**10%**	**4%**

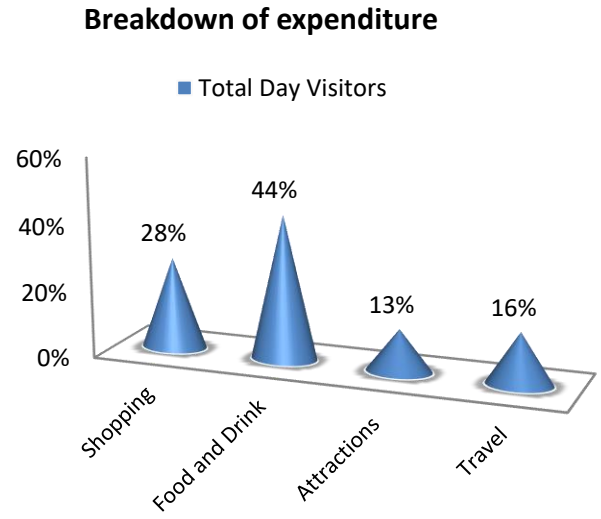
Value of Tourism

Expenditure Associated with Trips:

Direct Expenditure Associated with Trips

		Accomm.	Shopping	Food and Drink	Attractions	Travel	Total
UK Tourists		£37,664,000	£17,368,000	£31,711,000	£14,683,000	£21,858,000	£123,284,000
Overseas tourists		£3,994,000	£4,430,000	£3,495,000	£1,497,000	£1,535,000	£14,951,000
Total Staying		£41,658,000	£21,798,000	£35,206,000	£16,180,000	£23,393,000	£138,235,000
Total Staying (%)		30%	16%	25%	12%	17%	100%
Total Day Visitors		£0	£77,538,000	£122,202,000	£36,139,000	£43,974,000	£279,853,000
Total Day Visitors		0%	28%	44%	13%	16%	100%
Total	**2018**	**£41,658,000**	**£99,336,000**	**£157,408,000**	**£52,319,000**	**£67,367,000**	**£418,088,000**
%		**10%**	**24%**	**38%**	**13%**	**16%**	**100%**
Comparison	**2017**	**£44,166,000**	**£97,465,000**	**£154,364,000**	**£51,869,000**	**£66,368,000**	**£414,232,000**
Difference		**-6%**	**2%**	**2%**	**1%**	**2%**	**1%**





Other expenditure associated with tourism activity

Other expenditure associated with tourism activity - Estimated spend				
Second homes	**Boats**	**Static vans**	**Friends & relatives**	**Total**
£10,071,000	£768,930	£4,204,448	£15,245,000	£30,289,378

Spend on second homes is assumed to be an average of £2,100 on rates, maintenance, and replacement of furniture and fittings. Spend on boats assumed to be an average of £2,100 on berthing charges, servicing and maintenance and upgrading of equipment. Static van spend arises in the case of vans purchased by the owner and used as a second home. Expenditure is incurred in site fees, utility charges and other spending and is estimated at £2,100. Additional spending is incurred by friends and relatives as a result of people coming to stay with them. A cost of £185 per visit has been assumed based on national research for social

Direct Turnover Derived From Trip Expenditure

Business turnover arises as a result of tourist spending, from the purchase of supplies and services locally by businesses in receipt of visitor spending and as a result of the spending of wages in businesses by employees whose jobs are directly or indirectly supported by tourism spending.

		Staying Visitor	Day Visitors	Total
Accommodation		£42,362,000	£2,444,000	£44,806,000
Retail		£21,580,000	£76,763,000	£98,343,000
Catering		£34,149,000	£118,536,000	£152,685,000
Attractions		£16,749,000	£38,137,000	£54,886,000
Transport		£14,036,000	£26,384,000	£40,420,000
Non-trip spend		£30,289,378	£0	£30,289,378
Total Direct	**2018**	**£159,165,378**	**£262,264,000**	**£421,429,378**
Comparison	**2017**	**£163,905,250**	**£251,781,000**	**£415,686,250**
Difference		**-3%**	**4%**	**1%**

Adjustments have been made to recognise that some spending on retail and food and drink will fall within attractions or accommodation establishments. It is assumed that 40% of travel spend will take place at the origin of the trip rather than at the destination.

Supplier and Income Induced Turnover

		Staying Visitor	Day Visitors	Total
Indirect spend		£24,318,000	£36,565,000	£60,883,000
Non trip spending		£6,058,000	£0	£6,058,000
Income induced		£17,532,000	£5,174,000	£22,706,000
Total	**2018**	**£47,908,000**	**£41,739,000**	**£89,647,000**
Comparison	**2017**	**£49,318,000**	**£40,105,000**	**£89,423,000**
Difference		**-3%**	**4%**	**0%**

Income induced spending arises from expenditure by employees whose jobs are supported by tourism spend.

Total Local Business Turnover Supported by Tourism Activity – Value of Tourism

		Staying Visitor	Day Visitors	Total
Direct		£159,165,378	£262,264,000	£421,429,378
Indirect		£47,908,000	£41,739,000	£89,647,000
Total Value	**2018**	**£207,073,378**	**£304,003,000**	**£511,076,378**
Comparison	**2017**	**£213,223,250**	**£291,886,000**	**£505,109,250**
Difference		**-3%**	**4%**	**1%**

Employment

Employment

The model generates estimates of full time equivalent jobs based on visitor spending. The total number of 'actual' jobs will be higher when part time and seasonal working is taken into account. Conversion of full time equivalent jobs into actual jobs relies on information from business surveys in the sectors receiving

Direct employment

Full time equivalent (FTE)						
	Staying Visitor		Day Visitor		Total	
Accommodation	853	32%	49	1%	902	14%
Retailing	217	8%	771	20%	988	15%
Catering	626	23%	2,172	55%	2,798	42%
Entertainment	321	12%	732	19%	1,053	16%
Transport	106	4%	199	5%	305	5%
Non-trip spend	561	21%	0	0%	561	8%
Total FTE 2018	**2,684**		**3,923**		**6,607**	
Comparison 2017	**2,759**		**3,768**		**6,528**	
Difference	**-3%**		**4%**		**1%**	

Estimated actual jobs						
	Staying Visitor		Day Visitor		Total	
Accommodation	1,263	34%	73	1%	1,336	14%
Retailing	325	9%	1,156	20%	1,482	15%
Catering	939	25%	3,258	56%	4,197	44%
Entertainment	453	12%	1,032	18%	1,485	16%
Transport	149	4%	281	5%	430	4%
Non-trip spend	639	17%	0	0%	639	7%
Total Actual 2018	**3,769**		**5,800**		**9,569**	
Comparison 2017	**3,894**		**5,571**		**9,465**	
Difference	**-3%**		**4%**		**1%**	

Indirect & Induced Employment

Full time equivalent (FTE)			
	Staying Visitor	Day Visitors	Total
Indirect jobs	563	677	1,240
Induced jobs	325	96	420
Total FTE 2018	**887**	**773**	**1,660**
Comparison 2017	**913**	**743**	**1,656**
Difference	**-3%**	**4%**	**0%**

Estimated actual jobs			
	Staying Visitor	Day Visitors	Total
Indirect jobs	641	772	1,413
Induced jobs	370	109	479
Total Actual 2018	**1,011**	**881**	**1,893**
Comparison 2017	**1,041**	**847**	**1,888**
Difference	**-3%**	**4%**	**0%**

Total Jobs

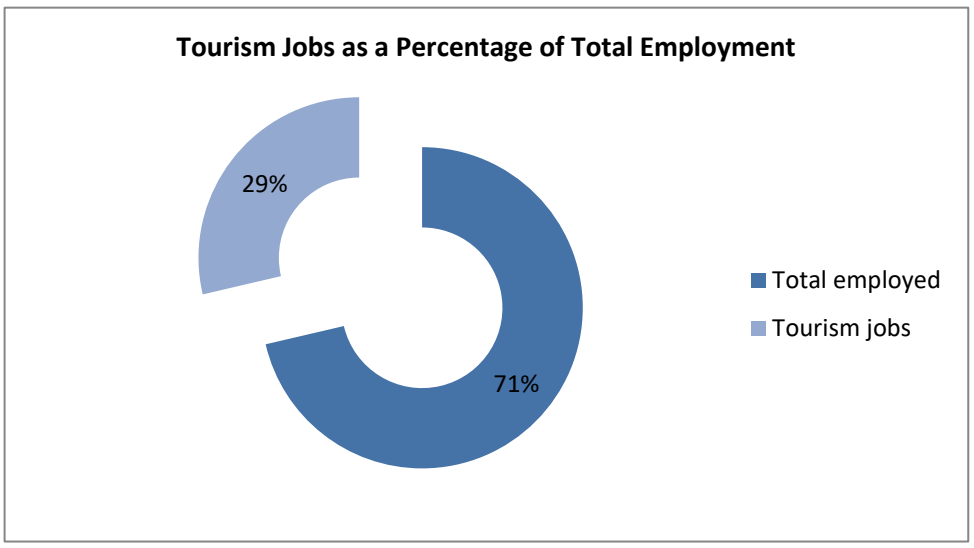
Actual jobs are estimated from surveys of relevant businesses at locations in England and take account of part time and seasonal working.

Full time equivalent (FTE)							
		Staying Visitor		Day Visitor		Total	
Direct		2,684	75%	3,923	84%	6,607	80%
Indirect		563	16%	677	14%	1,240	15%
Induced		325	9%	96	2%	420	5%
Total FTE	**2018**	**3,571**		**4,696**		**8,268**	
Comparison	**2017**	**3,673**		**4,511**		**8,184**	
Difference		**-3%**		**4%**		**1%**	

Estimated actual jobs							
		Staying Visitor		Day Visitor		Total	
Direct		3,769	79%	5,800	87%	9,569	83%
Indirect		641	13%	772	12%	1,413	12%
Induced		370	8%	109	2%	479	4%
Total Actual	**2018**	**4,780**		**6,681**		**11,461**	
Comparison	**2017**	**4,935**		**6,417**		**11,352**	
Difference		**-3%**		**4%**		**1%**	

Tourism Jobs as a Percentage of Total Employment

		Staying Visitor	Day visitors	Total
Total employed		40,000	40,000	40,000
Tourism jobs		4,780	6,681	11,461
Proportion all jobs		**12%**	**17%**	**29%**
Comparison	**2017**	**4,935**	**6,417**	**11,352**
Difference		**-3%**	**4%**	**1%**



Appendix I - Introduction about Cambridge Model

This report examines the volume and value of tourism and the impact of that expenditure on the local economy. The figures were derived using the Cambridge Economic Impact Model and the research was undertaken by Destination Research.

The model utilises information from national tourism surveys and regionally based data held by Destination Research. It distributes regional activity as measured in those surveys to local areas using 'drivers' such as the accommodation stock and occupancy which influence the distribution of tourism activity at local level.

Limitations of the Model

The methodology and accuracy of the above sources vary. The results of the model should therefore be regarded as estimates which are indicative of the scale and importance of visitor activity in the local area. It is important to note that in the national tourism surveys the sample sizes for each area changes year on year. This is as a result of the random probability nature of the methodology. As such, the results of the Cambridge Model are best viewed as a snapshot in time and we would caution against year-on-year comparisons.

It should be noted that the model cannot take into account any leakage of expenditure from tourists taking day trips out of the area in which they are staying. While it is assumed that these may broadly balance each other in many areas, in locations receiving significant numbers of day visitors from London, there is likely to be an underestimate in relation to the number of overseas day visitors staying in holiday accommodation in London.

Whilst it is important to be aware of these issues, we are confident that the estimates we have produced are as reliable as is practically possible within the constraints of the information available.

Rounding

All figures used in this report have been rounded. Therefore, in some tables there may be a slight discrepancy between totals and sub totals.

Data sources

The main national surveys used as data sources in stage one include:

- Great Britain Tourism Survey (GBTS) - information on tourism activity by GB residents;
- International Passenger Survey (IPS) information on overseas visitors to the United Kingdom;
- Day Visits in the annual Great Britain Day Visitor Survey using information on visits lasting more than 3 hours and taken on an irregular basis

These surveys provide information down to a regional level. In order to disaggregate data to a local level the following information sources are used:

- Records of known local accommodation stock held by Destination Research;
- VisitEngland's surveys of Visits to Attractions, which provide data on the number of visitors to individual tourist attractions ;
- Mid- 2018 estimates of resident population as based on the 2011 Census of Population;
- Selected data from the 2011 Census of Employment;
- Selected data on the countryside and coast including, national designations and length of the coastline.

Staying Visitors
The GBTS provides information on the total number of trips to the region and the relative proportions using different types of accommodation. By matching these figures to the supply of such accommodation, the regional average number of trips per bedspace or unit of accommodation can be derived. The IPS provides information on the total number of trips by overseas visitors to the region. The model uses three year rolling averages to reduce extreme highs and lows which are due to small sample sizes, rather than being a reflection on drastic changes in demand year-on-year.

Day Visitors
Information on day trips at the regional level is available from the Day Visits in Great Britain survey. The survey includes all leisure-related trips from home. It should be noted that a large proportion are local trips made by people resident in the locality. The model uses information from the survey to estimate the number of longer day trips (defined as those lasting at least 3 hours and involving travel of more than 20 miles) and irregular trips lasting more than 3 hours.

Impact of tourism expenditure
This section examines the impact of the tourism expenditure in terms of the direct, indirect and induced expenditure as well as an estimate of the actual jobs (both direct and indirect) supported by tourism expenditure in the district.

The GBTS, IPS and Day Visits to Great Britain survey data on the breakdown of visitor spending. The impact of this initial round of expenditure will be subsequently increased by multiplier effects. These arise from the purchase of supplies and services by the businesses in receipt of visitor expenditure (indirect impacts), and by the income induced-effects arising from the spending of wages by employees in the first round of business and in subsequent expenditure in supplier business (induced impacts).

The New Earnings Survey which provides information on wage levels by industry sector and region; An internal business database which includes data on the structure of business expenditure, local linkages and multiplier ratios drawn from a wide range of business and economic studies carried out by Geoff Broom Associates, PA Cambridge Economic Consultants and others. By applying the breakdown to the estimates of visitor spending, the model generates estimates of total direct spending.

Evidence from national studies suggests that some minor adjustments are required to match visitor spend to business turnover – for example, some expenditure on food and drink actually takes place in inns and hotels that fall in the accommodation sector and within attractions. More significantly, expenditure on travel costs associated with individual trips is equally likely to take place at the origin of the trip as the destination. Therefore the model assumes that only 40% of travel expenditure accrues to the destination area.

Number of full time job equivalents
Having identified the value of turnover generated by visitor spending, it is possible to estimate the employment associated with that spending. Wages for staff and drawings for the proprietors will absorb a proportion of that turnover. By applying these proportions to the overall additional turnover in each sector, the amount of money absorbed by employment costs can be calculated. The New Earnings Survey provides data from which the average costs by business sector, adjusted to take account of regional differences, can be calculated.

After allowing for additional costs such as National Insurance and pension costs, an average employment cost per full time equivalent job can be estimated. The number of such jobs in the local area can then be estimated by dividing the amount of business expenditure on wages and drawings by the average employment cost per job.

Number of Actual Jobs

The model generates estimates of full time equivalent jobs based on visitor spending. However, the total number of actual jobs will be higher when part time and seasonal working is taken into account. The full time equivalent jobs arising directly from visitor spending are converted into actual jobs using information from business surveys in the sectors receiving visitor spending (principally accommodation, food and drink, retail, attractions, transport). In general, the conversion factor between full time equivalent jobs and actual jobs varies around 1.5 in those sectors.

The indirect and induced jobs arise across a much wider range of employment sectors. Therefore, the average 1.16 for all sectors based on Census of Employment data has been used to convert full time equivalent jobs in this sector to actual jobs.

The employment estimates generated by the model include both self-employed and employed people supported by visitor expenditure. The model also includes an estimate of the additional jobs arising in the attractions sector, which are not related to visitor expenditure. However, the numbers do not include other tourism-related employment such as jobs in local authorities arising from their tourism functions, e.g. tourist information staff, additional public health, parks and gardens, public conveniences, maintenance sections and jobs arising from capital investment in tourism facilities.

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Appendix H - Economic Impact of Tourism – North Norfolk 2017 produced by Destination Research/Sergi Jarques

destinationresearch
delivering results : measuring what matters

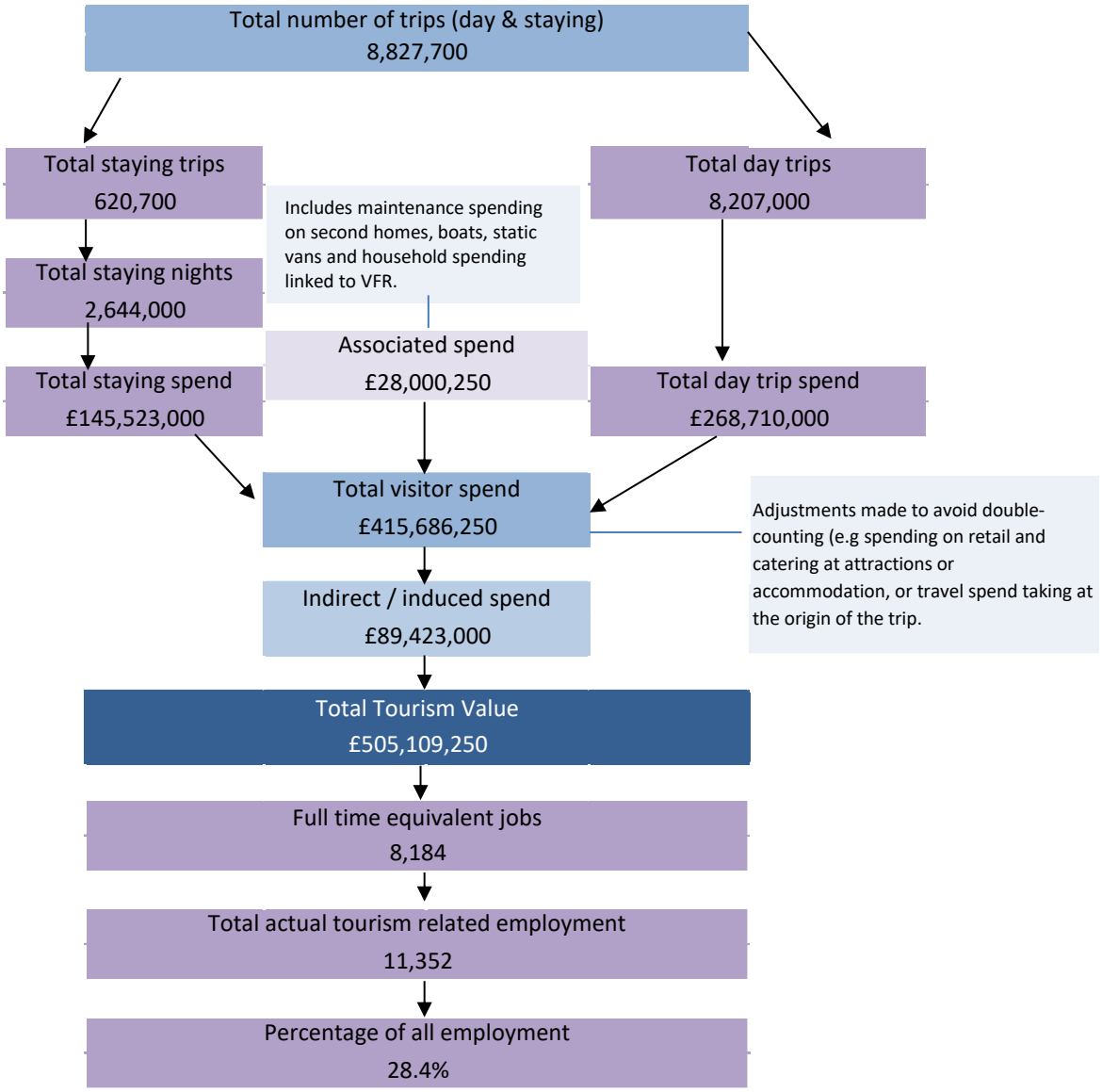
Economic Impact of Tourism

North Norfolk - 2017

Produced by:

Destination Research
Sergi Jarques, Director

Economic Impact of Tourism – Headline Figures North Norfolk - 2017

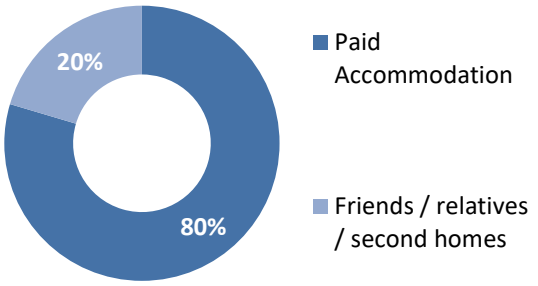


Economic Impact of Tourism – Year on year comparisons

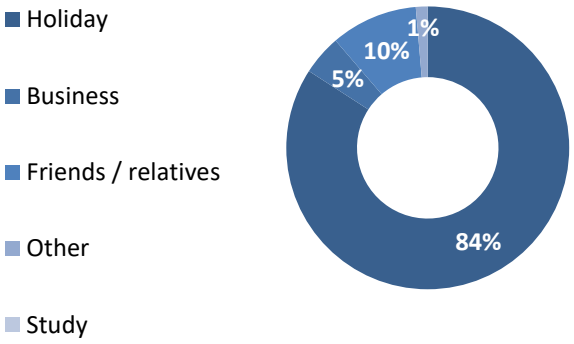
Day Trips	2016	2017	Annual variation
Day trips Volume	7,755,000	8,207,000	5.8%
Day trips Value	£261,055,000	£268,710,000	2.9%
Overnight trips			
Number of trip	553,500	620,700	12.1%
Number of nights	2,415,000	2,644,000	9.5%
Trip value	£141,018,000	£145,523,000	3.2%
Total Value	£490,357,250	£505,109,250	3.0%
Actual Jobs	11,020	11,352	3.0%

	2016	2017	Variation
Average length stay (nights x trip)	4.36	4.26	-2.3%
Spend x overnight trip	£ 254.55	£ 234.34	-7.9%
Spend x night	£ 58.39	£ 55.04	-5.7%
Spend x day trip	£ 33.66	£ 32.74	-2.7%

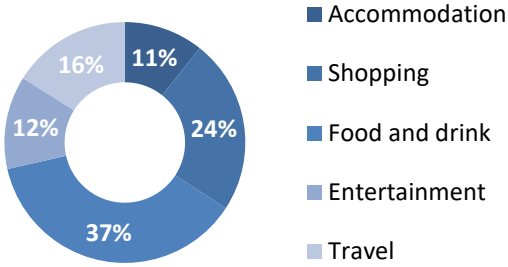
Type of Accommodation



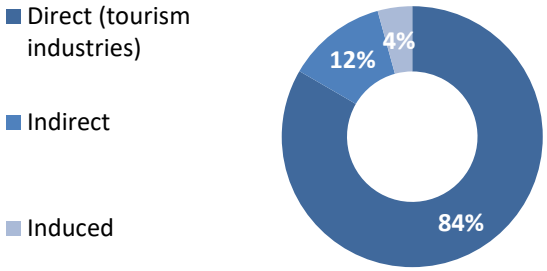
Trips by Purpose



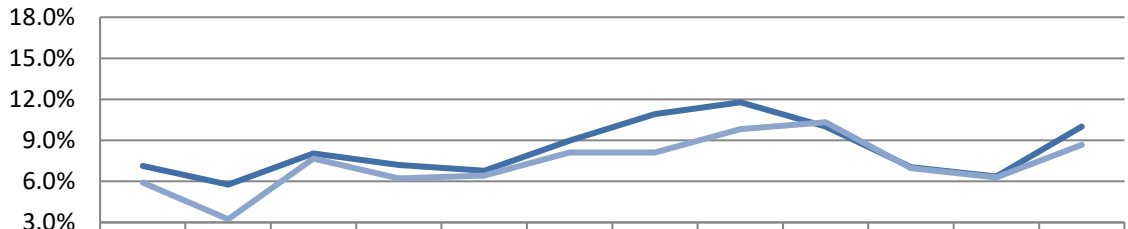
Breakdown of expenditure



Type of employment

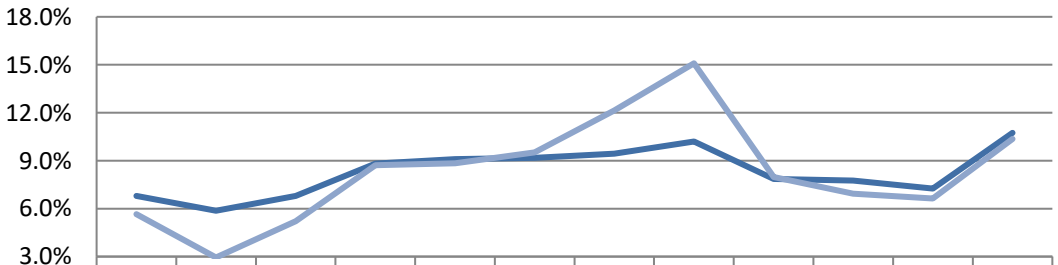


Seasonality - Day visitors



	Jan	feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Day trips	7.1%	5.8%	8.1%	7.2%	6.8%	9.0%	10.9%	11.8%	10.0%	7.0%	6.4%	10.0%
Day spend	5.9%	3.2%	7.7%	6.2%	6.4%	8.1%	8.1%	9.8%	10.3%	7.0%	6.3%	8.7%

Seasonality - Overnight visitors



	Jan	feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Overnight trips	6.8%	5.9%	6.8%	8.8%	9.1%	9.2%	9.4%	10.2%	7.8%	7.8%	7.3%	10.7%
Overnight spend	5.6%	2.9%	5.2%	8.7%	8.8%	9.5%	12.1%	15.1%	8.0%	6.9%	6.6%	10.4%

Contextual analysis

INTRODUCTION

This report examines the volume and value of tourism and the impact of visitor expenditure on the local economy in 2017 and provides comparative data against previously published data. The results are derived using the Cambridge Economic Impact Model under licence by Destination Research Ltd based on the latest data from national tourism surveys and regionally/locally based data.

CONTEXTUAL ANALYSIS

The three key surveys used to measure volume and expenditure from tourism trips are the GB Tourism Survey (for domestic overnight trips), the International Passenger Survey (IPS) for visits from overseas, and the BG Day Visitor Survey (GBDVS), which measures tourism day visits.

Domestic tourism

National Performance

In 2017, British residents took 104.2 million overnight trips in England, totalling 299 million nights away from home. The number of domestic trips was 5% higher than in 2016, and nights were up by 4% compared to the 2016. Holiday Trips in England in 2017 increased by 9% compared to 2016, with 48.9 million trips recorded.

Regional performance

The East of England region experienced a 3% increase in overnight trips during 2017. Bednights were up by 13% on 2016 and expenditure was also up by 13%. This resulted in an increase in the average length of trips (the number of night per trip) from 3 nights per trip in 2016 to 3.3 in 2017.

The average spend per night was unchanged at £52.5 and the spend per trip was up from £159.53 in 2016 to £175.54 in 2017. The region received more visitors in 2017 than in the previous year. But importantly, they stayed for longer, which resulted in an average greater expenditure levels per trip.

The GB Tourism Survey data is a key driver for the Cambridge model. However, it is not specifically designed to produce highly accurate results at regional level. In order to improve the accuracy of results we have applied a 3-year rolling average to this data to help smooth out short term market fluctuations and highlight longer-term trends.

Visits from overseas

National Performance

The number of visits in 2017 grew 4% to a record 39.2 million, after several years of growth since 2010. The number of visitor nights spent in the UK increased by 3% in 2017 to 286 million, with the average number of nights per visit declined slightly from 7.4 in 2016 to 7.3 in 2017. The value of spending increased by 9% to £24.5 billion. Average spend per visit was £7625 in 2017, up from £599 per visit in 2016.

Regional performance

The number of Overseas trips to the East of England in 2017 was unchanged at 2.4 million overnight trips. The total number of nights was down by 2% to 16.1 million. Spend was down by 4.5% to £815 million in 2017.

The International Passenger Survey (IPS) data is a key driver for the Cambridge model. However, as with the GBTS, it is not specifically designed to produce highly accurate results at regional level. In order to improve the accuracy of results we have applied a 3-year rolling average to this data to help smooth out short term market fluctuations and highlight longer-term trends.

Tourism Day Visits

National Performance

During 2017, GB residents took a total of 1,793 million Tourism Day Visits to destinations in England, Scotland or Wales, 2% down on 2016. Around £62.4 billion was spent during these trips, about 2.4% down on 2016.

The largest proportion of visits were taken to destinations in England (1,505 million visits or 84% of the total). The distribution of expenditure during visits broadly reflects this pattern, with a total value of day trips to England totalling £50.9 billion (81.5% of the total for GB).

Regional performance

During 2016, the volume tourism day visits in the East of England decreased by 5% to 133 million. However, spend was up by 10% to £3.85 billion).

Volume of Tourism

Staying Visitors - Accommodation Type

Trips by Accommodation

	UK		Overseas		Total	
Serviced	94,000	16%	1,800	6%	95,800	15%
Self catering	112,000	19%	4,100	14%	116,100	19%
Camping	71,000	12%	1,500	5%	72,500	12%
Static caravans	119,000	20%	600	2%	119,600	19%
Group/campus	34,000	6%	4,500	16%	38,500	6%
Paying guest	0	0%	0	0%	0	0%
Second homes	37,000	6%	1,500	5%	38,500	6%
Boat moorings	17,000	3%	0	0%	17,000	3%
Other	17,000	3%	1,300	4%	18,300	3%
Friends & relatives	92,000	16%	13,500	47%	105,500	17%
Total 2017	**592,000**		**29,000**		**621,000**	
Comparison 2016	**525,000**		**29,000**		**554,000**	
Difference	**13%**		**0%**		**12%**	

Nights by Accommodation

	UK		Overseas		Total	
Serviced	258,000	11%	8,000	3%	266,000	10%
Self catering	386,000	16%	84,000	28%	470,000	18%
Camping	340,000	14%	7,000	2%	347,000	13%
Static caravans	614,000	26%	2,000	1%	616,000	23%
Group/campus	84,000	4%	84,000	28%	168,000	6%
Paying guest	0	0%	0	0%	0	0%
Second homes	140,000	6%	8,000	3%	148,000	6%
Boat moorings	87,000	4%	0	0%	87,000	3%
Other	109,000	5%	3,000	1%	112,000	4%
Friends & relatives	332,000	14%	100,000	34%	432,000	16%
Total 2017	**2,348,000**		**296,000**		**2,644,000**	
Comparison 2016	**2,100,000**		**315,000**		**2,415,000**	
Difference	**12%**		**-6%**		**9%**	

Spend by Accommodation Type

	UK		Overseas		Total	
Serviced	£25,350,000	20%	£710,000	4%	£26,060,000	18%
Self catering	£25,581,000	20%	£5,590,000	33%	£31,171,000	21%
Camping	£19,358,000	15%	£336,000	2%	£19,694,000	14%
Static caravans	£27,416,000	21%	£196,000	1%	£27,612,000	19%
Group/campus	£5,914,000	5%	£4,732,000	28%	£10,646,000	7%
Paying guest	£0	0%	£0	0%	£0	0%
Second homes	£4,081,000	3%	£821,000	5%	£4,902,000	3%
Boat moorings	£6,101,000	5%	£0	0%	£6,101,000	4%
Other	£6,022,000	5%	£183,000	1%	£6,205,000	4%
Friends & relatives	£8,538,000	7%	£4,592,000	27%	£13,130,000	9%
Total 2017	**£128,362,000**		**£17,161,000**		**£145,523,000**	
Comparison 2016	**£123,066,000**		**£17,952,000**		**£141,018,000**	
Difference	**4%**		**-4%**		**3%**	

Serviced accommodation includes hotels, guesthouses, inns, B&B and serviced farmhouse accommodation. Paying guest refers to overseas visitors staying in private houses, primarily language school students. Other trips includes nights spent in transit, in lorry cabs and other temporary accommodation.

Staying Visitors - Purpose of Trip

Trips by Purpose

		UK		Overseas		Total	
Holiday		509,000	86%	13,200	46%	522,200	84%
Business		27,000	5%	1,400	5%	28,400	5%
Friends & relatives		49,000	8%	12,700	44%	61,700	10%
Other		7,000	1%	1,400	5%	8,400	1%
Study		0	0%	0	0%	0	0%
Total	**2017**	**592,000**		**28,700**		**620,700**	
Comparison	**2016**	**525,000**		**28,500**		**553,500**	
Difference		**13%**		**1%**		**12%**	

Nights by Purpose

		UK		Overseas		Total	
Holiday		2,039,000	87%	115,000	39%	2,154,000	81%
Business		77,000	3%	11,000	4%	88,000	3%
Friends & relatives		216,000	9%	157,000	53%	373,000	14%
Other		16,000	1%	13,000	4%	29,000	1%
Study		0	0%	0	0%	0	0%
Total	**2017**	**2,348,000**		**296,000**		**2,644,000**	
Comparison	**2016**	**2,100,000**		**315,000**		**2,415,000**	
Difference		**12%**		**-6%**		**9%**	

Spend by Purpose

		UK		Overseas		Total	
Holiday		£117,351,000	91%	£8,108,000	47%	£125,459,000	86%
Business		£4,749,000	4%	£841,000	5%	£5,590,000	4%
Friends & relatives		£5,049,000	4%	£7,342,000	43%	£12,391,000	9%
Other		£1,214,000	1%	£870,000	5%	£2,084,000	1%
Study		£0	0%	£0	0%	£0	0%
Total	**2017**	**£128,362,000**		**£17,161,000**		**£145,523,000**	
Comparison	**2016**	**£123,066,000**		**£17,952,000**		**£141,018,000**	
Difference		**4%**		**-4%**		**3%**	

Day Visitors

Trips and Spend by Urban, Rural and Coastal Area

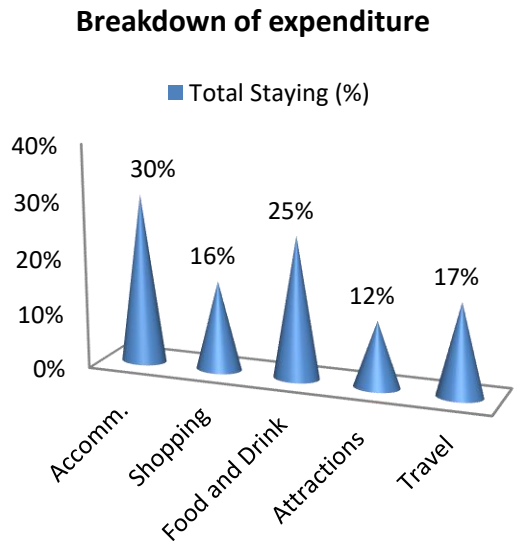
		Trips	Spend
Urban visits		2,979,000	£112,692,000
Countryside visits		3,201,000	£99,707,000
Coastal visits		2,027,000	£56,311,000
Total	**2017**	**8,207,000**	**£268,710,000**
Comparison	**2016**	**7,755,000**	**£261,055,000**
Difference		**6%**	**3%**

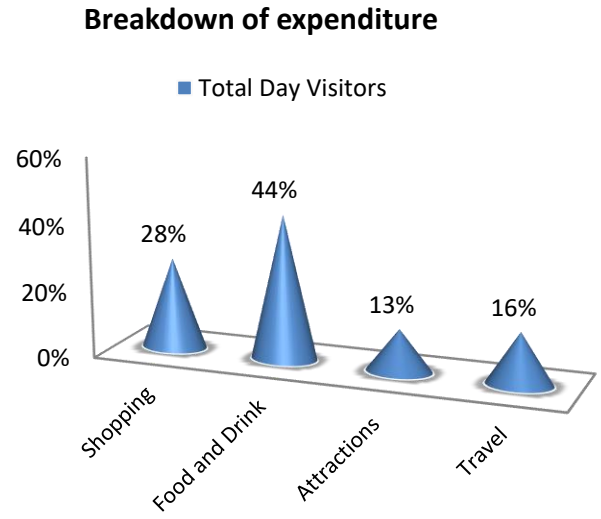
Value of Tourism

Expenditure Associated with Trips:

Direct Expenditure Associated with Trips

		Accomm.	Shopping	Food and Drink	Attractions	Travel	Total
UK Tourists		£39,582,000	£18,204,000	£32,909,000	£15,383,000	£22,284,000	£128,362,000
Overseas tourists		£4,584,000	£5,085,000	£4,011,000	£1,718,000	£1,762,000	£17,160,000
Total Staying		£44,166,000	£23,289,000	£36,920,000	£17,101,000	£24,046,000	£145,522,000
Total Staying (%)		30%	16%	25%	12%	17%	100%
Total Day Visitors		£0	£74,176,000	£117,444,000	£34,768,000	£42,322,000	£268,710,000
Total Day Visitors		0%	28%	44%	13%	16%	100%
Total	**2017**	**£44,166,000**	**£97,465,000**	**£154,364,000**	**£51,869,000**	**£66,368,000**	**£414,232,000**
%		**11%**	**24%**	**37%**	**13%**	**16%**	**100%**
Comparison	**2016**	**£42,765,000**	**£94,627,000**	**£149,908,000**	**£50,322,000**	**£64,451,000**	**£402,073,000**
Difference		**3%**	**3%**	**3%**	**3%**	**3%**	**3%**





Other expenditure associated with tourism activity

Other expenditure associated with tourism activity - Estimated spend				
Second homes	**Boats**	**Static vans**	**Friends & relatives**	**Total**
£10,047,000	£767,125	£4,195,125	£12,991,000	£28,000,250

Spend on second homes is assumed to be an average of £2,100 on rates, maintenance, and replacement of furniture and fittings. Spend on boats assumed to be an average of £2,100 on berthing charges, servicing and maintenance and upgrading of equipment. Static van spend arises in the case of vans purchased by the owner and used as a second home. Expenditure is incurred in site fees, utility charges and other spending and is estimated at £2,100. Additional spending is incurred by friends and relatives as a result of people coming to stay with them. A cost of £185 per visit has been assumed

Direct Turnover Derived From Trip Expenditure

Business turnover arises as a result of tourist spending, from the purchase of supplies and services locally by businesses in receipt of visitor spending and as a result of the spending of wages in businesses by employees whose jobs are directly or indirectly supported by tourism spending.

		Staying Visitor	Day Visitors	Total
Accommodation		£44,904,000	£2,349,000	£47,253,000
Retail		£23,057,000	£73,434,000	£96,491,000
Catering		£35,813,000	£113,921,000	£149,734,000
Attractions		£17,703,000	£36,684,000	£54,387,000
Transport		£14,428,000	£25,393,000	£39,821,000
Non-trip spend		£28,000,250	£0	£28,000,250
Total Direct	**2017**	**£163,905,250**	**£251,781,000**	**£415,686,250**
Comparison	**2016**	**£158,985,250**	**£244,584,000**	**£403,569,250**
Difference		**3%**	**3%**	**3%**

Adjustments have been made to recognise that some spending on retail and food and drink will fall within attractions or accommodation establishments. It is assumed that 40% of travel spend will take place at the origin of the trip rather than at the destination.

Supplier and Income Induced Turnover

		Staying Visitor	Day Visitors	Total
Indirect spend		£25,688,000	£35,132,000	£60,820,000
Non trip spending		£5,600,000	£0	£5,600,000
Income induced		£18,030,000	£4,973,000	£23,003,000
Total	**2017**	**£49,318,000**	**£40,105,000**	**£89,423,000**
Comparison	**2016**	**£47,808,000**	**£38,980,000**	**£86,788,000**
Difference		**3%**	**3%**	**3%**

Income induced spending arises from expenditure by employees whose jobs are supported by tourism spend.

Total Local Business Turnover Supported by Tourism Activity – Value of Tourism

		Staying Visitor	Day Visitors	Total
Direct		£163,905,250	£251,781,000	£415,686,250
Indirect		£49,318,000	£40,105,000	£89,423,000
Total Value	**2017**	**£213,223,250**	**£291,886,000**	**£505,109,250**
Comparison	**2016**	**£206,793,250**	**£283,564,000**	**£490,357,250**
Difference		**3%**	**3%**	**3%**

Employment

Employment

The model generates estimates of full time equivalent jobs based on visitor spending. The total number of 'actual' jobs will be higher when part time and seasonal working is taken into account. Conversion of full time equivalent jobs into actual jobs relies on information from business surveys in the sectors receiving

Direct employment

Full time equivalent (FTE)						
	Staying Visitor		Day Visitor		Total	
Accommodation	904	33%	47	1%	952	15%
Retailing	232	8%	738	20%	969	15%
Catering	656	24%	2,087	55%	2,744	42%
Entertainment	340	12%	704	19%	1,044	16%
Transport	109	4%	192	5%	301	5%
Non-trip spend	519	19%	0	0%	519	8%
Total FTE 2017	**2,759**		**3,768**		**6,528**	
Comparison 2016	**2,676**		**3,661**		**6,337**	
Difference	**3%**		**3%**		**3%**	

Estimated actual jobs						
	Staying Visitor		Day Visitor		Total	
Accommodation	1,339	34%	70	1%	1,409	15%
Retailing	347	9%	1,106	20%	1,454	15%
Catering	984	25%	3,131	56%	4,115	43%
Entertainment	479	12%	993	18%	1,472	16%
Transport	154	4%	270	5%	424	4%
Non-trip spend	591	15%	0	0%	591	6%
Total Actual 2017	**3,894**		**5,571**		**9,465**	
Comparison 2016	**3,775**		**5,413**		**9,188**	
Difference	**3%**		**3%**		**3%**	

Indirect & Induced Employment

Full time equivalent (FTE)			
	Staying Visitor	Day Visitors	Total
Indirect jobs	579	651	1,230
Induced jobs	334	92	426
Total FTE 2017	**913**	**743**	**1,656**
Comparison 2016	**885**	**722**	**1,607**
Difference	**3%**	**3%**	**3%**

Estimated actual jobs			
	Staying Visitor	Day Visitors	Total
Indirect jobs	661	742	1,402
Induced jobs	381	105	486
Total Actual 2017	**1,041**	**847**	**1,888**
Comparison 2016	**1,009**	**823**	**1,832**
Difference	**3%**	**3%**	**3%**

Total Jobs

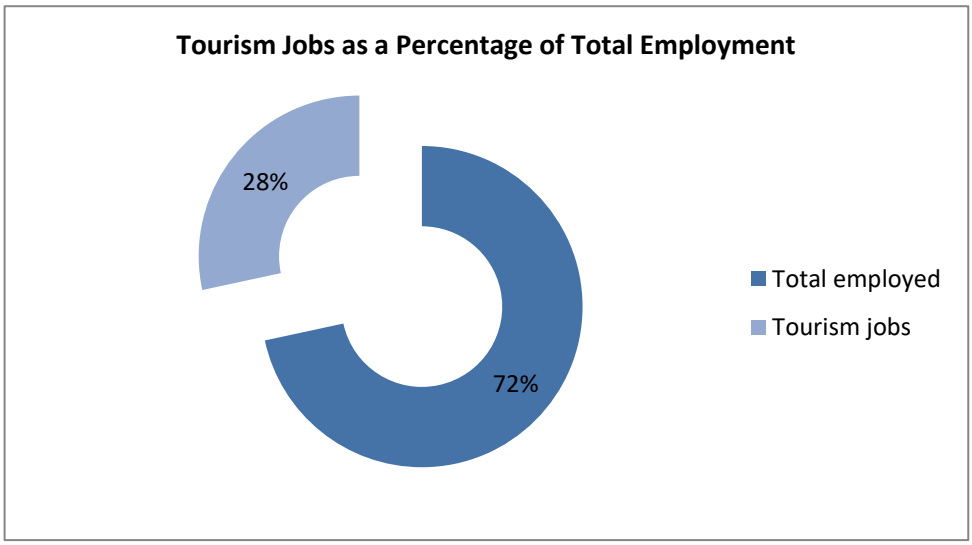
Actual jobs are estimated from surveys of relevant businesses at locations in England and take account of part time and seasonal working.

Full time equivalent (FTE)							
		Staying Visitor		Day Visitor		Total	
Direct		2,759	75%	3,768	84%	6,528	80%
Indirect		579	16%	651	14%	1,230	15%
Induced		334	9%	92	2%	426	5%
Total FTE	**2017**	**3,673**		**4,511**		**8,184**	
Comparison	**2016**	**3,561**		**4,383**		**7,944**	
Difference		**3%**		**3%**		**3%**	

Estimated actual jobs							
		Staying Visitor		Day Visitor		Total	
Direct		3,894	79%	5,571	87%	9,465	83%
Indirect		661	13%	742	12%	1,402	12%
Induced		381	8%	105	2%	486	4%
Total Actual	**2017**	**4,935**		**6,417**		**11,352**	
Comparison	**2016**	**4,784**		**6,236**		**11,020**	
Difference		**3%**		**3%**		**3%**	

Tourism Jobs as a Percentage of Total Employment

		Staying Visitor	Day visitors	Total
Total employed		40,000	40,000	40,000
Tourism jobs		4,935	6,417	11,352
Proportion all jobs		**12%**	**16%**	**28%**
Comparison	**2016**	**4,784**	**6,236**	**11,020**
Difference		**3%**	**3%**	**3%**



Economic Impact of Tourism – Headline Figures **North Norfolk - 2017**

The key 2017 results of the Economic Impact Assessment are:

8.8 million trips were undertaken in the area
8.2 million day trips
0.6 million overnight visits

2.6 million nights in the area as a result of overnight trips

£414 million spent by tourists during their visit to the area
£35 million spent on average in the local economy each month.

£146 million generated by overnight visits
£269 million generated from irregular day trips.

£505 million spent in the local area as result of tourism, taking into account multiplier effects.

11,352 jobs supported, both for local residents from those living nearby.
9,465 tourism jobs directly supported
1,888 non-tourism related jobs supported linked to multiplier spend from tourism.

Appendix I - Introduction about Cambridge Model

This report examines the volume and value of tourism and the impact of that expenditure on the local economy. The figures were derived using the Cambridge Economic Impact Model and the research was undertaken by Destination Research.

The model utilises information from national tourism surveys and regionally based data held by Destination Research. It distributes regional activity as measured in those surveys to local areas using 'drivers' such as the accommodation stock and occupancy which influence the distribution of tourism activity at local level.

Limitations of the Model

The methodology and accuracy of the above sources varies. The results of the model should therefore be regarded as estimates which are indicative of the scale and importance of visitor activity in the local area. It is important to note that in the national tourism surveys the sample sizes for each area changes year on year. This is as a result of the random probability nature of the methodology. As such, the results of the Cambridge Model are best viewed as a snapshot in time and we would caution against year-on-year comparisons.

It should be noted that the model cannot take into account any leakage of expenditure from tourists taking day trips out of the area in which they are staying. While it is assumed that these may broadly balance each other in many areas, in locations receiving significant numbers of day visitors from London, there is likely to be an underestimate in relation to the number of overseas day visitors staying in holiday accommodation in London.

Whilst it is important to be aware of these issues, we are confident that the estimates we have produced are as reliable as is practically possible within the constraints of the information available.

Rounding

All figures used in this report have been rounded. In some tables there may therefore be a slight discrepancy between totals and sub totals.

Data sources

The main national surveys used as data sources in stage one include:

- Great Britain Tourism Survey (GBTS) - information on tourism activity by GB residents;
- International Passenger Survey (IPS) information on overseas visitors to the United Kingdom;
- Day Visits in the annual Great Britain Day Visitor Survey using information on visits lasting more than 3 hours and taken on an irregular basis

These surveys provide information down to a regional level. In order to disaggregate data to a local level the following information sources are used:

- Records of known local accommodation stock held by Destination Research;
- VisitEngland's surveys of Visits to Attractions, which provide data on the number of visitors to individual tourist attractions ;
- Mid- 2014 estimates of resident population as based on the 2011 Census of Population;
- Selected data from the 2011 Census of Employment;
- Selected data on the countryside and coast including, national designations and length of the coastline.

Staying Visitors

The GBTS provides information on the total number of trips to the region and the relative proportions using different types of accommodation. By matching these figures to the supply of such accommodation, the regional average number of trips per bedspace or unit of accommodation can be derived. The IPS provides information on the total number of trips by overseas visitors to the region. The model uses three year rolling averages to reduce extreme highs and lows which are due to small sample sizes, rather than being a reflection on drastic changes in demand year-on-year.

Day Visitors

Information on day trips at the regional level is available from the Day Visits in Great Britain survey. The survey includes all leisure-related trips from home. It should be noted that a large proportion are local trips made by people resident in the locality. The model uses information from the survey to estimate the number of longer day trips (defined as those lasting at least 3 hours and involving travel of more than 20 miles) and irregular trips lasting more than 3 hours.

Impact of tourism expenditure

This section examines the impact of the tourism expenditure in terms of the direct, indirect and induced expenditure as well as an estimate of the actual jobs (both direct and indirect) supported by tourism expenditure in the district.

The GBTS, IPS and Day Visits to Great Britain survey data on the breakdown of visitor spending. The impact of this initial round of expenditure will be subsequently increased by multiplier effects. These arise from the purchase of supplies and services by the businesses in receipt of visitor expenditure (indirect impacts), and by the income induced-effects arising from the spending of wages by employees in the first round of business and in subsequent expenditure in supplier business (induced impacts).

The New Earnings Survey which provides information on wage levels by industry sector and region; An internal business database which includes data on the structure of business expenditure, local linkages and multiplier ratios drawn from a wide range of business and economic studies carried out by Geoff Broom Associates, PA Cambridge Economic Consultants and others. By applying the breakdown to the estimates of visitor spending, the model generates estimates of total direct spending.

Evidence from national studies suggests that some minor adjustments are required to match visitor spend to business turnover – for example, some expenditure on food and drink actually takes place in inns and hotels that fall in the accommodation sector and within attractions. More significantly, expenditure on travel costs associated with individual trips is equally likely to take place at the origin of the trip as the destination. Therefore the model assumes that only 40% of travel expenditure accrues to the destination area.

Number of full time job equivalents

Having identified the value of turnover generated by visitor spending, it is possible to estimate the employment associated with that spending. Wages for staff and drawings for the proprietors will absorb a proportion of that turnover. By applying these proportions to the overall additional turnover in each sector, the amount of money absorbed by employment costs can be calculated. The New Earnings Survey provides data from which the average costs by business sector, adjusted to take account of regional differences, can be calculated.

After allowing for additional costs such as National Insurance and pension costs, an average employment cost per full time equivalent job can be estimated. The number of such jobs in the local area can then be estimated by dividing the amount of business expenditure on wages and drawings by the average employment cost per job.

Number of Actual Jobs

The model generates estimates of full time equivalent jobs based on visitor spending. However, the total number of actual jobs will be higher when part time and seasonal working is taken into account. The full time equivalent jobs arising directly from visitor spending are converted into actual jobs using information from business surveys in the sectors receiving visitor spending. In general, the conversion factor varies around 1.5 in those sectors.

The indirect and induced jobs arise across a much wider range of employment sectors. Therefore, the average 1.16 for all sectors based on Census of Employment data has been used to convert full time equivalent jobs in this sector to actual jobs.

The employment estimates generated by the model include both self employed and employed

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Appendix J - Information About Visit North Norfolk

THE DEEP HISTORY COAST

The unique Deep History Coast in north-east Norfolk is home to some of the earliest evidence of human British civilisation with footsteps left by the UK's first tourists nearly one million years ago. The world's biggest mammoth skeleton remains were found at West Runton and a 550,000 year old flint axe was discovered in Happisburgh. Discover more about this fascinating coastline steeped in millions of years worth of history.

FIND OUT HOW TO BEACHCOMB

DEEP HISTORY COAST FILM

FIND OUT ABOUT WEST RUNTON BEACH

CROMER FOREST-BED FOSSIL PROJECT

FIND OUT ABOUT CROMER MUSEUM

DISCOVER MORE HISTORY AND HERITAGE

EXPLORING THE DEEP HISTORY COAST

This part of Norfolk has universally changed understanding of pre-prehistoric times. Discoveries have meant the Norfolk Deep History Coast

has contained some of the most important archaeological finds in Western Europe, the country's best preserved Neanderthal site and is the only county where evidence of four species of human have been found. This part of the country is where, pre-Ice Age, Britain was connected via a land mass to the Continent known as Doggerland.

Footprints dating back 850,000 years have been left at Happisburgh by the first visitors to Norfolk. These footprints, belonging to nomads hunting bison, rhinos, deer and mammoths, have become the oldest evidence of humans outside Africa's Great Rift Valley. The footprints were found in 2013 by chance when a team of scientists were, after high seas had scoured the shoreline revealing estuary mud, conducting a geophysics survey.

Historically, this area would have been a great plain, similar to East Africa's Serengeti, grazed by animals. The footmarks were discovered in what would have been an estuary of a river system that flowed into the North Sea and included the Thames, which was fed by an extinct river from the Midlands called the Bytham. The footprints were found to be the marks of toes and heels of five adults and children.

Along the coast at West Runton, the remains of a 600,000 year old mammoth were discovered. This discovery is the oldest mammoth skeleton to have been found in the UK and the most complete specimen of the species to have been found in the world. After a stormy night in 1990, a couple walking by the bottom of the cliffs discovered the pelvic bone of the mammoth. A year or so late after another storm, more bones were revealed. This lead to an exploratory dig taking place in 1992 and then an excavation in 1995. The most complete skeleton of a mammoth was revealed, identified as the species Mammuthus trogontherii (Steppe Mammoth).

Most of the skeleton was there; about 85%, and the missing parts were nibbled off by scavenging hyaenas as shown by hyaena bitemarks and fossilised hyaena dung! The skeleton is 4m tall at the shoulder and weighs 10 tonnes, making it twice as large as discoveries on the Jurassic Coast. You can see some of the remains in Cromer Museum, Gressenhall Farm and Workhouse and Norwich Castle Museum. Along the West Runton Freshwater Bed, rhino teeth and bones have also been found.

Furthermore, around 550,000 years ago, there was the discovery of a flint hand axe at Happisburgh. This Palaeolithic tool had been preserved in a former forest within a dense peaty deposit. The axe was discovered by a dog-walker in 2000, which led to even older tool and bone finds. The significance of this find changed history. It pushed back the evidence for human colonisation this far north by 100,000 years or more. You can see the flint tool at Norwich Castle Museum, just a short drive from north Norfolk.

Beachcombing along the Deep History Coast at beaches including West Runton and Happisburgh which is 16 miles away, can be fascinating with finds including amber, fossil sea urchins and belemnites. Search the shores of Hunstanton and you may find sharks teeth and look out for fossilised coral along Sheringham beach. There is also Cromer's underwater chalk reef 200m from the shore, the Cromer chalk ridge (the hightest point in East Anglia) and the prehistoric Cromer Forest-Bed in Weybourne. Each year, there are more than 20,000 fossil finds! You can take any fossil finds to the Cromer Museum for identification.

Please note: As long as you are not in a protected area, you can pick up small fossils that are lying around on the ground. Please do not remove any fossils from rocks or cliffs, and large fossils are best left for all to enjoy. If you are lucky enough to come across a rare find, please report it to a museum and if you're in a Site of Specific Scientific Interest, please follow any rules they might have. They are there to protect geology for future generations.

NATURE & WILDLIFE IN NORTH NORFOLK

SIGN UP AND KEEP UPDATED

HAPPISBURGH

BEST PLACES TO FIND FOSSILS

MUSEUMS IN NORTH NORFOLK

EXPLORE MORE OF NORTH NORFOLK

UNIQUE FACTS ABOUT NORTH NORFOLK

SEARCH FOR PLACES TO STAY

(Any Property Type)

From

Night(s) 1

Near

(Any town)

or Property name

SEARCH

DISCOVER HAPPISBURGH

The historic village of Happisburgh has a secluded sandy beach and a fascinating history showing the earliest signs of humans in Britain. The constantly changing coastline, its 18th century lighthouse and 15th century church makes Happisburgh a fascinating place to explore.

Happisburgh is home to the oldest working light in the county and the only independently operated lighthouse in the UK. The famous red and white striped lighthouse was built in 1790 and offers wonderful views of the coast and countryside. In the summer, it is open to visitors on occasional Sundays.

HISTORY AND HERITAGE OF NORTH NORFOLK

Coastal erosion is constantly changing the landscape of the coastline at Happisburgh and that has also revealed evidence of humans being present in Britain 200,000 years earlier than had previously been known. Flint axes and early fossilized human footprints dating back 800,000 years signified the oldest evidence of man outside the Great Rift Valley in Africa! These finds, as well as the mammoth skeleton in West Runton, have earned this coastline the name, the Deep History Coast.

FIND OUT ABOUT THE DEEP HISTORY COAST

WATCH 'HOW TO BEACH COMB'

St Mary's church also dominates the Happisburgh skyline and dates back to the 15th century. Its 110ft tower, overlooks the sea and is an important landmark warning mariners of the nearby sandbanks. Indeed, the

FIND A PLACE TO STAY

graveyard has memorials to the many sailors who lost their lives in the treacherous waters, including the 119 sailors of HMS Invincible, who in were on their way to join Nelson in Copenhagen in 1801. If you climb the 133 steps up the tower, you can see 30 churches, two lighthouses, seven water towers and even the Cathedral spire in the city of Norwich over 16 miles away.

VISIT NORWICH

The secluded, sandy beach is dog friendly and great for days out. From the beach, you can walk as far as Sea Palling taking in wonderful views. Happisburgh is a pretty village and is an ideal base for a north Norfolk holiday.

FIND A PLACE TO EAT

FIND THINGS TO DO

EXPLORE MORE OF NORTH NORFOLK

EXPLORE THE OUTDOORS

FIND THE HIDDEN GEMS OF NORTH NORFOLK

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DISCOVER MUNDESLEY

Mundesley is a pretty Victorian seaside village where families can enjoy a traditional holiday away from the hustle and bustle. Set in an Area of Outstanding Natural Beauty, Mundesley offers great coastal walks and is close to the Broads National Park.

The coastal village of Mundesley became popular with the Victorians, when visitors were brought to the area with the opening of a railway in 1889. Visitors were able to sample the finest air in the country! The railway has long gone, but the fresh sea breezes off the North Sea still attract visitors.

The village is a great starting point for country walks with plenty of footpaths and circular routes. Close by is Southrepps Common, an important area for wildlife with woodland and wild flowers.

MUNDESLEY CIRCULAR WALK

Mundesley's Blue Flag wide sandy beach, with colourful beach huts and shallow rock pools, are an ideal playground for children of all ages, and there is also great year-round sea fishing.

A fine nine-hole golf course built in 1901, sits on the hillside of the River Mun valley and offers unrivalled views over the coast and countryside, which is a designated Area of Outstanding Natural Beauty.

FIND OUT ABOUT GOLFING IN NORTH NORFOLK

AREA OF OUTSTANDING NATURAL BEAUTY

FIND A PLACE TO STAY

BLUE FLAG BEACHES

The charming village has pretty cottages, shops, pubs and places to eat and stay with pretty thatched buildings and stone walls. Mundesley is also home to the Maritime Museum, believed to be one of the smallest museums in England! Opposite the museum is a World War II memorial to the men who were killed while clearing landmines from the cliffs and beaches.

MUSEUMS IN NORTH NORFOLK

Mundesley is perfect for those seeking a traditional seaside holiday, scenic walks and family friendly activities.

FIND A PLACE TO EAT

FIND THINGS TO DO

EXPLORE MORE OF NORTH NORFOLK

FIND OUT WHATS ON IN NORTH NORFOLK

EXPLORE NORTH NORFOLK

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DISCOVER NORTH WALSHAM

North Walsham is steeped in history dating back to Anglo-Saxon times. Close to the Broads National Park and north Norfolk coast, and surrounded by scenic countryside, North Walsham is an ideal holiday base to explore north Norfolk.

The market town, North Walsham, became a centre for weaving in the Anglo-Saxon era, along with the nearby village of Worstead (from where the cloth gets its name). The wealth generated, enabled the local people to build St. Nicholas Church which dates back to 1330. Its tall tower is the second tallest in Norfolk after Norwich Cathedral.

CHURCHES IN NORTH NORFOLK

The market place houses a 16th century cross with clock, the focal point of the town, which was built to collect rent from the market traders. Today, a market runs on Thursdays and the rest of the town has plenty of shops, eateries, places to stay and historical buildings including Paston College where Horatio Nelson, spent his school days between 1768 and 1771.

For Nelson enthusiasts, you can visit Nelson's birthplace, Burnham Thorpe, about an hour away from North Walsham. A stroll around the village reveals the site of the Parsonage where Nelson was born (which was knocked down in 1803) and raised before going to sea at the tender age of 12. You will also find All Saint's Church where Nelson's father Edmund was rector and Nelson's local pub, The Lord Nelson, known at the time as the Plough Inn.

FIND A PLACE TO STAY

NORTH NORFOLK HISTORY AND HERITAGE

Nearby Bacton Woods has 280 acres of ancient woodland, dating back to Saxon times. The marked trails through the beautiful woodland offers great walking routes and terrain for mountain biking.

BACTON WOODS LEAFLET

Its historic buildings and proximity to the Broads National Park and coast, makes North Walsham well worth visiting.

DISCOVER THE BROADS NATIONAL PARK

WATCH 'HOW TO MOOR A BOAT'

FIND A PLACE TO EAT

FIND THINGS TO DO

EXPLORE MORE OF NORTH NORFOLK

SIGN UP TO OUR ENEWS TO HEAR MORE

NORTH NORFOLK ON FILM

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VISIT NORTH NORFOLK

Visit North Norfolk is the offically commissioned Destination Management Organisation and visitor guide for north Norfolk.

ABOUT VISIT NORTH NORFOLK

Visit North Norfolk, a membership organisation, is the official Destination Management Organisation (DMO) for the area, operating on a not-for-profit basis and delivering the official tourism website and marketing activity for North Norfolk District Council.

DMOs are organisations charged with representing a specific destination and helping the long-term development of the local tourism economy through targeted and strategic campaigns. Visit North Norfolk is responsible for promoting all that the area has to offer at local, regional and national levels and is affiliated with Visit East of England and Visit Norfolk. Visit North Norfolk, as the accredited authoritative DMO for north Norfolk, is also affiliated with Visit Britain.

Visit North Norfolk delivers two key aspects of the local tourism economy: support for businesses and the promotion of the area to potential visitors, providing a major channel for communication, support and access to market for the tourism industry.

By developing promotional campaigns and initiatives, Visit North Norfolk works with other DMOs to grow the area's visitor economy which is worth £505m and supports over 11,000 jobs. Marketing activity is supported by North Norfolk District Council and private business sponsorship and its core business is self-sustaining through business membership funding. Visit North Norfolk is a business-led DMO, operated by a group of local business leaders (in partnership with North Norfolk District Council). This meets the Government's stated direction of encouraging businesses to become more directly responsible for tourism promotion.

The board comprises the following directors:

Chairman: Andrew Hird, General Manager of Woodland Holiday Park
Mark Noble, Trustee of Pensthorpe Conservation Trust
Bee Hopkins, owner of The Hoste.

THOUGHT ABOUT MEMBERSHIP?

SIGN UP TO KEEP UPDATED

LATEST MARKETING CAMPAIGN

Appendix K - Information About Visit Norfolk

THE PERFECT YEAR-ROUND DESTINATION

GET AHEAD OF THE CROWD... BOOK YOUR 2019 HOLIDAY IN NORFOLK

WHERE TO GO IN NORFOLK

Great Yarmouth: one of the UK's top seaside resorts

North Norfolk: beautiful beaches, cliffs and tidal

Pensthorpe Natural Park - Naturally inspiring every generation

There's Nowhere Like Norfolk

Norfolk is a great all-year holiday, weekend or short break destination

On the mid-east coast of England, we enjoy over 90 miles of unspoilt coastline, beautiful countryside, the unique Broads National Park, forests and heathland, internationally important nature reserves, picturesque market towns, amazing birdwatching and the fabulous seaside resorts of Great Yarmouth, Cromer, Wells-next-the-Sea and Hunstanton.

There's Norwich, a fantastic city of heritage, culture and shopping, as well as countless outdoor activities, a fantastic variety of family theme parks and attractions, historical sights and Royal connections.

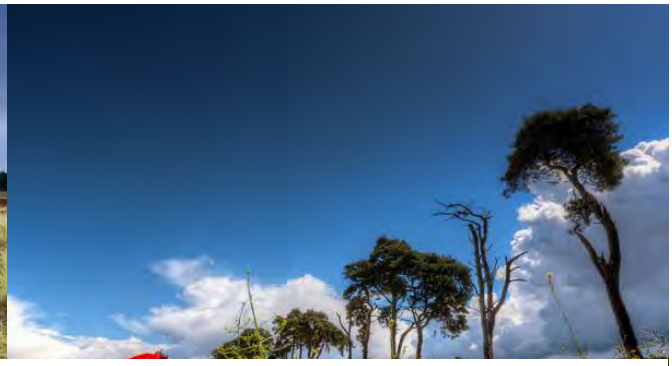
What are you waiting for? Come and Visit Norfolk...

WHAT'S ON IN NORFOLK

BOOK YOUR STAY IN NORFOLK

Where would you like to go in Norfolk?

Coast and seaside



Countryside

THINGS TO DO IN NORFOLK

Your essential Visit Norfolk Bucket List

Top 10 beaches in Norfolk

EXPLORE OUR COUNTY

Explore the seven areas of Norfolk - each one offering a superb range of things to do and see, attractions and accommodation...

Brecks & Thetford Forest

Broadland & Broads

Greater Yarmouth

King's Lynn & West Norfolk

North Norfolk

Norwich

South Norfolk & Waveney Valley

LEARN MORE ABOUT NORFOLK

Friendly Invasion: When Norfolk was 'Little America'

READ MORE

Special Relationship: The Norfolk man who saved the American Revolution

READ MORE

How a Norfolk man and his native Indian wife started The Special Relationship

READ MORE

SIGN UP FOR OUR NEWSLETTER

WHAT'S ON

FIND A PLACE TO STAY

NORTH NORFOLK COAST AND COUNTRYSIDE

North Norfolk is renowned for its spectacular coastline, fantastic wildlife, miles of glorious beaches, seaside communities and a beautiful hinterland of rolling countryside and picturesque market towns and villages. North Norfolk must be the birdwatching capital of the UK, and you can even take a boat trip to see our seal colony at Blakeney Point.

HIGHLIGHTS OF NORTH NORFOLK

An Area of Outstanding Natural Beauty

Between the lively seaside resort of Hunstanton and the pretty town of Sheringham is a spectacular coastline, most of which is designated as an Area of Outstanding Natural Beauty.

Here the landscape of tidal marshes, creeks, shingle spits, and sweeping golden beaches is backed by explorable pine woods. It includes the Holkham Hall and Estate, and its beach at Wells-next-the-Sea, consistently voted the best in Britain.

Further to the East is the imperious clifftop setting of Cromer, with its Victorian pier striding proudly out to sea. The coastline then meanders southward to the secluded beaches of Mundesley and Happisburgh, with its striped lighthouse, and inland to the traditional market town of North Walsham.

The magic of North Norfolk is that as the seasons and tides change, it offers completely different qualities and scenery.

The North Norfolk Railway begins at Sheringham and ends at genteel Holt, a fabulously handsome market town which has become a mecca for discerning visitors looking for independent shops. Most of Holt was burned in its famous fire of 1708, and in its place rose a splendid Georgian town focusing on an appealing Market Place.

This is also Deep History Coast, where the biggest and best-preserved mammoth skeleton was found, along with a prehistoric flint axe and 850,000 year old human footprints – the oldest evidence of man found outside the Great Rift Valley in Africa.

PLACES TO VISIT IN NORTH NORFOLK

Book your north Norfolk stay

Things to do in north Norfolk

Inland in north Norfolk, UK

WELLS TO HUNSTANTON

ABOUT VISIT NORFOLK

Visit Norfolk is the strategic voice of the county's visitor industry. Visitnorfolk.co.uk is run under contract by Visit East Anglia Ltd. and is responsible for promoting all that the county has to offer at local, regional and national levels.

It aims to develop promotional campaigns and initiatives and work with other DMOs (destination marketing organisations) to grow the county's visitor economy which supports some 61,521 jobs, 17.3% of all employment in Norfolk. The sector also supports thousands more jobs in retail, food production, culture and transport.

The visitor economy is the largest industry sector in the county, worth £3.055 billion.

Visit East Anglia won the contract to manage the development of Norfolk tourism from November 2012, following a tendering process overseen by New Anglia Local Enterprise Partnership and Norfolk County Council.

Visit Norfolk's marketing activity is supported by local district councils, the Broads Authority, and private sector partnerships including Visit Norwich, Enjoy The Broads, Visit North Norfolk, Norfolk and Suffolk Tourist Attractions and Gt Yarmouth Tourism Business Improvement District.

One of Visit Norfolk's key objectives is to encourage all the county's tourism organisations involved in promoting Norfolk to become more self-sustaining and less reliant on public funding. This meets the Government's stated direction of encouraging businesses to become more directly responsible for tourism promotion.

Visit Norfolk within the national context

Visit Norfolk works closely with its partner organisations, regional and national bodies to promote the county. The national tourism structure is:

Visit Britain: Britain's national tourism agency, responsible for marketing Britain overseas, working with thousands of organisations in the UK and overseas. Visit Britain promotes Britain in 35 markets around the world via a range of campaigns, and also promotes the tourism industry within the UK itself. Their consumer facing website is www.visitbritain.com.

Visit England: The strategic leadership body representing the public and private sector stakeholders of English Tourism. Visit England works in partnership with Visit Britain, local and regional DMOs, and the private sector, creating a national tourism strategy, optimising marketing investment, and developing the visitor experience across England.

Visit East Anglia: A business-led, not-for-profit organisation to promote tourism across East Anglia. It is supported by some of the most successful tourism businesses in Norfolk and Suffolk, including Adnams, Africa Alive!, Banham Zoo, BeWILDerwood, Dinosaur Adventure, Flying Kiwi Inns, Gough Hotels, Norfolk Broads Direct, Norfolk Country Cottages, Suffolk Secrets and T&A Hotel Collection and Wroxham Barns. Consumer, customer and membership focussed, Visit East Anglia is managed by experts and brings a unified tourism voice to East Anglia.

Visit East Anglia is working closely with Greater Anglia, the new East Anglian rail franchise operator, and has established links with the major airports, seaports and other gateways in both East Anglia and neighbouring counties.

Visit East Anglia Limited is also supported by the New Anglia Local Enterprise Partnership (LEP) and is therefore fully aligned with the Tourism Strategy for England.

Appendix L - Norfolk Vanguard Examining Authority schedule of changes to the draft Development Consent Order (Issued 09 May 2019) and the proposed inclusion of new Requirement 34 (tourism and associated business impact mitigation strategy)

The Planning Inspectorate

Application by Norfolk Vanguard Limited for an Order granting Development Consent for the Norfolk Vanguard Offshore Wind Farm

The Examining Authority's schedule of changes to the draft Development Consent Order

Issued on 9 May 2019

Ref	ExA's suggested changes	ExA's comments
Contents		
Schedules	SCHEDULE 9 PART 5 — Procedure for Appeals SCHEDULE 10 PART 5 — Procedure for Appeals SCHEDULE 11 PART 5 — Procedure for Appeals SCHEDULE 12 PART 5 — Procedure for Appeals	Amendment consequential to Part 5 in each of Schedules 9, 10, 11 and 12
Ref	**ExA's suggested changes**	**ExA's comments**
Articles		
2	—(1) In this Order… "the 2009 Act" means the Marine and Coastal Access Act 2009(n); "the 2011 Regulations" means the Marine Licensing (Licence Application Appeals) Regulations 2011(**a**); (a) S.I. 2011/934	Amendment consequential to Part 5 in each of Schedules 9, 10, 11 and 12

Ref	ExA's suggested changes	ExA's comments
Articles		
2	—(1) In this Order… "temporary stopping up of public rights of way plan" means the plan certified as the temporary stopping up of public rights of way plan by the Secretary of State for the purposes of this Order; "the tourism and associated business impact mitigation strategy" means the document certified as the tourism and associated business impact mitigation strategy by the Secretary of State for the purposes of this Order;	To reflect suggested amendment by NNDC
5(3) to 5(6)	(3) The undertaker must consult the Secretary of State before making an application for consent under this article by giving notice in writing of the proposed application ~~and the Secretary of State shall provide a response within four weeks of receipt of the notice~~. (4) The Secretary of State must consult the MMO before giving consent to the transfer or grant to another person of the whole or part of the benefit of the provisions of the deemed marine licences. (5) The Secretary of State must consult National Grid before giving consent to the transfer or grant to a person of any or all of the benefit of the provisions of this Order (excluding the deemed marine licences referred to in paragraph (2) above) (6) ~~The Secretary of State must determine an application for consent made under this article within a period of eight weeks commencing on the date the application is received by the Secretary of State, unless otherwise agreed in writing with the undertaker~~. *Subsequent sub-paragraphs renumbered accordingly*	The issue of whether it would be appropriate for a decision of the Secretary of State relating to the transfer of the benefit of the Order to be subject to arbitration has been explored in the examination. The ExA has sought evidence in relation to the justification for the approach suggested by the Applicant.
37(1)	(z) the outline skills and employment strategy (8.22); ~~and~~ (aa) the Development Principles (8.23)~~.~~ ; and (bb) the tourism and associated business impact mitigation strategy (8.24).	To reflect suggested amendment by NNDC

Ref	ExA's suggested changes	ExA's comments
Requirements		
2	2.- (1) … (e) subject to sub-paragraph (2) have a draught height of less than 22 metres from MHWS;. (2) (a) the number of wind turbine generators [in Norfolk Vanguard East] with a draught height of less than [ ]m from MHWS comprised in the authorised project must not exceed [ ]. (b) the number of wind turbine generators [in Norfolk Vanguard West] with a draught height of less than [ ]m from MHWS comprised in the authorised project must not exceed [ ]. *Subsequent sub-paragraphs renumbered accordingly*	To reflect suggestions made by NE and RSPB if required following application of further collision risk model(s)
2	~~(3) The total number of wind turbine generators must be apportioned between Norfolk Vanguard East and Norfolk Vanguard West (rounded to the nearest whole number) in accordance with the following formula –~~ ~~(a) two thirds of the total number of wind turbine generators in Norfolk Vanguard West and one third of the total number of wind turbine generators in Norfolk Vanguard East; or~~ ~~(b) half of the total number of wind turbine generators in Norfolk Vanguard West and half of the total number of wind turbine generators in Norfolk Vanguard East~~. 3.—(1) The total number of wind turbine generators forming part of the authorised project must not exceed 180 and shall be configured such that at any time: (a) No more than two-thirds of the total number of wind turbine generators (rounded to the nearest whole number) must be located in Norfolk Vanguard West; and (b) No more than one half of the total number of wind turbine generators (rounded to the nearest whole number) must be located in Norfolk Vanguard East.	To allow for flexibility between the minimum and maximum parameters

Ref	ExA's suggested changes	ExA's comments
Requirements		
17(1)	(1) No stage of the onshore transmission works may commence until for that stage a code of construction practice has been submitted to and approved by the relevant planning authority, in consultation with Norfolk County Council, the relevant statutory nature conservation body and the Environment Agency.	To ensure that nature conservation interests are fully considered in the CoCPs.
18	(2) The landscaping management scheme must include details of proposed hard and soft landscaping works appropriate for the relevant stage, including— … (d) details of existing trees to be removed (~~d~~ e) details of existing trees and hedgerows to be retained with measures for their protection during the construction period; (~~e~~ f) retained historic landscape features and proposals for restoration, where relevant; (~~f~~ g) implementation timetables for all landscaping works; (~~g~~ h) proposed finished heights, form and gradient of earthworks; and (~~h~~ i) maintenance of the landscaping;	To ensure better understanding of tree removal proposed and consequent replanting considered necessary under this Requirement
19(2)	(2) Any tree or shrub planted as part of an approved landscaping management scheme that within a period of ~~five~~ ten years after planting, is removed, dies or becomes, in the opinion of the relevant planning authority, seriously damaged or diseased must be replaced in the first available planting season with a specimen of the same species and size as that originally planted unless a different species is otherwise agreed in writing with the relevant planning authority.	To reflect likely timescales for planting to become established in this locality.
20(2)	(2) The code of construction practice must accord with the outline code of construction practice and include details, as appropriate to the relevant stage, on— … (d) construction noise and vibration (including the use of low noise reversing warnings on vehicles and temporary acoustic barriers);	To reflect concerns of NNDC

Ref	ExA's suggested changes	ExA's comments
Requirements		
26	(2) Outside the hours specified in paragraph (1), construction work may be undertaken for essential activities including but not limited to— ~~(a) continuous periods of operation that are required as assessed in the environmental statement, such as concrete pouring, drilling, and pulling cables (including fibre optic cables) through ducts;~~ (b) delivery to the onshore transmission works of abnormal loads that may otherwise cause congestion on the local road network; (c) works required that may necessitate the temporary closure of roads; ~~(d) onshore transmission works requiring trenchless installation techniques;~~ (e) onshore transmission works at the landfall; (f) commissioning or outage works associated with the extension to the Necton National Grid substation comprised within Work No. 10A; (g) commissioning or outage works associated with the overhead line modification works comprised within Work No. 11 and Work No. 11A; (h) electrical installation; and (i) emergency works. ***[re-number sub-paragraphs accordingly]*** (5) No crushing or screening works must take place at any time on any of the mobilisation areas, without the prior written consent of the relevant local authority.	The ES does not consider continuous periods of operation as referred to in sub-paragraph (a) other than at landfall, nor does it consider the impact of onshore transmission works requiring trenchless installation outside of the normal working hours.
34	(1) No part of Works No. 4C or Work No. 5 within the District of North Norfolk may commence until such time as a tourism and associated business impact mitigation strategy has been submitted to and approved in writing by North Norfolk District Council. (2) The tourism and associated business impact mitigation strategy referred to in sub-paragraph (1) must include: (a) Details of a contribution to be paid by the undertaker to Tourism Information Centres, Visit North Norfolk, Visit Norfolk and any other relevant organisations supporting and promoting tourism in North Norfolk; (b) Details of a method by which the contribution by the undertaker in (a) will be apportioned to the above organisations; (c) Details of who will administer the strategy; (d) Details of how the strategy will be funded including the cost of administration;	Amendment reflects suggestion made by NNDC

	(e) Details of how any monies unspent are to be returned to the undertaker; (f) Details of marketing campaigns (including funding) to be run in order to market North Norfolk in advance of, during and after construction works have been completed for Norfolk Vanguard for the purpose of generating tourist footfall and spend. (3) The tourism and associated business impact mitigation strategy must be implemented as approved. *Subsequent Requirement number(s) renumbered accordingly*	

Ref	ExA's suggested changes	ExA's comments
Deemed Marine Licences		
	The following paragraph and condition numbers refer to Schedule 9. Where there are equivalent provisions in Schedules 10, 11 and 12 the same amendments would apply.	
Part 1	~~"the appeal parties" means the MMO, the relevant consultee and the undertaker;~~ ~~"business day" means a day other than Saturday or Sunday which is not Christmas Day, Good Friday or a bank holiday under section 1 of the Banking and Financial Dealings Act 1971~~;	Amendment reflects changes proposed to appeal procedure in Part 5
Part 4 Condition 9(11)	(11) In case of damage to, or destruction or decay of, the authorised project seaward of MHWS or any part thereof including the exposure of cables the undertaker must as soon as possible and no later than 24 hours following the undertaker becoming aware of any such damage, destruction or decay, notify MMO, MCA, Trinity House, the Kingfisher Information Service of Seafish and the UK Hydrographic Office.	Amendment seeks to mitigate safety risks to fishing operations.
Condition 9(12)	(12) In case of exposure of cables on or above the seabed, the undertaker must within ~~five~~ three days following the receipt by the undertaker of the final survey report from the periodic burial survey, notify mariners by issuing a notice to mariners, the MMO and by informing Kingfisher Information Service of the location and extent of exposure.	Amendment reflects suggestion made by MCA
Condition 14 (1)	(n) a lighting and marking plan (o) an operation and maintenance programme	Amendment reflects suggestion made by MCA
Condition 14(1)(e)	(ee) For the avoidance of doubt "distribution" in sub-paragraph (e) of this paragraph must include quantities in respect of each structure comprised in the offshore works and intended to be subject to scour and cable protection **[Condition 9 in each of Schedules 11 and 12 to be amended accordingly]**	To provide for certainty in the Scour Protection and Cable Protection Plan
Condition 15(1)	—(1) Any archaeological reports produced in accordance with condition 14(h)(iii) ~~are to~~ must be agreed with the statutory historic body.	Amendment reflects drafting protocol
Condition 15(5)	(5) Unless otherwise agreed in writing with the undertaker, the MMO must use reasonable endeavours to determine an application for approval made under condition 14 as soon as practicable and in any event within a period of ~~six~~ four months commencing on the date the application is received by the MMO. ~~or if the MMO reasonably requests further information to~~	To reflect concerns of TH and provide certainty and consistency whilst preserving the possibility of

	~~determine the application for approval, within a period of four months commencing on the date that the further information is received by the MMO. For the purposes of this paragraph (5), the MMO may only request further information from the undertaker within a period of two months from receipt of the application for approval.~~	extension of time by agreement
Condition 15(8)	~~(8) No part of the authorised scheme may commence until the MMO, in consultation with(8) the MCA, has given written approval of an Emergency Response Co-operation Plan (ERCoP) which includes full details of the plan for emergency, response and co-operation for the construction, operation and decommissioning phases of that part of the authorised scheme in accordance with the MCA recommendations contained within MGN543 "Offshore Renewable Energy Installations (OREIs) – Guidance on UK Navigational Practice, Safety and Emergency Response Issues" and has confirmed in writing that the undertaker has taken into account and, so far as is applicable to that part of the authorised scheme, adequately addressed MCA recommendations contained within MGN543"Offshore Renewable Energy Installations (OREIs) – Guidance on UK Navigational Practice, Safety and Emergency Response Issues" and its annexes. The ERCoP and associated guidance and requirements must be implemented as approved, unless otherwise agreed in writing by the MMO in consultation with the MCA. The document must be reviewed at least annually or whenever changes are identified, whichever is sooner, and any proposed changes must be submitted to the MMO in writing for approval, in consultation with MCA.~~ (8) No part of the authorised project may commence until the MMO, in consultation with the MCA, has confirmed in writing that the undertaker has taken into account and, so far as is applicable to that stage of the project, adequately addressed all MCA recommendations as appropriate to the authorised project contained within MGN543 "Offshore Renewable Energy Installations (OREIs) – Guidance on UK Navigational Practice, Safety and Emergency Response Issues" and its annexes.	Amendment reflects suggestion made by MCA
Condition 18	(2)(b) "a high-resolution full sea floor coverage swath-bathymetry survey to include a 100% coverage that meets the requirements of IHO(b) S44ed5 Order 1a, and side scan sonar, of the area(s) within the Order limits in which it is proposed to carry out construction works and disposal activities under this licence;"	To reflect HE requirements to the extent they surpass IHO(b) S44ed5 Order 1a and provide certainty over extent of works affected
Condition 20	2(e) a bathymetric survey to monitor the effectiveness of archaeological exclusion zones identified to have been potentially impacted by construction works. The data shall be analysed by an accredited archaeologist as defined in the offshore written scheme of investigation required under condition 14(h).	Amendment reflects suggestion by HE

Schedule 10, Part 3, paragraph 2(1)	Work No. 1 (phase ~~1~~ 2)	To reflect the authorised works under the licence
Schedule 12, Part 3, paragraphs 2(1) – (4)	Work No. 2 (phase ~~1~~ 2) Work No. 3 (phase ~~1~~ 2) Work No. 4A (phase ~~1~~ 2) Work No. 4B (phase ~~1~~ 2)	To reflect the authorised works under the licence

Ref	ExA's suggested changes	ExA's comments
Schedules 9-12, Part 5 Appeal Procedure		
Part 5 Procedure for appeals	~~23. The undertaker must submit to the Secretary of State, a copy of the application submitted to the MMO and any supporting documentation which the undertaker may wish to provide ("the appeal documentation").~~ ~~24. The undertaker must on the same day provide copies of the appeal documentation to the MMO and any relevant consultee.~~ ~~25. As soon as is practicable after receiving the appeal documentation, but in any event within 20 business days of receiving the appeal documentation, the Secretary of State must appoint a person and forthwith notify the appeal parties of the identity of the appointed person and the address to which all correspondence for that person's attention should be sent.~~ ~~26. The MMO and any relevant consultee must submit written representations to the appointed person in respect of the appeal within 20 business days of the date on which the appeal parties are notified of the appointment of a person under paragraph 25 and must ensure that copies o f their written representations are sent to each other and to the undertaker on the day on which they are submitted to the appointed person.~~ ~~27. The appeal parties must make any counter-submissions to the appointed person within 20 business days of receipt of written representations pursuant to paragraph 26 above.~~ ~~28. The appointed person must make his decision and notify it to the appeal parties, with28. reasons, as soon as reasonably practicable. If the appointed person considers that further information is necessary to enable him to consider the appeal he must, as soon as practicable, notify the appeal parties in writing specifying the further information required, the appeal party from whom the information is sought, and the date by which the information is to be submitted.~~ ~~29. Any further information required pursuant to paragraph 28 must be provided by the party from whom the information is sought to the appointed person and to other appeal parties by the date specified by the appointed person. Any written representations concerning matters contained in the further information must be submitted to the appointed person, and made available to all appeal parties within 20 business days of that date.~~ ~~30. On an appeal the appointed person may –~~ ~~(a) allow or dismiss the appeal; or~~ ~~(b) reverse or vary any part of the decision of the MMO (whether the appeal relates to(2) that part of it or not),~~	To provide for an appeal procedure broadly consistent with existing statutory processes and consistent with similar DCO's

	~~and may deal with the application as if it had been made to the appointed person in the first instance.~~ ~~31. The appointed person may proceed to a decision on an appeal taking into account only such written representations as have been sent within the time limits prescribed, or set by the appointed person, under this paragraph.~~ ~~32. The appointed person may proceed to a decision even though no written representations have been made within those time limits, if it appears to the appointed person that there is sufficient material to enable a decision to be made on the merits of the case.~~ ~~33. The decision of the appointed person on an appeal is final and binding on the parties, and a court may entertain proceedings for questioning the decision only if the proceedings are brought by a claim for judicial review.~~ ~~34. If an approval is given by the appointed person pursuant to this Schedule, it is deemed to be an approval for the purpose of Part 4 of Schedule 9 as if it had been given by the MMO. The MMO may confirm any determination given by the appointed person in identical form in writing but a failure to give such confirmation (or a failure to give it in identical form) may not be taken to affect or invalidate the effect of the appointed person's determination.~~ ~~35. Save where a direction is given pursuant to paragraph 36 requiring the costs of the35. appointed person to be paid by the MMO, the reasonable costs of the appointed person must be met by the undertaker.~~ ~~36. On application by the MMO or the undertaker, the appointed person may give directions as to the costs of the appeal parties and as to the parties by whom the costs of the appeal are to be paid. In considering whether to make any such direction and the terms on which it is to be made, the appointed person must have regard to the Planning Practice Guidance on the award of costs or any guidance which may from time to time replace it.~~ (1) Where the MMO refuses an application for approval under condition 14 *[condition 9 in Schedules 11 and 12]* and notifies the undertaker accordingly, or fails to determine the application for approval in accordance with condition 15 *[condition 10 in Schedules 11 and 12]* the undertaker may by notice appeal against such a refusal or non-determination and the 2011 Regulations shall apply subject to the modifications set out in paragraph (2) (2) The 2011 Regulations are modified so as to read for the purposes of this Order only as follows— (a) In regulation 6(1) (time limit for the notice of appeal) for the words "6 months" there is substituted the words "4 months".	

	(b) For regulation 4(1) (appeal against marine licensing decisions) substitute— "A person who has applied for approval under condition 15 of Part 4 of Schedule 9; condition 15 of Part 4 of Schedule 10; condition 10 of Part 4 of Schedule 11; or condition 10 of Part 4 of Schedule 12 to the Norfolk Vanguard Offshore Wind Farm Order 201[ ] may by notice appeal against a decision to refuse such an application or a failure to determine such an application." (c) For regulation 7(2)(a) (contents of the notice of appeal) substitute— "a copy of the decision to which the appeal relates or, in the case of non-determination, the date by which the application should have been determined; and " (d) In regulation 8(1) (decision as to appeal procedure and start date) for the words "as soon as practicable after" there is substituted the words "within the period of [2] weeks beginning on the date of". (e) In regulation 10(3) (representations and further comments) after the words "the Secretary of State must" insert the words "within the period of [1] week" (f) In regulation 10(5) (representations and further comments) for the words "as soon as practicable after" there is substituted the words "within the period of [1] week of the end of". (g) In regulation 12(1) (establishing the hearing or inquiry) after the words "("the relevant date")" insert the words "which must be within [14] weeks of the start date". (h) For regulation 18(4) substitute— "Subject to paragraphs (1) and (3), each party should bear its own costs of a hearing or inquiry held under these Regulations." (i) For regulation 22(1)(b) and (c) (determining the appeal—general) substitute— "(b) allow the appeal and, if applicable, quash the decision in whole or in part; (c) where the appointed person quashes a decision under sub-paragraph (b) or allows the appeal in the case of non-determination, direct the Authority to approve the application for approval made under condition 15 of Part 4 of Schedule 9; condition 15 of Part 4 of Schedule 10; condition 10 of Part 4 of Schedule 11; or condition 10 of Part 4 of Schedule 12 to the Norfolk Vanguard Offshore Wind Farm Order 201[ ]." (j) In regulation 22(2) (determining the appeal—general) after the words "in writing of the determination" insert the words "within the period of [12] weeks beginning on the start date where the appeal is to be determined by written representations or within the period of [12] weeks beginning on the day after the close of the hearing or inquiry where the appeal is to be determined by way of hearing or inquiry"	

End of schedule