National Trust

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By email: sizewellc@planninginspectorate.gov.uk

Your Ref: EN010012
Our Ref: 20026265

Dear Sir/Madam

Application by NNB Generation Company (SZC) Limited for an Order Granting Development Consent for The Sizewell C Project

Procedural Deadline 2 Submission: Written Representation

Please find attached our Written Representation in respect of the application for a Development Consent Order for the proposed Sizewell C Nuclear Power Station.

Yours faithfully

[redacted]

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National Trust Written Representation

Sizewell C Nuclear Power Station

1. Introduction

1.1. The National Trust (the NT) was founded in 1895 as an independent charity to hold and manage, in perpetuity for the benefit of the nation, countryside and historic buildings in England, Wales and Northern Ireland. The NT fulfils its statutory responsibilities as laid down in the National Trust Acts, through ownership and direct management of the properties in its care. Section 4 of the National Trust Act 1907 defines the purpose of the National Trust as "The permanent preservation for the benefit of the nation of lands and tenements (including buildings) of beauty or historic interest and as regards lands for the preservation (so far as practicable) of their natural aspect features and animal and plant life". The Act also enables the NT to declare land inalienable, meaning that such land cannot be sold or mortgaged and once declared cannot be reversed.

2. Context

2.1. The National Trust owns 140 hectares of land at Dunwich Heath and Beach, which is located approximately 3 kilometres from the Sizewell C site, within the designated Suffolk Coast & Heaths Area of Outstanding Natural Beauty (AONB). Dunwich Heath is a surviving fragment of lowland heath – one of the UK's rarest habitats and forms a substantial part of a large continuous 400 hectare heathland tract at Minsmere, Dunwich, Westleton and Walberswick. Its sweeping slopes of heather and gorse, sandy soil and acid grassland support many insects, birds and animals which depend on this specialised heathland habitat. The site welcomes approximately 175,000 visitors per year. Conservation work continues to ensure that land at Dunwich continues to provide both an important space for wildlife to thrive and a special place for everybody to enjoy for years to come.

2.2. The majority of the land owned by the NT at Dunwich Heath and Beach was declared inalienable in 1967 and this demonstrates the importance of the land to the nation and that the Trust has a duty of care for it in the long term.

2.3. The Suffolk Coast is of unique importance for nature conservation supporting a diversity of habitats and species unparalleled in the UK, particularly in the area between Slaughden and Southwold.

2.4. Designations: The National Trust's land at Dunwich Heath and Beach is subject to the following designations:

- Misnmere to Walberswick Heaths and Marshes SAC
- Minsmere to Walberswick SPA
- Minsmere to Walberswick Ramsar Site
- Minsmere to Walberswick Heaths and Marshes SSSI
- Suffolk Coast and Heaths Area of Outstanding Natural Beauty (AONB)

- Suffolk Heritage Coast

3. Areas of interest

3.1. This Written Representation sets out the National Trust's response to the application for Development Consent submitted by NNB Generation Company (SZC) Ltd (hereafter referred to as 'the applicant'), including the changes which were submitted by the applicant in January 2021 and accepted by the Examining Authority on the 21st April 2021.

3.2. The Trust's key areas of interest are:

1. Recreational Displacement: Impact on the visitor capacity, enjoyment and infrastructure of our site at Dunwich Heath and Beach (see Section 6)

2. Recreational Displacement: Impacts on ecology and designated sites at Dunwich Heath and Beach and the wider Minsmere-Walberswick SSSI, SAC, SPA and Ramsar site. (see Section 7)

3. Recreational Displacement: Provision of alternative greenspace (see Section 8)

4. Landscape and Visual Impacts on our land at Dunwich Heath and Beach and the wider AONB (see Section 9)

5. Coastal Geomorphology and Long Term Coastal Change (see Section 10)

6. Impact on Tourism on the Suffolk Coast (see Section 11)

7. Historic Environment; Impacts from the development on non-designated heritage assets and impacts from the development on archaeology (see Section 12)

3.3. The comments set out in this representation apply to the lifetime of the development (construction, operation and decommissioning) and consider direct and indirect impacts on our land.

3.4. The National Trust has welcomed recent engagement with the applicant to discuss queries and concerns following the submission of the DCO application. **However, the NT remains concerned about the methodology and conclusions of some assessments submitted with the application, the absence of some key plans and assessments and inadequate proposals for monitoring, mitigation and compensation. We do not believe at this stage that adverse impacts upon Dunwich Heath and Beach and the wider designated wildlife sites or landscape can be avoided, mitigated or compensated.**

3.5. A number of the matters the NT raise within this Written Representation are the subject of discussions with the applicant and form part of the draft Statement of Common Ground (SOCG). The applicant shared a first draft of the SOCG on the 25 February. The Trust provided comments back to the applicant on the 22 March. A second draft of this document was meant to be shared with the Trust on the 1 April. EDF recently provided us with this second draft on the 21 May, but the NT has not yet had the opportunity to respond in writing to this and therefore we can confirm to the examiner(s) that all matters of concern

remain not agreed and that we are hopeful of more engagement following the submission of this written representation.

4. Changes to the Application

4.1. In January 2021 the applicant submitted a number of changes to the application. These have been accepted by the Examining Authority and form part of the application to be examined. The changes of interest or concern to the National Trust are:

1. Change 2: The change to the design of the permanent beach landing facility, which would require additional piles and would be greater in length (100 metres in total length)

2. Change 2: The construction of a new, temporary beach landing facility which would be in operation for approximately 8 years. This would be located c.165 metres to the south of the permanent BLF, would be up to approximately 505 metres in length and 12 metres in width and include a jetty head of up to approximately 62 metres wide for unloading vessels.

3. Change 2: The installation of a temporary conveyor along the length of the temporary BLF which would continue to the Hard Coastal Defence Feature and into the secure construction area. This would pass over the Coast Path.

4. Change 2: Increased vessel traffic to the temporary and permanent beach landing facilities

5. Change 4: Changes to parameter heights and activities on the main development site, including working heights of up to 40m AOD and exceptional working heights of up to 70m AOD for the construction of marine shafts and tunnelling.

6. Change 4: Reduction in the maximum height of the southern-most pylon from 79m AOD to 59mAOD.

7. Change 9: Changes to the design and height of the temporary sea defence, changes to the location and height of the Hard Coastal Sea Defence (HCDF) and management of the Soft Coastal Sea Defence (SCDF)

4.2. References to these changes will made, where relevant, in the following sections.

5. Principle of Development

5.1. The National Trust acknowledges that, as set out in The Planning Act 2008, major infrastructure proposals must be considered in accordance with National Policy Statements (NPS) and that the NPS for Nuclear Power Generation (EN-6) identifies Sizewell as a potentially suitable site for a nuclear power station.

5.2. However, Paragraph 1.1.2 of Overarching NPS for Energy EN-1 sets out that the IPC must decide an application for energy infrastructure in accordance with the relevant NPSs **except to the extent it is satisfied that to do so would result in adverse impacts from the**

development outweighing the benefits. The fact that a site is identified as potentially suitable within this NPS does not prevent the impacts being considered greater than the benefits.

5.3. With this in mind we believe the location and design of all energy schemes should take into account the full range of environmental considerations (given the potential for a high level of adverse impact to the landscape and environment of such schemes).

6. Recreational Displacement: Impact on the visitor capacity, enjoyment and infrastructure of our site at Dunwich Heath and Beach

6.1. The National Trust is concerned about an increase in visitors to Dunwich Heath and Beach as a result of the proposed development and the pressure that that this would place upon visitor infrastructure (e.g. car park, toilets, café, play area, paths) and the ability of NT staff to be able to engage with visitors. This increase would arise from local visitors, particularly dog walkers, due to displacement from Sizewell during construction and recreational visits by the construction workforce.

Recreational displacement

6.2. The area around the proposed Sizewell C main development site currently provides good opportunities for public access and outdoor recreation. This is primarily provided by the Sizewell beach frontage of the main development site, permissive access on parts of the EDF estate, including Kenton and Goose Hills woodlands, and the public footpaths in the vicinity of the development site. However, the proposal would introduce a significant amount of disruption to this provision during both the construction and operation stages of the development as a consequence of the introduction of new built form and infrastructure to the main development site, the beach and extending seaward, and limitations to the permissive path network on the EDF estate. In particular, we are concerned about the proposed enhanced permanent beach landing facility, the new temporary beach landing facility and associated conveyor (by virtue of their location and size), the noise and disruption as a result of the construction works and the increased traffic on local roads. The temporary closures of the coast path and footpath diversions which will be in place will diminish the users experience and make the area a much less attractive place to visit for recreation. As a result, local residents and visitors will seek alternative locations to visit. The applicant accepts this and acknowledges that displacement to other locations, including Dunwich Heath will occur. Ref: ES Volume 2 Main Development Site Chapter 15 Amenity and Recreation, Para.15.6.175 (Link to document)

6.3. The applicant carried out Visitor Surveys in 2014 to inform the recreational evidence base and assessments which have been submitted with the application. The 'Sizewell C Visitor Surveys' which can be found at Appendix A of ES Volume 2 Main Development Site Chapter 15 Amenity and Recreation Appendices 15A - 15J Part 1 of 3 (link to document) state that the Suffolk Coast Path at Dunwich Heath and Sizewell Beach were by far the busiest sites (Para.3.1.3). Dunwich Heath was also one of the locations where the greatest number of dog walkers were observed (para.3.1.10). The locations used most often were Dunwich Heath (estimated by EDF to be 175,934 visits pa) and Sizewell Beach (estimated by EDF to be 195,557 visits pa) – both coastal locations (see labelled pg 22/pdf pg24 - Table 8 para 3.1.4 and para.5.1.8). The National Trust agrees that the estimated annual visits to Dunwich Heath broadly accords with our view. We also agree that Dunwich Heath is one of the busiest coastal recreation sites that has the potential to be impacted by the development.

6.4. ES Volume 2 Main Development Site Chapter 15 Amenity and Recreation, Para.15.6.7, states the PRoW, Open Access Land, registered common land, permissive footpaths and the beach within the Suffolk Coast and Heaths AONB are judged to be of high value and high sensitivity. They are of high value because recreation is of great importance to the AONB. The National Trust agrees with this statement. The applicant acknowledges that there are expected to be long-term moderate adverse effects (significant) during the construction phase on, inter alia, users of receptor groups 5 Westleton Walks and Dunwich Heath and Receptor 8 Dunwich to Minsmere Coast in Para. 15.7.2. (Link to document)

6.5. The National Trust believes that a number of adverse effects would arise from an increase in visitor numbers at Dunwich Heath as a result of recreational displacement from Sizewell. The Sizewell C Visitor Survey (2014) results also show that 29% of 514 respondents would stop using the area around Sizewell C during construction (Para.15.6.32). Furthermore, the Rights of Way User Survey 2014 Sizewell C - Questionnaire Results set out at Appendix C show that Dunwich Heath is the most favoured alternative area to visit to avoid the construction. (Link to document) (PDF page 91).

6.6. The applicant has sought to quantify the recreational displacement to Dunwich Heath in their application. However, **the National Trust has concerns about the methodology used to calculate displaced visitors and we are of the opinion that these are not precautionary (as required by the Habitats Regulations Assessment guidance) and could be significantly higher than quoted in Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment Part 4 of 5, Appendix E Recreational Disturbance Assessment (Minsmere to Walkberswick SPA/SAC) (Link to document). We also have concerns about how these have been used to inform the Environmental Statement (ES) and the shadow Habitats Regulations Assessment (HRA) as discussed in Section 7 of this document.**

6.7. EDF have taken two approaches to estimate additional visits to locations as a result of displacement of existing users from the Sizewell area and the construction workforce; identified by EDF as a **realistic** and a **precautionary** approach.

6.8. The methodology for calculating the **realistic** approach is set out in Para.3.2.28, (pdf page 438, marked page 38) of Annex A Recreational Disturbance Evidence Base contained in Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment Part 4 of 5, Appendix E Recreational Disturbance Assessment (Minsmere to Walkberswick SPA/SAC). This applies a percentage increase (2.33% which represents the number of respondents to the Visitor Survey who named Dunwich Heath as a location they would be displaced to) to represent displacement to Dunwich Heath based on the applicants estimated annual visitor numbers to Dunwich Heath. We disagree with this approach as it would not be visitors to our site (i.e. applying the 2.33% to our 175,000 visitors) that would be displaced to our site.

6.9. The methodology for calculating the **precautionary** approach is set out in Para.3.2.30, (pdf page 439, marked page 39) of the document referenced above in para.6.8. For Dunwich Heath it applies the same 2.33% to an estimated figure of 500,000 visits/year in the Sizewell survey area. As set out in Para 3.2.27, (i. Calculation of annual visits to the area) of Annex A: Recreational Disturbance Evidence Base (see PDF page 438, printed page 38) this 500,000 figure is a rounding down of estimated annual levels of use (517,246) based on counts at each of the seven 2014 Sizewell C visitor surveys locations, with no explanation as to why a rounded down figure is deemed precautionary.

6.10. The National Trust is further concerned that the use of 2.33% does not represent a precautionary approach to the calculation of recreational displacement to Dunwich Heath. This is because this figure does not make any allowance for:

- The 56 respondents (10.89% of the total no. of respondents) who stated they would be displaced but did not name a location
- The 13 respondents (2.5% of the total no. of respondents) who said they were not sure they would be displaced by the development
- The 18 respondents (3.5% of the total no. of respondents) who did not provide a response on displacement

6.11. The Trust accepts that it would be unrealistic to fully uplift the percentage increase in visitors at Dunwich Heath to reflect these three bullet points as these respondents are referring to the wider Sizewell area. However, we feel an appropriate approach that would be precautionary would have been to accommodate an allowance for this uncertainty in EDF's methodology. Given Dunwich Heath is one of the six locations identified as being most frequently mentioned (Para. 4.1.22 Appendix A of ES Volume 2 Main Development Site Chapter 15 Amenity and Recreation Appendices 15A - 15J Part 1 of 3 link to document) by respondents as an alternative location for recreation, it would be seem reasonable to apportion this number across six sites.

6.12. The realistic approach that the applicant has used to inform their assessments gives a displacement figure of 4,288 for Dunwich Heath. However, we are of the opinion that using the precautionary approach set out by the applicant and factoring in adjustments to resolve both the rounding down and the uncertainty contained within the survey as explained above, would provide a figure for recreational displacement closer to 26,000 additional annual visits to Dunwich Heath.

6.13. The National Trust is also of the opinion that the additional infrastructure proposed as a result of the changes to the application (notably the addition of a new temporary beach landing facility and conveyor which would cross the beach in front of the application site, requiring walkers to pass underneath it) would further deter people from Sizewell and displace visitors to other locations. The extent and impact of the development now proposed is therefore different from that which was used to inform the questions posed as part of the Sizewell C Visitor Surveys undertaken in 2014. Given this and preceding points made in this document the Trust remains concerned that figures used in the assessments are not precautionary.

Visits by the construction workforce

6.14. The applicant has sought to quantify the number of visits made to Dunwich Heath by the construction workforce in their application. **The National Trust has concerns about the methodology used to estimate the use of the countryside by the workforce and believe the resultant estimates are exceptionally low and not precautionary.**

6.15. It is stated in Para 3.3.17, PDF page 447, number page 47 of Annex A: Recreational Disturbance Evidence Base (Link) that a mid-range estimate (between what is uncertain) has been set at around 10% to represent the likelihood of campus, private rented sector and tourist accommodation based workers (who do not have dogs with them – this is 4,800 workers) visiting outdoor informal recreational resources around Sizewell once a week. The

National Trust believes the use of the 10% figure is very low and would question whether it represents a precautionary approach to estimating the number of additional visits to the countryside that could be made by the construction workforce. It is of note that the 2018/19 MENE report (See Appendix E) states 65% of adults spend time in the natural environment at least once a week. The use of this figure would clearly increase the number of estimated visits to Dunwich Heath by the construction workforce without dogs by 6.5 times. We remain unclear as to the justification and evidence on which the 10% figure has been based.

6.16. The 10% figure is then multiplied to reflect a theoretical number of annual visits and adjusted down to allow for shift patterns and holidays. To make this figure site specific a percentage has been derived for each named location from a survey of Non-home based outage workers in 2016 (see para 15.6.52, pdf page 64, number page 61, ES Volume 2, Chapter 15, Amenity and Recreation) (Link) which asked workers where they visited in 'the countryside around Sizewell', as well as 'other' and 'open space, park or playing field in town or village'. Given the long lead-in time for this development proposal it is of concern to the Trust that the assessment of visits to the countryside (including our site) by the construction workforce is reliant on a single survey of construction workers. Given the applicant's unique position to access this type of audience the Trust would have expected the applicant to draw on a more comprehensive evidence base in support of estimates contained within its submission.

Uncertainty over inconsistent use of figures in documents

6.17. **The National Trust is also concerned that the use of figures by the applicant is inconsistent and it is difficult to follow where and how these figures have been used**. This is compounded when different totals are used, for example;

- It is stated in ES Volume 2 Main Development Site Chapter 14 Terrestrial Ecology and Ornithology Appendix 14B1 Plants and Habitats Synthesis Report Para 1.3.52 (pdf page 23, marked page 20), that 'The Recreational Disturbance Evidence Base has estimated that the total number of additional visits to the wider countryside by the construction workforce would be 60,000 per year.' This figure is then assigned to key locations but does not add up to the number specified.

- Table 3.9: Estimated numbers of construction worker visits to locations per year included in Annex A: Recreational disturbance evidence base of Appendix E: Recreational Disturbance Assessment (PDF page 450) does not include a total column that aggregates the numbers of visits by workers without dogs and workers with dogs. It if did it would state a figure of 32,706 for total visits by construction workers. This does not accord with the above total figure (60,000) contained within the Plants and Habitats Synthesis Report or its breakdown of key locations.

- Table 2.1 of the Shadow HRA report Appendix E: Recreational Disturbance Assessment (PDF page 320) does not include in its total the visits by construction workers with dogs.

6.18. **The inconsistent use of figures is of great concern when trying to establish whether the approach adopted by the applicant is precautionary and when seeking clarity over the figures applied to consideration of our site.** We currently have a range of visits by construction workers quoted to be 327 or 2,000. We presume this disparity makes it difficult for EDF, other managers of sites and regulators to clearly understand the impacts or

mitigation requirements related to recreational displacement. We have asked for clarity on this matter from EDF but have yet to receive a clear and concise explanation regarding the use of figures in each assessment.

Monitoring & Mitigation

6.19. The National Trust notes that Para.5.10.24 of EN-1 states "Rights of way, National Trails and other rights of access to land are important recreational facilities for example for walkers, cyclists and horse riders. The IPC should expect applicants to take appropriate mitigation measures to address adverse effects on coastal access, National Trails and other rights of way. Where this is not the case the IPC should consider what appropriate mitigation requirements might be attached to any grant of development consent". Furthermore, the Trust notes and supports Policy SCLP3.4 (Proposals for Major Energy Infrastructure Projects) of the adopted Suffolk Coastal Local Plan (September 2020) states that such projects should deliver positive outcomes for the local community and surrounding development.

6.20. The National Trust notes mention of Terrestrial Ecology Monitoring & Mitigation Plan in Requirement 4 in the draft DCO. We also acknowledge the applicant's proposal to develop a Dunwich Heath Monitoring and Mitigation Plan that in part relates to the monitoring and mitigation of recreational displacement and visitor pressure. However, it is unclear how the Dunwich Heath Monitoring and Mitigation Plan relates to Requirement 4 and whether it would be secured through the draft DCO or through the s.106 agreement.

6.21. **The National Trust considers that the impacts of recreational displacement on Dunwich Heath have been poorly assessed**. If Development Consent is granted, the Trust feels it is imperative that ring-fenced mitigation funding is provided to enable us to monitor, manage and engage with the predicted increase in visitors and demand on our property operations and visitor infrastructure that will arise as a consequence of this development. This funding should cover the duration of the construction phase of development (predicted to last 12 years).

6.22. We acknowledge that the applicant is proposing a Resilience Fund for the National Trust and we understand that EDF states the purpose of this fund is to off-set perceived impacts and risks caused by the development. We note that Schedule 13 (Resilience Funds) includes a provision for the National Trust Dunwich Heath and Coastguard Cottages Resilience Fund and we can confirm we have held some limited discussions with EDF on this matter but that it has yet to be agreed. We are concerned however that by agreeing to accept funding as part of a Resilience Fund that this would prevent us from being able to access other appropriate funds for mitigation should this be required as a result of ongoing monitoring. It may also preclude us from being able to work in partnership, such as with the AONB Partnership or the Suffolk Coast Destination Management Organisation and others to deliver mitigation beyond our site boundary (for example the delivery of compensatory habitat or landscape schemes within the AONB).

7. Recreational Displacement: Impacts on ecology and designated sites at Dunwich Heath and Beach and the wider Minsmere-Walberswick SSSI, SAC, SPA and Ramsar site.

7.1. The National Trust believes that recreational displacement arising from the proposed Sizewell C power station development has the potential to adversely impact upon UK and

European protected species and habitats at Dunwich Heath and beach, and at a landscape scale across the wider Minsmere-Walberswick SSSI, SAC, SPA and Ramsar site.

7.2. The Suffolk Coast and particularly this area between Southwold and Aldeburgh is popular for recreation, which includes tourists, day visitors, and local residents. The Sizewell C proposal would result in changes in recreational use as it would involve a large construction workforce that would be living and working in the area. In addition, construction work would displace existing recreation use around the main development site (for example through footpath diversions, beach closure, noise, traffic, etc). This is likely to lead to an increase in recreational users at Dunwich Heath and beach, most notably regular dog walkers. These visitors may not be familiar with, or sympathetic to the sensitivities of the site which could give rise to the potential for resultant disturbance (especially by dog walkers) to ground nesting birds particularly, important designated and undesignated wildlife features of lowland heath and coast. An unmanaged increase in visitor numbers would unacceptably increase the risk of damage, contamination, disturbance and fire resulting in loss of ecological features of international importance and destruction of bird breeding habitats at Dunwich Heath and Beach.

7.3. The National Trust note para 5.3.3 of EN-1 states "Where the development is subject to EIA the applicant should ensure that the ES clearly sets out any effects on internationally, nationally and locally designated sites of ecological or geological conservation importance, on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity". The following paragraph goes on to state that the applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests. Para.5.3.8 states "In taking decisions, the IPC should ensure that appropriate weight is attached to designated sites of international, national and local importance; protected species; habitats and other species of principal importance for the conservation of biodiversity; and to biodiversity and geological interests within the wider environment".

7.4. **The impact of visitor displacement to Dunwich Heath and Beach on wildlife and ecology has not been adequately assessed in the Shadow HRA and ES, largely due to flawed data and survey methodology and lack of precautionary approach resulting in a likely severe underestimation. These concerns are supported by the findings in an independent report produced by Footprint Ecology, commissioned by the National Trust and RSPB jointly.**

7.5. Dunwich Heath must be included in the proposals for an Ecological Management and Monitoring Plan to enhance existing recreational management measures and minimise the potential for recreational disturbance on breeding nightjar and other breeding birds of heathland habitats, Dartford Warbler, Stone Curlew and Woodlark. This plan must also include monitoring and mitigation for the heathland habitat and vegetated shingle. It should identify all necessary avoidance, mitigation, compensation, offset and enhancement and monitoring measures with regards to species affected by the development and must take into account both the direct and indirect impacts.

<u>The ecological importance and sensitivity of Dunwich Heath to increased recreation usage</u>

7.6. As stated in the context section of this Written Representation our site and Dunwich Heath and Beach is subject to a large number of designations and comprises of a mosaic of heather heathland, acid grassland and woodland/scrub habitats, supporting rare plants, ground nesting birds and invertebrates. These habitats and species are all sensitive to recreational

pressures. The National Trust is expanding this heathland habitat by reverting former arable land to heath at adjacent Mount Pleasant Farm, creating areas of more heather and acid grassland, reversing national habitat loss trends, adapting to coastal change and repairing local habitat fragmentation.

7.7. The beach at Dunwich Heath supports a unique and fragile perennial and annual vegetated shingle habitat (also designated SSSI/SAC features), with rare plant species such as yellow horned poppy, sea kale and sea pea and specialist shingle invertebrates. Vegetated shingle habitat is very vulnerable to trampling which harms the plants and breaks down the delicate shingle structure that allows them to grow.

7.8. The soft cliff habitat at Dunwich presents a rare dynamic natural transition between heath and beach habitats and is particularly important for specialist invertebrates, scarce plants and sand martins. Many of these are niche species have adapted to the cliffs exposed friable conditions and needs to stay undisturbed for nature to thrive.

7.9. National Trust staff and volunteers undertake carefully planned management to maintaining the balance of these component parts, essential for good ecological condition.

7.10. Dunwich Heath is open access land and crossed by a number of Public Right of Ways (PRoWs) and permissive paths so requires much active management by National Trust staff and volunteers to ensure optimal condition for habitats and species, whilst also welcoming visitors to enjoy this popular and beautiful place in a responsible and informed way that cares for nature. Avoiding disturbance to ground-nesting birds and other wildlife, particularly by free ranging dogs and trampling of sensitive heathland and vegetated shingle habitat is vitally important to maintain favourable condition of designated features.

7.11. In light of our concerns about recreational displacement arising from the proposed development adversely impacting on Minsmere-Walberswick SAC/SPA features, in summer 2020 National Trust and RSPB jointly commissioned Footprint Ecology to examine impacts of recreation related to Sizewell C and implications for European sites (Liley, D. & Saunders, P. (2020)[1]), plus review Sizewell C application documents and evidence in relation to recreation impacts (Liley, D. & Saunders, P. (2020)[2]). Footprint Ecology are consultants working in the field of assessing recreational impacts on ecology. The full reports that present their findings can be found at Appendix C.

7.12. Footprint Ecology highlight a wide range of vulnerable features and risks to the conservation interest resulting from recreation use including:

- Annual vegetation of drift lines (Minsmere to Walberswick Heaths & Marshes SAC), risks from damage and contamination;
- Perennial vegetation of stony banks (Minsmere to Walberswick Heaths & Marshes SAC), risks from damage and contamination;
- European dry heaths (Minsmere to Walberswick Heaths & Marshes SAC), risks from fire and contamination;
- Breeding Nightjar (Minsmere to Walberswick SPA), risks from disturbance and fire, and;
- Breeding Woodlark and Nightjar (Sandlings SPA), risks from disturbance and fire (Liley, D. & Saunders, P. (2020)[1])

7.13. Footprint Ecology raised concerns about the adequacy of EDF Co's assessment. Its report overview states "*The assessment by EDF is not adequate to rule out the conclusion of no adverse effect on integrity set out in the HRA*", that visitor survey providing an accurate description of current use across European sites and supporting habitat to inform mitigation was lacking , stating "*instead a number of errors and muddled information with conflicting information scattered across different reports. There is a lack of details as to what the levels of change are to be expected in which precise locations and a failure to apply this to the ecological interest at the appropriate level of detail*" (Liley, D. & Saunders, P. (2020)[2]) (Page 6).

7.14. Footprint Ecology findings support the National Trust's opinion that recreational displacement arising from the proposed development has the potential to adversely impact upon UK and European protected species and habitats at Dunwich Heath and beach and at a landscape scale across the wider SSSI/SAC/SPA/Ramsar Site. Additional documentation provided by EDF since the Footprint Ecology review does not change this opinion.

<u>The National Trust concerns about the assessment of impact of increased recreational visitor numbers on Dunwich Heath and wider Minsmere-Walberswick's ecological features</u>

7.15. **The National Trust consider that the impact of increased recreational disturbance on ecological features at Dunwich Heath and the wider designated sites has not been adequately assessed in the Shadow HRA and ES, largely due to flawed data and survey methodology and lack of precautionary approach**. These concerns are supported by Footprint Ecology findings (Liley, D. & Saunders, P. (2020)[1, 2]).

7.16. EDF state in the Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment Part 1 of 5 (May 2020) para 7.7.34. that "This potential displacement of recreational users, including to the Minsmere to Walberswick Heaths and Marshes SAC, has to be considered in the context of the large number of recreational visits already made to the SAC. Data within the Plants and Habitats Synthesis Report as seen in Volume 2, Chapter 14, Appendix 14B1, indicates that the car-park locations that give access to the SAC already together receive an estimated 1,114,206 recreational visits per year, and that any increase due to recreation users displaced from the Sizewell area would be small (estimated to be approximately an additional 20,000 recreational visits per annum). In addition, this pressure would be diffuse and spread across a large number of potential car-park access points." NT does not agree.

7.17. The Trust believes the 20,000 figure is both a significant increase, particularly in the absence of management measures to manage visitor and dog behaviours and appears to be taken from Table 2.1 (Estimated additional visits to locations in the study area (two scenarios) as a result of displacement of existing users from the Sizewell area and the construction workforce) of Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment Part 4 of 5 Appendix E, Annex A: Recreational Disturbance Assessment (Minsmere to Walkberswick SPA/SAC). Although the total for each SPA/SAC is not provided in the table, the total for column 4 which shows increases in visits/year based on % of displaced visitors is 23,172 visits, with 4,288 of these visits to Dunwich Heath. The text below the table defines this as the 'Realistic' approach which we have discussed previously in this written representation from para 6.8. The 'Precautionary' approach is shown in column 7 of the same table, which shows the increase in visits/year based on 500,000 visits to the Sizewell Area. The total increase in visits for the Minsmere to Walberswick SPA/SAC would be 88,623 visits/year, with 11,839 of these being to Dunwich

Heath. An even more significant increase clearly, particularly in the absence of management measures to manage visitors and dog behaviours

7.18. The Shadow HRA Part 4 of 5 (para 3.4.5) states that an increase in recreational visits is predicted following the displacement of visitors from areas affected by construction activity, with the Minsmere to Walberswick area identified as potentially receiving the highest number of displaced visitors. The assessment predicted any potential increase in recreational visits is to be small in the context of the estimated existing number of recreational visits; in addition any increase in pressure would be diffuse and spread across a large number of potential car park access points (Shadow HRA Part 4 of 5 Para 4.2.3). The NT does not agree.

7.19. It is not clear how the Shadow HRA has reached conclusions of no adverse effect on site integrity for many of the European qualifying species and habitats, given weak data often applied at a macro scale, particularly in relation to Dunwich Heath. The step from likely significant effect (notably in Shadow HRA Part 1 of 5 Screening Tables and Shadow HRA Part 4 of 5 Screening Matrices) to no adverse effect on site integrity is often unqualified and based on assumption. Assessment of individual features is considered from paragraph 7.23 below.

7.20. The National Trust considers visitor survey methodology and data used in the assessment to be limited and significantly underestimates potential increased site use.

- SZC Public Access Visitor Survey information is provided in ES 6.3 Volume 2 ES 6.3 Volume 2 Chapter 15 Amenity and Recreation Appendix 15A-15J Part1 of 3. This details that a combination of observation and questionnaire surveys were carried out at six survey locations in August and November 2014 (5.1.2) 4,214 users were observed and 514 questionnaires were completed and deemed a robust evidence base for impact assessment (5.13).

- This is a very limited number of survey locations that included Dunwich Heath Car park. Footprint Ecology noted that m*any of the smaller, more vulnerable, locations (from an ecological perspective) have not been surveyed.* (Liley, D. & Saunders, P. (2020)[2]). Such locations are not subject to active visitor management.

- There is a notable gap of survey data from spring. Many countryside sites see marked peaks in visitors around the Easter period. The spring is also a time when breeding bird interest (particularly ground nesting birds on heathland) and other ecological interest is vulnerable to recreation impacts. No survey information to the north of Dunwich Coastguards was included.

- Footprint Ecology "would have expected to see much more detailed mapping of visitor flows and numbers (both current and predicted), providing heat maps of footfall. These maps would then be overlaid with ecological data and checked with site managers/local organisations" (Liley, D. & Saunders, P. (2020)[2]).

- Footprint Ecology reported that *"predictions of increased use are confusingly presented, with different estimates given in different reports alongside some clear errors. Estimates appear very low compared to national data and are much lower than*

we would expect, based on our experience of visitor surveys and recreational use of the countryside" (Liley, D. & Saunders, P. (2020)[2]).

- The National Trust notes that the Shadow HRA Part 1 of 5 was incorrectly based on EDFs purported realistic numbers as opposed to precautionary scenario. EDF consultants provided the Trust with updated precautionary figures on 16 November 2020 for Minsmere to Walberswick Heaths and Marshes SAC. This increased estimated visitors to the SAC from 1,114,206 to 1,129,822 and that any increase due to recreation users displaced from the Sizewell area would be approximately 88,623 (rather than 20,000) recreational visits per annum. EDF Co concluded that the corrected numbers do not change the Shadow HRA conclusions given the way the assessment has been undertaken and that a monitoring and mitigation plan would be in place (see appended email of 16 November 2020). It seems incredible that a four-fold increase in predicted visitors would not change the assessment. The Trust has been able to calculate the figure quoted by querying some of the tables provided in the submission however we have not been able to locate any rationale/justification set out in any of the submitted documents detailing how the figure has been used in assessments. We raised this in response to EDF's consultation on the proposed changes to the DCO application. The applicant's consultants stated that a correction would be included in the errata that would be provided to PINS at the time the changes to the application were submitted. The National Trust has been unable to find the location of this corrected information in the changes to the application which were submitted in January 2021 and accepted by the Examining Authority.

- Shadow HRA Report Addendum (8.3.5–10) discusses the uplift in visitor numbers at key locations obtained when those participants in the visitor surveys who stated they would be displaced but not where they would be displaced to are attributed to the main displacement sites. Despite reference to Dunwich Heath no figures were provided with only Eastbridge and Minsmere Outer deemed relevant to the HRA. Again, assertions are made that mitigation measures for breeding heathland birds have already been proposed (8.3.8) but are not detailed.

- This gives the Trust little confidence that the survey design, effort and analysis is adequate to provide an understanding of visitor use and how that might change.

7.21. The National Trust considers ecological data and knowledge is missing from the assessment - Important sensitive protected features are not adequately considered in the DCO documentation including;

- Absence of any consideration of presence of or disturbance of breeding Woodlark and Stone curlew at Dunwich Heath, and Dartford warbler across the whole site in the ES.
- Absence of any consideration of the presence of, or disturbance to, breeding Nightjar at Dunwich Heath and,
- Minimal consideration of trampling of vegetated shingle and heathland habitats across the whole SAC in the Shadow HRA.

7.22. The National Trust considers that there is a lack of geographical consideration of recreational receptors sites and ecological sensitivities in the assessment, notably at Dunwich Heath;

- Dunwich Heath was not included in the survey of Ecological Important Features (EIF) to inform the Shadow HRA or ES.
- The 2014 Visitor Survey is geographically limited with regard to informing the assessment of recreational receptor sites and ecological sensitivities (i.e. no hot spot mapping)

7.23. **It is of concern that the DCO documentation lacks any integrated ecological assessment across the whole development site and adjacent designated sites at a landscape scale. Individual areas of ecological reporting may fail to recognise serious overall ecological harm or degradation.**

7.24. The DCO documentation makes reference to monitoring and mitigation measures addressing any potential adverse impacts but proposals are scant and fail to address the nature conservation issues that are likely to arise. The Mitigation and Monitoring plan approach is discussed below from paragraph 7.63 onwards.

Shadow HRA and ES assessment of specific Features & Habitats; Nightjar, Dartford warbler, Stone Curlew, Woodlark, Heathland & Vegetated shingle

Breeding Nightjar

7.25. Dunwich Heath is important for breeding Nightjar; it supports an average of 7.5 churing males (assume pairs) between 2015-19 (Dunwich Heath and Mount Pleasant), this is ⅓ of the Minsmere-Walberswick SPA population or ¼ if you exclude Mount Pleasant (non SSSI/SPA although functionally linked). The Dunwich Heath and Mount Pleasant population trend has been stable to positive over the last 10 years. (Data: Sandlings breeding bird survey, collected by conservation partners, coordinated by RSPB)). Dunwich Heath as a key recreational receptor site that supports Nightjar yet has not been considered in the Shadow HRA.

7.26. The National Trust is concerned how the impact of increased recreational usage on breeding Nightjar has been assessed in the DCO documentation.

7.27. Assessment of impacts of increased recreational disturbance on breeding Nightjar at Dunwich Heath is absent from the Shadow HRA Part 1 of 5. Breeding Nightjar data used in the report is out of date, i.e. under 6.3.54 Table 6.5 Population estimates for the qualifying features of the Minsmere-Walberswick SPA for Nightjar is 13 males (2011/12-15/16). There were 20.8 pairs average between 2015-19 on the SPA/SSSI (not including Mount Pleasant which would make it 22.6 pairs average between 2015-19) (Data taken from Sandlings breeding bird survey, collected by conservation partners, coordinated by RSPB).

7.28. Also, visitor survey data is limited and underestimates potential increased site use.

7.29. Shadow HRA Part 1 of 5, 8.8.431 notes that the nightjar breeding population of the Minsmere-Walberswick SPA has declined by 45% since classification. This is important to note as it further emphasises importance of the Dunwich Heath population and that the decline may be related to increased recreational pressure of wider heathland brought about by introduction of Open Access under Countryside and Rights of Way (CROW) Act 2000.

7.30. Shadow HRA Part 1 of 5, notes that the main nesting areas for nightjar within the SPA are on the Minsmere RSPB reserve, with smaller numbers in the Dunwich Forest area of the Dingle

Marshes Reserve(8.8.432). The Shadow HRA Addendum submitted in January 2021 focused Nightjar additional surveys within the Main Development Site (MDS), with none found to be present. Optimal habitats for Nightjar at Dunwich/Westleton Heaths outside the main development site (3.5km to north of the site) where noted and surveyors assessed activity at Dunwich Heath for a calibrated comparison confirming that nightjar were breeding in these habitats to the north of the RSPB Minsmere Reserve. No further conclusion was drawn or amendment made to the Shadow HRA based on these findings.

7.31. The Shadow HRA Part 1 of 5 identified potential adverse effect on Nightjar at Minsmere south due to increased recreational disturbance (iv. Disturbance due to increase in recreational pressure during construction and decommissioning (8.8.429)) and states that this can be addressed through mitigation (i.e. enhancement of recreational management measures). The Shadow HRA proposed that existing recreational management measures at Westleton Heath and other heathland areas within the Minsmere (southern) section of the Minsmere-Walberswick SPA, were enhanced to minimise the potential for any increase in recreational disturbance pressure on breeding nightjar and other breeding birds of heathland habitats (8.8.434) and that this would be part of a monitoring and mitigation plan, to be agreed with land managers. This is supported in principle, but the proposal lacks detail and does not include Dunwich Heath as a key receptor site.

7.32. It is considered by EDF that Dunwich Forest has the capacity to accommodate a significant level of recreational use without any adverse effects on this species (Para 8.8.435, Shadow HRA 1 of 5). However, the National Trust believes that areas of Dunwich Forest, whilst outside the SPA, almost certainly have a functionally linked breeding population of nightjar. We are unclear how EDF have reached their conclusion, whether this takes into account the functionally linked breeding population of nightjar or how no adverse effect could be achieved.

7.33. The Shadow HRA and its Shadow HRA Addendum does not address National Trust concerns with regard to potential adverse impact of increased recreational usage of Dunwich Heath and wider site on breeding Nightjar. The assessment is based on limited visitor survey data that significantly underestimates potential increased site use, missing ecological data/knowledge and lack of geographical consideration of receptors sites (i.e. Dunwich Heath). This presents an unacceptable risk to the designated feature that would lead to potential ecological degradation of the site and wider SSSI/SPA.

7.34. Adequate assessment, monitoring and mitigation is required to ensure the conservation objectives for breeding Nightjar within the Minsmere-Walberswick SPA are met and Minsmere-Walberswick SSSI is not adversely impacted by increased recreational usage of Dunwich Heath and the wider area resulting from Sizewell C power station.

Dartford warbler

7.35. The National Trust is concerned that the impact of increased recreational usage on breeding Dartford warbler at Dunwich Heath has not been assessed in the DCO documentation.

7.36. Dunwich Heath supports an important population of Dartford warbler. It is not a Minsmere-Walberswick SPA or SSSI designated feature, although this may be seen as historical oversight in light of the important population now established in Suffolk (it is a SPA qualifying species elsewhere in its UK range). Dartford warbler recolonised Suffolk after a gap of nearly 70 years, with confirmed breeding records at Dunwich Heath in 1995 with a 5

year mean average of 31.8 pairs breeding (2015-2019) at Dunwich Heath/Mount Pleasant (National Trust records). The large extent of heather and *Ulex galli* at Dunwich Heath provides optimal nesting habitat. It is likely that Dartford warbler would be considered as a potential Minsmere-Walberswick SSSI feature as part of any notification review by Natural England (in its own right or as part of Heathland Bird Assemblage Feature). The species is protected, listed on W&CA Schedule 1, Part 1, UK conservation status: Amber.

7.37. The National Trust has concerns with regard to potential adverse impact on this protected sensitive heathland species at Dunwich Heath and across the wider SSSI/SAC/SPA. Increased recreational disturbance presents a significant risk to Dartford warbler at Dunwich Heath and could lead to abandonment and potential ecological degradation of the site and wider area. At Dunwich Heath Dartford warbler prefer to nest in the mature heather, usually very low down in the bush making them vulnerable to disturbance, particularly by dogs. They are also at risk from fires destroying their breeding habitat.

7.38. Assessment of impacts of increased recreational disturbance on Dartford warbler is absent from the DCO documentation. Given Dartford warbler's Schedule 1 listing alone, the species should be considered alongside the other bird species identified in ES Chapter 14, Appendix 14B2, Ornithology Synthesis Report (para 1.4.70 and Table 1.3).

7.39. Adequate assessment, monitoring and mitigation is required to ensure breeding Dartford warbler is not adversely impacted by increased recreational usage of Dunwich Heath and the wider area resulting from Sizewell C power station, as a W&CA Schedule 1, Part 1, listed bird.

Stone curlew

7.40. The National Trust is concerned that the impact of increased recreational usage on Stone curlew at Dunwich Heath's Mount Pleasant area has not been assessed in the DCO documentation.

7.41. Stone curlew have bred in recent years at Dunwich Heath's Mount Pleasant. Stone curlew is not a SSSI or SPA feature but is protected, listed on W&CA Schedule 1, Part 1, UK conservation status: Amber and it is possible that it would be considered as a potential Minsmere-Walberswick SSSI feature as part of any notification review by Natural England (in its own right or as part of Heathland Bird Assemblage Feature).

7.42. Stone curlew are considered within the documentation ES Chapter 14, Appendix 14B2, Ornithology Synthesis Report as a relevant ornithological Important Ecological Feature potentially affected by increased recreational disturbance (Para 1.4.137), however presence of Stone curlew at Dunwich Heath's Mount Pleasant is not acknowledged and assessment of impacts of increased recreational disturbance on the species are absent.

7.43. National Trust is concerned that additional recreational disturbance would have an adverse impact on this highly sensitive species and could lead to loss of Stone curlew at the site and wider area, undoing considerable conservation effort.

7.44. Adequate assessment, monitoring and mitigation is required to ensure breeding Stone curlew is not adversely impacted by increased recreational usage of Dunwich Heath and the wider area resulting from Sizewell C power station, as a W&CA Schedule 1, Part 1, listed bird.

Breeding Woodlark

7.45. The National Trust is concerned that the impact of increased recreational usage on breeding Woodlark on Minsmere-Walberswick SSSI is absent from the DCO documentation (notably ES Chapter 14, Appendix 14B2, Ornithology Synthesis Report).

7.46. The Minsmere-Walberswick population of breeding Woodlark was not considered in the ES or Shadow HRA, despite it being a species listed in the JNCC SPA Review and a Minsmere-Walberswick SSSI Feature. It is a feature of the Sandlings SPA (noted in ES Chapter 14, Appendix 14B2, Ornithology Synthesis Report, see below) and that population is probably functionally linked to Minsmere-Walberswick. The Minsmere-Walberswick SSSI/JNCC SPA Review Attribute is 20 pairs (1996). There were 35.2 pairs (average 2015-19) recorded on the Minsmere-Walberswick SPA/SSSI area with 3.6 pairs (average 2015-19) at Dunwich Heath (1/6 population) (not including Mount Pleasant farm) (Data; Sandlings breeding bird survey, collected by conservation partners, coordinated by RSPB). Dunwich Heath accordingly holds an important population of breeding Woodlark.

7.47. The National Trust has concerns that Dunwich Heath's Woodlark SSSI feature could be adversely impacted by increased visitor pressure leading to the ecological degradation of the site and wider SSSI/SPAs. We note that this potential impact has not been assessed.

7.48. The Sandlings SPA population is noted in Shadow HRA Part 1 of 5 which states "indirect effects of increased recreational pressure on woodlark are considered unlikely" (8.11.68). Subject to enhanced management measures being implemented at Aldringham Walks and North Warren, increase in recreational pressure during the construction of Sizewell C is not predicted to adversely affect the ability of the Sandlings SPA to achieve the conservation objectives for breeding woodlark either directly or indirectly via effects on habitats (8.11.69)."

7.49. It is unclear what these enhanced management measures are being implemented at Aldringham Walks and North Warren, and whether they might be applicable to Dunwich Heath.

7.50. Adequate assessment, monitoring and mitigation is required to ensure the breeding Woodlark feature of Minsmere-Walberswick SSSI is not adversely impacted by increased recreational usage of Dunwich Heath and the wider area resulting from Sizewell C power station.

Heathland (European Dry Heaths)

7.51. The National Trust believes that EDF has not adequately assessed the impact of increased recreational usage on heathland habitat and questions how the Shadow HRA can confidently conclude no adverse effect on integrity, from recreation impacts based on the data and evidence that supports the assessment.

7.52. Dunwich Heath is a superb example of coastal lowland heathland habitat (SAC/SSSI Feature (Supporting SPA features), which forms a substantial part of a large continuous heathland tract at Minsmere, Dunwich and Westleton Heath, plus Walberswick. Dunwich Heath has a mosaic of heathland, acid grassland and woodland/scrub habitats (140 ha in total). This heathland also supports important priority species such as Antlion, Silver studded blue butterfly, adder and rare heathland birds.

7.53. Whilst the Shadow HRA Part 1 of 5 and Shadow HRA Part 4 of 5 recognise the heathland's high sensitivity to recreational disturbance, its conclusions of no adverse impact (Shadow HRA Part 1 of 5 7.7.38) are based on a weak evidence base (i.e. visitor data see above), plus application of much assumption (i.e. behaviours), and lack precautionary approach. It is not clear that the importance of Dunwich Heath for heathland has been considered as a key receptors site.

7.54. The National Trust is concerned that this flawed assessment may lead to an underestimate of a likely increase of recreational disturbance and associated impacts on heathland habitat, with lack of adequate compensation and mitigation identified as a result. This could lead to ecological degradation of our site.

7.55. Adequate assessment, monitoring and mitigation is required to ensure the conservation objectives for Heathland habitat within the Minsmere-Walberswick SAC are met and Minsmere-Walberswick SSSI is not adversely impacted by increased recreational usage of Dunwich Heath and the wider area resulting from Sizewell C power station.

Vegetated Shingle (Annual vegetation of drift lines and Perennial vegetation of stony banks)

7.56. The National Trust believes that EDF Co has not adequately assessed the impact of increased recreational usage on vegetated shingle habitat at Dunwich Heath beach frontage.

7.57. Vegetated shingle habitat is rare and fragile, it is present between Walberswick and Minsmere. It is a SAC/SSSI Feature and supports a variety of scarce shingle plants and specialist invertebrates. The most recent Natural England SSSI site condition monitoring survey (2012) identified that vegetated shingle habitat at Dunwich (SSSI Unit 111) was in unfavourable condition due to recreational disturbance (trampling) and in favourable condition at Minsmere but at risk due to recreation disturbance (SSSI Unit 111). The issue of recreational disturbance is also listed Natural England's *Improvement Programme for England's Natura 2000 Sites (IPENS)* report, (see page 2 , 6-9) (2014), including specifically referring to "*impact from increased disturbance from proposed Sizewell C Development; through displacement of users away from Sizewell area (and possibly onto SPA areas) and increased population during construction in the locality*", page 9.

7.58. Whilst the Shadow HRA Part 1 of 5 and Shadow HRA Part 4 of 5 recognises vegetated shingle as having high sensitivity to recreational disturbance, its conclusions of no adverse impact (Shadow HRA Part 1 of 5 7.7.85)) are based on a weak evidence base (i.e. visitor data see 7.15 above), plus application of much assumption, and a lack of a precautionary approach. EDF Co uses the habitats unfavourable condition status due to trampling to dismiss adverse impact from SZC associated increased recreational usage. We believe this is flawed as any additional trampling of vegetated shingle, damaged or not, will impact on the habitat and its recovery, being very fragile and vulnerable to disturbance. The National Trust has put measures in place to remedy trampling issues by roping off vegetated shingle along Dunwich cliffs to remove recreational pressure and allow recovery of the habitat. The resource required to manage these pressures is based on current and historic trends of use. We are concerned that in the face of an uplift in recreational pressure our site will not have access to adequate resource to implement reactive zoning of the site to prevent further damaged of the remaining vegetated shingle and facilitate its recovery. The Trust has been in discussion with EDF regarding the need to fund this type of mitigation however we have yet to reach agreement.

7.59. South of Dunwich details of the BLF and coastal defences for the MDS are emerging. ES Addendum (AS-181) section 2.10 acknowledges additional adverse effects on noise and views experienced by beach users as a result of these changes but argues that they are of limited significance as impacts are already major adverse. However, we are concerned that the potential for additional displacement particularly affecting the beach frontage of the Minsmere-Walberswick designated sites is not assessed. The Document also explains that the Suffolk Coast Path would be redirected up and down the shoreline as necessary to facilitate construction of the enhanced permanent BLF (2.2.67). As there is a potential for increased recreational impacts on vegetated shingle which is a SSSI/SAC feature these should be assessed.

7.60. There appears to be a lack of appreciation of the dynamic nature of the whole frontage and the mobility/dynamic character of features (including shingle habitats, Little tern, etc.) in the documentation. Opportunities to enhance the frontage as a whole (including Leiston to Aldeburgh beach vegetated shingle (SSSI feature), Sizewell beach vegetated shingle (CWS) and dune, Minsmere to Dunwich beach vegetated shingle (SSSI/SAC feature) and dune (SSSI feature) and Dunwich to Walberswick vegetated shingle (SSSI/SAC feature) and dune (SSSI feature)) for wildlife is not considered. Nor is it recognised that there is potential scope for the recovery of the frontage as a whole through appropriate measures. Additionally, we have concerns about the ability of the trampled strandline and perennial vegetation habitat to evolve and recover to favourable condition if impacted by the installation of the proposed hard and soft coastal defence features (including shingle recharge) the nature and extent of which often arrest natural processes and active roll back of beaches.

7.61. The flawed assessment may lead to an underestimation of the likely increase of recreational disturbance and associated impacts on Vegetated shingle habitat, with a lack of adequate compensation and mitigation identified as a result. As such there is a risk that ecological degradation of our site could occur.

7.62. Adequate assessment, monitoring and mitigation is required to ensure the conservation objectives for Vegetated Shingle habitats within the Minsmere-Walberswick SAC are met and Minsmere-Walberswick SSSI is not adversely impacted by increased recreational usage of Dunwich Heath beach and the wider frontage resulting from Sizewell C power station.

Monitoring & Mitigation

7.63. One of the principles (no.5) set out in the JLAG SZC Suffolk Ecology Principles (see Appendix A) sets out that EDF must produce and implement an Ecological Management and Monitoring Plan (EMMP) as part of the Development Consent Order. It should identify all necessary avoidance, mitigation, compensation, offset & enhancement and monitoring measures with regards to species affected by the development and must take into account both the direct and indirect impacts. Principle no.6 states that the EMMP must be of sufficient detail and scope to achieve functioning and sustainable compensatory habitat, together with ecological enhancements, during and after construction.

7.64. The National Trust considers that the monitoring of designated species and habitats and non-designated features (such as Stone Curlew, Dartford Warbler) is required with funding available for mitigation linked to monitoring to address any adverse impact from the proposed development. This could include enhanced on-site recreational disturbance mitigation measures and the expansion of semi-natural habitats in the wider area.

7.65. National Trust considers there is inadequate information on ecological monitoring proposals to identify any negative impact from increased recreational usage associated SZC in the Shadow HRA/DCO documentation despite the impression created within several documents that this forms part of the documentation and that its purpose would be to support the minimisation of impacts on European designated sites and species from displaced visitors.

7.66. In the absence of monitoring information in the submission it is difficult for the National Trust to rely on the principal of monitoring to support the delivery of mitigation. Furthermore, there is inadequate information on ecological mitigation proposals to address impacts from recreational disturbance/displacement within the documentation. As such the Trust believes that mitigation measures are scant and fail to address the nature conservation issues that are likely to arise. This view is supported by Footprint Ecology (Liley, D. & Saunders, P. (2020)[2], page 24).

7.67. Mitigation proposals in the Documentation are vague and ambiguous. For example a Rights of Way and Access Strategy is reported through documentation as being developed to minimise displacement of visitors and construction workers to the SSSI/SAC/SPA/Ramsar site for recreation, however there is no information on how it does this (ES Volume 2 Chapter 15 Amenity and Recreation (Appendix 15I Rights of Way and Access Strategy)). The Shadow HRA Part 1 of 5 indicates the Rights of Way and Access Strategy will include monitoring and mitigation. The document itself does not include a monitoring strategy and its scope is principally concerned with the Main Development Site.

7.68. EDF Co's Draft Section 106 Agreement Heads of Terms does refer to monitoring impacts on European Sites relating to recreational displacement during the construction phase as a result of the Sizewell C Project, but no detail on this monitoring has been identified in the consultation documentation.

7.69. The National Trust notes mention of the Terrestrial Ecology Monitoring & Mitigation Plan in Requirement 4 in the draft DCO. However it is unclear how the Dunwich Heath Monitoring and Mitigation Plan (now know as the Monitoring and Mitigation Plan for Minsmere-Walberswick European sites and Sandlings (North) European site) relates to this Requirement and whether it would be secured through the draft DCO.

7.70. The National Trust notes that Schedule 11 (Natural Environment) of the Draft Section 106 Agreement makes provision for a European Sites Access Contingency Fund and that Schedule 13 makes provision for the National Trust Dunwich Heath and Coastguard Cottages Resilience Fund. The National Trust understands that it would be excluded from the European Sites Access Contingency Fund under current proposals. It is unclear how the funding for mitigating impacts on designated features at Dunwich Heath would be secured. The National Trust is in discussion with EDF about this matter but it is yet to be agreed.

7.71. The National Trust has had several meetings with the applicant's consultants to discuss monitoring and mitigation plans and welcomes this engagement to develop effective measures. The National Trust was provided with an initial draft of a Dunwich Heath Monitoring and Mitigation Plan on 19 August 2020. This draft lacked any real content. At a meeting with EDF on the 16 November 2020 the National Trust provided an indication of what monitoring and mitigation measures would be expected to manage any negative impacts on Dunwich Heath and the wider site SAC/SPA/SSSI features. A second draft of EDF's document was received on 26 January 2020 following which further comments in writing were provided by the Trust on 16 February 2020.

7.72. A third draft of the Monitoring and Mitigation Plan now *titled for Minsmere-Walberswick European sites and Sandlings (North) European site* was circulated by the applicant to stakeholders on 12 May 2021. This provides greater detail of survey and mitigation proposals. It outlines funding for Initial Mitigation Measures and Monitoring (S106), and Additional Mitigation Measures (S106 Contingency Fund element). It also notes contribution through S106 to Suffolk Coast RAMS. As of 2 June 2021 the NT has not yet had the opportunity to respond in writing to this latest draft and therefore we can confirm to the examiner(s) that all matters of concern remain not agreed and that we are hopeful of more engagement following the submission of this written representation.

7.73. **It is a fundamental concern that the Shadow HRA does not recognise potential impacts on Dunwich Heath's European features from recreational usage uplift and therefore mitigation is not prioritised as a statutory requirement at Dunwich.**

8. Recreational Displacement: Provision of alternative greenspace

8.1. The National Trust believes that recreational displacement arising from the development should not all be directed to existing designated sites. These sites are of international importance for nature conservation and this must be balanced with the role they play in providing access to natural greenspace given their protected status. Footprint Ecology (Liley, D. & Saunders, P. (2020)[2]) describe the Suffolk Coast as of unique importance for nature conservation supporting a diversity of habitats and species unparalleled in the UK, particularly in the area between Slaughden and Southwold. It is popular with recreational users and management for access and often highly sensitive habitats and species (described in Liley, D. & Saunders, P. (2020)[1]) can be challenging. Conservation partners actively undertake measures to enable people and nature to exist side by side on these special places. Footprint Ecology state that Sizewell C would disrupt this balance *(*Liley, D. & Saunders, P. (2020)[2]*).* Capacity can be reached and balance lost when management measures cannot adequately mitigate impacts and ecological degradation occurs. This situation must be avoided at all costs.

8.2. Provision of new / alternative greenspace allows for access to take place away from designated sites and avoid potential impacts that increased recreational usage brings, and can reduce or remove the need for complex mitigation. EN-1 acknowledges that an energy infrastructure project will have direct effects on the existing use of the proposed site and may have indirect effects on the use, or planned use, of land in the vicinity for other types of development (Para.5.10.1). Para.5.10.2 goes on to state "The Government's policy is to ensure there is adequate provision of high quality open space (including green infrastructure) and sports and recreation facilities to meet the needs of local communities. Open spaces, sports and recreational facilities all help to underpin people's quality of life and have a vital role to play in promoting healthy living".

8.3. National Trust acknowledges the provision 27 ha of new recreational land, including areas where dogs will be allowed to be exercised off-lead at Aldhurst Farm and improvements to Kenton Hills carpark, however the National Trust has not seen any evidence from the applicant of the assessment of the capacity and adequacy of these or other access provision sites. The National Trust considers that monitoring of these sites to deliver their intended purpose is required. The National Trust is not aware that the monitoring of these sites is covered by any of the Monitoring and Mitigation Plans proposed by EDF.

8.4. It is Footprint Ecology's opinion that that green space provision proposed by SZC Co is inadequate to address the scale of impact that might occur. For example, new greenspace is provided in some parts of the country, such as the Thames Basin Heaths, at 8ha per 1,000 new residents, in order to resolve the issues from increased recreation associated with new development. While this metric is not necessarily transferable to the Suffolk Coast, we are concerned that changed patterns and behaviours of recreation could sustain beyond the construction period and become habit, without returning to pre-construction conditions.

8.5. The National Trust wishes to see evidence of the capacity and appropriateness of the provision of greenspace by EDF. Should this assessment highlight limitations with this provision we would want to see additional greenspace for recreation provided as part of this development as a precautionary approach to protect the ecological robustness and integrity of protected habitats and species, particularly on designated sites. Any such provision should be made prior to any need for further mitigation being identified by monitoring. Provision of additional attractive destination greenspace should be provided on undesignated land and in close proximity to Sizewell and should be secured through the draft s106 if required.

9. Landscape and Visual Impacts on our land at Dunwich Heath and Beach and the wider AONB

9.1. The application site is located within the nationally designated Suffolk Coast and Heaths Area of Outstanding Natural Beauty (AONB), which is a high quality, highly valued landscape. It is also located on the Suffolk Heritage Coast. Due to its location and elevated position the National Trust's site at Dunwich Heath provides the best vantage point for the Sizewell C site and as such visual impacts.

9.2. **The National Trust is concerned about the long-term adverse impact that the development would have on the landscape and seascape views from our site and on the character of the AONB. We are concerned about the generic design of the proposal and how this will sit within a highly designated landscape. Further, we are concerned that the applicant has not provided sufficient detailed designs to show the true scale of the development and enable a holistic assessment of the landscape and visual impacts. We are of the opinion that it would not be possible to mitigate the impacts on our site due to its location and character.**

9.3. Para.5.9.9 of NPS EN-1 reminds us that "AONBs have been confirmed by the Government as having the highest status of protection in relation to landscape and scenic beauty". This is also reflected in Para.172 of the National Planning Policy Framework (NPPF), which also states that great weight should be given to conserving and enhancing their landscape and scenic beauty. The purposes of the AONB designation is to conserve and enhance the natural beauty of the area, as set out in s82(1) of the Countryside and Rights of Way Act 2000. Para 3.10.3 of NPS EN-6 states that there is the potential for long-term effects on visual amenity at Sizewell, given the Suffolk Coast and Heaths Area of Outstanding Natural Beauty. The Heritage Coast is also afforded protection through the National Planning Policy Framework (2019). Para.173 states that "planning policies and decisions should be consistent with the special character of the area and the importance of its conservation. Major development within a Heritage Coast is unlikely to be appropriate, unless it is compatible with its special character".

9.4. The AONB's natural beauty is defined by a set of 'Natural Beauty Indicators' which were agreed between the applicant, Suffolk Coastal District Council (now East Suffolk Council), Suffolk County Council and the AONB Partnership. These are[1]:

- Landscape quality
- Scenic quality
- Relative wildness
- Relative tranquillity
- Natural heritage features
- Cultural heritage

9.5. Regard should also be had to the JLAG 'Sizewell C Design Principles' (Appendix A) agreed by the applicant. local authorities and other stakeholders (including the National Trust). These state that "Sizewell C should be an environmental exemplar demonstrating how a large infrastructure project can be delivered in an area of very high environmental sensitivity".

Landscape and Visual Impact Assessment

9.6. A Landscape and Visual Impact Assessment (LVIA) (Link to Doc) has been submitted with the application, as part of the Environmental Statement. The methodology is drawn from The Guidelines for Landscape and Visual Impact Assessment (GLVIA), 3rd edition, 2013 and other technical notes and guidance issued by the Landscape Institute. The National Trust is satisfied that the methodology used for the LVIA conforms to this guidance. By its nature an LVIA will always have an element of subjectivity, and we acknowledge that it is not the intention to hide this development within the landscape totally. Link to doc.

9.7. The Coastguard Cottages at Dunwich Heath, which are owned by the National Trust, is a viewpoint which has been used in the applicant's LVIA (representative viewpoint R17). Coastguard Cottages include three holiday cottages, a tenanted cottage, office space, a cafe and a lookout area (used as cafe seating) and all face south directly towards Sizewell. Coastguard Cottages are considered to be a non-designated heritage asset by the local planning authority and this is acknowledged in Chapter 16 (Terrestrial Historic Environment) of the applicant's ES. Views of the existing power stations (Sizewell A and B) come into view on the approach road to Coastguard Cottages. The most prominent views are from the area around the Cottages, car park and cliff tops, but views are also experienced from paths within the heath, the beach itself and along the Suffolk Coast Path/Sandlings Walk to the south of the National Trust's site. It is important that the cumulative impact of the proposed development (including the changes submitted) are considered with the buildings and infrastructure related to Sizewell A and B. The scale of this proposal is such that it would double the nuclear power station site at Sizewell, extend the associated infrastructure seaward and significantly extend the mass of development in a westerly direction, all of which will be highly visible from our site.

Landscape and Visual Impacts During Construction

9.8. The LVIA acknowledges that the area adjacent Coastguard Cottages would have the most prominent views of the construction site (Para.13.6.82). It states that cranes, tall plant and emerging power station structures will be clearly visible. Furthermore, it acknowledges that similar, but less open views would be available across the heath. Para. 13.6.122 of the LVIA

[1] Suffolk Coast and Heaths Area of Outstanding Natural Beauty (AONB) Natural Beauty and Special Qualities Indicators V1.8 Version Date: 21 November 2016 Link to Doc

states that "As a valued view within the AONB, and adjacent to a visitor destination, visual receptors would be of high sensitivity. The scale of effects at this viewpoint would be medium during construction, increasing to Large–medium scale when the tallest cranes are in use (exceptional periods). Given that elements of the Sizewell C Project construction would punctuate the skyline across much of the focal area of the view, the long-term effects would be wide in extent".

9.9. The LVIA[2] concludes the following for the construction phase:

- Visual Receptor Group 5: Westleton Walks and Dunwich Heath:
  Overall, the long-term visual effects are judged to be medium magnitude, major–moderate (significant) and adverse.

- Visual Receptor Group 8: Dunwich to Minsmere Coast:
  These effects would be of high–medium magnitude, major to major–moderate (significant) and adverse.

- Specific viewpoints - Viewpoint at Dunwich Heath Coastguard Cottages (R17):
  The magnitude of effect would be high–medium leading to overall effects of major to major– moderate (significant) and adverse.

- Night-time:
  Major–moderate (significant) and adverse visual effects would occur within Visual Receptor groups 5 and 8.

<u>During Operation</u>

9.10. Para.13.6.236 states that the photomontages for representative viewpoint R17 (Figures 13.10.66 and 13.10.67) illustrate that the proposed power station would appear in front of the existing power stations but along the same axial alignment parallel to the coastline. Para. It also states that due to the elevation, it would be possible to see the majority of the turbine halls, reactor domes and pylon towers from our site. These are some of the largest structures. **Whilst the National Trust notes the proposed power station may be on the same axial alignment parallel to the coastline as the existing power stations, what the assessment fails to take account of is that due to the curve in the coastline, the increased and sheer east-west scale of the proposed structures and pylons will be most evident and significant when viewed from our site at Dunwich Heath.**

9.11. The National Trust objects to the pylons and overhead power lines which would have an excessive and intrusive impact within the sensitive landscape. Suffolk County Council sought independent advice on the power export connection at the site. The report concludes that the use of Gas Insulated Line (in surface troughs, above ground and/or in galleries) is an attractive alternative to overhead transmission lines but was dismissed by the applicant without adequate justification. Whilst it is noted that the height of one of the pylons has been reduced (from 70 AOD to 59 AOD) as part of the changes submitted by the applicant, this does not overcome the cumulative visual impact of the pylons and power lines across the landscape.

[2] Para.13.6.81-13.6.111 and 13.6.121-13.6.123

9.12. The LVIA[3] concludes the following during operation:

- Visual Receptor Group 5: Westleton Walks and Dunwich Heath:
  Major-moderate to moderate (significant) and adverse (long-term and permanent).

- Visual Receptor Group 8: Dunwich to Minsmere Coast:
  Long-term and permanent effects of medium magnitude, major–moderate (significant) and adverse.

- Specific Viewpoints - Viewpoint R17 at Dunwich Heath Coastguard Cottages:
  Major-moderate to moderate (significant) and adverse.

- Night-time: Would not exceed moderate (not significant) and adverse for the visual receptor groups 5 and 8.

9.13. The National Trust generally agrees with the conclusions of the LVIA and considers that the application, as originally submitted would, have a long-term (construction phase) and permanent (operational phase) major, significant and adverse impact on views from from the area around Coastguard Cottages.

Changes to the application

9.14. The changes to the development which were submitted in January 2021 further compound our concerns about the harmful impact of the development on views from Dunwich Heath and Beach and the AONB, particularly during construction.

9.15. The effects of the enhanced and permanent Beach Landing Facility (BLF) will create further adverse landscape and visual effects generally along the coastline. This will be approximately 100 metres longer than originally proposed and would enable approximately 100 beach landings per annual campaign period (1 April to 31 October), with this level of delivery expected for approximately four years. A temporary BLF is now also proposed. This would be to the south of the permanent BLF but would be far greater in length; up to approximately 505 metres in length. It would also include a jetty head up to approximately 62 metres wide. A temporary conveyor (for which detailed designs have not been provided) would extend along the length of the temporary deck to the HCDF and into the construction, passing over the Suffolk Coast Path is also proposed. This would have the capacity to accommodate up to 400 deliveries during the campaign period and up to an additional 200 deliveries outside of the summer campain period during operation.

9.16. Furthermore, increased mooring and movement of vessels at the jetty and out at sea along with associated noise and lighting will also increase the landscape and visual effects and impact on the tranquillity and landscape quality and character of the area (both landscape and seascape).

9.17. Whilst the National Trust acknowledges the benefits in terms of a reduction in HGV movements and impacts on the local road network, the visual and aural impacts of these changes will detrimentally add to harm to our site as previously identified and increase harm to the character of the AONB in this location. These must also be considered in combination

[3] Para.13.6.234-13.6.265 and 13.6.290-13.6.291

with the increase in parameter heights and acitivites on the main development site, the increase to the minimum crest height of the permanent sea defence, the increase in the adaptive height of the HCDF, and the movement of the HCDF further east which are now also proposed.

9.18. As identified within the Landscale and Visual section of the Addendum to the LVIA (submitted in January 2021) (REF. 6.14 Revision: 1.0 Applicable Regulation: Regulation 5(2)(a) PINS Reference Number: EN010012 Environmental Statement Addendum Volume 1: Environmental Statement Addendum Chapters Chapter 2 Main Development Site, Section 2.8 Landscape and Visual) the effects of the new beach landing facility during the construction phase will be Large/Adverse. Para 2.8.25 states "Large and large-medium scale effects would extend for a greater distance than assessed in the ES, stretching along the coastline adjacent to Minsmere to the edge of the area of higher ground at Dunwich Coastguard Cottages to the north" Doc link .

9.19. Para.2.8.37 of the aforementioned document refers to Visual Receptor Group 8: Dunwich to Minsmere Coast. It states that "The temporary BLF would introduce further static and moving lighting to the coastal and offshore environment, extending lighting approximately 500m into the sea with a backdrop of undeveloped and unlit sea, but viewed in the context of the construction lighting associated with the main development site. Considering the high-medium sensitivity of receptors, the medium-term visual effects would be of large scale and experienced over a wide extent of the visual receptor group. These effects would be of high to high-medium magnitude, and remain major to major-moderate (significant) and adverse". The National Trust considers that the night time lighting will dominate the sky from Dunwich Heath as it will reach across much of the south facing view. In the daytime the construction site will be the dominant view but extended further out into the currently unspoilt character of the seascape as a result of the changes to the BLFs.

9.20. Para. 2.8.53 states that over the period of its construction and operation, the area of the Suffolk Coast and Heaths AONB that would experience large to large-medium scale effects would occur along the coast between approximately Dunwich Coastguard Cottages and Thorpe Ness and remain as recorded in the ES.

9.21. The National Trust notes that no updated visualisations have been provided showing the scale of development in front of the Main Development Site and extending out into the North Sea from our site (Viewpoint R17). This is disappointing and we consider that the applicant has not demonstrated the true scale of the development. It does not allow third parties to make a full judgement about the visual impacts of the development. It is also disappointing that the application has reached this stage and the design of the HCDF has still not yet been provided and assessed in LVIA.

9.22. Notwithstanding the above, we consider that the effect of the changes would still be the highest in terms of visual impact and shows a major alteration to qualities or characteristics of the landscape and seascape that will be fundamentally and permanently changed. The changes to the permanent BLF and the introduction of a second temporary BLF will increase the overall footprint of development further seawards and as such increase the impact of the development during construction and operational phases from receptors within the AONB. As the effects on our site were already identified as major/signficant/adverse in the original LVIA, there is no other reportable upper limit to convey the increase of effects.

Impacts on the AONB

9.23. **However, the National Trust does not agree with the assertion within the LVIA that land & seascape and visual effects would only occur over localised sections of the AONB and that the effects during operation on these designations is not significant.** We acknowledge that a viewpoint from Dunwich Heath has been assessed as part of the LVIA. However, the grouping of individual viewpoints into receptor groups, shows a cumulative effect which is not a true representation as some could read Large/Adverse and others Small/Negligible and distorts the actual overall impact. Such a signficant and adverse impact upon one part of the AONB would have a harmful impact upon the wider AONB as a whole and the purpose of its designation (to conserve and enhance the natural beauty of the area). It is difficult to understand how a design which has been replicated from Hinkley Point C is sensitive to the character on the Suffolk Coast and Heaths AONB and how it would conserve and enhance the landscape and scenic beauty of the AONB, as required by planning policy. Both sites sit within very different landscapes.

Design

9.24. Section 4.5 of EN-1 sets out the principles of good design that should be applied to all energy NSIPs. Para.4.5.1 states that "Applying "good design" to energy projects should produce sustainable infrastructure sensitive to place, efficient in the use of natural resources and energy used in their construction and operation, matched by an appearance that demonstrates good aesthetic as far as possible". Section 3.10 of this NPS and Section 5.9 of EN-1. States that the IPC should consider how good design can act to mitigate the impacts of new nuclear power stations, such as landscape and visual impacts.

9.25. The elevational design, external treatments and use of colour on the principal and ancillary buildings and associated infrastructure are a fundamental component of how the projects can be sensitive to place, particularly during the operation of the site. The Sizewell C site is located to the north of Sizewell A and B and would therefore bring the new built form closer to Dunwich Heath and obscure views of the iconic Sizewell B dome. The National Trust fails to understand how the bare concrete domes would be sensitive to their immediate and wider surroundings and consider that this treatment would exacerbate the visual intrusion of these structures within the landscape. The design would not be contextual to the wider landscape within which the power station would sit. Lifting and shifting the generic design from an undesignated landscape at Hinkley, to a designated landscape at Sizewell does not demonstrate applying good design sensitive to place. Currently the design is of little merit and would not be a case of exemplar design (as required by the JLAG 'Sizewell C Design Principles') the which is sensitive to the highly designated landscape within which it would sit. External lighting (on the buildings, within the site and on the Beach Landing Facilities) and in combination with lighting at Sizewell A and B will also enhance the prominence of the development and impact on the dark skies of this area. However, such details have not yet been provided and will be subject of requirements. Without details of the proposed lighting it is difficult to understand how conclusions can be drawn about night-time impacts during operation. Given the visibility of the development site from Dunwich Heath, it is important that we are involved in discussions about detailed design and lighting if consent is granted and these matters are dealt with through requirements.

9.26. In conclusion, the National Trust consider that the proposal by virtue of it scale, generic design and location would have a significant and adverse effect on the setting and views from Dunwich Heath and Beach (landscape and seascape) both during construction and operation. This includes the setting of the Coastguard Cottages, which the local authority considers a non-designated heritage asset. The character of the sensitive coastal landscape within which Coastguard Cottages sit would be eroded by further industrialisation of this part of the coastline, to the detriment of the AONB and Heritage Coast. The development would not be compatible with its natural character, as required by the NPPF.

9.27. However, the National Trust does not agree that landscape and visual impacts over localised sections of the AONB would not be harmful to the wider character of the AONB. It would introduce a large-scale construction project into a designated landscape (which at the AONBs narrowest point stretches across its entire width, effectively cutting it in half) which would have a long term negative visual impact on the landscape. It would be detrimental to the defined natural beauty and special qualities of the AONB and the statutory purposes for which it was designated (to conserve and enhance the natural beauty of the area).

Mitigation/Compensation

9.28. The National Trust accepts that it is not appropriate or possible to hide a development of this nature and size, and that some (limited) embedded mitigation is proposed. If Development Consent is granted for this development, it is important that the adequate funding for landscape mitigation and compensation within the AONB is provided by the applicant. We consider that Dunwich Heath will be one of the receptors of greatest harm from the visual impacts of the development.

9.29. There may be opportunity for some small-scale interventions for visual mitigation at Dunwich Heath. However, given the character of our site, it would not be possible to fully mitigate the scale of impacts on our site which were identified through the LVIA, and further impacts as a result of the DCO changes. The National Trust also notes that Schedule 13 (Resilience Funds) of the draft s.106 Agreement includes a provision for a National Trust Dunwich Heath and Coastguard Cottages Resilience Fund which could fund on-site mitigation. The National Trust is in discussion with EDF about this matter but it is yet to be agreed.

9.30. It is important that sufficient funding which reflects the scale of adverse visual impacts across this highly sensitive landscape is made available for the extent of its lifetime. If it is ultimately concluded that there is not a viable alternative to mitigating the visual impacts on our site, it must be ensured that the fund includes appropriate compensation for the residual impacts.

9.31. The National Trust understands that funding for mitigation and compensation will be also be provided through a Natural Enviroment Fund if consent is granted for the development. Given the magnitude of the impact on views from Dunwich Heath and Beach, we wish to ensure that we would be able to access this fund in order to implement interventions either alone or in partnership with others (either on our site or within the wider landscape). EDF have indicated that the National Trust will be able to access the Natural Environment Fund

but this is yet to be agreed in a Statement of Common Ground. The National Trust notes that this would be secured through a **s.106 Agreement**.

9.32. The National Trust notes that it is named as a consultee to East Suffolk Council in Requirement 12 (Main development site: Reserved Matters) of the **draft DCO** and welcomes this where such buildings will be visible from Dunwich Heath.

10. Coastal Geomorphology and Long Term Coastal Change

10.1. The National Trust land holding at Dunwich Heath includes the ownership of approximately 1.5 km of coastline. The NT is concerned about the long-term impacts on its land (the majority of which is inalienable) and infrastructure at Dunwich Heath and Beach (as set out in Section 2 of this written representation) arising from coastal change that is a direct or indirect consequence of the development. The National Trust is committed to ensuring nature, beauty and history are here for everyone, for ever. As such our concerns represented in this response apply to all stages of the development which we acknowledge covers a period of approximately 97 years (12 years of construction, 60 years of operation, 25 years of decommissioning).

10.2. The Trust acknowledges the statement within EN-1 (Para.5.5.7) that highlights "If the development will have an impact on coastal processes the applicant must demonstrate how the impacts will be managed to minimise adverse impacts on other parts of the coast". It also states that applicants should assess "the effects of the proposed project on maintaining coastal recreation sites and features; and the vulnerability of the proposed development to coastal change, taking account of climate change, during the project's operational life and any decommissioning period". Furthermore paragraph 5.5.11 states "The IPC should not normally consent new development in areas of dynamic shorelines where the proposal could inhibit sediment flow or have an adverse impact on coastal processes at other locations. Impacts on **coastal processes must be managed to minimise adverse impacts on other parts of the coast**".

10.3. Policy EN-1 recognises change on the coastline and seabed is understood to be both direct and indirect. The direct impacts on the immediate coastline are generally associated with the footprint of the built infrastructure including the hard and soft coastal defences, temporary and permanent beach landing facilities and all associated mooring and berthing works, as well as other associated infrastructure including intakes outfalls and fish bypass structures. Any of these structures alone or in combination may over time also impact or alter physical processes that in turn cause change to the immediately adjacent coastline. Policy EN-1 para 5.5.4 also highlights that indirect changes to the coastline and seabed might arise as a result of a hydrodynamic response to direct changes. This could lead to localised or more widespread coastal erosion or accretion.

10.4. In addition, the proposed structures will interact with physical processes and geomorphological features that integrate to and interact with the marine environment in the nearshore and even offshore; Policy EN-6 recognises the importance of such matters including to bar and bank systems.

10.5. We acknowledge this part of the Suffolk coast is dynamic and subject to change showing decadal-scale behaviour and gradual long term erosion, our aim (as far as possible) is for any measures for management / development to retain the natural evolution of the coast. The coastal management of our site has been guided by the National Trust 'Shifting Shores' coastal policy statement, our 2015 position statement on 'Coast – the next 50 years' (see Appendix D) and the local Shoreline Management Plan (SMP). As set out in the Trust's 2015 position statement our approach to coastal management aims to:

- Understand the natural processes that shape the coast
- Conserve our coastal and marine wildlife
- Protect and restore our beautiful coastal landscape and seascape
- Conserve the cultural heritage of our coastline
- Help people have great experiences and care for the coast
- Promote productive and sustainable use of coastal assets

10.6. The effective management of the coast is also addressed within the (advisory) Shoreline Management Plan (SMP7 – Lowestoft Ness to Landguard Point) where the following policies apply;

- Hold The Line - applies in front of Sizewell Power station and Sizewell Village frontage through to the year 2105,
- Managed Realignment - applies to the north side of the development on Minsmere and the National Trust beaches through to 2055 followed by No Active Intervention through to 2105
- No Active Intervention - applies to the cliffed section of the National Trust property through to the Dunwich cliffs (Dunwich and Minsmere Cliffs).

10.7. The SMP policies have been adopted by the local authority (also the Coast Protection Authority) and the Environment Agency (both public bodies responsible for coastal erosion and flood defence) and acknowledge the importance of retaining the natural characteristics of this coastline within the management approaches applied. The evidence used to develop this policy position identified that the sustained management of freshwater habitats in Minsmere and the low lying part of the National Trust property was not a sustainable long-term option (Pye and Blott 2006[4]) given the projected Sea Level Rise (SLR) and costs associated with the maintenance of the sluice at Minsmere and the barrier beach.

10.8. The National Trust believes it is important to take account of the sustainability of the coast and not leave future generations with a burden of cost (to either manage the coast for the development or in having to manage the coast through intervention for other users), negative impact (including loss) to environmental features (including biological and geomorphological features), or societal losses such as changes to amenity, character or features of recognised societal interest such as sandy beaches, cliff exposures, or landmark buildings.

10.9. The National Trust acknowledges that the assessment of long-term coastal change involves a high degree of uncertainty, however the aspects of the development we are concerned about impacting long term coastal processes are;

[4] Pye, K., Blott, S.J. 2006 Coastal processes and morphological change in the Dunwich-Sizewell area, Suffolk, UK. Journal of Coastal Research 223:453–473

- The Hard Coastal Defence Feature (HCDF)
- The Soft Coastal Defence Feature (SCDF)
- The enhanced permanent Beach Landing Facility (BLF)
- The new temporary Beach Landing Facility (BLF)
- All associated mooring and berthing works
- Other associated infrastructure, such as intakes outfalls and fish bypass structures

10.10. The National Trust notes that the provision of the HCDF and SCDF advances the line of the development seaward and that this is contrary to the policy set out in the SMP (see Local Impact Report). As such the development proposal is replacing Hold the Line with an Advance the Line approach and identifies alteration to the shoreline to the north of the development whereby Managed Realignment effectively becomes Hold the Line. These approaches were rejected through the SMP process.

10.11. The National Trust also notes that the draft DCO proposed not to remove the SZC HCDF after decommissioning. The Trust's preferred outcome at decommissioning would be to be able to remove this advanced line and reinstate natural coastal processes by removal of any man-made fixed point on the coast (in a carefully managed way) that is in an advanced position that has already been rejected for effective coastal management. Without such commitment it remains unclear who would take responsibility for (including the cost) maintaining such a structure and what purpose this would perform if the power station were decommissioned (or building not completed). Thus, it would leave future generations with uncertain costs and on-going impacts to the coast (if maintained) or a situation of uncertainty (were no active intervention to apply to it); potentially leading to sudden and rapid coastal change of the stored-up affects from nearly 100 years of existence.

10.12. The National Trust believes the application does not adequately assess the potential range of impacts the proposal (included the features bullet pointed above) may have on long term coastal geomorphological processes. We believe impacts could include;

- Ecological and geomorphological impacts from the alteration of natural coastal processes.
- Impacts on visitor infrastructure (including loss or limitations to access along beach frontage) from accelerated coastal erosion.
- Changes to material entering the coastal system and nourishment of the frontage, impacts on accretion, ridge formation and the development of vegetated shingle habitat.
- Loss of freshwater designated habitat and supporting habitat at a faster rate than through natural processes (100 yrs).
- Loss of landscape and ecological value particularly if hard defences or soft defences that pin the shoreline position creep along the frontage.

10.13. As a near neighbour the Trust feels there is a focus in the assessment of the risk to the nuclear power station itself, rather than an assessment of the role the development may have in affecting coastal change on this part of the coast. As stated previously this latter issue is a requirement of EN-1. The Trust is therefore concerned that there are potential / possible impacts of the proposal on our site during the lifetime of the development that have not been fully explored as part of an integrated and holistic assessment. We note that the worst-case scenario for the operator of the site is that the impacts of coastal processes on the development could lead to an exposure of the hard defence. However, the worst-case scenario for the National Trust is that the proposal would lead to a substantial change to the profile, plan form or sedimentary make up of our beach and cliffs and how the natural

system (including the sub tidal system) functions throughout the lifespan of the development, decommissioning, and the period following decommissioning where the coast may be recovering from the influences and changes imposed by the development. For these reasons we are of the view that any proposals for the monitoring of the coast should be extended further to cover our property.

Uncertainty within assessments

10.14. The National Trust believes there is uncertainty in the assessment of large scale, long term, accelerated coastal change. This uncertainty results from;

A. A lack of detail behind assumptions presented to support the baseline assessment
B. The omission of certain factors from the assessment
C. The approach to and complexity of modelling long term coastal change.

A. Lack of detail behind assumptions presented to support the baseline assessment

10.15. The National Trust believes the following matters highlight a lack of detail behind the assumptions supporting the baseline assessment undertaken in support of the submission;

i. The National Trust considers that the on/off shore extent of the study area is limited in respect of long term change. We believe there is a lack of consideration of change in features over time, and that there are alongshore limitations on geographical spatial scale[5] that may both impact upon and interact with the development in a different way to present.

ii. There is insufficient consideration of the interchange of coastal erosion/accretion and sediment supply[6]. This includes relevance for the National Trust cliffed frontage and how sediment may be demanded by coastal change and the interaction of that with the features of the development. It is limited by EDF in the offshore to the first bar system and alongshore to a 'bay' form they define themselves as the Greater Sizewell Bay (GSB) but they do not assess how this evolves as a bay form in the long term or account for uncertainty in how that process may evolve over the next hundred years.

iii. There is little coverage of how sediment inputs (from outside their set limits) might behave in the future[7], but it is assumed this sediment supply will be transported to the Sizewell C frontage. This outcome is uncertain and involves sediment from Covehithe and Benacre feeding sediment alongshore to the south.

B. The omission of certain factors from the assessment

10.16. The National Trust believes the following factors have been omitted from the assessment of long-term coastal change, this relates both to written documents and assumptions applied through modelling or other methods of assessment;

[5] ES Volume 2 Main Development Site Chapter 20 Coastal Geomorphology and Hydrodynamics has various references to the bank systems and interrelationship with the offshore bank such as 20.4.60 and related interchanges such as 20.4.34, 20.4.42, 20.4.68

[6] Chapter 20 highlights the 'Zone of Influence' e.g. 20.3.9 and 20.4.22. The latter paragraph also references sediment sources and this also appears in section 5.2, and 6.1.1 and 6.5 of Appendix 2.15A to Ch 20.

[7] These matters are included in a number of paragraphs such as 2.3.3 and 2.3.4 of Appendix 20A Coastal Geomorphology and Hydrodynamics. The delivery of sediment transport appears in 20.4.68 and 2.3.6 of Appendix 20A and other documents such as Appendix 2.15A to Ch20 and within the CMMP.

i. There is no evident consideration of changes that might arise in the offshore banks over time. The approach disregards any change in these features and / or to incident conditions that might be altered by them e.g. wave height or direction, alongshore subtidal channels and tidal flows, sediment transport pathways both at the shoreline and offshore etc.

ii. It is unclear why periods of higher historic change (such as significant erosive phases around the 1850s) have not been drawn out from the Historic Trend Analysis (HTA) and used in the assessment as part of a change envelope, let alone including scenarios that could be above those in severity in the future.

iii. In ES Volume 2 Main Development Site Chapter 20 Coastal Geomorphology and Hydrodynamics (link to document), 20.4.22 uses the primary potential sources of new sediment entering the Greater Sizewell Bay (GSB) as the Minsmere – Dunwich Cliffs (within the GSB) and the Easton – Covehithe Cliffs (2.5–10.5km north of the GSB). When the EDF defined Zone of Influence is considered it ignores the wider system including to Easton – Covehithe which is clearly relevant to the context and conditions applying to the Sizewell C frontage. Furthermore, the Minsmere[8] (OBJ) shows that for the Minsmere-Dunwich cliffs, a significant shift in cliffline retreat rate took place after 1925. In the period 1883–1925 the retreat rate varied between 1.49 ± 0.78 and 1.72 ± 0.30 m/yr; between 1925 and 1992 it varied between 0.41 ± 0.21 and 0.65 ± 0.24 m/yr, with a further fall to a retreat rate of 0.25 ± 0.26 m/yr between 1992 and 2008. The potential feed or lack of feed of sediment should be explored in the assessment as this will influence both the degree to which SZC forms a promontory on the coast (and hence interrupts longshore processes) and the amount of beach recharge that will be necessary to apply; it should not simply be stated that this will be whatever is required to fix the shoreline of the SCDF but should evaluate whether such is sustainable under (at least) different scenarios than have historically arisen.

iv. There are inherent difficulties and uncertainty in assessing and modelling long-term cliff change. This may mean conclusions in assessments of the impacts of cliff change (including results from modelling) do not accurately represent any future condition in the long-term and so only present short-term (≤ 20 years) impacts. The approach adopted seems to not address important matters such as potential changing orientation of the coastline as a result of climate change scenarios, change in direction of wave and tidal forces as a result of sea level rise and climate change possibilities over the next century, or the consequence of change in pluvial events to mass movement processes on cliffs. Such matters may not be totally apparent (or have existed) in the historic data in the HTA and require expert interpretation and consideration of the consequence to processes both in nett and event driven / periodic responses on an ongoing basis during the lifetime of the development and after decommissioning. The feed of sediment from cliff input cannot be assumed to continue as it has in the past and the consequences of such change should be

[8] Brooks, S.M., Spencer, T. 2010 Temporal and spatial variations in recession rates and sediment release from soft rock cliffs, Suffolk coast, UK. Geomorphology 124, 26-41 [doi:10.1016/j.geomorph.2010.08.005]

incorporated to the assessment, including how this interacts with the development to impact upon the surrounding shoreline, nearshore, and offshore areas over the lifespan of the development.

v. The approach to modelling has been to model individual components of the development, there does not appear to be any modelling that combines all the structures and management measures to be applied to the development to show how they interact; the cumulative effects taken together may not behave the same as individual components, we believe this is important on a coastline where there are known interactions between the shoreline and nearshore and offshore processes, sediments and geomorphology.

vi. The only assessment related to ships appears to be inclusion as a static feature moored at a facility and some consideration of dredging needed to achieve navigational access. The impact of ship movements to and from the temporary and permanent BLFs is not covered by modelling (nor assessed in terms of its long-term implications). Impacts from ship generated waves, squat, propellor disturbance, alone and combined with navigational dredging (altering the geomorphology directly) and the influence on processes of the structures need to be assessed both in terms of their direct impact to the seabed and geomorphological features such as banks (including the offshore banks) and bars and the indirect effects of those changes to the surrounding coast (and use of it). We note the increased emphasis in use of the BLF in the changes submitted (which appear to involve thousands of transits mainly (but not exclusively) in summer conditions and the provision of a new temporary BLF and longer permanent BLF. This clearly means a greater reliance and frequency of use of this mode of transport and should be supported by assessment that integrates the impacts of shipping in combination with the structures created for the development.

vii. The design of the permanent HCDF is absent from the submission and the changes submission. We note the mention in the East Suffolk Council and Suffolk County Council Joint Local Impact Report that they cannot complete their assessment without this information and that therefore mitigation cannot be determined. We are concerned that the examination is progressing without key information. We are unclear as to the nature of the design that forms a key component of the assessments and this prevents us from being able to fully review and assess the proposals and their impact on our stetch of coast. We would also hope that the applicant would be sufficiently familiar with the design to be able to present it more fully to the examining authority and interested parties.

viii. The National Trust notes the changes submitted by the applicant now include an additional Beach Landing Facility. We note that a number of assumptions on aspects of the structure have been made regarding these facilities to support modelling. We are unclear if a final design has been developed for these facilities. The Trust would expect any future change in the design of these facilities would require modelling and assessment to be undertaken again (and that be within the in-combination context of all the structures of the development as a whole). This clearly has the possibility of altering assessments already relied upon and on which we have based

our response. We would have hoped that the design for these facilities would be sufficiently advanced prior to submission of any changes to be able to present it more fully to the examining authority and interested parties.

C. The approach to and complexity of modelling long term coastal change.

10.17. The National Trust believes the following matters highlight the uncertainty contained within the approach to, and complexity of, modelling long term coastal change adopted by the applicant in support of their submission.

i. The National Trust has concern about the application of the Expert Geomorphological Assessment (EGA) submitted with the application (ES Volume 2 Main Development Site Chapter 20 Coastal Geomorphology and Hydrodynamics Appendix 20A Coastal Geomorphology and Hydrodynamics: Synthesis for Environmental Impact Assessment) (link to document). The EGA is narrow in application with the study area limited in geographical scale (only EDF site). The focus of the assessment is on one primary issue, the protection of a hard coastal defence feature (HCDF) once the soft coastal defence feature (SCDF) that initially lies seaward of it, erodes away. The hypothetical HCDF do not apply the range of geomorphological hypotheses already known about. The approach to assessment uses a limited number of variables and these limitations preclude presenting a range of possible outcomes. Uncertainty in long term coastal change from the whole development is poorly dealt with as a consequence. The Trust notes that following the submission of further changes to elements of the proposal impacting the coast such as to the HCDF, SCDF and BLFs by EDF there has been no update provided to the EGA. The consequence of this including the change in design, the introduction of on-going beach recharge and placing coarser sediments has not been further assessed in respect of the impact of these changes including to the long-term geomorphological evolution of the coast and bar/bank system and therefore the assessment is incomplete.

ii. The National Trust is concerned that the approach to the EGA may limit the breadth of potential impacts and outcomes identified. Other approaches (as set out below) if adopted, may result in greater uncertainty (thereby identifying different impacts and outcomes) than currently presented. For example In Volume 2 Chapter 20 Coastal Geomorphology and Hydrodynamics, the expert panel's argument supporting their approach links back to Wolman and Miller (1960[9]) in that this coast is dominated by events of moderate magnitude and frequency (e.g. the action of moderate regular events that do most of the work that changes geomorphic systems (20.4.77)). But there are alternative arguments to this model, stemming from Schumm's (1973[10]) equally classic work emphasising thresholds for change in landscapes and thus non-linear change. On this storm-surge dominated coast, and where rainfall patterns are the most continental in the UK, a strong case can be made for Brunsden and

[9] Wolman, M.G., Miller, J.P., 1960. Magnitude and frequency of forces in geomorphic processes. Journal of Geology 68, 54–74.
[10] Schumm, S.A., 1973. Geomorphic thresholds and complex response of drainage systems. In: Morisawa, M. (Ed.), Fluvial Geomorphology. Binghampton, New York, pp. 299–309.

Thorne's (1979[11]) assertion 'where the average values of disturbing stresses are low but the variation about the mean is large, then the landscape is likely to be dominated by large events, large storage and abrupt discontinuities.'. The breadth of potential impacts and outcomes have thus not been addressed in this respect.

iii. The applicant's work from Chapter 20 also does not seem to carry forward the (e.g. Stive et al 1991[12]) concept of coastal scale and evolution which identifies (in essence) that longer a timescale that is applied to a matter the larger the geographical extent needs to be considered. In short, changes over decadal scales warrant consideration of some kilometres of coastline to understand the morphological response and change (see for example Characterisation and prediction of large-scale, long-term change of coastal geomorphological behaviours. For example, if the approach set out in Defra science report SC060074/SR1, August 2009 where used this would identify tens of kilometres to address the consideration of 97 years of change. This appears to have been recognised through the Greater Sizewell Bay being identified but this scale does not carry forward to the Coastal Processes Monitoring and Mitigation Plan (which focus to scales of localised and hence relatively short-term change only).

iv. The National Trust is concerned that offshore banks and their role in sediment exchange with the shoreline does not appear to be included in the applicant's assessment and modelling in support of their submission. This adds to the uncertainty of the developments impact on long term coastal change. Pethick and Leggett (1993[13]) further classified the coastline of eastern England into three Integrated Scale Coastal Evolution (ISCE) units (building on the Stive approach). The second of these three units consists of two retreating cliff sections in glacial sands and gravels 215 (Cromer to Happisburgh and Lowestoft to Thorpeness) separated by a section of low foreshore fronted by narrow dunes. General sediment movement is to the south, with local reversals at cuspate forelands, or 'nesses' (such as Thorpeness). This relatively low energy 'inner shoreline' sits inside an offshore 'outer shoreline' characterised by the Suffolk and Norfolk Banks and adjusted to extreme waves from the south east (Pethick and Leggett 1993). This work highlights the importance of consideration of the offshore banks within the assessment as how these change over time will have a linked response on the shoreline and could alter how the development interacts with the natural processes as they themselves evolve over the coming ten decades. It is feasible that a high magnitude low frequency event might arise in the next hundred years that could interact on such a scale. Whilst the occurrence of this may be uncertain, it is both feasible and has an assessment methodology than can consider the consequence (impacts) to and (impacts) from the development. It would be proportionate to apply such thinking and knowledge that already exists to the assessments made by the applicant and

[11] Brunsden, D., Thornes, J.B., 1979. Landscape sensitivity and change. Transactions of the Institute of British Geographers NS4, 303–484.

[12] Stive, M.J.F., Roelvink, D.J.A. and de Vriend, H.J. (1991). Large-scale coastal evolution concept. Proceedings of the 22nd International Conference on Coastal Engineering. Delft, American Society of Civil Engineers., New York, 1962-1974.

[13] Pethick JS, Leggett D 1993 The morphology of the Anglian coast. In: Hillen R, Verhagen HJ (Eds.) Coastlines of the Southern North Sea. American Society of Civil Engineers (ASCE), New York, pp 52-64.

incorporate that to the mitigation and monitoring plans to address the matter of uncertainty.

v. The National Trust would agree with the applicant's assertion that "there is no current computational modelling platform able to accurately integrate the numerous environmental processes that drive shoreline change (especially for mixed gravel/sand beaches), and there is no published evidence that shoreline change models can be reliably applied over the required multidecadal timescale" (section Appendix 20A, 7.2, pg133) or "there is no current computational modelling platform able to accurately integrate the numerous environmental processes that drive shoreline change" (section Volume 2 Chapter 20 Coastal Geomorphology and Hydrodynamics, 20.4.72 pg 27) and further National Trust would consider that holds true not just for the shoreline change but also for other geomorphic features including the nearshore bar system. Whilst EDF acknowledge this uncertainty requires ongoing reassessment the statements made to the National Trust directly imply certainty in knowing what the outcomes are for our stretch of coast. However, we are concerned their statements relate to the short-term impacts on their narrow frontage only and do not reflect the uncertainty regarding long-term impacts along a wider frontage. EDF have also discounted applying the EGA (in full) with new data and information as it emerges to help identify and predict any long-term impacts during the (97 year) lifespan of the development.

vi. In Appendix 20A, section 2.3.6.3, recent shoreline change (1992-2016) is analysed and this underpins the shoreline change projections which are then used to assess the impacts of having a hard point at Sizewell C on future shoreline change. Future shoreline change will affect erosion and flooding of habitats (loss of habitat) and change the pathway characteristics as well as the receptor responses so this is an important underpinning matter. There is a very heavy reliance stressed concerning ongoing sediment supplied from the cliff section between Benacre and Southwold to maintain future stability (or even grow) the Dunwich-Sizewell Bank – it is referred to frequently throughout Chapter 20 (e.g. 2.4.3 Future regional sediment supply; Pg52 in particular). The Trust is concerned that there is a lack of clarity around a large number of factors supporting assumptions regarding sediment supply, for example;

- The sediment transport modelling presented doesn't go far enough north to include the identified sources of Covehithe and Easton (as well as Benacre).
- These rapidly retreating sediment-rich cliffs don't form part of the Greater Sizewell Bay (GSB) which is the modelling focus presented in Chapter 20 (Figure 12), so it is unclear what the boundary conditions to the north of the region are and how future change was incorporated in line with the timescale of the development.
- We cannot locate a bathymetric survey covering north of the GSB
- The model analysis for the temporary and permanent BLFs shows some matters of concern by concentrating on the dynamics of the outer and inner longshore bars when an important morphological unit controlling inshore hydrodynamics and sediment transport is the Sizewell-Dunwich Bank. The modelling approach appears to only apply sand-sized sediment to nearshore bed processes and shoreline, a 1:20 year return wave height, and assumes that other factors (such as Sea Level Rise and bank elevation) remain fixed into the future. It is unclear why a wider variance in these factors is not considered over the lifetime of the development.

Climate Change

10.18. The range of magnitude, frequency and direction of extreme events is partially dealt with under sea level rise and climate change scenarios. The National Trust believes it is important to consider how climate change and sea level rise might change and modify the processes that will interact with the geomorphology, the development and hence the risks. Wave contributions to coastal sea level changes (setup and swash) depend on several factors that can vary in response to internal climate variability and climate change, including deep-water wave field, water-depth, and geomorphology. From this it can be seen that there is a miriad of possible outcomes but a number of directions of travel that could be considered and assessed when thinking about how the development interacts with the physical processes and geomorphology into the future

10.19. The Intergovernmental Panel on Climate Change (IPCC) SROCC Report (Oppenheimer et al, 2019[14]) identified a number of matters to consider including that due to projected GMSL [General Mean Sea Level] rise, ESLs [Extreme Sea Levels] that are historically rare (for example, today's hundred-year event) will become common by 2100 under all RCPs (high confidence). In the same report changes in storm surges and waves are identified to enhance the effects of relative Sea Level Rise (SLR) along the majority of northern European coasts, with contributions rising levels by up to 40% in the North Sea (Vousdoukas et al., 2017[15]). Arns et al. (2017[16]) found that an increase in sea level may reduce the depth-limitation of waves, thereby resulting in waves with greater energy approaching the coast; including such changes to wave effects is crucial for coastal adaptation and planning (e.g., Isobe, 2013). Arns et al. (2017) also report that coastal protection design heights need to be increased by 48–56% in the German Bight region relative to a design height based on the effect of SLR on ESL only. Combining SLR with extreme value theory applied to past observations of tides, storm surges and waves, Vitousek et al. (2017[17]) found that a 10–20 cm SLR could result in a doubling of coastal flooding frequency in the tropics; for the southern North Sea region, Weisse et al. (2012[18]) argue that increasing storm activity also increases hazards from ESL events. However, a stationarity of the wave climate is often assumed for projections of ESL events (Vitousek et al., 2017).

10.20. We have concerns around the underpinning basis and established baseline of the assessments (ES Volume 2 Chapter 20 and associated appendices) applied to the original assessments and also carried forward to changes such as BLFs and HCDF and SCDF structures including to modelling carried out and conclusions from that feeding directly to the proposed mitigation and monitoring plan. This concern includes:

- The way sea level rise figures have been applied, for example in ES Volume 2 Chapter 20, para. 20.4.64 sea level rise of 0.76m is identified at Sizewell by the end

[14] Oppenheimer, M. et al. 2019: Sea Level Rise and Implications for Low-Lying Islands, Coasts and Communities. In: IPCC Special Report on the Ocean and Cryosphere in a Changing Climate [H.-O. Pörtner, D.C. et al.

[15] Vousdoukas, M.I. et al., 2016: Projections of extreme storm surge levels along Europe. Clim. Dyn., 47(9–10), 3171–3190.

[16] Arns, A. et al., 2017: Sea level rise induced amplification of coastal protection design heights. Sci. Rep., 7, 40171, doi:10.1038/srep40171.

[17] Vitousek, S. et al., 2017: Doubling of coastal flooding frequency within decades due to sea level rise. Sci. Rep., 7(1), 1399

[18] Weisse, R., H. von Storch, H.D. Niemeyer and H. Knaack, 2012: Changing North Sea storm surge climate: An increasing hazard? Ocean Coast. Manage, 68, 58–68.

of operation (2090; RCP8.5 70th percentile scenario). It seems strange to take a single sea level rise projection rather than explore how the range of conditions might interact with the development and hence influence impacts from it. The 70th percentile is not commonly seen in the literature. A more usual approach, used in several coastal vulnerability studies (e.g. Hinkel et al., 2014[19]) would be to choose a range from the 5% percentile for RCP2.6 (Low emission), 50% for RCP4.5 (Intermediate emission) and 90% for RCP8.5 (High emission), for the years 2050 and 2100; if the 70th percentile is believed to hold some significance then that could be included to such assessment as well.

- EDF cite an increase in precipitation but there is no consideration as to how this could affect coastal change and therefore vulnerability

- The text on storm events puts great store by the bi-directional regional nearshore wave climate (as it is locking into the average conditions here rather than considering the range of conditions that might arise and interact) but the 'Beast from the East' and the 'Mini Beast' at the end of February / beginning of March 2018 came from a due East direction; thus such events are foreseeable, have happened, and this type of event could be evaluated as part of the assessment to inform the understanding of the geomorphological functioning and how less common events can cause significant change and influence the potential impacts arising from the development.

- Lack of apparent analysis of recent storm events (that have occurred prior to EDF issuing its information). For example, Appendix 20A, section.2.2.2.1 and Figure 6 and associated text puts great store by the bi-directional regional nearshore wave climate but the 'Beast from the East' and the 'Mini Beast' at the end of February / beginning of March 2018 came from a due East direction and led to significant and rapid coastal change (a potential scenario that should be evaluated in respect of how this interacts with the development and how the developments impacts might alter in such circumstances). That event was measured at the Southwold Approach WaveNet site (20 m water depth) to have peak significant wave heights of 4.42m on 1st March 2018, the highest since records began in 2010, and were sustained at > 3m over 47 hours. Taken together, these two events stripped the beach to the bedrock platform at Covehithe and resulted in local cliff retreat rates of 11 m. Thus these sorts of events that drive significant change and are important to this coastline and its sedimentary system and geomorphological response; they should be evaluated in the impact assessment and the impacts that then arise from the development as well as the more generalised and averaged conditions applied. Phases of storminess and storm clusters are shown to be important (1990s were much stormier than 2000s) and we now seem to be in an era of very odd weather patterns (eg: strong easterlies developed under Sudden Stratospheric Warming or phases when the jet stream becomes anchored and allows storm clusters to affect coastal settings). So the relevance of change needs to be tied to the conditions prevailing at the time and those could be used in assessment of the future changes that might arise under (a range of) climate change and sea level rise projections

[19] Hinkel, J., Lincke, D., Vafeidis, A.T., Perrette, M., Nicholls, R.J., Tol, R.S., Marzeion, B., Fettweis, C.I., Levermann, A. 2014 Coastal flood damage and adaptation costs under 21st century sea-level rise. Proceedings of the National Academy of Sciences, 111(9), 3292-3297.

- Lack of inclusion of foreseeable potential scales of events or combinations of events that could arise and what affects they might have (even where these might mean extremes of either sudden catastrophic change or periods of stasis for the coast)

- The beach envelope has largely been looked at from the profile rather than the plan-form and this leads to relatively short term and hence localised scale of impacts being considered rather than the long term and hence wider (tens of kilometres) scale of impacts.

Monitoring and mitigation

10.21. The National Trust notes a Sizewell C Coastal Processes Monitoring and Mitigation Plan (CPMMP) has been submitted to the Examining Authority. The National Trust has not been engaged in any specific discussions about this plan. Having reviewed this the National Trust notes that there is no provision for monitoring, mitigating or compensating impacts arising from the development's influence on NT land or designated sites extending more than 1.5 km beyond the centre of the development site.

10.22. The applicant and National Trust acknowledge (as set out above in para 10.17 v.) that modelling coastal processes over the long term is difficult. For this reason we wish to see an independent and transparent CPMMP for long term coastal change (until the HCDF is removed following decommissioning) that includes Dunwich Heath and Beach. We believe the CPMMP requires a wider scope than currently proposed as there is a high degree of uncertainty regarding the developments impact on long term coastal change. Therefore, it is appropriate that EDF should monitor coastal change for the lifetime of the development (through to full decommissioning) and include the designated sites to the north of the development site up to the northern boundary of our land. The National Trust should also be involved in the any steering group overseeing the reporting of findings and decisions related to future monitoring.

10.23. The mitigation proposed in the application is focussed on narrow interventions. It is proposed to rely on beach recharge to maintain a soft feature in front of the hard defence. There has been no detail provided about the likely volumes of recharge required to maintain the soft defence over its lifetime. The time window originally stated for when it was considered likely to result in exposure of the hard defence was 2053-2087. This time window has been replaced by a commitment of the applicant to maintain the beach recharge for a period of time shorter than the lifetime of the development. This raises important questions regarding the sustainability of the approach adopted by the applicant as highlighted in the Local Impacts Report. However, it is of note that there is no mention of other mitigation / compensation interventions for any other long term features/scenarios (also covered by Ex.Q CG1.30).

10.24. The monitoring should include the need to identify possible impacts on our land attributable to the development. If this was evidenced by the monitoring then appropriate mitigation or compensation funding should be made available to the Trust. This may include impacts on Coastguards cottages themselves and our visitor operation from any expedited cliff erosion as a result of the development. Mitigation and compensation proposals should be linked to specific triggers and / or associated to thresholds of long-term coastal change. The National Trust notes that the Examining Authority has asked the applicant to set out the proposals for mitigation/compensation for adverse impacts resulting from the project upon Dunwich

Heath and Beach that might arise from coastal change (Doc Ref Ex.A Q CG1.19). Suggested measures on this matter have been provided to EDF.

DCO and S106

10.25. The National Trust notes that Requirement 7a of the **draft DCO** makes provision for Coastal Processes Monitoring and Mitigation Plan (CPMMP). The National Trust does not agree that its land at Dunwich Heath and Beach should be excluded from this plan and believes it should be a stakeholder in its development and party to on-going review.

10.26. The National Trust is concerned that there is no provision in the **draft s.106 agreement** for mitigation / compensation should the monitoring show that there is an impact on third party land from the development.

11. Impact on Tourism on the Suffolk Coast

11.1. The National Trust believes that the proposed development will impact on tourism on the Suffolk Coast. As a tourist destination and the operator of holiday cottages within the Coastguard Cottages building, the National Trust are concerned there will be changes in audience segments and behaviours.

11.2. The National Trust acknowledges EDF's assessment and conclusions (Para. 9.7.82 onwards of ES Volume 2 Main Development Site Chapter 9 Socio-economics) (Link to document) and agrees that there is a need for a Tourism Fund.

11.3. The National Trust believes access to funding (via both the Dunwich Heath Resillience Fund and the Tourism Fund) to cover the duration of the construction phase of development will enable the National Trust to engage with a changing visitor experience (including for those staying at the National Trust's holiday cottages) and changing visitor segments, for example through marketing. This will enable staff to explain Sizewell C to visitors (particularly those visitors not aligned with our charitable purposes) and to promote Dunwich Heath as a place to visit (working with partners if necessary) and to undertake interventions at Coastguard Cottages if required, such as sound proofing or black-out blinds.

11.4. We would like to agree a framework to ensure that the applicant engages with us to update us on progress with the project and provides funding to support our Marketing and Communications activities.

11.5. The National Trust notes that Schedule 15 (Tourism) of the **draft s.106 agreement** makes provision for a Tourism Fund and that the National Trust would have access to this fund. However, it is not yet clear how the Fund would be accessed or managed.

12. Historic Environment; Impacts from the development on non-designated heritage assets and Impacts from the development on archaeology

12.1. The National Trust believes that there will be impacts from the development and industrialisation of this part of the Heritage Coast on the setting and community value (past and present) of the National Trust owned Coastguard Cottages and their environs.

12.2. The National Trust and East Suffolk Council consider that Coastguard Cottages are a 'Non-Designated Heritage Asset' and are part of the character and heritage of this part of the East Suffolk coastline.

12.3. The significance of the site and buildings are reflected in their use during World War 2. The Coastguard service was formed in 1822 and built the Coastguard Cottages around 1827. World War 2 had a major impact on the Heath and on the beach. During the World War 2, Dunwich Heath was one of the heaviest defended parts of the Suffolk coastline with a radar station, coastal artillery battery and anti-invasion defences. The low ground to the south was flooded to prevent invasion (now RSPB Minsmere) and the higher ground at Dunwich Heath was identified as a 'spur' of land vulnerable to invasion and was therefore heavily defended with beach defences, infantry positions, pill boxes, a Coastal Defence Battery on the cliff to the south, and an anti-aircraft gun emplacement. This section of coast was thought to be a likely invasion point for a German landing. In 1943 it hosted one of the most significant military exercises to prepare for the D-Day landings. It was once fortified with anti-aircraft guns, tank defences and a radar station, and has since been transformed back into precious wildlife habitat, as detailed above.

12.4. Chapter 16 (Terrestrial Historic Environment) of the submitted ES (Link to document) identifies Coastguard Cottages as being of medium heritage significance. Para.16.4.143 states that the present setting of Coastguard Cottages "within heathland reinforces a sense of isolation and a specifically local context for these buildings, and views out to sea contribute to an understanding of the purpose, and past function, of the buildings, adding to the asset's historic interest". It also states that "The distance and intervening landscape between the existing Sizewell B power station, and the asset, is sufficient to provide a strong sense of separation and for the qualities of remoteness, the distinctive heathland landscape, and the coastal relationship to remain intact".

12.5. Para.16.6.101 states that the construction works associated with the proposed development would be "prominently visible" from the Cottages. It also states that works on the main construction area would present a more cluttered, and busy appearance, which would present a sense of change in the setting of the asset and "would slightly affect the contribution of the setting to the historic interests of the asset, primarily by affecting the sense of seclusion, and would detract from the viewer's aesthetic appreciation of the asset, particularly when the cottages are viewed from the north, where the proposed development would be juxtaposed with the cottages against the horizon".

12.6. At Para.16.6.103 the assessment concludes that change to the asset (deriving from a loss of historic interest, and the diminution of aesthetic appreciation) would be minor adverse, which would be not significant.

12.7. The coastal landscape within which the site is located provides the setting for Coastguard Cottages. The proposed development would impact on views to, and from the Cottages. The setting would be eroded by the further industrialisation associated with the proposed development (particularly the construction phase).

12.8. The development, including the two beach landing facilities, conveyor and associated infrastructure (along with lighting and the movement and mooring of large vessels) will occupy a large footprint on the main development site, including Sizewell beach and would extend over 500 metres easterly into the sea. All of this would be visible within the setting of Coastguard Cottages, the location of which affords elevated views of the landscape and

seascape towards the Sizewell C site. Accordingly, we are of the opinion that this would have a greater impact on the setting of Coastguard Cottages and that the level of effects on significance would be greater than set out in the applicant's original assessment. We note that in Section 2.11 of Environmental Statement Addendum (Chapter 2 Main Development Site) submitted in January 2021 that the applicant considers that "there would be theoretical visibility of construction in some views from heritage assets to the north and south along the coast including the non-designated Coastguard Cottages" but concludes that the increased visibility and proposed changes would not serve to increase the magnitude of change and, therefore, the level of significance of the effects on the Coastguard Cottages does not alter from that assessed within Chapter 16 of the ES which was originally submitted. As indicated above we do not agree with conclusion.

12.9. We also note the view of East Suffolk Council in the Local Impact Report which states "This development creates a magnitude of change here greater than experienced by any other heritage asset, resulting from the intensification of the industrialisation of this part of the coastline and subsequent reduction in the undeveloped coastal landscape which currently contributes to an appreciation of the Coastguard Cottages". We agree with the Council's position that challenges the conclusion of the ES with regard to the significance of effect on Coastguard Cottages and we concur that in our view there will be a medium magnitude of impact leading to a moderate adverse effect for our asset of medium heritage significance.

12.10. The National Trust has raised in discussions with EDF access to the Heritage Fund included in Schedule 7 of the draft s.106. agreement, or mitigation within the Dunwich Heath Resilience Fund, for funds to enable the National Trust to assess and carry out heritage enhancements in and around Coastguard Cottages. These will enable the National Trust to better interpret the significance of the site. Measures may also be funded from the National Trust Dunwich Heath and Coastguard Cottages Resilience Fund. This is yet to be agreed.

12.11. The National Trust believes there may be indirect impacts on archaeology on its site at Dunwich Heath arising from any mitigation works which require ground works. These indirect impacts have not been considered or assessed as part of the current submission as the mitigation works are not yet known and remain difficult to quantify until such measures are agreed. Once measures are agreed the potential for impacts on archaeology may require a Watching Brief and possibly further archaeological investigation. The National Trust believe these costs would be closely associated with any agree migitation for other matters set out above and would be incorporated in the costing for funding of any appropriate mitigation.

Appendices

- **A1** - JLAG SZC Suffolk Ecology Principles
- **A2** - JLAG SZC Suffolk Landscape Principles
- **B** - Email correspondence from Alan Lewis to National Trust dated 16 November 2020
- **C1** - Footprint Ecology Report, Impacts of recreation related to Sizewell C and implications for European sites, Durwyn Liley & Phil Saunders, 9 Oct 2020
- **C2** - Footprint Ecology Report, Review of Sizewell C application documents and evidence in relation to recreation impacts, Durwyn Liley & Phil Saunders, 9 Oct 2020

- **D** - National Trust Shifting Shores document- Playing our Part at the Coast Policy Statement

- **E** - Monitor of Engagement with the Natural Environment (MENE) – The national survey on people and the natural environment - Headline report 2019

Suffolk Ecology Principles for Sizewell C

The production of these ecological principles has been led by Suffolk County Council & Suffolk Coastal District Council in collaboration and discussion with National Trust, RSPB, Suffolk Coast & Heaths AONB, Suffolk Preservation Society, Suffolk Wildlife Trust and the Woodland Trust.

Introduction

a. Sizewell C should be an environmental exemplar demonstrating how a large infrastructure project can be delivered in an area of very high environmental sensitivity[1].

b. National Policy Statement EN-1 makes it clear that, as a general principle, '*development should aim to avoid significant harm to biodiversity … including through mitigation and consideration of reasonable alternatives'* and that '*where significant harm cannot be avoided, then appropriate compensation measures should be sought*' (EN-1:5.3.7). To enforce this stance, the IPC (now PINS) is instructed in EN-1 to '*give substantial weight to any such harm to the detriment of biodiversity features of national or regional importance which it considers may result from a proposed development*' (EN-1: 5.3.17).

c. The Appraisal of Sustainability (AoS) identifies that the construction and presence of the development will have the potential to cause adverse effects on sites and species of both European and national nature conservation importance through '*potential impacts on water resources and quality, habitat and species loss and fragmentation, and disturbance (noise, light and visual)*' (EN-6 Volume II: C.8.53). This means that '*significant strategic effects on biodiversity cannot be ruled out at this stage of the appraisal*' (EN-6 Volume II: C.8.53 and C.8.61).

d. EN-1 states that '*development proposals provide many opportunities for building-in beneficial biodiversity or geological features as part of good design*' and that when considering proposals, the IPC (now PINS) '*should maximise such opportunities in and around developments, using requirements or planning obligations where appropriate*' (EN-6 Volume II':5.3.15). The AoS (Main Report 2010: 7.5.35 and 7.5.36) notes that there is '*potential for mitigation or compensation of biodiversity effects*' arising from the Sizewell C development and lists the following possibilities:

- *'creation of replacement habitat;*
- *maintaining the connectivity of wildlife corridors for certain species around the site;*
- *avoidance of the need to develop in or disturb sensitive areas;*
- *suitable design and location of coastal and fluvial flood defence works and the marine landing station;*
- *suitable construction methods; and*
- *suitable design and location of the cooling water abstraction and discharge points'*, including the incorporation of fish protection measures.

[1] SCC Cabinet report of 29/01/2013

e) In line with the Government's Natural Environment White Paper[2] (NEWP), any net loss in biodiversity must be avoided in favour of net gain through the support of well-functioning ecosystems and resilient ecological networks.

f) This guidance document identifies a series of key principles to avoid or minimise adverse ecological impacts caused by the development. The principles include an overarching set of general ecological principles followed by more specific sub-principles which deal with particular areas of complexity and concern: herptile species, bat species and SSSI and hydrology functionality.

Overarching Ecology Principles

1) The development must follow the mitigation hierarchy and prioritise the avoidance of adverse ecological impacts before considering mitigation, compensation, offset and enhancement measures. Given the scale of the development it is expected that offsetting of some residual impacts will be required.

2) EDF Energy are a statutory undertaker with regard to s40 of the Natural Environment and Rural Communities (NERC) Act 2006 and therefore have a duty to have regard to the conservation of biodiversity. The Sizewell C development should be an environmental exemplar and, as such, a complete ecological picture should be available from the environmental assessment with the aim of ensuring that what follows the development is of a higher standard than what was present previously. There must be a robust assessment of the habitats[3] and populations of protected and priority species likely to be affected by the development (including associated development). Any assessment must include species and habitats designated under:

   - UK or European legislation;
   - UK Biodiversity Action Plan (UK BAP), as defined in s41 NERC Act 2006;
   - IUCN Red Data Book invertebrate and plant species;
   - Birds of Conservation Concern (BoCC); and
   - Citations for the affected SSSI, SAC, SPA and Ramsar sites.
   - Other legally protected species

3) Any assessment must be undertaken by suitably qualified ecologists according to national[4] and local[5] guidance and should have the aim of determining a realistic understanding of population sizes and habitat requirements of all species. This may necessitate the need to consult specialist ecological experts.

[2] The Natural Choice: securing the value of nature: http://www.official-documents.gov.uk/document/cm80/8082/8082.pdf

[3] This should include a comparative audit of habitats lost or degraded by the development against those to be restored or created as compensation

[4] According to CIEEM guidelines for EIA (2006) and BS42020 Biodiversity – Code of Practice for Planning and Development

[5] Suffolk Local Biodiversity Action Plan, Species Action Plans and Habitat Action Plans should be used as a guide to the relevant priorities at the local level.

4) In addition to survey work undertaken by the developer, existing evidence regarding species, habitats and ecological connectivity in and around the Sizewell Estate should be used to understand baseline conditions and identify appropriate mitigation or compensation. For instance, EDF should regularly make use of up-to-date Suffolk Biological Records Centre records.

5) EDF must produce and implement an Ecological Management and Monitoring Plan (EMMP) as part of the Development Consent Order. It should identify all necessary avoidance, mitigation, compensation, offset & enhancement and monitoring measures with regards to species affected by the development and must take into account both the direct and indirect impacts. For instance, the identification of indirect impacts should include the ecological implications of increased vehicular traffic.

6) The EMMP must be of sufficient detail and scope to achieve functioning and sustainable compensatory habitat, together with ecological enhancements, during and after construction.

7) In the interest of developing good Statements of Common Ground with Interested Parties, the developer should work with the full range of environmental stakeholders throughout the ecological assessment and EMMP process. This will demonstrate to PINS that the developer has sought to build a consensus with key organisations locally.

8) The connectivity, functionality and resilience of both land and water-based wildlife sites and corridors for species around the site must be maintained and strengthened. This is supported by the principles contained in the National Planning Policy Framework (NPPF) which makes clear that the planning system should seek to establish '*coherent ecological networks that are more resilient to current and future pressures*' (paragraph 109). In line with this approach, any new habitat created should have the ability, before work commences, to form part of the existing ecological network and strengthen links across the landscape to allow species to move between sites. Specific requirements for corridors will be determined by the needs of the species present. Functional ecological linkage between Sizewell Marshes and the Minsmere to Walberswick SPA in particular must be maintained. The maintenance and strengthening of ecological corridors is in line with the 'landscape-scale' conservation principles expressed by the NEWP.

9) The 'favourable condition' of the Sizewell Marshes SSSI must be maintained throughout and after the development in line with Recommendations 11 and 14 of the Lawton Report and paragraph 5.3.11 of National Policy Statement EN-1. The SSSI is designated for outstanding invertebrates and breeding birds (and several nationally scarce plants are also present) and these species assemblages should remain intact.

10) EDF must ensure that appropriate resource is available to create compensatory habitat where necessary and monitor and manage such sites for the lifetime of the development (including decommissioning) and, if necessary, alter their environmental management according to the findings of monitoring. Effective long-term monitoring is necessary to determine and ensure the success of mitigation/compensation measures. Any compensatory habitat must be created on at least a 'like for like' basis, capable of supporting the same number of individuals and species as the site lost, and be assessed as meeting mitigation objectives by a qualified ecologist prior to any species translocation taking place.

11) Translocation should only be considered as a last resort. If it is considered necessary then animals should be moved to newly created habitat within the Sizewell Estate as a first option, the use of existing habitats is not acceptable. If it is not feasible to create sufficient habitat on-site to accommodate all displaced animals, receptor site/s must be as close to the Sizewell Estate as possible.

12) The developer should avoid the introduction of non-native species to the Sizewell Estate during construction. Ongoing surveys of non-native species should inform the EMMP.

13) Provision should be made for greater opportunities to use the Sizewell Estate for ecological education opportunities for local communities post-construction.

14) Those organisations that have drawn up these principles should form the basis of a Suffolk ecological and landscape liaison group that EDF can consult on survey methodology, assessment of impacts and proposed mitigation, management and monitoring and the development of the EMMP referred to above.

1 Suffolk principles for herpetofauna

1.1 Introduction

a. In order to meet the requirement of EN-1 and EN-6 regarding minimising impacts to biodiversity (see Appendix 1 for key sections), the footprint of development at all stages (construction, operation and decommissioning) must avoid or minimise disturbance to protected reptiles and amphibian species (addressed collectively in this document as 'herpetofauna'[6]).

b. All native reptiles and amphibians are protected by law under the Wildlife and Countryside Act 1981, meaning it is illegal to sell or intentionally kill or injure them. The great crested newt and natterjack toad have additional special protection under UK law, making it illegal to catch, possess or handle them without a licence or to cause them any harm or damage their habitat in any way.

c. It has been identified that a range of herpetofauna will require mitigation or compensation given the importance of populations present on the Sizewell estate (highlighted by survey work since 2007). Of particular concern are the populations of adder and slow worm which EDF identify as '*exceptiona*l' (EDF, 2012[7]: Table 4.2.4). Measures to address negative impacts upon herpetofauna should be included in the EMMP and should follow the mitigation hierarchy as set out in NE standing advice for reptiles[8]. This will include the creation of new habitat in the short term for that being lost and in the longer term EDF should contribute to the creation of further habitat that supports larger herpetofauna populations in line with the requirement that Sizewell C acts as an environmental exemplar.

d. These principles seek to minimise or avoid adverse impacts of the development upon herpetofauna populations present. They were formulated in August 2013 by the following organisations: Suffolk County Council, Suffolk Coastal District Council, RSPB, Suffolk Wildlife Trust and National Trust.

1.2 Principles for addressing impacts to herpetofauna populations on the Sizewell Estate

1) All works must be legally compliant in terms of the protected species status of herptofauna.

2) All surveys should follow national guidance [8,9,10].

[6] Herpetofauna in the context of the Sizewell Estate include: adder, slow worm, grass snake, common lizard, natterjack toad, common frog, common toad, great-crested newt and smooth newt.

[7] Sizewell C Stage 1 Environmental Report, November 2012

[8] http://www.naturalengland.org.uk/Images/Reptiles_tcm6-21712.pdf

[9] Herpetofauna Groups of Great Britain and Ireland (1998). Evaluating local mitigation/translocation: best practice and lawful standards. Available at: http://www.arguk.org/external-publications/view-category. Note that this is the advice sheet recommended by NE whilst drawing up new guidelines to replace the withdrawn TIN102.

3) Existing evidence regarding herpetofauna populations in and around the Sizewell Estate should be used to understand baseline conditions and identify appropriate mitigation or compensation.

4) Mitigation measures must be based on the requirements of specific species.

5) Animals should be moved to newly created habitat within the Sizewell Estate as a first option. If it is not possible to create sufficient habitat to accommodate all displaced animals, receptor site/s must be as close to the Sizewell Estate as possible. Use of forestry off the estate, should be seen as a last resort, as it is already subject to habitat enhancement works.

6) Any newly created or restored habitat must be of the necessary condition and scale to support viable amphibian and reptile populations displaced from the development. The new site should also be ecologically connected to the wider landscape, rather than being isolated. It should be identified, created and in a suitable condition before any clearance of existing herpetofauna takes place on the development site. Consequently, it is essential that work to create appropriate habitat begins now given the time required for the appropriate condition to be achieved. New habitat must be assessed as meeting mitigation objectives by a suitably qualified ecologist.

7) Appropriate resource must be provided to create new habitat, manage it for the lifetime of the project (including decommissioning), and ensure adequate monitoring is in place. This is necessary to determine the success of mitigation/compensation measures and to guide ongoing management.

Survey and monitoring requirements

8) The reptile and amphibian populations on the Sizewell Estate must be robustly assessed to determine a realistic understanding of reptile and amphibian populations.

9) In order to understand impacts that could arise from the development of Sizewell C on herpetofauna, surveys must follow the national guidance for herpetofauna survey (as stated above), translocation and management methodology, as set out in the Amphibian and Reptile Group guidance[9] and Amphibian and Reptile Conservation guidance[11].

10) Translocation receptor sites must be surveyed as per the donor site to confirm presence and status of any local herpetofauna populations.

11) During & post-construction monitoring will be necessary to determine the outcome of the translocation on the populations at the receptor site and their status and viability. Similarly during & post-construction monitoring should also be carried out on the development site and adjacent to it, to determine potential impacts of the development on animals & populations not translocated.

[10] http://www.narrs.org.uk/documents/Survey_protocols_for_the_British_herpetofauna.pdf.

[11] Edgar, P., Foster, J., & Baker. J. (2010). *Reptile Habitat Management Handbook*. ARC Trust

Receptor site identification

12) Methodology for this must follow the current guidance set out in Section 4 of the HGBI Advisory Note for Amphibian and Reptile Groups[9]. This is reproduced below for clarity (emphasis added):

4.1 "Onsite" or "in situ" solutions
In many cases, it may be best to attempt to retain at least part of the population on site. An on site solution obviates the uncertainties often associated with translocations, but in order for the scheme to work effectively, suitable additional habitat needs to be constructed within or close by the development site. Alternatively, land on site which is currently not managed sympathetically could be brought into favourable management in order to support the population to remain.

4.2 Selector of receptor sites
Suitable receptor sites should ideally:

a. *Be local to the donor site, and as close as possible to it (at least within the same county or similar administrative area, and the same geology and habitat type).*
b. *Not currently support a population of the species to be translocated, for known reasons, but be capable of supporting them given suitable remedial works if necessary. This is important because the translocation should result in no net loss of sites. Exceptions to this may be made for single or very low numbers of animals unlikely to form a viable breeding population if introduced to an unoccupied site. In this case, it may be appropriate to select receptor sites of the species, but being capable of supporting more given suitable remedial works.*
c. *Not be subject to planning or other threats in the foreseeable future.*
d. *Be subject to a written, agreed and funded pre- and post-translocation management agreement.*
e. *Be subject to a written, agreed and funded pre- and post-construction monitoring programme.*

13) Translocation sites should have the ability, under sympathetic management, to form part of the existing habitat matrix and strengthen links across the landscape that allows herpetofauna to move between sites.

14) In order to identify sites the Sizewell Environmental Stakeholder Group refers EDF to the following information to assist in the identification of translocation sites:
- It is important that EDF utilise the best available local knowledge to inform their plans.
- Information in the Suffolk Amphibian and Reptile Atlas (Provisional 2007) should be used.
- Herpetofauna specialists with knowledge of the Sizewell area should be consulted to ensure the most up to date distribution data is assessed.
- EDF should support updating the 2007 distribution maps to ensure the most robust baseline information is used to inform conclusions about herpetofauna populations and translocation work.

- Where new sites may be required EDF should utilise information on historic heathland extent on the Suffolk Coast, for example, The Landscape Partnership report on Heathland Restoration in the Suffolk Sandlings[12].

Site management

15) EDF must produce an Ecological Management and Monitoring Plan (EMMP). This should form part of the Development Consent Order. This should include plans for compensatory habitat provision, and set out a programme of post-construction monitoring. This plan should also identify appropriate actions to be carried out should impacts be identified through post-construction monitoring.

16) Management principles should be agreed with the aforementioned ecological and landscape liaison group and be aligned with the strategy outlined in the 'Suffolk Principles for the management of the Sizewell Estate'.

17) EDF must ensure appropriate resource is available to manage and monitor such sites for the lifetime of the development (including decommissioning).

[12] The Landscape Partnership (2012). *Heathland Restoration in the Suffolk Sandlings Environmental Statement for Suffolk Coastal District Council*. Available at: http://www.thelandscapepartnership.com/download/files/Sandlings-Environmental-Statement.pdf

2 Suffolk principles for bat species

2.1 Introduction

a) In order to meet the requirement of EN-1 and EN-6 regarding minimising impacts to biodiversity (see Appendix 1 for key sections), the footprint of the development at all stages (construction, operation and decommissioning) must avoid or minimise impacts upon bat species. All bat species and their roosts are fully protected by legislation (Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations (2010) (as amended)). The combined legislation makes it illegal to deliberately kill, injure or capture (take) bats, deliberately or recklessly disturb bats (whether in a roost or not) or damage, destroy or obstruct access to bat roosts.

b) A range of bat species have been identified that will require adequate mitigation or compensation given the importance of the populations present on the Sizewell estate (see Appendix 3 for further information). Measures to address negative impacts upon bat species should be included in the EMMP.

c) These principles seek to minimise or avoid adverse impacts of the development upon bat species resulting from the proposed development. They were formulated in September 2013 by the following organisations: Suffolk County Council, RSPB and Suffolk Wildlife Trust.

2.2 Principles for addressing impacts to bat populations on the Sizewell Estate

Pre-construction

1) The use of the Sizewell Estate by bat species throughout the year must be robustly surveyed based on up to date information and according to published best practice guidance (e.g. Bat Conservation Trust survey guidelines[13]), in order to identify areas which provide roosting, foraging or commuting habitat.

2) Assessment should be made of how habitats used by bats within the Sizewell Estate function as part of a network of habitats within the wider landscape, including connectivity between areas such as Minsmere and Aldringham Walks, and how ecological connectivity may be affected by the proposed development. Assessment should be undertaken in accordance with relevant published best practice guidance (e.g. Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment in the United Kingdom[14]), where such guidance exists.

3) Assessment should also be made of the use of associated development sites and transport link sites (including rail routes) by bats.

[13] Hundt, L. (2012). Bat Surveys: Good Practice Guidelines 2nd Edition. Bat Conservation Trust

[14] Guidelines for Ecological Impact Assessment in the United Kingdom (IEEM, 2006)

4) Evaluation of the value of all development sites throughout the year, both individually and cumulatively, should be undertaken. This should evaluate value for both individual species and species assemblages.

5) The design and layout of the proposed development, including areas of temporary, transport and associated development use, should ensure that adverse impacts on bat species are avoided. Having considered all feasible alternatives, where avoidance is not possible adequate mitigation measures should be identified to ensure that there are no adverse impacts on local bat populations. Where avoidance or mitigation is not possible, as a last resort, adequate compensation / offset measures, which have a reasonable likelihood of succeeding, should be secured. The package of measures should ensure that net gain for bats is secured in accordance with section 5.3.18 of National Policy Statement EN-1.

Construction

6) Parts of the Sizewell Estate and the associated development sites identified as important for bat roosting, foraging, commuting or hibernating should be protected from any adverse impacts that may result from construction activities. This may include, but is not limited to, minimisation of lighting of sensitive areas and noisy or vibration creating activities close to bat roosting, foraging, commuting or hibernating areas.

Operational impacts

7) Operational requirements of the power station, such as the need for permanent exterior lighting, should be deployed in such a way as to avoid adverse impacts on bat roosting, foraging, commuting or hibernating habitat.

Post construction

8) It should be ensured that appropriate resource is available to monitor bat populations on the Estate, during both the construction and operation phases for the lifetime of the development.

9) Opportunities for ecological enhancements for bats, such as new roosting and hibernating sites or foraging habitat, should be secured as part of any new development. Such enhancements should be part of a strategic approach to habitat creation resulting from the development, in line with the estate management strategy outlined in the ‘Suffolk Principles for the management of the Sizewell Estate’.

10) An Ecological Management and Monitoring Plan (EMMP) should be produced and form part of the Development Consent Order. This should include plans for compensatory habitat provision, and set out a programme of post-construction monitoring. This plan should also identify appropriate actions to be carried out should impacts be identified through post-construction monitoring.

3 Suffolk principles for SSSI and hydrological issues

3.1 Introduction

a) The Appraisal of Sustainability identified the potential for adverse impacts on national & international wildlife sites[15]. It outlines the potential for mitigation and compensation of biodiversity effects on UK sites, including the creation of replacement habitat.

b) In order to meet the requirement of EN-1 and EN-6 regarding minimising impacts to biodiversity (see Appendices 1 and 2 for key sections), EDF will also need to assess the hydrological impacts of the development, including *inter alia*, effects on water quality, resources and groundwater, and compliance with the Water Framework Directive.

c) Any mitigation and compensatory measures relating to designated sites and hydrology should also be outlined in the EMMP.

d) These principles are designed to ensure that the closely interrelated issues of nationally designated site integrity and hydrological functionality are not adversely affected by the development. They were formulated in September 2013 by the following organisations: Suffolk County Council, RSPB, Suffolk Wildlife Trust, National Trust and Suffolk Preservation Society.

3.2 Key principles regarding SSSI and hydrology

SSSI mitigation and compensation

1) 4.6ha of the Sizewell Marshes SSSI are currently proposed be lost due to the footprint of the nuclear island. The land take of the SSSI needs to be clearly justified and minimised. This should include consideration of any potential further loss due to the construction of additional infrastructure.

2) Parts of the Sizewell Marshes SSSI within the application boundary will not be lost permanently. However, it is likely that the disturbance within the area could be substantial and therefore affect its ability to function once construction is complete. This entire area of SSSI (*c.*6.4ha in total based on area projected to be permanently lost and area subject to significant disturbance) should therefore be compensated and not just the 4.6 ha that is likely to be permanently removed.

3) EDF should provide suitable evidence and appropriate mitigation measures to show the ecological and hydrological function of the remaining parts of the SSSI will not be impaired. If evidence appears to the contrary or mitigation is unlikely to be successful, then further compensation will be required.

4) Compensation / offset site(s) should provide a direct replacement for habitat lost or damaged due to the development. The selected site(s) should be capable of supporting

[15] It specifically identifies the following designated sites: Sizewell Marshes SSSI, Minsmere Walberswick Heaths and Marshes SSSI, Leiston-Aldeburgh SSSI, AldeOre Estuary SSSI, Alde-Ore and Butley Estuaries SAC, Alde-Ore Estuary SPA / Ramsar, Minsmere to Walberswick Heaths and Marshes SAC, Minsmere to Walberswick SPA / Ramsar, Orfordness -Shingle Street SAC, Sandlings SPA and Outer Thames Estuary SPA.

the species and functions provided by the section of SSSI to be lost. Selected site(s) should be as close to the habitat lost as possible, and should be functionally connected to existing habitat. The size of the site(s) required will depend on the amount of habitat required to support the species, numbers of individuals and functions of the lost (and impaired) habitat. As a minimum, it should be no smaller than the total area lost, but may need to be larger to account for sub-optimal habitat development and to ensure compensatory habitat can function effectively. EDF should consider that more isolated or distant sites may require a greater ratio of habitat created to habitat lost in order for the site to be fully functional.

5) An "*extensive programme of habitat restoration and creation*[16]*"* is being explored. The selection of sites for SSSI compensation and those for creation of any additional habitat should be planned in a strategic way to ensure any habitat is developed in the right locations and to maximise benefits for biodiversity.

6) Creation of compensation sites should begin as soon as possible, and at the latest once the construction phase of the development starts. There will be a time lag between compensatory sites being created and becoming ecologically functional (fully able to compensate for the site lost/damaged). Site creation is therefore required as soon as possible in order to minimise the delay between development commencing (and subsequent SSSI loss/damage) and compensatory sites becoming fully functional.

7) EDF must ensure appropriate resource is available to manage and monitor compensation sites for the lifetime of the development (including decommissioning).

8) An Ecological Management and Monitoring Plan (EMMP) should be produced and form part of the Development Consent Order. This should include plans for compensatory habitat provision, and set out a programme of post-construction monitoring. This plan should also identify appropriate actions to be carried out should impacts be identified through post-construction monitoring.

<u>Baseline hydrological assessment and modelling</u>

9) Assessment of hydrological and physical characteristics of the substrate in the section of the platform within and adjacent to the SSSI is required. This is in order to assess the stability of the proposed platform and avoid any slumping with potential impacts on drainage and thereby the ecological and hydrological functionality of the rest of the SSSI.

10) Hydrological studies should be used to understand the role of the Minsmere Sluice in providing adequate drainage from the site and inform potential mitigation. Such studies should include consideration of changes in flow rates, floodplain storage and the potential impact of sluice failure on flooding. Modelling and impact prediction should consider that the sluice is gravity drained and therefore does not function at certain states of tide. An assessment of the impact of water backing up in the Leiston Drain and flooding the Minsmere Levels must also be carried out, especially given the poor water quality of the Leiston Drain. Current understanding indicates that the sluice has a projected lifetime of 20-25 years.

[16] EDF Energy (2012) Initial Proposals and Options: Environmental Report, para. 4.2.11

11) Any modelling of impacts needs to consider predicted increases in rainfall, climate change scenarios and rising sea levels.

12) An assessment of the underlying aquifer will be necessary in order to understand suitability for, and effects of, any onsite abstraction of potable water, if applicable.

13) A water balance assessment should be carried out for the site and surrounding area in order to understand any impacts of changes in water flows, storage or discharges resulting from the development, and their effects on biodiversity.

Hydrological impacts on designated sites

14) There is a need to understand the hydrological issues associated with the development, including impacts on Sizewell Marshes SSSI, and potential impacts downstream on the Minsmere-Walberswick SPA and Ramsar site, and Minsmere to Walberswick Heaths and Marshes SSSI (including the RSPB Minsmere reserve). EDF should also consider impacts on any locally designated sites that may be affected by the development.

15) EDF should ensure that the ability to manage water levels on the Sizewell Marshes SSSI is retained, as this is essential for the management of the site.

16) If hydrological, and thereby ecological functionality, studies show that the Minsmere Sluice is key to ensuring adequate drainage from the site, this structure needs to be secured for the operational lifetime of Sizewell C.

17) Any bridges (permanent or temporary) should be constructed to best practice in consultation with Natural England using a clear span design to ensure that hydrological function is not impeded.

18) The impacts of any planned diversion of Leiston Drain must assess the effects on flow in the Drain itself and resulting drainage from adjacent sites, implications for relative flow from other channels and effect on flood risk to designated sites. An assessment of the minimum distance required to keep the Drain hydrologically separate from the adjacent channel will also be required in order to avoid adverse impacts on flow and water quality.

19) In the event of the need to win material from the site during construction, further details and assessment will be required in order to demonstrate that no hydrological impacts will result.

Effluent and abstractions

20) If sewage effluent from any aspect of the development, including the campus, is planned to be diverted through Leiston STW, EDF must assess the potential impact of the increased demand on the capacity of the STW and on water quality. There should be no risk to the receiving waterbody of impacts on water quality affecting achievement of SSSI targets. Alternative options should also be explored for managing wastewater.

21) If it is anticipated that wastewater will be treated by temporary package plants, then the system should be hydrologically separate from outside inputs such as runoff and rainfall.

22) Surface runoff from car parks and other areas of hard standing must be carefully managed, including the provision of SuDS, to ensure there is no risk to the receiving

waterbody of impacts on water quality. EDF must ensure adequate provision of Sustainable Drainage Systems (SuDS) in order to manage runoff.

23) Water quality targets for effluent discharge from the development must relate to SSSI targets and not default to WFD targets, unless WFD targets are more stringent.

24) The Environment Agency's Pollution Prevention Guidance (PPG) should be followed during construction to ensure that designated sites are not adversely affected in terms of water quantity or quality. Consideration should be given to the potential for saline seepage and release of contaminants, and the management of discharges resulting from de-watering.

25) The anticipated levels of water use and a suitable potable water source for the development must be identified to ensure there is adequate capacity and that this can be achieved in a sustainable manner that will not have an adverse effect upon river flows or wetland sites. If onsite abstraction is under consideration, the assessment of effects on the underlying aquifer should demonstrate that this will not result in potential impacts upon Sizewell Marshes SSSI and other designated sites.

Additional infrastructure sites

26) Assessment of hydrological impacts should be carried out for additional infrastructure sites, including both permanent and temporary aspects of the development.

APPENDIX 1:

Biodiversity and the National Policy Statements EN-1 & EN-6 (quotes identified in italics)

a. Section 4.1.4 of EN-1 makes it clear that *'the IPC* [now PINS] *will need to take ... into account environmental ... benefits and adverse impacts, at national, regional and local levels'*

b. Section 5.3.4 of EN-1 states that the '*applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests*'.

c. Section 5.3.7 of EN-1 sets out the general principle that *'development should aim to avoid significant harm to biodiversity … including through mitigation and consideration of reasonable alternatives'* and that *'where significant harm cannot be avoided, then appropriate compensation measures should be sought*'. Section 5.3.8 highlights that this should apply to sites that are locally important for the biodiversity they support, as well as sites that contribute to the overall ecological network of an area: *'In taking decisions, the IPC should ensure that appropriate weight is attached to designated sites of international, national, and local importance; habitats and species of principal importance for the conservation of biodiversity; and to biodiversity and geological interests in the wider environment'.*

d. Section 5.3.11 of EN-1 states, with regard to SSSIs, that the IPC (now PINS) *'should use requirements and/or planning obligations to mitigate the harmful aspects of the development and, where possible, to ensure the conservation and enhancement of the site's biodiversity or geological interest."*

e. Section 5.3.14 of EN-1 recognises the valuable biodiversity resource provided by ancient woodland and separate veteran trees and states that their '*loss should be avoided*'.

f. Section 5.3.15 of EN-1 asserts that when considering proposals, the IPC (now PINS) should maximise '*opportunities for building-in beneficial biodiversity or geological features as part of good design in and around developments … using requirements or planning obligations where appropriate*' (EN-1: 5.3.15).

g. EN-1 notes that '*many individual wildlife species receive statutory protection under a range of legislative provisions'* and that '*other species and habitats have been identified as being of principal importance for the conservation of biodiversity … and thereby requiring conservation action'* (EN-1: 5.3.16 and 5.3.17). It states that the IPC (now PINS) *'should ensure that these species and habitats are protected from the adverse effects of development by using requirements or planning obligations' (EN-1: 5.3.17)*.

h. Section 5.3.18 of EN-1 outlines a range of mitigation principles that developers should follow which are relevant to the proposed Sizewell C development:
    i. *During construction, they [the developer] will seek to ensure that activities will be confined to the minimum areas required for the works;*
    ii. *During construction and operation best practice will be followed to ensure that risk of disturbance or damage to species or habitats is minimised;*

iii. Habitats will, where practicable, be restored after construction works have finished; and

iv. Opportunities will be taken to enhance existing habitats and, where practicable, to create new habitats of value within the site landscaping proposals.

i. EN-6 (Volume II) assesses that the effective implementation of avoidance and mitigation measures may help to address adverse effects on European Site integrity, but that more detailed project level Habitats Regulations Assessment is required. With regards to sites of UK conservation importance, it identifies the '*potential for the mitigation of biodiversity effects'* including the '*creation of replacement habitat*' (EN-6 Volume II: C.8.63 and C.8.61).

j. Section 3.9.6 of EN-6 (Volume I) supports the mitigation measures highlighted in EN-1 to avoid or minimise impacts on biodiversity. En-6 specifically highlights the need to:
   i. Vary building layout to avoid ecologically sensitive areas;
   ii. Provide on-site measures to protect habitats and species and to avoid or minimise pollution and the disturbance of wildlife.

k. Section C.8.63 of EN-6 (Volume II) states that the "*...applicant will need to submit an ecological mitigation and management plan to minimise the impacts"* from construction of a new nuclear power station at Sizewell.

l. The Appraisal of Sustainability (AoS) identifies that the Sizewell C development has the potential to cause impacts upon internationally and nationally designated sites[17] of ecological importance through '*potential impacts on water resources and quality, habitat and species loss and fragmentation, and disturbance (noise, light and visual)*' (EN-6 Volume II: C.8.53). This means that '*significant strategic effects on biodiversity cannot be ruled out at this stage of the appraisal*' (EN-6 Volume II: C.8.53).

m. The AoS found that the construction and presence of the development are '*likely to lead to direct loss and fragmentation of habitats within the Sizewell Marshes SSSI*' (EN-6 Volume II: C.8.62). In terms of compensation, the AoS states that there is '*potential for habitat creation within the wider area in order to replace lost 'wet meadows' habitats of the Sizewell Marshes SSSI'* (EN-6 Volume II: C.8.63) but finds that '*it may not be possible to fully compensate for losses of this habitat*' (EN-6 Volume II: C.8.63).

n. The AoS (Main Report 2010: 7.5.35 and 7.5.36) identifies the following possible forms of mitigation at Sizewell for adverse effects on both national and international sites of nature conservation:

   - *'creation of replacement habitat;*
   - *maintaining the connectivity of wildlife corridors for certain species around the site;*
   - *avoidance of the need to develop in or disturb sensitive areas;*

[17] It specifically identifies the following designated sites: Sizewell Marshes SSSI, Minsmere Walberswick Heaths and Marshes SSSI, Leiston-Aldeburgh SSSI, AldeOre Estuary SSSI, Alde-Ore and Butley Estuaries SAC, Alde-Ore Estuary SPA / Ramsar, Minsmere to Walberswick Heaths and Marshes SAC, Minsmere to Walberswick SPA / Ramsar, Orfordness -Shingle Street SAC, Sandlings SPA and Outer Thames Estuary SPA.

- *suitable design and location of coastal and fluvial flood defence works and the marine landing station;*
- *suitable construction methods; and*
- *suitable design and location of the cooling water abstraction and discharge points'*, including the incorporation of fish protection measures.

*****

APPENDIX 2:

Hydrology and the National Policy Statements EN-1 & EN-6 (quotes identified in italics)

a. Section 5.15.2 of EN-1 highlights the importance of gathering adequate hydrological baseline data by stating that *'where the project is likely to have effects on the water environment, the applicant should undertake an assessment of the existing status of, and impacts of the proposed project on, water quality, water resources and physical characteristics of the water environment as part of the ES or equivalent'.*

b. Section 5.15.6 of EN-1 states the importance of compliance with *inter alia* the Water Framework Directive. It states that *'the IPC* [now PINS] *should satisfy itself that a proposal has regard to the River Basin Management Plans and meets the requirements of the Water Framework Directive (including Article 4.7) and its daughter directives, including those on priority substances and groundwater. The specific objectives for particular river basins are set out in River Basin Management Plans. The IPC* [now PINS] *should also consider the interactions of the proposed project with other plans such as Water Resources Management Plans and Shoreline/Estuary Management Plans*'.

c. Section 3.9.3 of EN-6 (Volume I) states that *'applicants should also consider the effects of the construction of a new nuclear power station on the groundwater regime'.*

*****

APPENDIX 3:

Existing bat survey information

In preparation for the Sizewell C development, bat surveys were started in 2007 in order to establish a baseline of the use of the Sizewell Estate by bats. Significant bat survey effort has been undertaken in 2007; 2010 and 2011. This has included activity and roost surveys and the use of static detectors and radio tracking. From the surveys undertaken to date at least 10 species of bat are known to be present on the Estate at some point during the year. The species recorded in the period 2007 to 2011 are:

Species	UK Distribution[18]	Suffolk Distribution[19][20]
Barbastelle bat (*Barbastella barbastellus*)	Rare, restricted to southern and central England and Wales	Widespread but uncommon
Brown long-eared bat (*Plecotus auritus*)	One of the most common species, widespread throughout UK	Widespread and common
Common pipistrelle bat (*Pipistrellus pipistrellus*)	One of Britain's commonest species, widespread distribution	Widespread and common
Daubenton's bat (*Myotis daubentonii*)	Fairly widespread throughout UK	Widespread and locally common
Leisler's bat (*Nyctalus leisleri*)	Rare in British Isles, although third most common species in Ireland	Rare and uncommon
Nathusius' pipistrelle bat (*Pipistrellus nathusii*)	Widely recorded throughout the UK, however records are sparse. Very small number of known maternity colonies in England	Rare
Natterer's bat (*Myotis natterei*)	Widespread distribution throughout UK, however generally scarce. UK population is of international importance	Widespread and uncommon
Noctule bat (*Nyctalus noctula*)	Relatively widespread in England and Wales, however becoming scarce in some areas	Widespread and uncommon
Soprano pipistrelle bat (*Pipistrellus pygmaeus*)	One of Britain's commonest species, widespread distribution	Widespread and common
Serotine bat (*Eptesicus*	Less common species, mainly	Widespread and uncommon

[18] Bat Conservation Trust (website accessed 03/10/2013)

[19] Bats in Suffolk Distribution Atlas 1982-2011 (Suffolk Bat Group, September 2012)

[20] Suffolk Local Biodiversity Action Plan Grouped Plan for Bats (Suffolk Biodiversity Partnership, March 2012)

serotinus)	occurring south of a line drawn between The Wash and parts of south Wales	

Of particular note is that the surveys undertaken between 2007 and 2011 have identified that the Sizewell Estate supports a maternity colony of barbastelle bats. The barbastelle is one of Britain's rarest bats and is listed on Annex II of the EU Habitats Directive[21]. To date only a relatively small number of maternity colonies have been discovered in the UK. A number of these maternity sites have subsequently been designated as Special Areas of Conservation (SAC)[22]. This makes the Sizewell Estate of at least national, and possibly international, importance for the species.

Nathusius' pipistrelles have also been recorded on the Estate, with peak periods of activity appearing to correlate with the spring and autumn migratory periods. Until the 1990's this species was considered a winter visiting migrant to the UK and it appears that a small number of breeding populations are supplemented by migratory individuals during the winter[23]. There are few records of this species for Suffolk and the Sizewell Estate may support a significant population for at least part of the year.

All bat species and their roosts are fully protected by legislation (Wildlife and Countryside Act (1981) (as amended) and the Conservation of Habitats and Species Regulations (2010) (as amended)). The combined legislation makes it illegal to deliberately kill, injure or capture (take) bats, deliberately or recklessly disturb bats (whether in a roost or not) or damage, destroy or obstruct access to bat roosts.

Four of the bat species recorded on the Estate (barbastelle; noctule; soprano pipistrelle and brown long-eared) are listed as species of principal importance in England under section 41 of the Natural Environment and Rural Communities (NERC) Act (2006)[24]. The S41 list is used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under section 40 of the Act, to have regard to the conservation of biodiversity in England, when carrying out their normal functions.

All bat species recorded in Suffolk are also included in a Local Biodiversity Action Plan (BAP)[25] grouped plan, setting out targeted actions for these species in the county.

*****

[21] Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (amended 2007)

[22] http://jncc.defra.gov.uk/protectedsites/sacselection/species.asp?FeatureIntCode=S1308 (accessed 13/09/2013)

[23] Bat Conservation Trust Nathusius' Pipistrelle Factsheet (accessed 03/10/2013)

[24] Natural Environment and Rural Communities (NERC) Act (2006) (accessed 03/10/2013)

[25] Suffolk Local Biodiversity Action Plan Grouped Plan for Bats (Suffolk Biodiversity Partnership, March 2012)

Sizewell C Design Principles: the local perspective

The production of these design principles has been led by Suffolk County Council & Suffolk Coastal District Council in collaboration and discussion with National Trust, RSPB, Suffolk Wildlife Trust and the Suffolk Coast & Heaths AONB.

Introduction

a. Sizewell C should be an environmental exemplar demonstrating how a large infrastructure project can be delivered in an area of very high environmental sensitivity[1].

b. Sizewell C is wholly within the Suffolk Coast & Heaths Area of Outstanding Natural Beauty (AONB) and on the Suffolk Heritage Coast (EN-6 vol II c.8.102 (i). It is the only nuclear new build proposed within a protected landscape in England. The Appraisal of Sustainability[2] identified that there is the potential for some long lasting adverse direct and indirect effects on landscape character and also visual impacts on the Suffolk Coast & Heaths AONB and Heritage Coast, with limited potential for mitigation, such that it could have an effect on the purpose of the AONB designation. To further understand these effects and the effectiveness of the mitigating actions proposed by the nominator of the site, further detailed assessment at project level will be required – the Appraisal of Sustainability suggests through the provision of an integrated landscape, heritage and architectural plan. The potential for remaining effects can best be fully assessed when detailed plans come forward. However, given the limited scope for mitigation, a level of impact is likely to remain.

c. The Appraisal of Sustainability has also identified the potential for impact on national & international wildlife sites. It outlines the potential for mitigation and compensation of biodiversity effects on UK sites (Sizewell Marshes SSSI), including the creation of replacement habitat. It states developers can avoid or minimise disturbance to protected species through careful site layout, design, routing, location of the development, associated infrastructure, and construction management and timings. The Appraisal of Sustainability finds that there is potential for habitat creation within the wider area in order to replace lost 'wet meadows' habitats of the Sizewell Marshes SSSI. The applicant will need to develop an ecological mitigation and management plan to minimise the impacts. Impacts on bats & reptiles particularly will need adequate mitigation or compensation.

d. Sizewell B is seen as an iconic structure, and one that arguably adds to the intrigue and character of the Suffolk coast. It represents a significant step change in design from Sizewell A. Sizewell B proves that innovative design can go hand in hand with operational functionality and safety and security requirements.

[1] SCC Cabinet report of 29/01/2013
[2] Which accompanied the National Policy Statement EN-6

e. The design and layout of the principal and ancillary buildings and associated infrastructure (including lighting and fencing) at Sizewell C are a fundamental component of how this project can be sensitive to place. This is a prerequisite of the criteria for "good design" set out in the National Policy Statement EN-1. Furthermore, the nuclear specific National Policy Statement EN-6 goes further to state that consideration of design is important to mitigate the negative effects of development, such as landscape and visual impacts. A summary of the relevant extracts of the National Policy Statements is appended to this note.

f. Design and layout of the site and its associated infrastructure needs to work across a number of inter-related areas including landscape, ecology, hydrology and the vision for EDF's estate. These issues must be afforded considerable weight alongside the safety, security, operational and engineering aspects of the development.

Suffolk's Design Principles

1. Sizewell C must be sensitive to place, both in terms of design, layout and finishes, sited as it will be in a nationally protected landscape and heritage coast area and adjacent to and on wildlife sites of national and international importance. A return to the incongruous design and bare concrete of Sizewell A is unacceptable. The design should also have regard to any future decommissioning of Sizewell A & B and the visual changes decommissioning will incur over the next century or more.

2. Given that EN-1 & EN-6 both state that design is an important part of mitigating the impact of new infrastructure, the design and treatment of Sizewell C's principal structures must relate well to the surrounding landscape and seascape, existing buildings and the way in which they may change over the next century. In particular, the design must respect and work with the iconic design and treatment of the B station. Sizewell B demonstrates 'the art of the possible', with a combination of innovative design solutions that meet operational, security and safety requirements.

3. The appearance and proportions of the Sizewell C domes and stacks are a critical design issue given the design of Sizewell B. EDF will need to fully justify why the bare concrete domes and visible stacks, cannot be incorporated under a clad superstructure, as with Sizewell B. Given the national landscape designation of the area and the importance of sensitivity to place, cost should not be the sole determining factor.

4. All design should be robust through time and finishes should be long lasting and capable of being refreshed.

5. The Generic Design Assessment for the principal buildings should be tested, in terms of the latitude for innovative design and treatment, within the confines of operational, security and safety requirements. This should include the height of the stacks, which should be fully justified in the context of visual and potential ecological impacts.

6. The design, layout and finishes of ancillary buildings and infrastructure (including bridges, lighting and fencing) on the C station should also be designed to ensure that they minimise visual impact, such as through the use of green walls. Low level visual clutter should be minimised, and the amalgamation of the ancillary buildings should be fully explored. The height of the buildings adjacent to the edges of the site should take into account the visibility from the surrounding countryside.

7. All temporary infrastructure used to facilitate construction should be removed following construction and the visual impact of any remaining 'footprint' or remnant of temporary development minimised.

8. Landscaping to minimise the visual intrusion, and enhance local landscape character and biodiversity must be considered hand-in-hand with building design. The landscape and visual impacts, as set out in the Appraisal of Sustainability (accompanying NPS EN-6), will be such that offsite compensatory landscape and amenity enhancements to the wider area (AONB landscapes and beyond) will be required. The seascape and visual impacts should also be assessed, given the protected AONB landscape of the coast and also the extent of the Heritage Coast definition off-shore. The requirement to consider seascape as part of the landscape and visual effects of energy projects is set out in EN-1 section 5.9.1. The UK Marine Policy Statement (section 2.6.5) similarly points to the need to assess impacts on seascape.

9. Design of the main and ancillary infrastructure should have regard to the potential for embedded ecological mitigation and enhancement (such as green & brown roofs, green walls, appropriate vegetation planting and bird nesting habitat, including but not limited to black redstart, peregrine falcon and swift). The design should also have regard to the need to minimise any adverse impacts on species and habitats, with particular attention to bridges, lighting, large areas of glass and baffling of noise sources. The ecological impacts of Sizewell C, as set out in the Appraisal of Sustainability (accompanying NPS EN-6), will be such that offsite compensatory habitat and enhancements to the wider area (AONB landscapes and beyond) will be required. Where compensating direct losses of habitat, these will need to be functioning in advance of any losses.

10. Coastal protection and MOLF design must demonstrate sensitivity to place and coastal processes. Design should take advantage of opportunities to enhance land/seascape character and terrestrial & marine biodiversity.

11. Public access, both permissive and statutory, must be fully considered as part of the design. This is particularly important in terms of coastal protection and the MOLF, regarding maintaining access to the beach. However, design must have consideration of the visual amenity of permissive and statutory routes both coastal and further inland.

12. Sizewell C should be an exemplar in terms of innovative nuclear power station design in the 21st century and add to the intrigue and character of

the Suffolk coast. The development should be something that both local communities can embrace and that EDF-Energy can be proud of as a legacy.

ANNEX

Design and the National Policy Statements EN-1 & EN-6

EN-1 provides some very clear direction to applicants in relation to good design, principally in section 4.5, entitled "Criteria for "good design" for energy infrastructure, which sets out that;

- Applying good design to energy projects should produce sustainable infrastructure sensitive to place, efficient in the use of natural resources and energy used in their construction and operation, matched by an appearance that demonstrates good aesthetic as far as possible.
- Good design is also a means by which impacts can be mitigated.
- PINS should satisfy itself that the applicant has taken into account both functionality (fitness for purpose & sustainability) and aesthetics (contribution to the quality of the area in which it will be located) as far as possible.
- An acknowledgement that applicants may have limited or no choice in terms of physical appearance (though this paper notes that the example of Sizewell B demonstrates what is possible in terms of innovate design of a nuclear power station).
- Application documents should present process, choices, reasons for favoured choice etc of design.
- PINS should take into account the ultimate purpose of the infrastructure and bear in mind the operational, safety & security requirements which the design has to satisfy.

Section 5.9.1 of EN-1 states the landscape and visual effects of energy projects will vary on a case by case basis according to the type of development, its location and the landscape setting of the proposed development. In this context, references to landscape should be taken as covering seascape and townscape where appropriate.

Section 5.9.11 of EN-1 states PINS should ensure that projects consented in AONBs should be carried out to high environmental standards.

EN-6 (Volume I) provides further guidance regarding design issues, in particular Section 2.8 which further qualifies the design tests set out in EN-1 in requiring that;

- Good design should be applied to all Nationally Significant Infrastructure Projects. The need for safety and security of the nuclear power station, and the need to control the impacts of its operations, must be given substantial weight.
- PINS should consider how good design can act to mitigate the impacts of new nuclear power stations, such as landscape and visual impacts (the effectiveness of the B station design is an example of this).
- The Generic Design Assessment, site licensing and environmental permitting processes will consider certain aspects of design, which PINS should not replicate.

Section 3.10 of EN-6 concerns landscape and visual impacts of nuclear development. It:

- Identifies the potential for long-term effects on visual amenity at Sizewell, given the Suffolk Coast & Heaths AONB.
- Acknowledges that cooling towers may increase a nuclear power station's visual impact on the landscape and further states that applicants should justify the use of a natural draft cooling system given that towers are large and can emit significant steam plumes.
- States that PINS would not expect visual impacts to be eliminated with mitigation, given that the scope for mitigation will be quite limited. Mitigation should however be designed to reduce the visual intrusion of the project as far as reasonably practicable.

Volume II of EN-6 discusses the Sizewell C site in detail, noting that the nominator has proposed that visual impacts could be mitigated by siting the main buildings on the same visual axis of the existing stations.

Although the layout proposed in the Stage One consultation does broadly meet these criteria regarding the easterly line, reactor buildings are further west than that of the B station. Furthermore the western peripheral buildings appear to be larger than those of the B station, thereby potential increasing the east-west depth of large buildings, particularly from views up and down the coast.

Furthermore, the accompanying Appraisal of Sustainability identifies that;

- While existing power stations at Sizewell are already prominent features within the AONB, the new power station, given the scale of the development, is likely to cause long lasting adverse direct and indirect effects on landscape character and visual impacts of the AONB.
- There is the potential for some long lasting adverse direct and indirect effects on landscape character and visual impacts on the AONB, with limited potential for mitigation given that the nominated site is wholly within the AONB.
- That Sizewell C could be so damaging as to have an effect on the purpose of the designation.

Brown1, Graham

From: Lewis, Alan [redacted]
Sent: 16 November 2020 17:39
To: Hay, Emma; Brown1, Graham; Crabb, Nina
Cc: Rebecca Calder; Philip Brashaw [redacted] Matt Simpson [redacted] Murray Grant [redacted]
Subject: SZC - Correction to the sHRA

Hi all

I promised to share this correction with you and can confirm this will be included in the errata we submit to PINS.

Kind regards

Alan

SPAs

To cover SPAs first, these assessments presented changes in visitor numbers for both the realistic and precautionary scenarios and so for SPAs everything is in line with the Appendix 5.10E - Recreational Disturbance Assessment.

SACs

However for the SACs (and Ramsar site for habitats features), the HRA links back to old numbers and the realistic as opposed to precautionary scenario. The text from the HRA is pasted below, with what should be the correct numbers (based on the precautionary scenario) added in red.

Alde, Ore and Butley Estuaries SAC and Alde-Ore Estuaries Ramsar site

7.4.76*…..car park locations that give access to the Ramsar site already receive an estimated 580,000 [correct] recreational visits per year, and that any increase due to recreational users displaced from Sizewell would be small (estimated to be an additional 29,000 [34,062] recreational visits in this case per annum).*

Minsmere to Walberswick Heaths and Marshes SAC

7.7.34 the car-park locations that give access to the SAC already together receive an estimated 1,114,206 [1,129,822] recreational visits per year, and that any increase due to recreation users displaced from the Sizewell area would be small (estimated to be approximately an additional 20,000 [88,623] recreational visits per annum).

Conclusions

- The corrected numbers do not change the HRA conclusions given the way the assessment has been undertaken and that a monitoring and mitigation plan would be in place.
- For SACs, the main text / body of the Shadow HRA does not quote specific percentage changes or use the percentage change to inform its conclusions.

FOOTPRINT ECOLOGY

Impacts of recreation related to Sizewell C and implications for European sites

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Summary

This report has been commissioned by the National Trust and the RSPB in light of concerns regarding proposals for Sizewell C Power Station and potential nature conservation impacts from recreation use. The area around Sizewell is of outstanding importance for nature conservation and contains a mix of habitats and species that are unique in the UK. The area is also popular for recreation, which includes tourists, day visitors, and local residents. There is a difficult balancing act to ensure access and conservation do not conflict in a relatively small area.

The Sizewell C proposal would result in changes in recreation use as it would involve a large construction workforce that would be living and working in the area. In addition, construction work would displace existing recreation use (for example through footpath diversions, noise, traffic, etc). We review the impacts of recreation on the nature conservation interest of relevant sites, focussing on the European sites (i.e. those that are subject to particularly strict protection) and their qualifying features.

We highlight a wide range of vulnerable features and risks to their conservation interest resulting from recreation use. Likely significant effects are clear for a range of sites and interest features and, in particular, we highlight:

- Annual vegetation of drift lines (Minsmere to Walberswick Heaths & Marshes SAC), risks from damage and contamination;
- Perennial vegetation of stony banks (Minsmere to Walberswick Heaths & Marshes SAC), risks from damage and contamination;
- European dry heaths (Minsmere to Walberswick Heaths & Marshes SAC), risks from fire and contamination;
- Wintering waterbirds, including White-fronted Goose (Minsmere to Walberswick SPA), risks from disturbance;
- Breeding birds, including Nightjar, Avocet, and Little Tern (Minsmere to Walberswick SPA), risks from disturbance;
- Breeding Nightjar (Minsmere to Walberswick SPA), risks from disturbance and fire; and
- Breeding Woodlark and Nightjar (Sandlings SPA), risks from disturbance and fire.

People coming to the area to live and work in the vicinity will seek nearby greenspace for recreational use that is not necessarily related or connected to the area's conservation interest, and such use will include exercise and dog walking. It may extend to sea angling, barbeques, swimming, and beach recreation. Such use is likely to be away from areas perceived as 'nature reserves' (i.e. where there are hides, wardens, and a fee to enter) and instead focus their use at more peripheral locations. These are often still part of the European site and do not have necessary infrastructure to manage access. We would expect

construction workers based in the area to utilise more informal parking and locations where they can easily access beaches, quiet areas of heath, etc. Use by construction workers is also likely to take place in the early mornings, evenings, and around shift work and therefore not necessarily fit with peak visitor use and the current visitor profile.

We provide an overview of the mitigation that is likely to be necessary, highlighting that a package of measures will be required, and this will need to include monitoring to help pick up emerging issues.

Contents

Acknowledgements

This report has been commissioned by the National Trust and RSPB to provide background and help inform responses by the National Trust and the RSPB to the proposals for a new Sizewell C Power Station. Our thanks to Emma Hay (National Trust) for overseeing the work and in addition to Jacqui Miller (RSPB) and Adam Rowlands (RSPB) for useful discussion and context.

1. Introduction

Overview

1.1 The RSPB and National Trust are concerned about the potential for displacement of recreational users from the vicinity of the Sizewell C development (SZC) to neighbouring designated sites during the construction period.

1.2 Risks from recreation potentially relate to:

- Use of nearby sites for recreation by construction workers, including those potentially housed in purpose-built accommodation at Eastbridge, and;
- Displacement of visitors who would otherwise have gone to Sizewell, to access the beach and coastline around the power station and have been displaced due to the traffic, construction work and changes to access.

1.3 Displacement of visitors from Sizewell is likely to primarily relate to those using the large public car-park just to the south of Sizewell A, who might be expected to shift to other locations. There may also be some displacement in visitor routes around the general area, for example visitors at Dunwich and Minsmere may be deterred from walking as far south as they might have done otherwise due to the construction work.

1.4 The National Trust, with the RSPB, have therefore commissioned this report to review the sensitivity of designated site features to recreation impacts and to consider the potential for suitable mitigation.

2. Relevant European sites

2.1 For recreation issues associated with new housing in Suffolk, the Recreation Avoidance Mitigation Strategy (Hoskin, Liley, & Panter, 2019) highlights how different mitigation strategies around the country define zones of influence (drawing on visitor data to show where changes in housing are likely to result in changes in access use) ranging from 5-15km. Drawing on data from the Suffolk Sandlings (Cruickshanks, Liley, & Hoskin, 2010) and the Deben Estuary (Lake, et al., 2014), the Suffolk strategy uses 13km. This is helpful as a broad guide to indicate where impacts may be expected.

2.2 Based on this guide, our knowledge of the nearby European sites and their draw for recreation and their accessibility from Sizewell/Eastbridge (taking into account the road network), we would anticipate the potential for risks at the following sites:

- Alde, Ore & Butley Estuaries SAC;
- Benacre to Easton Bavents Lagoons SAC;
- Orfordness - Shingle Street SAC;
- Minsmere to Walberswick Heaths & Marshes SAC;
- Alde-Ore Estuary SPA;
- Benacre to Easton Bavents SPA;
- Minsmere to Walberswick SPA;
- Sandlings SPA;
- Alde - Ore Estuary Ramsar, and;
- Minsmere - Walberswick Ramsar.

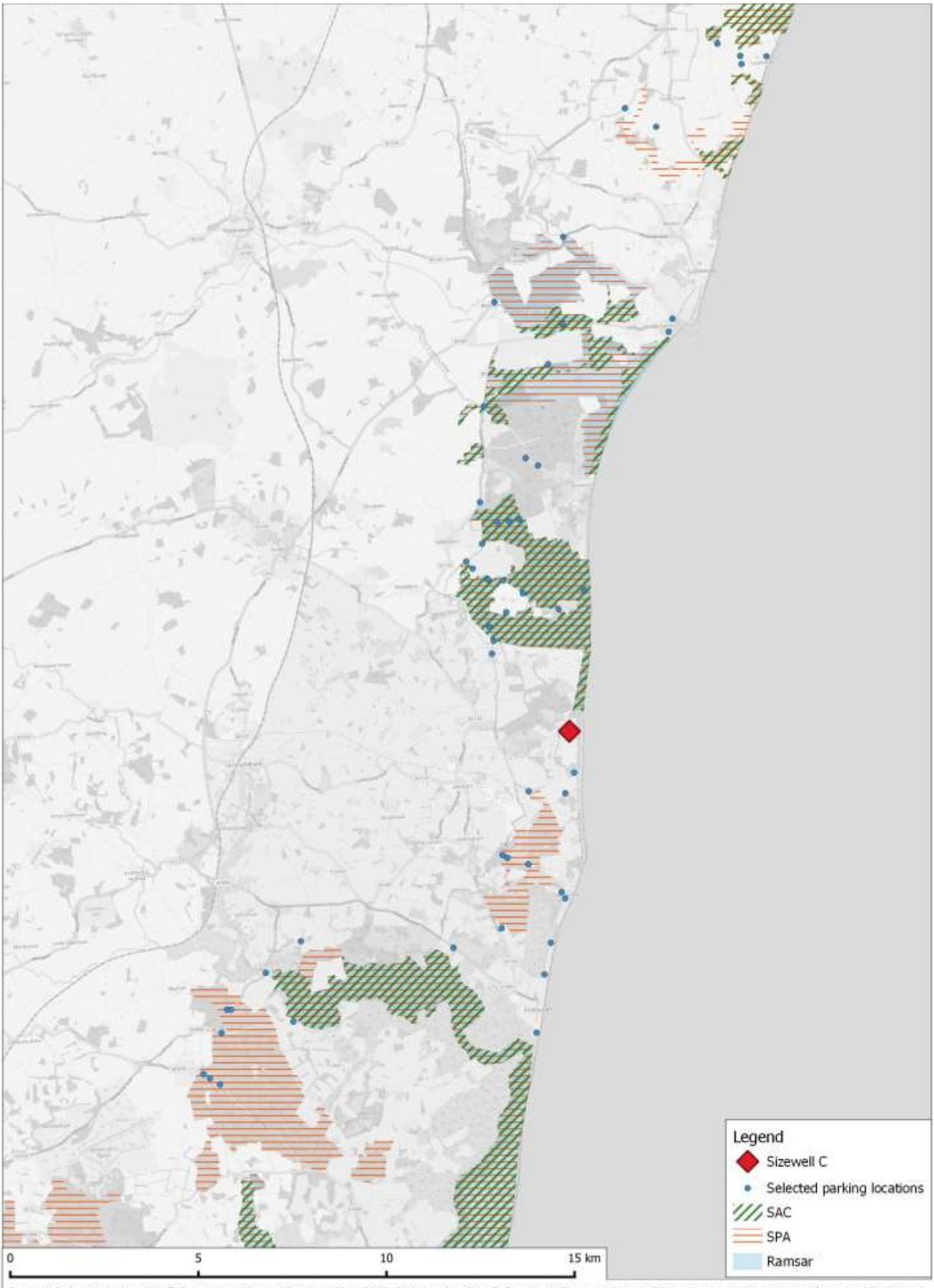
2.3 These European sites are shown in Map 1, where a selection of parking locations are also shown. These parking locations do not represent a comprehensive review of all potential parking locations and have not been systematically mapped from site visits. However, they are drawn on our knowledge of the sites and reflect locations where access might be expected to be deflected/change. There are a wide range of possible parking locations not mapped (see for example Cruickshanks et al., 2010) and those shown are intended as a guide only, providing a broad indication of the key areas where access might change.

2.4 We have discounted the following European sites as not relevant, even though they are potentially within the kinds of distance whereby displacement might be expected:

- Southern North Sea SAC, as this is a marine site designated for Harbour Porpoise *Phocoena phocoena*;

- Outer Thames Estuary SPA. as this is a marine site classified for foraging terns and non-breeding Red-throated Diver *Gavia stellata*;
- Staverton Park & the Thicks SAC, as this site is linearly c.15km from Sizewell, with travel distance larger still due to the barrier of the Alde-Ore Estuary. Public access at the SAC is limited to a public footpath close to the boundary of the SAC, and;
- Dew's Ponds SAC, as this is an inland site, comprising various ponds on arable land, and designated for Great-crested Newts *Triturus cristatus*. It is unlikely to draw visitors away from the coast.

Map 1: Overview of sites and parking provision



3. Impacts from recreation

3.1 The nature conservation impacts of recreation are summarised in a number of general reviews (e.g. Buckley, 2004; Liddle, 1997; Liley et al., 2010; Lowen, Liley, Underhill-Day, & Whitehouse, 2008).

3.2 We group impacts from recreation under the following broad headings, which we use to structure this section:

- Disturbance;
- Damage;
- Fire;
- Contamination, and;
- Impacts on site management.

Disturbance

Overview

3.3 Disturbance occurs where human activity influences an animal's behaviour or survival. By far the majority of the literature (and there are thousands of studies), focuses on birds (Brawn, Robinson, & Thompson III, 2001; Hill et al., 1997; for general reviews see Hockin et al., 1992; Lowen et al., 2008; Showler, 2010; Steven, Pickering, & Castley, 2011; Whitfield, Ruddock, & Bullman, 2008). Disturbance can also affect mammals, herptiles (see Edgar, 2002 for review) and invertebrates.

General principles

3.4 The presence of people in the countryside will influence wildlife in many ways. For many species, people or their pets (e.g. dogs) are a potential threat and as such it is to be expected that the response will be to modify behaviour, for example fleeing. The relative trade-off as to when to change behaviour and respond to the threat will relate to the perceived scale of the threat and the costs involved (e.g. lost foraging time). This perspective can be used to understand the behavioural responses to people and led one author to describe human disturbance as predation-free predators (Beale & Monaghan, 2004).

3.5 With people (and their pets) viewed as potential predators, there is clearly a greater threat posed (and therefore a greater behavioural response) when, for example, there are more people, in larger groups (Beale & Monaghan,

2004, 2005) or when people approach directly (Smith-Castro & Rodewald, 2010) or faster (Bellefleur, Lee, & Ronconi, 2009).

3.6 The presence of people may also draw particular predators, for example a study in America showed the crow (corvid) populations were centred around campgrounds (Marzluff & Neatherlin, 2006) while Kays *et al.* (2017) used camera traps to show a range of predators actively selected human-made paths. As such the presence of people may also influence the distribution and abundance of predators with a knock-on effect for potential prey species.

Impacts

3.7 Disturbance can therefore have a range of different impacts, potentially affecting distribution, breeding success, and health. Impacts can be chronic, for example otherwise suitable nesting habitat being completely avoided (e.g. Liley & Sutherland, 2007) or more short-term in nature, for example birds becoming alert and then resuming the initial activity (e.g. Fernandez-Juricic, Jimenez, & Lucas, 2001). Birds might be temporarily displaced from particular locations and such behavioural responses will have some energetic costs, even if only very short term in duration. Impacts can also include indirect mortality, for example through increased predation associated with disturbance (e.g. Brambilla, Rubolini, & Guidali, 2004).

3.8 There are also examples of direct predation by pet dogs, for example dogs were recorded as predators of nests and incubating adult Ringed Plovers *Charadrius hiaticula* on Lindisfarne (Pienkowski, 1984). Some studies have shown evidence of accidental trampling of nests and young, including herptiles (Edgar, 2002) and birds (Liley & Sutherland, 2007). There are also studies that show direct trampling impacts by people of invertebrates (Ciach, Maślanka, Krzus, & Wojas, 2017).

3.9 Much harder to measure and record are physiological effects, for example related to stress, and these may in turn affect fitness. While studies are limited, there is evidence of physiological effects in terms of increased heart rate (Ellenberg, Mattern, & Seddon, 2013) and stress-hormones (Thiel, et al,. 2011).

Relevant qualifying features

3.10 At coastal sites, there are a range of studies that show reduced breeding success for breeding birds such as gulls and terns (Medeiros et al., 2007;

Robert & Ralph, 1975; Sandvik & Barrett, 2001). Little Terns *Sternula albifrons* are particularly vulnerable to disturbance as they nest on open sandy/shingle beaches where access is often concentrated. They will avoid nesting in otherwise suitable habitat where there are high disturbance levels (i.e. more people) (Ratcliffe, et al., 2008). Colonies will vary in size and location between years and there is likely to be interchange between different sites along the Suffolk coast over time.

3.11 Disturbance to wintering and passage waterbirds can result in:

- A reduction in the time spent feeding due to repeated flushing/increased vigilance (Bright, et al, 2003; Fitzpatrick & Bouchez, 1998; Stillman & Goss-Custard, 2002; Thomas, Kvitek, & Bretz, 2003; Yasué, 2005);
- Increased energetic costs (Nolet, et al, 2002; Stock & Hofeditz, 1997);
- Avoidance of areas of otherwise suitable habitat, potentially using poorer quality feeding/roosting sites instead (Burton, et al., 2002; Burton, Rehfisch, & Clark, 2002; Cryer, et al.1987; Gill, 1996), and;
- Increased stress (Payne et al., 2012; Sharpe, et al., 2009).

3.12 Disturbance arising from human activity has been shown to negatively affect the foraging efficiency and fat accumulation rate of diving ducks (Knapton, Petrie, & Herring, 2000), with pedestrian and cycle-based activity shown to have a greater impact in the winter than vehicular disturbance (Pease, Rose, & Butler, 2005).

3.13 For species associated with reedbeds, there is limited evidence of disturbance impacts for Bitterns (Underhill-Day, 1981), but while recreational disturbance of breeding birds at the nest is less likely, it has been suggested that human activity on the edges of reed-beds and on waterway margins may have an impact (Underhill-Day & Wilson, 1978). There is evidence of disturbance effecting breeding success for Marsh Harriers, for example. Underhill-Day (1984) found that 9% of nests were deserted as a result of human disturbance, and a range of activities were involved that included photography, walking, and fishing. Other studies have highlighted increased energetic costs imposed upon nesting Marsh Harriers by disturbance (Fernandez & Azkona, 1993).

3.14 For heathland bird species there are a range of disturbance studies. For both Nightjar and Woodlark, studies have shown recreation use affects the distribution of birds within sites, such that busy areas are avoided (Liley et al. 2006; Mallord, et al. 2007; Lowe, Rogers & Durrant, 2014). For Nightjars there

is also evidence of breeding success being lower on busier sites and busier parts of sites (Murison 2002). For Woodlarks at least, there are clear population-level impacts as a result of the presence of people on the heaths (Mallord et al. 2007).

3.15 Little work has been undertaken on disturbance impacts for wintering Hen Harrier. Traditional roost sites are identified as places where access management measures, or exclusions/restrictions, should be implemented in relation to CRoW (Brown & Langston, 2001). A well-known hen harrier roost site in Dorset was abandoned in 1997, with local counters believing that increased access by walkers and other recreational activities was the cause (Lowen et al., 2008).

3.16 Impacts for different European site qualifying features are summarised in Table 1.

Table 1: European site qualifying features identified as being susceptible to disturbance impacts from recreational activity.

Qualifying feature	European site(s)	Seasonality	References	Notes
Breeding wildfowl (i.e. Gadwall, Shoveler, and Teal)	Minsmere-Walberswick SPA; Minsmere-Walberswick Ramsar	Spring and Summer		Potential for disturbance at wetland breeding localities if walkers/dogs are able to access water's edge.
Wintering wildfowl (i.e. Gadwall, Shoveler, and White-fronted Goose)	Minsmere-Walberswick SPA	Winter		Recreational disturbance could potentially influence where birds feed, time spent feeding and flushing will have energetic consequences.
Marsh Harrier	Minsmere-Walberswick SPA; Alde-Ore Estuary SPA; Benacre to Eastern Bavents SPA; Minsmere-Walberswick Ramsar	Spring and Summer	(Fernandez & Azkona, 1993; Underhill-Day, 1984)	Both males and female spend less time near the nest, bring in fewer food items, and exhibit stress-related behaviours when disturbed.
Hen Harrier	Minsmere-Walberswick SPA	Winter	(A. Brown & Langston, 2001; Lowen et al., 2008)	Winter roost sites are likely to be susceptible to disturbance.
Bittern	Minsmere-Walberswick SPA; Benacre to Eastern Bavents SPA; Minsmere-Walberswick Ramsar	Spring and Summer	(Underhill-Day & Wilson, 1978)	Impacts more relevant to feeding birds and assumed access difficult and unlikely to nest sites
Bearded Tit	Minsmere-Walberswick SPA; Minsmere-Walberswick Ramsar	Spring and Summer		Potential scope for disturbance if accessing extensive reedbed localities.
Avocet	Minsmere-Walberswick SPA; Alde-Ore Estuary SPA; Alde-Ore Ramsar; Minsmere-Walberswick Ramsar	Spring and Summer	(Scarton, 2018)	Any access to breeding localities could lead to disturbance/abandonment. Birds respond at quite considerable distances to presence of people.
Avocet	Alde-Ore Estuary SPA	Winter		
Lesser Black-backed Gull	Alde-Ore Estuary SPA; Alde-Ore Ramsar	Spring and Summer		Potential for disturbance effects at breeding colonies, although recreational access considered unlikely on the Alde-Ore Estuary due to isolated nature of colonies.
Sandwich Tern	Alde-Ore Estuary SPA	Spring and Summer	(Brown & Grice, 2005; Garthe &	Potential for abandonment, damage to eggs/chicks, and increased levels of natural predation at colonies. Nests

Qualifying feature	European site(s)	Seasonality	References	Notes
			Flore, 2007; Lloyd, Bibby, & Everett, 1975)	in large colonies and single access events can cause whole colonies to desert.
Little Tern	Minsmere-Walberswick SPA; Alde-Ore Estuary SPA; Benacre to Eastern Bavents SPA	Spring and Summer	(Medeiros et al., 2007; Ratcliffe, Schmitt, Mayo, Tratalos, & Drewitt, 2008)	Decreased productivity, and increased levels of natural predation, arising from recreational activity. Birds also avoid nesting on beaches with high levels of access. Colonies are mobile and can shift between years, responding to habitat change and other factors.
European Nightjar	Minsmere-Walberswick SPA; Sandlings SPA	Spring and Summer (to late August)	(Liley, Clarke, Mallord, & Bullock, 2006; Lowe, Rogers, & Durrant, 2014; Murison, 2002)	Recreational activity can lead to avoidance of certain areas within a site, and also negatively impact productivity. Dunwich Forest population is likely to be functionally linked to birds within the Minsmere-Walberswick SPA and Sandlings SPA.
Woodlark	Sandlings SPA	All year (although increased impact in Spring and Summer). Potentially particularly vulnerable when settling on territories in Feb/March.	(Eyre & Baldwin, 2014; Mallord, Dolman, Brown, & Sutherland, 2007)	Recreational activity can lead to displacement or avoidance of certain areas within a site, and also negatively impact productivity. Studies with nest cameras have shown some instances where nests lost due to joggers or bikes crushing nests. We consider birds within the Minsmere-Walberswick SPA and within Dunwich Forest population to be functionally-linked to the Sandlings population.
Redshank	Alde-Ore Estuary SPA; Alde-Ore Ramsar	Winter	(Fitzpatrick & Bouchez, 1998)	Birds prone to flushing and lost feeding time following recreational disturbance
Ruff	Alde-Ore Estuary SPA	Winter		Wintering birds feeding on areas of wet grassland may be susceptible to disturbance effects.

Damage

Overview

3.17 Recreational activities can lead to changes in soil characteristics and ultimately lead to erosion. Although erosion brought about by recreational activities is small compared to natural factors it can none the less an important form of soil degradation (Holden et al., 2007). Changes to substrates can in turn lead to changes in the ecological communities they support.

3.18 At lower levels of use, the main impact is on vegetation and is largely mechanical (Bayfield & Aitken, 1992; Liddle, 1997) while higher levels of use will also affect substrates. Light use may cause a slight decrease in vegetation cover, and a decline in the incidence of flowering. Bare ground may be colonised by trampling resistant species. Heavier ground pressure leads to greater losses of vegetation. Significant erosion can be expected where the plant cover falls below 70% (Liddle, 1997), but erosion can commence before this level is reached (Kuss & Morgan, 1984). As loss of vegetation takes place, there is disruption and progressive loss of soil horizons by direct physical abrasion or loosening and indirectly by water and wind erosion. Important changes in soil structure and chemistry can result from compaction. Poor permeability to water can increase surface run-off, and reduced aeration can result in anaerobic conditions and poor root growth.

3.19 Trampling has been shown to alter the amount of litter present (Bayfield & Brookes, 1979), soil water content, soil temperature and chemistry (Liddle, 1997). There is also some evidence that trampling and resulting compaction can effect soil health and the mycorrhizae or bacteria present (with knock-on implications for plant health) (Fay, 2014).

3.20 Different recreational activities can have a significantly different impact. In general, walking is likely to be less damaging that horse riding, cycling, or motorised vehicles. For example, Weaver and Dale (1978) showed that horses were substantially more damaging, and motorcycles slightly more damaging, than hikers in grassland and woodland in the US Pacific Northwest. Thurston and Reader (2001) suggest that mountain bikes cause the same amount of damage as hikers in deciduous woodland, although MacIntyre (1991) and Rees (1990) show that mountain bikes may cause slightly more damage than foot traffic depending on the type of habitat.

Relevant qualifying features

3.21 Heather-dominated vegetation is very susceptible to trampling damage, though there may be some differences related to individual species response and soil conditions. In summer and winter trials on undamaged lowland heathland in England (Harrison, 1981), it was shown that 400 passes in the first summer of the experiment, caused heather cover to fall to about 50%, and by 800 passes it was less than 10%. The vegetation failed to recover in the period following the experimental trampling, after winter only, summer only, or all season trampling.

3.22 Seasonal and habitat response was tested in trials on heathland in Brittany (Gallet & Roze, 2001a) and though there were some differences, in all cases trampling led to a great decrease in vegetation cover, with the vegetation cover varying between 0 and 50% under 750 passes. Dry heathland was more resistant than mesophilous (humid) heath and significantly so with winter trampling, but both heath types were equally vulnerable in wet conditions. Gorse was more resilient than heathers; and younger dwarf shrubs were less vulnerable than older plants.

3.23 Though trampling can damage the dwarf shrub community of heathland, there are some aspects of the habitat that need the canopy to be broken, even to the extent of bare ground being sustained. Bare ground and early successional habitats are a very important component of the heathland ecosystem, important for a suite of plants, invertebrates and reptiles (Byfield & Pearman, 1996; Key, 2000; Lake & Underhill-Day, 1999). Typically, small, low-growing, herbs with low competitive capacity require these open conditions and lack of suppression by a taller canopy. Some may be ruderals or annuals that can only survive in such conditions.

3.24 Some kind of physical disturbance is usually required to create these bare ground habitats, and hence a certain level of physical disturbance, including erosion resulting from trampling, can be beneficial. However, the level of disturbance required is difficult to define and is likely to vary between sites (Lake, Bullock & Hartley 2001). There are likely to be optimum levels of use that maintain the bare ground habitats but do not continually disturb the substrate. Such levels of use have never been quantified, nor is it known whether sporadic use is likely to be better at maintaining bare ground habitats than low level, continuous use.

3.25 Research has shown that shingle vegetation, strandline communities, and reedbed are easily damaged by trampling, and that this can lead to a decrease in plant species diversity within shingle communities particularly (Penny Anderson Associates, 2009). This has been shown to be the case historically on the Orford Shingle (Fuller & Randall, 1988). Trampling in reedbeds is likely to be constrained by high water levels for much of the year, although may prove an issue during periods of low water and/or at the periphery of the locality. Such peripheral trampling/poaching is also of potential import for coastal lagoons and other isolated waterbodies.

3.26 Fen habitats are also highly susceptible to trampling damage, although the high water table present in tall herb fen may dissuade access away from the periphery. Nevertheless. Due to the wet, or seasonally wet, ground present within fens, the habitat is extremely susceptible to trampling damage where access is possible (Penny Anderson Associates, 2009). Experimental trampling carried out over several years within fens in Norway led to severe damage (Arneson, 1999) and results from Scotland showed that taller fen grasses were less resilient to trampling than sedges (Rees & Tivy, 1977).

3.27 Impacts of recreation upon saltmarsh have been relatively little studied, due to the often inaccessible nature of the terrain (Penny Anderson Associates, 2009), although several studies identify trampling effects (Hewitt, 1973; Schofield, 1967). The creation of distinct pathways across saltmarsh, potentially leading to changes in vegetation community structure/composition, has also been noted (Chandrasekara & Frid, 1996). In Coombes (2007) review of trampling effects on different East Anglian coastal habitats, the data show saltmarshes as more robust compared to certain other coastal habitats.

3.28 Impacts upon notable plant and invertebrate species within the qualifying habitats is likely to vary by habitat type. Some light trampling within more robust fen habitats and reedbed may prove beneficial for invertebrates especially, although notable plants/invertebrates associated with sand dune and coastal shingle are particularly susceptible to damage via trampling (Penny Anderson Associates, 2009).

3.29 Impacts for different European site qualifying features are summarised in Table 2.

Table 2: European site qualifying features identified as being susceptible to physical damage arising from recreational activity

Qualifying feature	European site(s)	Seasonality	References	Notes
H4030 European dry heaths	Minsmere-Walberswick Heaths & Marshes SAC	During the growing season. Lichens more vulnerable during the summer when dry.	(Byfield & Pearman, 1996; Gallet & Roze, 2001b; Harrison, 1981; Key, 2000; Lake et al., 2001; Lake & Underhill-Day, 1999; Penny Anderson Associates, 2009)	Some limited trampling/disturbance required to maintain important bare ground habitat components.
H1210 Annual vegetation of drift lines	Minsmere-Walberswick Heaths & Marshes SAC; Orfordness-Shingle Street SAC	During growing season.	(Doody & Randall, 2003)	Dynamic habitat type, susceptible to impact of tidal /storm action. Pioneer species susceptible to trampling impacts.
H1220 Perennial vegetation of stony banks	Minsmere-Walberswick Heaths & Marshes SAC; Orfordness-Shingle Street SAC	All year as trampling changes structure.	(Doody & Randall, 2003; Lowen et al., 2008)	Highly susceptible to trampling effects, with often isolated/patchy nature of vegetation on shingle and damage to shingle structure potentially exacerbating impact more so than in more contiguous habitat types, and making recovery and recolonization more difficult/slower. Areas with lichen cover particularly vulnerable.
H1150 Coastal lagoons	Benacre to Easton Bavents Lagoons SAC; Orfordness-Shingle Street SAC	Throughout year	(Lowen et al., 2008; Penny Anderson Associates, 2009; Saunders, Selwyn, Richardson, May, & Heeps, 2000)	Damage from pedestrian access likely to be limited to periphery of habitat, where shallow water may support specialised communities. Entry by people/dogs into deeper sections risks further physical damage to substrate. Trampling issues suggested as 'minimal' by Saunders *et al.*
H1330 Atlantic salt meadows	Alde-Ore & Butley Estuaries SAC	Throughout year	(Chandrasekara & Frid, 1996; Coombes, 2007; Hewitt, 1973; Lowen et al., 2008; Penny	Human access within saltmarsh habitats constrained by topography and tidal action, forcing creation of distinct, and sometimes heavily utilised, pathways within accessible locations. Trampling has been shown to cause physical

Qualifying feature	European site(s)	Seasonality	References	Notes
			Anderson Associates, 2009; Schofield, 1967)	damage to habitat and changes in community structure. Saltmarsh habitats potentially less vulnerable compared to other coastal habitats.
H1130 Estuaries	Alde-Ore & Butley Estuaries SAC	Throughout year	(Lowen et al., 2008; Penny Anderson Associates, 2009)	Dynamic/tidal nature of habitat means that lasting effects often concentrated in vicinity of high water mark. Possible for damage to estuarine substrate invertebrate and algal/pioneer plant communities via trampling. Many areas inaccessible or difficult to access.
H1140 Mudflats and sandflats	Alde-Ore & Butley Estuaries SAC	Throughout year	(Lowen et al., 2008; Penny Anderson Associates, 2009)	Dynamic/tidal nature of habitat means that lasting effects often concentrated in vicinity of high water mark. Possible for damage to substrate invertebrate and algal/pioneer plant communities via trampling but risks low given the difficulties with access..
Wetland habitats	Minsmere-Walberswick Ramsar	Throughout year	(Arneson, 1999; Lowen et al., 2008; Penny Anderson Associates, 2009; Rees & Tivy, 1977)	Physical damage likely to be limited to periphery during periods of high water. Drier parts of reedbeds can be readily accessible and trampling risks possible. Would require relatively high or repeated incursions for marked structural damage. Tall/waterlogged fen habitats highly susceptible to trampling impacts, including loss of less robust plant species leading to change in community structure. Potential for poaching of banks and trampling of marginal, and potentially emergent/submerged, vegetation, e.g. where dogs access water.
Nationally scarce plant species and British Red Data book invertebrates	Minsmere-Walberswick Ramsar	Throughout year		Impacts likely to relate to structural change to habitats, for which see above.

Fire

Overview

3.30 Fires in the countryside can be caused accidentally from discarded cigarettes, by sparks from a campfire, BBQs or from burning a dumped or stolen car, from fireworks, as a result of a controlled fire getting out of control, from discarded bottles in strong sunlight, from children playing with matches or similar, and from deliberate arson. Fire risks have increased with climate change (anon, 2017; Jolly et al., 2015; Moffat & Gazzard, 2019) and major fire incidents on nature reserves are becoming more common.

3.31 Based on 217 questionnaires from a sample of lowland heaths in Dorset, Kirby and Tantram (Tantram, Boobyer, & Kirby, 1999) found that 61% of fires were caused by arson, 8% from management fires getting out of control, 7% from bonfires and the remainder from camp fires, burning refuse, vehicle fires, property fire and sparks from a railway. The only natural cause of fire was from lightning. The same study noted that there was a widespread belief among the public and nature conservation professionals that most fires were deliberate and that children were often believed to be responsible (this would be most relevant on sites close to residential areas rather than remote uplands).

3.32 A number of studies have linked the incidence of fires with areas used by the public, or with the extent of urbanisation. In the Peak District National Park during 1970-1995, 84% of 324 recorded fires were next to roads, paths or within areas of open access, and many burnt areas on Exmoor are close to public roads (Miller & Miles, 1984). Kirby and Tantram (1999) noted that of the 26 lowland heathland SSSIs in Dorset with the highest number of fires, 1990-1998, 70% were located in or adjacent to urban areas, including the top nine.

Relevant qualifying features

3.33 Fires can have major impacts on the soil, vegetation, and fauna present, and recovery can take many years. After a fire where temperature and intensity are moderate, vegetation recovery will be largely influenced by the vegetation composition before the fire, although subsequent management, particularly grazing and trampling, will influence regeneration. The less palatable or better-adapted species may be favoured by grazing, so that, for example, on heathlands, cross leaved-heath and the more unpalatable

graminoids may benefit initially at the expense of heather. Pioneer communities, such as those on shingle banks, may be particularly impacted by fire, due to the small amounts of soil present and the time taken for those soils to develop (Randall, 2004). Any recovery following fire will be further hindered by the small size of the seedbank in pioneer communities.

3.34 A range of studies show impacts of fires for invertebrate populations. Recovery of the full community of unburnt areas can take as little as two years in grassland to 20 years in heathland habitats (Bell, Wheater, & Cullen, 2001; Panzer, 2002). While some species and communities can benefit from the open conditions following a fire or in regularly burned sites, others can be seriously depleted or even eliminated (Kirby, 2001). Fires is a frequently used tool in reedbed management, but if allowed to burn out of control it can damage invertebrate populations within reed stubble and litter, and potentially cause subsurface burns in areas with peat soils (Hawke & Jose, 1996).

3.35 Where fires are extensive, whole populations of invertebrates can be destroyed and large fires may cause local extinctions in less mobile species. Invertebrate groups which are most vulnerable to fire in open habitats are those present in the litter as eggs or larvae in spring when many fires take place, species with only one generation per annum and sedentary or flightless species or groups. These include molluscs, leafhoppers, grasshoppers and some butterfly and moth species (Kerney, 1999; Panzer, 2002).

3.36 Fire can also be particularly damaging to reptiles, and the occurrence of fires within heathland can also lead to habitat and/or nest destruction for important bird species (e.g. Nightjar and Woodlark).

3.37 Impacts for different European site qualifying features are summarised in Table 3.

Table 3: European site qualifying features identified as being susceptible to fires arising from recreational activity

Qualifying feature	European site(s)	Seasonality	References	Notes
H4030 European dry heaths	Minsmere-Walberswick Heaths & Marshes SAC	Can occur throughout year, particularly likely during prolonged hot/dry weather. Impact greater in spring/summer.	(Bell et al., 2001; Borghesio, 2009; Panzer, 2002; Underhill-Day, 2005)	Fire can be a useful management tool but such management is targeted to limited areas and only undertaken in the late winter. Wildfire can damage extensive areas of habitat and have devastating effects upon important bird, invertebrate, and plant species. Grazing levels can impact subsequent recovery, and long-term changes in habitat structure are possible if not carefully managed.
H1210 Annual vegetation of drift lines	Minsmere-Walberswick Heaths & Marshes SAC; Orfordness-Shingle Street SAC	Throughout year (potentially higher risk in summer months as increased access levels, use of disposable barbeques, etc)		Low risk due to patchy/tideline distribution and thin soils, impacts likely to be localised as fire unlikely to spread.
H1220 Perennial vegetation of stony banks	Minsmere-Walberswick Heaths & Marshes SAC; Orfordness-Shingle Street SAC	Throughout year (potentially higher risk in summer months as increased access levels, use of disposable barbeques, etc)	(Doody & Randall, 2003; Randall, 2004)	Higher risk than drift line communities due to more contiguous vegetation patches with more developed humus layer, but spread still unlikely and impacts possibly localised. Long-lasting impact due to time taken for soils to develop and paucity of seedbank available for recovery.
Wetland habitats	Minsmere-Walberswick Ramsar	Throughout year. Higher risk during periods of low water levels.	(Hawke & Jose, 1996)	Wildfire can destroy large areas of contiguous reedbed habitat and proved difficult to control. High water levels will preclude extensive damage to invertebrate communities within reed litter, but fires during periods of low water can lead to large die-offs of stubble and litter invertebrate populations.

Qualifying feature	European site(s)	Seasonality	References	Notes
Nationally scarce plant species and British Red Data book invertebrates	Minsmere-Walberswick Ramsar	Throughout year. Higher risk during periods of low water levels.	(Hawke & Jose, 1996)	Particular concern for drier parts of reedbeds, see above.

Contamination

Overview

3.38 Contamination risks include:

- Nutrient enrichment from dog fouling;
- Contamination of ponds and water bonds from incursions by dogs and people;
- Litter;
- Spreading of invasive species, and;
- Spreading of disease.

3.39 Air quality may also be affected via emissions from vehicles and fires, which may have resultant, diffuse, effects upon vegetation. Any changes in air quality resulting solely from increases in levels of recreational access will be difficult to isolate from changes as a result of general traffic, industry, nearby infrastructure, etc, and air quality effects are therefore not considered further within this report.

3.40 A relatively limited number of studies have addressed the impacts of dog fouling (Bull, 1998; Groome, Denton, & Smith, 2018; Taylor, Anderson, Taylor, Longden, & Fisher, 2005). Dogs will typically defecate within 10 minutes of a walk starting, and as a consequence most (but not all) deposition tends to occur within 400m of a site entrance (Taylor *et al.,* 2005). In addition, most faeces are deposited close to the path, with a peak at approximately 1m from the path edge (Shaw, Lankey, & Hollingham, 1995). Similarly, dogs will typically urinate at the start of a walk, but they will also urinate at frequent intervals during the walk too. The total volume deposited on sites may be surprisingly large. Over one year at Burnham Beeches National Nature Reserve, Barnard (2003) estimated the total amounts of urine as 30,000 litres and 60 tonnes of faeces from dogs.

3.41 Nutrient levels in soil (particularly nitrogen and phosphorous) are important factors determining plant species composition for many habitats, the typical effect will be equivalent to applying a high level of fertilizer, resulting in a reduction in species richness and the presence of species typically associated with more improved habitats. The impacts of dog fouling can often be seen in the form of grassy wedges/edges of paths on many heaths with high levels of access. This can be exacerbated by trampling, which has a lesser effect on species such as grasses (which grow from the base rather than the tip).

3.42 Ponds and small water bodies are often popular with dogs and dog walkers will often seek such features out, particularly in hot weather. Heavy use by dogs leads to turbid water, an impoverished invertebrate flora, and a loss of vegetation (Denton & Groome, 2017; Groome et al., 2018). These impacts are linked to the trampling/splashing of the dogs and are potentially exacerbated by contamination from wormer, tick, and flea treatments (Groome et al., 2018).

3.43 A further consideration is that of sunscreen and other personal care products. Personal care products containing oxybenzone and octinoxate are being banned from some areas of the world where they are thought to be contributing to the disruption of marine ecosytems. In freshwater systems, carbon-based and nano-particulate UV filters have been shown to negatively impact invertebrates (e.g. Schmitt, et al., 2008). These issues will be relevant where people enter the water.

3.44 Litter can cause direct mortality of bird, reptile, and small mammal species, and may become concentrated within certain habitats (e.g. on beaches: (Storrier, et al., 2007)). It can also be problematic for site managers if ingested by livestock.

3.45 Contamination can also include the spread of invasive species. Studies have shown that recreation can act as a vector to spread seeds over considerable distances (Wichmann et al., 2009). Additional footfall and dogs entering water bodies may increase the spread of species such as New Zealand Pigmyweed *Crassula helmsii* (Groome et al., 2018), which has been recorded near the northern boundary of the Minsmere RSPB reserve[1]. On terrestrial habitats, the occurrence of Piri-piri Burr *Acaena novae-zelandiae* has long been linked to recreation (Usher et al., 1986). The species is now widespread in the area, including around the Minsmere main RSPB car-park.

Relevant qualifying features

3.46 Relevant qualifying features are nutrient-poor habitats such as heathland and water features that are readily accessible to people and dogs. Relevant features are listed in Table 4.

[1] See RSPB website, accessed 4th July 2020

Table 4: European site qualifying features identified as being susceptible to contamination impacts from recreational activity

Qualifying feature	European site(s)	Seasonality	References	Notes
H4030 European dry heaths	Minsmere-Walberswick Heaths & Marshes SAC	Throughout year	(Denton & Groome, 2017; Marrs, 1988; Shaw et al., 1995; Underhill-Day, 2005)	Dog faeces/urine will enrich nutrient poor habitats and lead to changes in community composition. This can become concentrated car parks/access gates and can form grassy wedges alongside tracks and paths. Litter can prove a fire risk (e.g. glass, dropped cigarettes), and may prove problematic for site managers if ingested by grazing livestock. Spread of invasive species such as Piri-Piri Burr also a risk.
H1210 Annual vegetation of drift lines	Minsmere-Walberswick Heaths & Marshes SAC; Orfordness-Shingle Street SAC	Throughout year	(Storrier et al., 2007)	Risk of enrichment from dog faeces/urine. Litter (plastic in particular) often concentrated on tideline, potentially inducing physiological stress/shading if deposited over vegetation.
H1220 Perennial vegetation of stony banks	Minsmere-Walberswick Heaths & Marshes SAC; Orfordness-Shingle Street SAC	Throughout year		Risk of enrichment from dog faeces/urine.
H1150 Coastal lagoons	Benacre to Easton Bavents Lagoons SAC; Orfordness-Shingle Street SAC	Throughout year	(Saunders et al., 2000)	Risk of enrichment from dog faeces/urine. Also contamination from dog/animal skin treatments and human sunscreen. Risk of transporting disease (e.g. Chytrid) and invasive species propagules between wetland sites on footwear/clothing. Litter/waste impacts for coastal lagoons described as' observable' by Saunders *et al.*
H1330 Atlantic salt meadows	Alde-Ore & Butley Estuaries SAC	Throughout year		Risk of enrichment from dog faeces/urine, in addition to litter deposition, although severe impact considered less likely due to tidal nature of habitat.
Wetland habitats	Minsmere-Walberswick Ramsar	Throughout year		Risk of enrichment from dog faeces/urine. Also contamination from dog/animal skin treatments. Risk of transporting disease (e.g. Chytrid) and

Qualifying feature	European site(s)	Seasonality	References	Notes
				invasive species propagules between wetland sites on footwear/clothing. Litter may prove problematic for site managers if ingested by grazing livestock.
Nationally scarce plant species and British Red Data book invertebrates	Minsmere-Walberswick Ramsar	Throughout year		Risk of enrichment from dog faeces/urine. Also contamination from dog/animal skin treatments. Risk of transporting disease (e.g. Chytrid) and invasive species propagules between wetland sites on footwear/clothing. Litter may prove problematic for site managers if ingested by grazing livestock.

Impacts on site management

Overview

3.47 Damage to infrastructure can occur in a variety of ways. With more footfall, infrastructure such as car parks, paths, gates, and stiles are likely to need more maintenance and repair, and direct damage can also occur through vandalism. Increased levels of use may also lead to an increase in public opposition to management programmes associated with conservation, such as the control of invasive species (Bremner & Park, 2007). Seasonal impacts may also occur due to closures of certain paths in periods of wet weather, leading to time taken up by site managers to deal with complaints from members of the public and a potential increase in visitor numbers in novel areas of a site.

3.48 Recreational activity can be a particular problem where livestock grazing is used in conservation grazing. Dog-walkers and horse riders may be concerned about interactions with livestock, while walkers and others may be concerned about the impact of fencing and gates on open access areas or about disease. In some cases, livestock grazing (particularly sheep) is found to be untenable on sites popular with dog walkers due to worrying and death of sheep by dogs (e.g. Taylor *et al.* 2005), and displacement of livestock away from heavily utilised areas may occur. Dogs are also an issue for the welfare of livestock through the transfer of pathogens such as *Neospora* from dogs to cattle through dog faeces (causing abortion in infected cattle).

3.49 Another potential issue relates to demand for access and pressure for particular interventions, infrastructure or facilities. On sites with current recreation use visitors may well wish for better path surfacing, toilets, cafes, dog bins etc. Where access is not encouraged or there is no access there may be demand from local people and visitors for access to be provided. These issues can bring added pressure for site managers or a need to compromise between nature conservation and recreation.

Relevant qualifying features

3.50 Pressure on site managers to maintain the upkeep of recreation/access infrastructure (e.g. fencing, gates, car parks, etc) will be inherent in the face of increasing recreational activity levels, irrespective of the habitat under review. Particular focus has therefore been placed upon those habitats within which livestock are used in conservation grazing.

3.51 Ponies and cattle are used to graze areas of heathland within the SPA/SAC/Ramsar, with more robust, free-ranging, Koniks present within wetter habitats. Potential risks arise for these livestock from the ingestion of litter, worrying by dogs, and damage to fencing (leading to them accessing unsuitable areas). The presence of increased numbers, or novel, visitors within areas subject to grazing may lead to the livestock avoiding busier parts of the site (or conversely congregating if visitors begin to feed them). Any impact on the grazers could potentially impact upon the structure and quality of any of the habitats within which they are deployed.

3.52 Impacts for different European site qualifying features are summarised in Table 5.

Table 5: European site qualifying features identified as being susceptible to changes in site management arising from recreational activity

Qualifying feature	European site(s)	Seasonality	References	Notes
H4030 European dry heaths	Minsmere-Walberswick Heaths & Marshes SAC	Throughout year		Ponies, cattle and sheep used for conservation grazing on the heath and adjoining acid grassland. Damage to infrastructure and the presence of dogs/people could lead to changes in the distribution of grazers on site. Also risk of killing, injury, or disease transmission from dogs to livestock. Increased access makes some aspects of practical conservation management (e.g. tree clearance burning) more difficult.
Wetland habitats	Minsmere-Walberswick Ramsar	Throughout year		Konik ponies are used as conservation grazers in wetland areas. Damage to infrastructure and the presence of dogs/people could lead to changes in the distribution of grazers on site. Also risk of killing, injury, or disease transmission from dogs to livestock. Increased levels of access may add to pressure for water levels/flood risk to be managed differently.
Nationally scarce plant species and British Red Data book invertebrates	Minsmere-Walberswick Ramsar	Throughout year		Habitat structure will be important for these species. Konik ponies are used as conservation grazers in wetland areas. Damage to infrastructure and the presence of dogs/people could lead to changes in the distribution of grazers on site. Also risk of killing, injury, or disease transmission from dogs to livestock. Increased levels of access may add to pressure for water levels/flood risk to be managed differently.

4. Implications of Sizewell C in terms of recreation use and impact

4.1 The Suffolk coast draws visitors for a wide range of recreation use. These include a mix of tourists, day-visitors and local residents. In total, nearly 13 million visits were estimated to East Suffolk in 2018 (Destination Research, 2018), comprising a mix of day trips (just over 12 million) and staying trips (nearly 700,000).

4.2 In the Sizewell area, there are a wide range of opportunities for informal recreation use of countryside sites, these include 'flagship' locations such as the main RSPB car-park at Minsmere or the National Trust car-park at Dunwich. At these locations there are visitor centres, visitor engagement staff and facilities provided for recreation use. These locations are free for members but otherwise there is a fee to access. There are also numerous much more informal locations where parking is free and there are footpaths or open access land with relatively little access infrastructure in place.

4.3 EDF have provided some estimates of visitor numbers to different locations around Sizewell and increases in use they predict associated with the proposals for Sizewell C (i.e. additional recreational use from construction workers and from displaced visitors). The data from EDF are summarised in Maps 2 and 3[2]. It is important to note that we have found errors in the EDF reports and do not agree with the methods used (see separate review for details and comment).

4.4 The EDF estimates relate to very broad areas– i.e. 'Sandlings Walk', 'Rendlesham', and 'Minsmere Outer'. These are too ambiguous and very generalised, encompassing multiple access points and a wide area. It is impossible to drill down into the data at a scale that ecological data and visitor data can be combined in a meaningful way. Many places (e.g. Dunwich Beach, Tunstall Forest, Sandlings Walk, Rendlesham, Orford, Aldeburgh, Southwold and Walberswick) are all assumed to have the same levels of current use (150,000 per annum), which is unlikely.

[2] The maps are drawn from the data in Table 2.1, and the figures based on the 500,000 visits to Sizewell area columns (page 320 of the pdf) within Appendix E: Recreational Disturbance Assessment, within the 5.10 Shadow HRA Vol. 1: Screening and appropriate assessment. PINS document reference: APP-148

4.5 Despite these concerns, we have generated Map 2, which shows current visitor estimates by EDF and the estimates of additional use. The pie charts are graduated to reflect the total number of visitors (current and new combined) that EDF estimate. The pie charts are drawn in the approximate locations reflecting the names used by EDF and relate to a general area rather than the specific location.

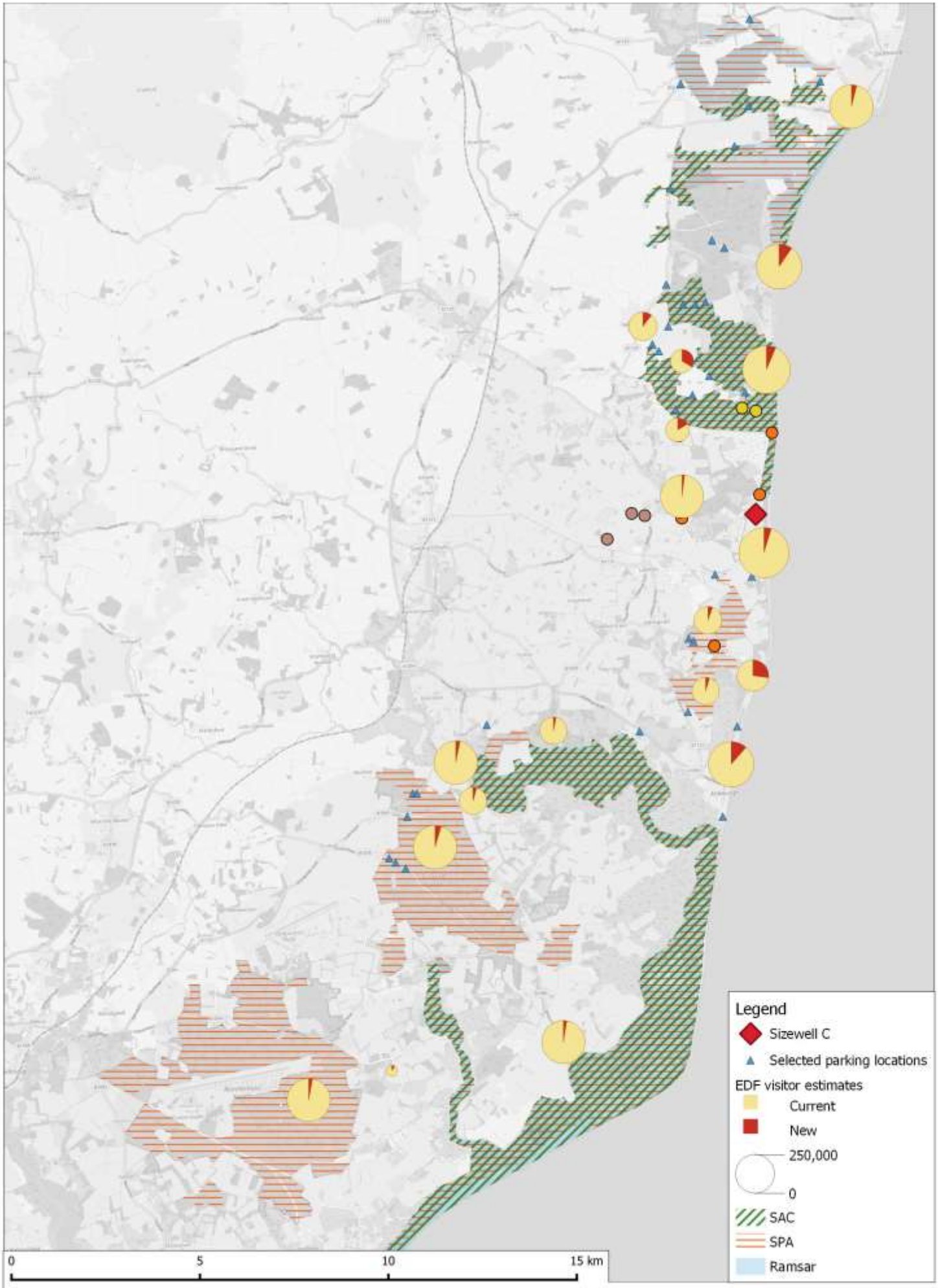
4.6 Map 3 is similar and uses the same data, although the circles are graduated to show the % increase in use estimated by EDF for each general location.

4.7 In both Map 2 and Map 3 we have also shown parking locations. These are approximate and intended as a guide only, they have not been systematically mapped on the ground and checked. These blue points do highlight the range of parking locations whereby visitors can access European sites. We would have expected EDF to present visitor data at this kind of resolution, i.e. current and predicted visitor numbers at each access point. This would have allowed much more detailed analysis of visitor data alongside ecological data (habitats and species distributions). Such data gathering would then have allowed changes in access to be related to vulnerable species, providing a means by which impacts could be properly assessed and appropriate mitigation established. Unfortunately, such data are lacking, and it is not possible to gain a robust and reliable overview of current recreation use, let alone reliable predictions of future use were Sizewell C to go ahead.

European sites and qualifying features

4.8 In Table 6 we summarise the European sites and identify the qualifying features we consider potentially vulnerable to recreation impacts. We have scored each according to the likely risks from the Sizewell C proposal.

Map 2: EDF estimates of visitor use and change



Map 3: EDF estimates of visitor use: percentage increase

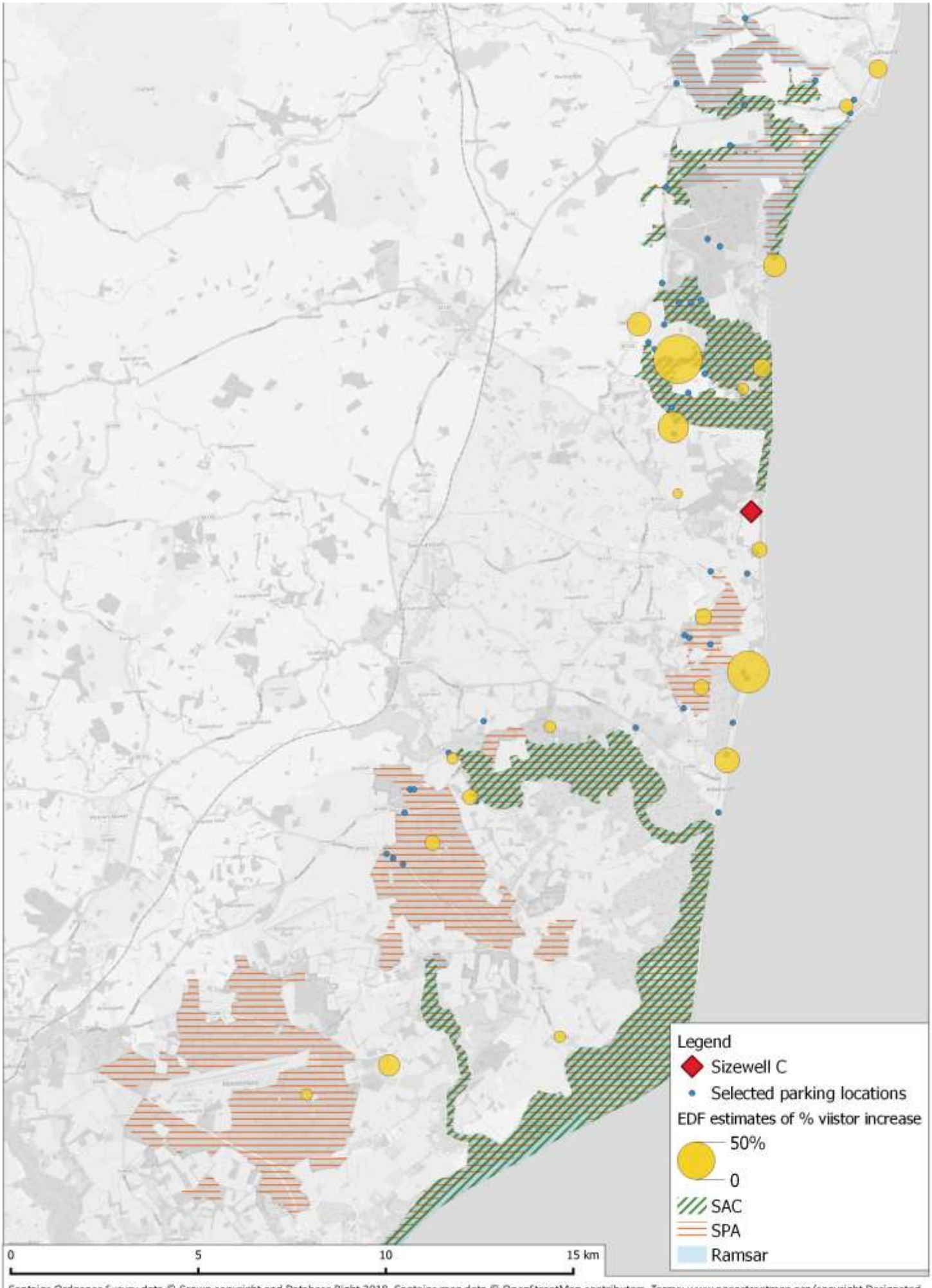


Table 6: Overview of potential impacts by site and qualifying feature. All features considered at risk are listed below, where there is overlap between Natura 2000 site features and Ramsar then we have not repeated the relevant information for the Ramsar sites. We have scored the potential impacts on a scale of 1-5. 1= risks very low, likely impact low and of relatively low concern – likely significant effects (LSE) can probably be ruled out but further checks/review necessary. 5 = risks marked, likely to occur and of major concern, may be hard to rule out adverse effects on integrity, even with mitigation. Blank cells indicate no risk identified. Shading reflects the score (from 1 (amber) to 5 (dark red)). Avian interest features are identified as breeding (br) and/or wintering (w).

European site(s)	Qualifying feature	Disturbance	Damage	Fire	Contamination	Impacts on site management	Notes and key concerns
Alde, Ore & Butley Estuaries SAC	1130 Estuaries		1				These are intertidal and subtidal habitats. Access to estuary habitat at Slaughden, Snape and Iken, potentially further afield (e.g. Orford, Boyton). Risks relate to very limited trampling damage, e.g. access to boats, paddleboards, kayaks etc. Probably can be ruled out as no LSE.
	1140 Mudflats and sandflats not covered by water at low tide		1				These are intertidal habitats. Access possible at Slaughden, Snape and Iken, potentially further afield (e.g. Orford, Boyton). Risks relate to very limited trampling damage, e.g. access to boats, paddleboards, kayaks etc. and people walking out from shore. Probably can be ruled out as no LSE due to nature of terrain relatively robust habitat. Probably can be ruled out as no LSE.
	1330 Atlantic salt meadows (Glauco-Puccinellietalia)		1				Trampling damage possible on saltmarshes, which are relatively easy to walk on. Trampling can cause loss of vegetation and lead to risks from erosion (e.g. storm surges). Risks limited to locations such as Slaughden, Snape and Iken, potentially further afield (e.g. Orford, Boyton).
Benacre to Easton Bavents Lagoons SAC	1150 Coastal lagoons		1		1		Some distance away from Sizewell and therefore unlikely to see marked changes in access. Lagoons vulnerable to damage from trampling around edge and increased turbidity and pollution from dogs and people entering the water. Benacre, Covehithe, and Easton Broad are the key locations. Access likely to have little impact given dynamic coastline and changes to these habitats in recent years. Probably can be ruled out as no LSE.
Orfordness - Shingle Street SAC	1150 Coastal lagoons		1		1		These are percolation lagoons and have changed shape markedly over time. Key location is at Shingle Street, which is a considerable travel distance from the Sizewell area. Risks relate to damage from

Impacts of recreation related to Sizewell C and implications for European sites.

European site(s)	Qualifying feature	Disturbance	Damage	Fire	Contamination	Impacts on site management	Notes and key concerns
							trampling around edge and increased turbidity, and pollution from dogs and people entering the water. Starlet Sea Anemone *Nematostella vectensis* likely to be vulnerable to trampling. LSE can probably be ruled out due to the travel distance.
	1210 Annual vegetation of drift lines		1	1	1		Accessible areas at Slaughden and Shingle Street. Risks relate to trampling leading to loss of vegetation. Localised impacts from barbeques and fires on the beach, resulting in small burnt patches. Contamination from dog fouling, and possibly from litter, fishing wire etc. as a result of increased fishing use.
	1220 Perennial vegetation of stony banks		2	1	1		Accessible areas at Slaughden and Shingle Street. Risks relate to trampling leading to loss of vegetation and damage to lichens. Contamination from dog fouling, and possibly from litter, fishing wire etc. as a result of increased fishing use.
Minsmere to Walberswick Heaths & Marshes SAC	1210 Annual vegetation of drift lines		3	1	3		Concerns would relate to a marked and prolonged spike in access, at Sizewell, from Eastbridge to the Sluice area, around Dunwich Cliffs, Dunwich and Walberswick. Potential for increased use in evenings and early mornings due to proximity to construction campus. Further trampling will lead to vegetation loss, potential for beach fires/barbeques to also cause localised vegetation damage. Contamination from dog fouling.
	4030 European dry heaths		2	4	3	2	Numerous easily accessible locations where access likely to increase markedly. Trampling damage from increased footfall likely to lead to track widening, increase in grasses, exacerbated further by nutrient enrichment from dog fouling. Risks of spread of species such as Piri-Piri Burr. Fire risk marked concern, from discarded cigarettes, barbeques and campfires and potential for major incident in area between Westleton and Eastbridge or Dunwich Heath. Given proximity of construction workers campus, barbeques etc in evenings a clear risk. Impacts to management relate to the potential for grazing to be compromised, for example through incidents with dogs.

Impacts of recreation related to Sizewell C and implications for European sites.

European site(s)	Qualifying feature	Disturbance	Damage	Fire	Contamination	Impacts on site management	Notes and key concerns
	1220 Perennial vegetation of stony banks		3	2	3		Concerns would relate to a marked and prolonged spike in access, at Sizewell, from Eastbridge to the Sluice area, around Dunwich Cliffs, Dunwich and Walberswick. Potential for increased use in evenings and early mornings due to proximity to construction campus. Further trampling will lead to vegetation loss, potential for beach fires/barbeques to also cause localised vegetation damage. Contamination from dog fouling, and possibly from litter, fishing wire etc. as a result of increased fishing use.
Alde-Ore Estuary SPA	Marsh Harrier (br)	1					Disturbance at nest a risk and birds can nest in small patches of reed and crops, potentially accessible and vulnerable, e.g. from dogs. Due to distance and habitat risks probably low.
	Lesser Black-backed Gull (br)	1					Gulls breed on Orfordness and accessibility limited and access difficult. Risks very low and LSE can probably be ruled out.
	Ruff (w)	1					Low numbers winter and use wet grassland that is difficult to access due to ditches and water table. Very low risk from dogs off lead. Relevant locations will be Hollesley Marshes, Boyton Marshes, and Town Marshes, all of which are outside the SPA (but functionally-linked).
	Avocet (br & w)	2					Breeding can occur, or is possible, at a range of locations, including Hazlewood Marshes, saltmarsh areas, Havergate Island and lagoons near Shingle Street. Most areas inaccessible and access controlled, but impacts possible at some of the breeding sites. Estuary is narrow and issues for birds feeding on intertidal areas from dogs off-lead, people straying onto saltmarsh.
	Little Tern (br)	2					Little Terns have bred at a range of locations along the coast – numbers can fluctuate and colonies shift between years. Birds will shift between different European sites and different parts of the coast. Species highly vulnerable to disturbance from dogs off lead and people on beaches. Alde-Ore sites are primarily at Orfordness, where access is difficult.
	Sandwich Tern (br)	1					Main breeding site is Havergate where nesting in recent years only sporadic. Colonies can shift markedly over time and are very vulnerable to disturbance events. LSE to the species at Havergate can probably be ruled out.

Impacts of recreation related to Sizewell C and implications for European sites.

European site(s)	Qualifying feature	Disturbance	Damage	Fire	Contamination	Impacts on site management	Notes and key concerns
	Redshank (w)	2					Increased access at Iken, Snape, Hazlewood Marshes, Town Marshes and Slaughden has potential to increase amount birds are flushed and disrupt foraging. Dogs off-leads likely to be a particular issue. Impacts during particularly cold weather perhaps most likely.
Benacre to Easton Bavents SPA	Bittern (br)	1					Nest sites unlikely to be vulnerable due to difficulties in access. Birds feeding around peripheral areas of reedbeds perhaps vulnerable to increased access, including dogs off-leads. Given distance from Sizewell, LSE can probably be ruled out.
	Marsh Harrier (br)	1					Disturbance at nest a risk and birds can nest in small patches of reed and crops, potentially accessible and vulnerable, e.g. from dogs. Due to distance and habitat risks probably low.
	Little Tern (br)	2					Little Terns have bred at a range of locations along the coast – numbers can fluctuate and colonies shift between years. Birds will shift between different European sites and different parts of the coast. Species highly vulnerable to disturbance from dogs off lead and people on beaches. Main breeding at Benacre but could nest at other locations, however in recent years main colony in area is further north still at Kessingland. While highly vulnerable to disturbance impacts, concern low due to distance from Sizewell.
Minsmere to Walberswick SPA	Shoveler (br & w)	2				1	Present on pools and waterbodies and grazing marsh across the area, and potentially vulnerable to disturbance from dogs and people in the vicinity of Eastbridge, including Minsmere Levels. Impacts from site management relate to issues with achieving necessary grazing.
	Teal (br)	2				1	Present on pools and waterbodies and grazing marsh across the area, and potentially vulnerable to disturbance from dogs and people in the vicinity of Eastbridge, including Minsmere Levels. Impacts from site management relate to issues with achieving necessary grazing.
	Gadwall (br & w)	2				1	Present on pools and waterbodies and grazing marsh across the area, and potentially vulnerable to disturbance from dogs and people in the vicinity of Eastbridge, including Minsmere Levels. Impacts from site management relate to issues with achieving necessary grazing.

Impacts of recreation related to Sizewell C and implications for European sites.

European site(s)	Qualifying feature	Disturbance	Damage	Fire	Contamination	Impacts on site management	Notes and key concerns
	European White-fronted Goose (w)	3				1	Birds wintering on Minsmere Levels and nearby grazing marsh at risk from increased use by people and dogs. Risk of birds using the area less and increased flushing when present. Impacts from site management relate to issues with achieving necessary grazing.
	Bittern (br)	2		1			Nest sites unlikely to be vulnerable due to difficulties in access. Birds feeding around peripheral areas of reedbeds perhaps vulnerable to increased access, including dogs off-leads. Potential for birds to use areas such as around Eastbridge less. Fire risk to upper parts of reedbeds and during periods of extreme dry weather. Reedbed adjoins heath/dry areas e.g. Keeble Marsh and risk of fire spreading between habitats.
	Nightjar (br)	4		3		1	Birds around Westleton, on Dunwich Heath and in Dunwich Forest vulnerable to increased disturbance, particularly from dog walking. Potential for birds to avoid nesting in some areas and risk of reduced breeding success. A major fire incident on the heaths could result in direct loss of nests and reduction in number of territories in subsequent year(s).
	Marsh Harrier (br)	2		1			Disturbance at nest a risk and birds can nest in small patches of reed and crops, potentially accessible and vulnerable, e.g. from dogs.
	Hen Harrier (w)	2		2			Increased disturbance at roost could result in roost being abandoned, access in evening (e.g. dog walkers) particularly of concern. Roosts in deep heather on the heath, which could be destroyed by fire.
	Avocet (br)	3					Birds nesting on the lagoons at Walberswick marshes and Dingle vulnerable to disturbance, particularly from dogs off leads. Risks include birds avoiding areas of otherwise suitable habitat and chicks being killed by dogs.
	Little Tern (br)	3					Little Terns have previously bred at a range of locations along the coast including in front of Sizewell A Power Station. Numbers can fluctuate and colonies shift between years. Birds will shift between different European sites and different parts of the coast. This species highly vulnerable to disturbance from dogs off lead and people on beaches. Increased access could result in birds avoiding otherwise suitable habitat, colonies deserting, breeding success being compromised and dogs killing chicks.

Impacts of recreation related to Sizewell C and implications for European sites.

European site(s)	Qualifying feature	Disturbance	Damage	Fire	Contamination	Impacts on site management	Notes and key concerns
Sandlings SPA	Nightjar (br)	4		3		1	Birds around Aldringham Walks, North Warren, and potentially Snape and Tunstall Forest vulnerable to increased disturbance, particularly from dog walking. Potential for birds to avoid nesting in some areas and risk of reduced breeding success. A major fire incident could result in direct loss of nests and reduction in number of territories in subsequent year(s).
	Woodlark (br)	4				2	Birds around Aldringham Walks, North Warren, and potentially Snape and Tunstall Forest vulnerable to increased disturbance, particularly from dog walking. Also birds around Minsmere and Dunwich Forest functionally-linked to this SPA. Potential for birds to avoid nesting in some areas and risk of reduced breeding success. A major fire incident could result in direct loss of nests and reduction in number of territories in subsequent year(s). Access may also compromise ability to graze sites effectively e.g. through dog incidents and livestock. Marked increases in dogs may affect rabbit distribution and use, which is also important for Woodlarks.
Alde - Ore Estuary Ramsar (additional to SPA/SACs)	Notable assemblage of breeding and wintering wetland birds	2					Increased access at Iken, Snape, Hazlewood Marshes, Town Marshes and Slaughden has potential to increase amount birds are flushed and disrupt foraging. Dogs off-leads likely to be a particular issue.
Minsmere - Walberswick Ramsar (additional to SPA/SAC)	Site contains a mosaic of marine, freshwater, marshland and associated habitats, complete with transitional areas in between. Contains the largest continuous stand of reedbeds in England		1	2	2	2	Trampling damage in drier areas and peripheral habitats possible. Major fire incident in reedbeds a concern. Contamination risks from dogs in ditches, pools, and wet habitats spreading invasive species such as New Zealand Pygmyweed. Dog incidents could affect ability to graze effectively.

European site(s)	Qualifying feature	Disturbance	Damage	Fire	Contamination	Impacts on site management	Notes and key concerns
	and Wales, and rare transition in grazing marsh ditch plants from brackish to fresh water						
	Nationally scarce plant species and British Red Data book invertebrates, including a population of Narrow-mouthed Whorl Snail		1	1	2	1	Trampling damage in drier areas and peripheral habitats possible. Major fire incident in reedbeds a concern. Contamination risks from dogs in ditches, pools and wet habitats spreading invasive species such as New Zealand Pygmyweed. Dog incidents could affect ability to graze effectively.
	An important assemblage of rare breeding birds associated with marshland and reedbeds	2		1		1	Risks from increased disturbance around periphery of wetland areas, from dogs off-leads and walkers. A major fire incident in reedbed could result in loss of breeding territories and species richness. Dog incidents could affect ability to graze effectively.

Vulnerable features that are not qualifying interest

4.10 Our focus in this report is on the European site interest. However, it is important to note that the area contains a wide range of habitats and species that is of outstanding importance for nature conservation and unique within the UK. There are other species and habitats in the vicinity which, while not qualifying features for the European site, are also of considerable conservation importance and potentially vulnerable. These include:

- **Stone Curlew** *Burhinus oedicnemus* breed on the acid grassland and open sandy farmland in the Walberswick/Westleton area, including the outer parts of the Minsmere RSPB reserve. The population is relatively low and the species is particularly vulnerable to disturbance, with dogs off-led a concern (Clarke & Liley, 2013; Taylor, 2006; Taylor, Green, & Perrins, 2007).
- **Ringed Plover** nest in small numbers on the beaches and are highly vulnerable to disturbance, which influences settlement pattern and breeding success (Liley & Sutherland, 2007).
- **Dartford Warbler** *Sylvia undata* nest low down in heathland vegetation and studies have shown impacts from disturbance, with reduced breeding success in disturbed territories. This species returned to Suffolk in the 1990s.
- **Adder** *Vipera berus* are found in a range of habitats in the general area, including heathland, scrub and the back of the beach. This declining reptile is vulnerable to recreation impacts, particularly dog attacks (Worthington-Hill, 2015)**.**
- **Acid Grassland** is vulnerable to impacts from fire and eutrophication (e.g. from dog fouling), while extensive grazing which is important to maintain the habitat, can be difficult where access is high.
- **Scarce invertebrates** there are a number of species, such as Antlion *Euroleon nostras*, for which the Minsmere area is important. There are risks for some of these species from access, for example through trampling and fire.

5. Mitigation

5.1 In this section we briefly consider the likely visitor profile and behaviours and set out broad approaches to mitigation that might be relevant.

Visitor profile and behaviours

5.2 The issues identified arise from increased recreation use associated with a marked increase in the local population and displacement of existing access.

5.3 It is important to recognise that there is potential for a marked change in visitor profile and the way people access the sites identified. This is because use by locally based construction workers will be very different to the use associated with recreation by tourists, day visitors travelling from a wide area, and second homeowners. Postcode analysis of visitors to the main part of the Minsmere RSPB Reserve (e.g. Hoskin et al., 2019) reveals people travelling considerable distances to visit the reserve. These visitors are likely to be drawn for the specific nature interest and wildlife spectacle.

5.4 People coming to the area to live and work in the vicinity will seek nearby greenspace for recreational use that is not necessarily related or connected to the area's conservation interest, and such use will include exercise and dog walking. It may extend to sea angling, barbeques, swimming, and beach recreation. Such people are likely to consciously avoid the areas they perceive as 'nature reserves' (i.e. where there are hides, wardens and a fee to enter) and instead focus their use at more peripheral locations. These are often still part of the European site and do not have necessary infrastructure to manage access. For example, around the Westleton and Eastbridge there are numerous public rights of way and also many areas that are 'open access' under the Countryside and Rights of Way Act (2000). The focus for increased recreational use is likely to be away from the main car-parks (such as the main Minsmere car-park and NT Dunwich Heath) where existing visitor management and engagement is focussed. We would expect construction workers based in the area to utilise more informal parking and locations where they can easily access beaches, quiet areas of heath, etc.

5.5 Use by construction workers will also be likely to take place in the early mornings, evenings, and around shift work and therefore not necessarily fit with peak visitor use and the current visitor profile.

Mitigation Options

5.6 Given the range of issues identified and the range of risks, a package of mitigation measures will be necessary. Any package will need to involve a number of different measures and be flexible in order to respond to changing access patterns or particular issues. Weather conditions, trends in access, the occurrence of rare wildlife, and a range of other factors will influence the scale of risk and the particular concerns at any one time. Different measures may be more important at some times compared to others. For example, prolonged periods of dry weather and a hot summer will bring particular fire risks, while cold winter weather may make birds more vulnerable to disturbance.

5.7 An overview of some potential mitigation options are summarised in Table 7. This indicates which measures may relate to which kinds of impact. In order to develop any mitigation package in detail, it will be necessary to draw on visitor data and liaise closely with the relevant site managers.

5.8 Any mitigation package should also include comprehensive monitoring that should be integrated alongside the mitigation and pick-up any emerging issues. Monitoring would potentially include counts of parked vehicles, counts of people, visitor interviews and regular checks on infrastructure. Unfortunately, the data collection to inform the evidence base presented by EDF is inadequate to form a foundation for such monitoring. Ideally the data collected to date would provide a baseline from which changes could be identified and locations targeted for mitigation. Unfortunately EDF have not collected such data at the relevant level of detail.

Table 7: Overview of possible mitigation options.

Mitigation option	Disturbance	Damage	Fire	Contamination	Impacts on site management	Notes
Increased warden presence	✓	✓	✓	✓	✓	Targeted to vulnerable locations. Can be flexible and responsive to emerging issues. Needs to be adequately resourced to be effective as mitigation and likely to involve anti-social hours.
Fenced exclosures on beach	✓	✓	✓			Not always effective and need to be combined with other measures (signage, warden presence). Fencing can protect vegetation and suitable habitat for breeding birds.
Access restriction	✓	✓		✓	✓	Options include enhancing fencing, ensuring gates are locked, making gates effective barriers for dogs (e.g. with mesh), blocking access to watersides etc. These measures provide potential to restrict access by dogs into sensitive watercourses, access onto grazing marsh etc. These approaches can be difficult to maintain and can be compromised by vandalism, cutting etc.
Temporary signage	✓	✓	✓	✓		Providing ability to highlight particular issues, such as high fire risk, presence of rare breeding birds, livestock.
Waymarking and permanent signage	✓	✓		✓	✓	Helps direct visitors and manipulate visitor flow.
Path management	✓	✓			✓	Boardwalks and vegetation management on path edges can help keep access to paths. Potential for less sensitive public footpaths and routes to be enhanced.

Mitigation option	Disturbance	Damage	Fire	Contamination	Impacts on site management	Notes
Dead hedging	✓	✓			✓	For example, using cut gorse and brash. Potential to close off desire lines as they form and potentially limit access by dogs. Likely to be effective only as a short term response measure and reactive.
Firebreaks			✓			Additional firebreaks, potentially targeting protection of areas at risk for changes in access. Can create new desire lines so need to be chosen carefully. Regular cutting required to maintain.
Fire management planning			✓			Reserves will have existing fire management plans. These may benefit/need reviewing in light of changes in access and visitor pressure.
Access to water/provision of new fire hydrants			✓			New fire hydrants on heath have been provided as mitigation for housing on Dorset Heaths. Clearly will not stop impact occurring but may lessen effect.
Public engagement	✓		✓	✓		Scope for messaging to target particular behaviours and issues, such as as use of disposable barbeques, dogs off-leads, dog fouling etc. Potential to react to new/emerging issues. Potential for targeted information provision at construction campus as to where to go for recreation. There is little certainty associated with these measures and they perhaps work best to reinforce other measures (e.g. wardening).
Controls on local shops selling disposable barbeques			✓			Potentially difficult to secure and limited in effectiveness if available more widely.

Mitigation option	Disturbance	Damage	Fire	Contamination	Impacts on site management	Notes
Controls on parking	✓	✓	✓	✓	✓	Potential to close off small parking locations, e.g. with bunds or dragons teeth. Also possible to reduce the number of spaces. Gates on car-parks can prevent access in late evening/early morning and help limit anti-social behaviour.
Provision of dog bins/litter bins				✓		Bins require emptying and therefore cost to maintain.
Provision of dedicated space for exercise and dog walking for construction workers	✓	✓		✓	✓	Would need to be large and could be promoted directly to workers. May be difficult to provide an adequate space to deflect people from the coast.
Gym membership for construction workers	✓	✓				Would not be effective for dog walkers but may work to direct certain activities (e.g. jogging) away from sensitive locations. Would require some research and survey work to determine whether any likelihood of effectiveness.
Screening	✓					Potential for planting/vegetation growth, use of reed/heather screens or other structures to create visual barriers for people and dogs. Likely to be an option only in limited/specific locations.
Manipulation of water levels	✓	✓				Raising water levels or retaining deep water in ditches etc. may help restrict access to some locations.
Enforcement	✓			✓		There may be scope with PSPOs in some locations to control dogs off leads and fouling. Would require enforcement and may be difficult to establish.

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FOOTPRINT ECOLOGY

Review of Sizewell C application documents and evidence in relation to recreation impacts

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Summary

Footprint Ecology have been commissioned by the National Trust and RSPB to provide a review of evidence (submitted as part of the Sizewell C application) on recreation issues. The construction of the power station will require a peak workforce of 7,900 construction workers, leading to a marked increase in the number of residents in the area. In addition, construction will result in the closure of access routes and the displacement of visitors due to path closures, noise, additional traffic, etc. Marked changes in local access are therefore likely. The Sizewell C site is directly adjacent to multiple European sites where there are existing rights of access and numerous species and habitats vulnerable to recreation impacts.

Recreation impacts include disturbance, trampling, increased fire risk, and contamination (e.g. spread of invasive species, dog fouling, etc). Some of the key sensitive areas are already carefully managed, with resources in place to both manage access and allow visitors to experience the area while minimising harm. Areas such as the main car park at Minsmere draw visitors from across the country and are well-known visitor destinations, drawing visitors for the wildlife spectacle and nature interest. Here there are well marked paths, hides, screens, wardens and careful management to allow wildlife to flourish and people to be able to experience it.

Concern with respect to the Sizewell C proposals and recreation impacts therefore relates to vulnerable features within the more peripheral areas of the European sites, where public footpaths, informal parking, and open access provide opportunities for recreational use, and where any issues arising from access are much harder to manage. Access to these locations is more likely to be for dog walking, jogging, picnics, barbeques, fishing, etc. (rather than to see wildlife).

Our review highlights that:

The baseline for current visitor use is inadequate. Count data (visitor numbers) are only provided for a small number of locations (surveyed in 2014) and just for August and November. Many of the smaller, more vulnerable, locations (from an ecological perspective) have not been surveyed.

Predictions of increased use are confusingly presented, with different estimates given in different reports alongside some clear errors. Estimates appear very low compared to national data and are much lower than we would expect, based on our experience of visitor surveys and recreational use of the countryside.

Impacts are poorly assessed, and the consideration of impacts for the following are particularly poor and inadequate:

- Perennial vegetation of stony banks (Minsmere to Walberswick Heaths & Marshes SAC);
- European Dry Heaths (Minsmere to Walberswick Heaths & Marshes SAC);
- Little Tern (Minsmere-Walberswick SPA);
- Nightjar (Minsmere-Walberswick SPA);
- Hen Harrier (Minsmere-Walberswick SPA);
- Wintering waterbirds (Shoveler, Gadwall, White-fronted Goose) (Minsmere-Walberswick SPA);
- Breeding waterbirds (Shoveler, Gadwall, Teal) (Minsmere-Walberswick SPA), and;
- Woodlark (Sandlings SPA).

Mitigation measures are scant and fail to address the nature conservation issues that are likely to arise.

Ultimately the Suffolk Coast is of unique importance for nature conservation and supports a diversity of habitats and species that is unparalleled in the UK, particularly in the area between Slaughden and Southwold. The area also draws high numbers of visitors, resulting in a difficult balancing act to manage both access and nature conservation; it is a crowded area.

Sizewell C would disrupt the balance and the application documents do not provide the robust assessment and mitigation package that we expected. The assessment of impacts is inadequate, and predictions of changes in visitor use are full of inaccuracies, confusing, and poorly put together. Necessary mitigation, targeted to the vulnerable locations, is virtually non-existent. Ultimately, the information as presented in the Shadow HRA does not allow a conclusion of no adverse effect on integrity, from recreation impacts, to be drawn for a range of different species and habitats across multiple European sites.

Contents

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1. Introduction

1.1 This document has been commissioned by the National Trust and RSPB to assist both organisations with their response to the application for a new power station at Sizewell C. Both organisations are concerned about impacts from recreation, for example through displacement of recreational users from the vicinity of the Sizewell C development to neighbouring sites during the construction period.

1.2 This report involves a review of specific ecological reports with the aim of checking the robustness of EDF's conclusions. We structure the report addressing the following questions, set by the National Trust/RSPB:

- What is Footprint Ecology's view on the adequacy of EDF's assessment of recreational disturbance impacts (particularly in the HRA) and the robustness of the data on which this is based? Please qualify this view.
- Is any monitoring strategy proposed by EDF sufficient to detect ecological impacts of increased recreational disturbance, with appropriate triggers to secure further mitigation if adverse effects are shown, and assess the effectiveness of mitigation? This may be included in the DCO application or be developed as an Examination requirement.
- Is any mitigation strategy proposed by EDF sufficient to address ecological impacts of increased recreational disturbance? Again, this may be included in the DCO application or be developed as an Examination requirement.
- What would be valuable questions and points that National Trust and RSPB should raise in relation to recreational disturbance impacts with EDF and why?

1.3 More general points or concerns are set out in a table at the end of the report, which picks up any additional points that result from our review.

1.4 Our focus is on the recreation impacts to the nature conservation interest, particularly that relating to European sites. Table 1 lists the documents referred to in this report.

Table 1: Documents referred to in this report. Hyperlinks are provided in the final column.

Name of document (as used in this report)	Full document title	Filename	Page number of pdf where doc starts (as relevant)	Doc number
Shadow HRA	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	EN010012-001765-SZC_Bk5_5.10_V1_Shadow_HRA_Report_Part_1_of_5		APP-145
Recreational Disturbance Assessment	Shadow HRA report Appendix E: Recreational Disturbance Assessment	EN010012-001768-SZC_Bk5_5.10_V1_Shadow_HRA_Report_Part_4_of_5	305	APP-148
Shadow HRA Recreational Disturbance Evidence Base	SHADOW HRA ANNEX A: RECREATIONAL DISTURBANCE EVIDENCE BASE	EN010012-001768-SZC_Bk5_5.10_V1_Shadow_HRA_Report_Part_4_of_5	397	APP-148
Terrestrial Ecology and Ornithology Report	6.3 Volume 2 Main Development Site Chapter 14 Terrestrial Ecology and Ornithology	EN010012-001844-SZC_Bk6_ES_V2_Ch14_Terrestrial Ecology and Ornithology		APP-224
Sport and Leisure Audit	Volume 2, Main Development Site, Chapter 9, Appendix 9E: Sport and Leisure Audit and Estimated Demand	SZC_Bk6_ES_V2_Ch9_Socio-economics_App9A_9f	75	APP-196
Terrestrial Ecology and Ornithology Report – Ornithology Appendix	6.3 Volume 2 Main Development Site: Chapter 14 – Terrestrial Ecology and Ornithology – Appendix 14A7: Ornithology Part 1 of 2	EN010012-002256-SZC_Bk6_ES_V2_Ch14_Terrestrial_Ecology_Ornithology_Appx14A7_Orni_2013117_1		APP-237
Plants and Habitats Synthesis Report	6.3 Volume 2 Main Development Site Chapter 14 Terrestrial Ecology and Ornithology Appendix 14B1 Plants and Habitats Synthesis Report	EN010012-001871-SZC_Bk6_ES_V2_Ch14_Terrestrial_Ecology_Ornithology_Appx14B1_Plants_Habitats_Synthesis		APP-250

Name of document (as used in this report)	Full document title	Filename	Page number of pdf where doc starts (as relevant)	Doc number
Ornithology Synthesis Report	6.3 Volume 2 Main Development Site Chapter 14 Terrestrial Ecology and Ornithology Appendix 14B2 Ornithology Synthesis Report	EN010012-001856-SZC_Bk6_ES_V2_Ch14_Terrestrial_Ecology_Ornithology_Appx14B2_Ornithology_Synthesis		APP-251
Amenity and Recreation Report	6.3 Volume 2 Main Development Site Chapter 15 Amenity and Recreation	EN010012-001882-SZC_Bk6_ES_V2_Ch15_Amenity and Recreation		APP-267
2014 Sizewell C Visitor Surveys	6.3 Volume 2 Main Development Site Chapter 15 Amenity and Recreation Appendix A: 2014 Sizewell c visitor surveys	EN010012-001884-SZC_Bk6_ES_V2_Ch15_Amenity_and_Recreation_Appx15A_15J_Part_1_of_3		APP-268
2015 Sizewell C RSPB Minsmere Visitor Surveys	6.3 Volume 2 Main Development Site Chapter 15 Amenity and Recreation Appendix B: 2015 Sizewell c RSPB Minsmere visitor surveys	EN010012-001885-SZC_Bk6_ES_V2_Ch15_Amenity_and_Recreation_Appx15A_15J_Part_2_of_3	2	APP-269
2016-2018 Sizewell C Visitor Surveys	6.3 Volume 2 Main Development Site, Chapter 15 Amenity and Recreation Appendix15C: 2016-2018 SIZEWELL C VISITOR SURVEYS 2	EN010012-001885-SZC_Bk6_ES_V2_Ch15_Amenity_and_Recreation_Appx15A_15J_Part_2_of_3	63	APP-269
Amenity and Recreation Baseline Report	ES VOLUME 2, CHAPTER 15, APPENDIX 15F: AMENITY AND RECREATION BASELINE REPORT	EN010012-001886-SZC_Bk6_ES_V2_Ch15_Amenity_and_Recreation_Appx15A_15J_Part_3_of_3	43	APP-270
Description of non-significant effects	6.3 Volume 2 Main Development Site Chapter 15 Amenity and Recreation Appendix 15G: Description of non-significant effects	EN010012-001886-SZC_Bk6_ES_V2_Ch15_Amenity_and_Recreation_Appx15A_15J_Part_3_of_3	78	APP-270
Rights of Way and Access Strategy	VOLUME 2, CHAPTER 15, APPENDIX 15I: RIGHTS OF WAY AND ACCESS STRATEGY	EN010012-001886-SZC_Bk6_ES_V2_Ch15_Amenity_and_Recreation_Appx15A_15J_Part_3_of_3	111	APP-270

Name of document (as used in this report)	Full document title	Filename	Page number of pdf where doc starts (as relevant)	Doc number
Planning Statement	Planning Statement Appendix 8.4J Section 106 Heads of Terms	EN010012-002218-SZC_Bk8_8.4_Planning_Statement_AppxJ_S106_Heads_of_Terms		APP-600
Mitigation Route Map	8.12 Mitigation Route Map	EN010012-002234-SZC_Bk8_8.12_Mitigation_Route_Map		APP-616

About Footprint Ecology

1.5 Footprint Ecology are a specialist consultancy with particular expertise in the assessment of recreation impacts on nature conservation sites. Our work includes Local Plan HRAs, writing mitigation plans for European sites, visitor survey work, reserve management plans, and visitor management strategies for nature conservation sites.

1.6 Our work on visitor management, recreation assessment, and visitor surveys has included sites such as the New Forest National Park, Epping Forest, Burnham Beeches, the North Kent coast, Wicken Fen, Hatfield Forest, the Humber, Morecambe Bay, the Severn Estuary, Poole Harbour, the Exe Estuary, the Solent, the Dorset Heaths, the Wealden Heaths and the Thames Basin Heaths.

1.7 We have provided advice to Natural England on open access provision under CRoW and on coastal access and we have acted for Natural England, RSPB and local authority clients at public inquiry. Previous work in Suffolk has included visitor surveys on the southern part of the Suffolk Sandlings, a visitor survey of the River Deben, Local Plan HRA work for Ipswich Borough Council, Suffolk Coastal District Council, and Waveney District Council (and now East Suffolk Council). We wrote the Suffolk Coast Recreational Disturbance Avoidance and Mitigation Strategy (RAMS).

2. Adequacy of EDF's assessment of recreation impacts

Overview

2.1 The assessment by EDF is not adequate to rule out the conclusions of no adverse effect on integrity set out in the HRA.

2.2 We expected to see detailed visitor survey work that provided an accurate description of the current use, showing numbers of visitors and footfall across the relevant European sites and supporting habitat. This would have provided the detail of levels of use along different paths and the number of vehicles parked in different locations, allowing maps of current recreation use to be produced. Change could then be predicted to show how construction work and visitor displacement would change access and maps produced to show change alongside ecological data (species and habitats). This would then clearly indicate which locations and which interest features would be vulnerable to change and ensure mitigation measures were fit for purpose and appropriately targeted.

2.3 Instead we find a number of errors and muddled information, with conflicting information scattered across different reports. There is a lack of detail as to what levels of change are to be expected in which precise locations and a failure to apply this to the ecological interest at the appropriate level of detail.

Baseline on visitor use

Existing visitor data

2.4 The **Amenity and Recreation Baseline Report** (para 1.2.2) and **Shadow HRA recreational disturbance evidence base** (para 2.4.1) both list a range of studies as relevant baseline visitor survey information.

2.5 It is noteworthy that while the list in the Shadow HRA recreational disturbance evidence base and the Amenity and Recreation Baseline in the ES are superficially similar, they differ, with 13 studies listed in the Shadow HRA recreational disturbance evidence base and 11 in the Amenity and Recreation Baseline Report, and a different mix in each. While the Shadow HRA recreational disturbance evidence base supposedly includes reports to 2019 and the Amenity and Recreation Baseline only to 2018, it is only the list

in the Amenity and Recreation Baseline that includes a report from 2019. These errors highlight that material is repeated in different places and shoddily collated and does not provide confidence of a robust assessment.

2.6 The **Amenity and Recreation Baseline Report** (para 1.2.4) describes this as a 'good resource'. However, most of the studies listed are very specific (e.g. RSPB data for the core part of Minsmere Reserve) or are general (e.g. Suffolk County Council's Green Access Strategy) with limited relevance. Most are dated (e.g. 2010, 2011, even 2004) and most cover locations well away from Sizewell (e.g. Deben Estuary). As a baseline there is scant information on visitor numbers, activities at different locations relevant to Sizewell C, or how use varies at the different sites.

Surveys commissioned by EDF

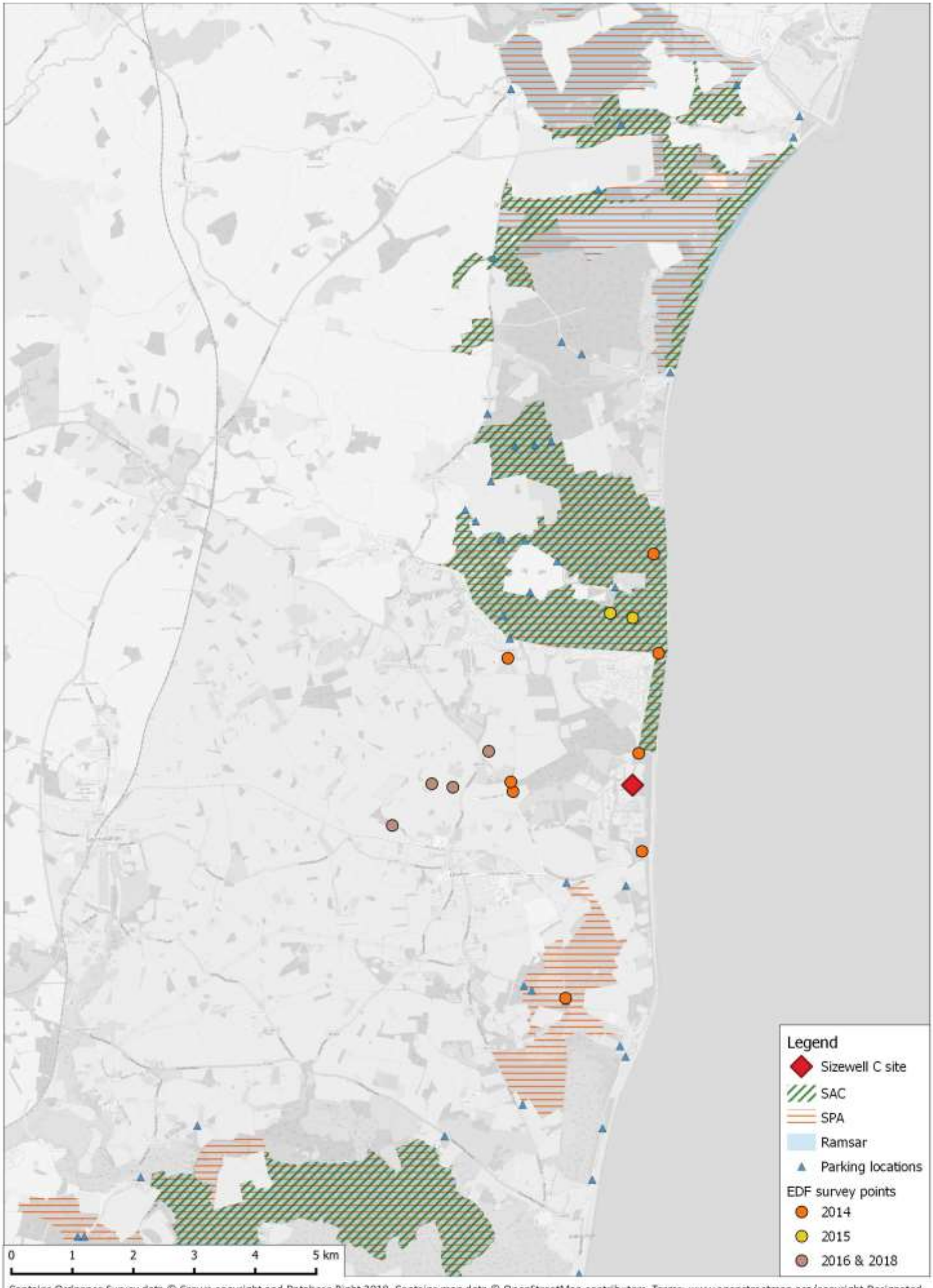
2.7 EDF commissioned visitor surveys to gain a more detailed understanding. These involved:

- 2014: 7 locations surveyed in August and November (514 questionnaires) summarised in 2014 **Sizewell C Visitor Surveys**;
- 2015: focussed on the Minsmere Reserve (133 questionnaires) summarised in **2015 Sizewell C RSPB Minsmere Visitor Surveys**;
- Additional surveys undertaken at 5 locations (surveyed in both August 2016 and November 2018, **2016-2018 Sizewell C Visitor Surveys**). These are however not referred to in the Shadow HRA recreational disturbance evidence base and are located away from European sites.

2.8 Map 1 details the locations for all the EDF surveys carried out in 2014, 2015, 2016 and 2018 in relation to the European sites. The map also shows a selection of parking locations around the European sites – locations where visitors might park when visiting them. These are shown as blue triangles and are not intended to be exhaustive. The map highlights that the survey coverage by EDF is minimal. In particular, there are no survey data from locations to the west of the Minsmere Reserve, around Westleton, or north of Dunwich Coastguards. Given the scant information in the existing baseline, we have little confidence that the survey effort is adequate to provide an understanding of visitor use and how that might change. We would have expected better spatial coverage. We would also have expected routes to be mapped and maps produced to show visitor numbers along different paths, allowing visitor data to be overlaid with ecological data. This is missing.

2.9 Surveys were conducted during August and November. While these months allow some comparison across the year, they are a poor choice. During August the coast is very busy with tourists and it might be expected that use by local residents would be reduced during this time. By contrast, November is likely to be more focussed towards local use, but likely to be quite limited. There is a notable gap of survey data from the spring. During the spring we would expect increased local use, making use of the warmer weather and longer days, with people coming from slightly further afield. Many countryside sites see marked peaks in visitors around the Easter period. The spring is also a time when breeding bird interest and other ecological interest is vulnerable to recreation impacts.

Map 1: Overview of European sites, parking provision, and EDF survey locations



Predictions of changes in visitor use

Visits from the construction workforce

2.10 The **Shadow HRA recreational disturbance evidence base** (para 3.3.3) states that the approach taken to estimate recreational use by the construction workforce is based on the best available data and is precautionary. From a review of the data this does not seem to be the case.

2.11 EDF state in para 15.6.42 onwards of the **Amenity and Recreation Report** that the peak workforce would use different types of accommodation and provide the numbers in each:

- 7,900 workers;
  - 2,000 drawn from the existing population;
  - 5,900 non-home based ('NHB');
    - 880 buy homes;
    - 2,400 campus;
    - 600 caravans, and;
    - 2,000 renting (private rented sector or using tourist accomodation).

2.12 However, no evidence is given as to how these estimates are broken down and we suspect there is likely to be considerable guess work in estimating relative proportions. While these are 'peak' figures, it is clear that the workforce will number over 7,000 for 2 years (**Shadow HRA recreational disturbance evidence base** para 3.3.5).

2.13 We have constructed Figure 1 below to try and understand the numbers provided by EDF and understand their related estimates of countryside visits.

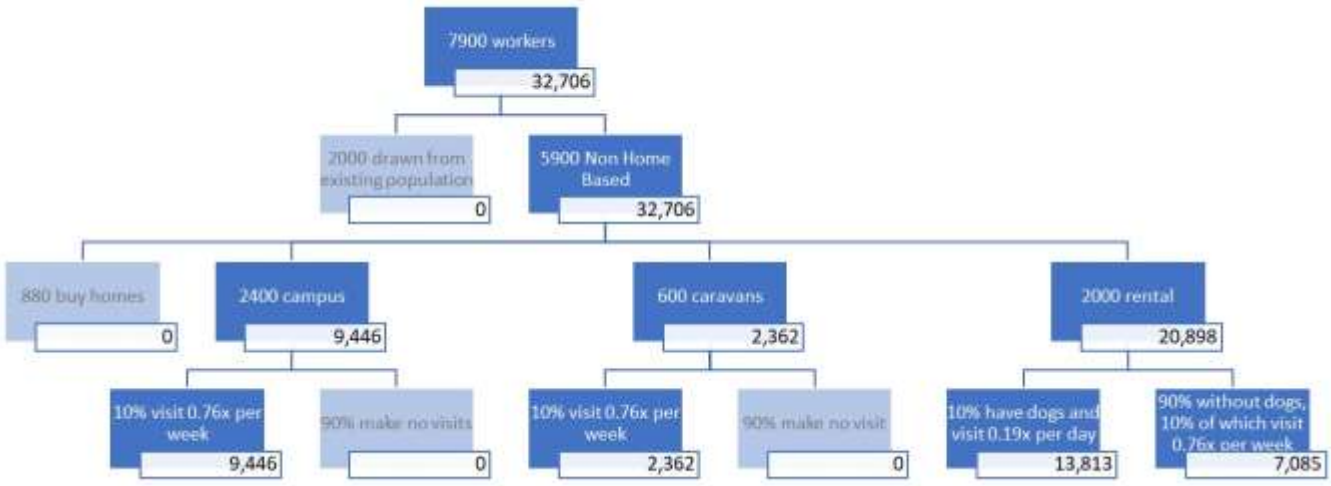


Figure 1: Chart summarising construction workforce and the estimates made of visits to the countryside by each segment. Pale boxes are those where no net increase in visits assumed by EDF. Numbers in bottom right indicate EDF estimates of countryside visits per year for each segment.

2.14 The 2,000 workers who are estimated to come from the existing population, and the 880 who buy their own homes, are discounted by EDF in terms of any recreational impact. EDF suggest they would not be net additional people to the area and therefore have no net additional effect on recreation activity (e.g. para 3.3.6). However, these workers should not be discounted, as they are more likely to visit the area around Sizewell C as they will be based there for work. Some of this workforce might travel independently to, and undertake recreational visits after, work – for example going fishing in the vicinity, walking the dog, or meeting friends or family when their shift has finished.

2.15 For the remaining 5,020 non home-based workers the assumption is made that 10% of those in rental accommodation (10% of 2,000 is 200) will have a dog or dogs and walk their pet daily. This 10% is apparently derived from a mystery shopper survey of rental providers to check how many properties allowed dogs. This rental shopper survey revealed marked variation and was very limited in scope. Many tourist lets, etc, may well have restrictions on pet ownership, but those workers living in rented accommodation are nevertheless considered more likely to own dogs than those living on the campus or in caravans (where dogs are not allowed) and as such are likely to seek out accommodation where pets are allowed. No consideration of this is made.

2.16 The number of dog walks is adjusted down to account for shift work (87%) and holidays (87%). It is not clear how the 87% figures have been derived and it would appear that the assumption is that dog walking would only take place on days when construction workers were doing shifts. The number of dog walks to local countryside sites is then reduced by a further 75% to account for 'short walks local to accommodation before and after shifts, often at night'. Again no justification is made for the application of the 75%.

2.17 For the rest of the 5,020 (i.e. those without dogs), 10% are assumed to undertake informal recreation in the countryside around Sizewell once a week (para 3.3.15 of the **Shadow HRA**). This appears to highly speculative, drawing on tourist board surveys from 2004 for visits by residents of Suffolk Coastal while discounting much more recent, national survey data (MENE) that gives typical visit rates to the countryside.

2.18 The resulting estimates for use of the countryside by the workforce are exceptionally low and far from precautionary. 7,900 workers are predicted to make 32,706 recreation visits to the countryside per year – this equates to around 4 visits per worker. The 32,706 visits are made up of 18,893 visits by those without dogs and 13,813 dog walks.

2.19 Whilst the 32,706 figure is given in the Shadow HRA, a very different estimate is confusingly given in the **Plants and Habitats Synthesis Report** which, on page 20, para 1.3.52, states that there will be 60,000 additional countryside visits per year from the construction workforce. In para 1.3.53 a total of 39,000 are anticipated for the key sites of Sizewell Beach/Sizewell Estate (20,000 annual visits), Aldeburgh (7,000 annual visits), Thorpeness (4,000 annual visits), Dunwich Heath (2,000 annual visits), Dunwich Beach (4,000 annual visits) and Minsmere (2,000 annual visits).

2.20 Further discrepancies are evident in the **Amenity and Recreation Report**. Table 15.7 gives a figure for 18,893 annual countryside visits made by workers without dogs. However, table 15.8 suggests construction workers with dogs would make 55,254 annual visits (after allowing for shift patterns and holidays).

2.21 EDF argue that the levels of recreational use of the countryside among construction workers will be low because: they will work long shifts; they may visit their family, etc/return to a permanent home at weekends; and they are likely to use gyms and sports facilities instead of the countryside, etc. These arguments are made with little justification or support. Market segmentation/demographic profiles produced by Sport England are referred

to (e.g. para 3.3.11 of the **Shadow HRA recreational disturbance evidence base**, see also the **Sport and Leisure Audit)** to justify assumptions about low levels of countryside recreation use. It is important to note that these profiles relate to organised sports, not countryside recreation use.

2.22 The **Shadow HRA recreational disturbance evidence base** totally fails to address that:

- The construction workforce will be based in a highly attractive area with lots of countryside recreation opportunities;
- The campus at Eastbridge is directly adjacent to numerous footpaths that provide access directly to the beach, woodland, heathland, and marshes – with multiple opportunities for activities such as mountain biking, jogging, fishing, photography, picnics, and walking;
- Some workers are likely to be drawn to work in the area and particular accommodation types due to recreation opportunities;
- Shift workers and those in temporary accommodation may use their weekends and non-shift time to explore the new area, and;
- There are increasing trends for informal recreational use of the countryside and that, following Covid, access patterns have changed markedly.

2.23 It is possible to drill into survey data and figures from other studies to highlight just how low the estimates from EDF are, with some consideration of relevant studies provided below.

2.24 Natural England's Monitoring Engagement with the Natural Environment (MENE) dataset provides national data on recreation use, with MENE data cited in the Shadow HRA recreational disturbance evidence base (para 2.4.18). Here, EDF's own report states that 3 in 5 adults in England make visits to the natural environment once a week and 51% of these visits were to the countryside or coast.

2.25 Drawing on the most recent MENE data (O'Neill, 2019), the average number of visits to the natural environment taken per person per week in 2018/19 was 1.7. This visit rate has been rising steadily (it was 1.3 in 2009). If this rate of 1.7 were applied to the entire workforce (7,900) across the whole year (52 weeks), this gives a figure of 698,360 visits per annum. Even if it is applied to just 45 weeks of the year, and to the 5,000 workers in private rental accommodation, and in caravans or on campus, the figure would be 382,500 visits to the natural environment. This figure is well over 10x as much as the 'precautionary' estimates made by EDF. While we concur this may still be an

overestimate, it does provide context as to how low the EDF estimates appear.

2.26 Sport England data (Gordon, et al., 2015) shows:

- 58% of the population 'Enjoy the outdoors';
- Out of the UK population of 43.7 million (aged over 16), some 32.4 million are 'active', i.e. take part in any kind of sport or outdoor activity, with 8.96 million (i.e. 20.5% of all those aged over 16) participants in outdoor activities;
- Males tend to be more active outdoors compared to females and activities such as mountain biking and running all have a male bias, and;
- 44% of gym users prefer to access outdoors, i.e. would prefer to be outside.

2.27 The Sports England Active Lives survey data can be accessed online with the online tool[1] and is able to provide information for particular sectors. The figures below are the percentage of people who walked for leisure/cycled (all cycling types) at least twice in the 28 days prior to the survey:

- National Statistics Socio-economic classes 6-8 (lower), i.e. those undertaking semi-routine occupations, routine occupations, or the long-term unemployed: 35.9%/12.7%;
- All adult males: 41.9%/21.1%;
- Those aged 16-34: 34.2%/17.9%;
- Those currently employed: 44%/19.4%, and;
- Single people: 36.8%/16.2%.

2.28 While these figures clearly do not single out those likely to be undertaking construction work at Sizewell C, they clearly indicate well over a third of individuals would likely walk for leisure (which includes dog walking) at least twice a month, and somewhere around 15-20% might be cycling (i.e. road cycling, mountain biking, etc). These are two activities which would be relevant to the construction workforce at Sizewell C.

Displaced visitors

2.29 The **2014 Sizewell C Visitor Surveys** (from 2014) indicate in para 4.1.17 that 65% of interviewees overall would not stop using the area around Sizewell C during construction, 29% would stop using it, and 2.5% said that they were not sure. Broadly about a third of visitors would choose to visit another

[1] https://activelives.sportengland.org/ accessed 06/08/2020

location, with the data suggesting that most would not be deflected very far and across a wide variety of locations.

2.30 The effect of displacement is estimated (in terms of additional visitor use) within the **Shadow HRA recreational disturbance evidence base (**paras 3.2.28 – 3.2.31**)**. The approach is fundamentally flawed. The screen shot below is taken from the **Shadow HRA recreational disturbance evidence base** (page 39 of the report), and, for example, calculates (erroneously) a figure of 4,380 visits to Aldeburgh. The errors in the calculation are set out below the screenshot. It should be noted that similar figures are used in other documents – for example the **Plants and Habitats Synthesis Report** (which gives a value of 4,377 for Aldeburgh in Table 1.5).

Table 3.5: Extrapolated visitor numbers for locations given by survey respondees as sites to which they would relocate during construction of SZC

			Most 'realistic' approach			'Precautionary' approach		
Column No.	1	2	3	4	5	6	7	8
Location	% of survey visitors displaced to location	Existing visitor numbers to location	Extra visits / year	Extra visits / day	% extra over existing visits	Extra visits / yr based on 500,000 visits in Sizewell area	Extra visits / day	% extra over existing visits
Aldeburgh	2.92%	150000	4380	12.0	2.9	14600	40	9.7
Butley	0.19%	10000	19	0.05	0.2	950	2.6	9.5

2.31 Below we use blue text to explain how the values in the table have been calculated by EDF and the black text describes why this is wrong, using the numbers given for Aldeburgh.

Column 1: 15 interviewees from the 2014 survey stated they would be displaced to Aldeburgh. 514 people were interviewed, giving the value of 2.92%. In the 2014 survey there were 15 interviewees who stated they would be displaced to Aldeburgh however 151 interviewees said they would be displaced somewhere and only 95 of those could name a location, presumably because they weren't sure. Therefore the % actually displaced to Aldeburgh could be higher.

Column 2: This is how many people EDF estimate visit Aldeburgh per year. The figure is essentially a rough guess, and the same value is applied to most sites. It highlights the poor quality of the data used.

Column 3: This figure is the 2.92% figure applied to column 2, i.e. 2.92% of 150,000. This step does not make sense and is where the fundamental error has crept in. It is not 2.92% of the people that visit Aldeburgh that are displaced, but 2.92% of the people visiting locations further north around Sizewell. The application of 2.92% to the number of visitors already visiting Aldeburgh makes no sense.

Column 4: This is simply 4380 divided by 365.

Column 5: This is simply column 1 repeated (and rounded down). This is the same as column 1 because the wrong numbers have been used in earlier columns.

Column 6: This is 2.92% of 500,000.

2.32 It would have been better to take the percentage of interviewees at each location where surveys were conducted that were displaced to different locations and then scale those figures up, based on the observation data at the relevant survey locations. In order to understand what that uplift might then mean, accurate visitor totals for the receptor sites is necessary and that is entirely missing from the EDF reports. The calculations given in columns 6-8 are more reasonable and make much more sense.

2.33 Within the 2014 visitor survey reports there is no breakdown of the percentages that would be displaced by survey point. This is critical information as it is necessary to understand the variation between locations.

2.34 The general approach of asking people whether they might be displaced and where they might go is useful, because there are few alternative means to ascertain such information. There are however concerns about such preference surveys and actual likely behaviour. This issue is discussed in the **Shadow HRA evidence base report** (para 3.2.5-3.2.12) but not really addressed. The text suggests some visitors may state they would be displaced but not actually change their behaviour, whereas no consideration is made that the opposite could occur. It is quite possible that some interviewees might not appreciate the scale of works and disruption and as such believe they wouldn't be displaced – but once work has started they may well be put off.

2.35 The **Shadow HRA evidence base report** (para 3.4.1) suggests that a precautionary approach is used and 29% of visitors are considered likely to be displaced. This is not precautionary, as it excludes those who indicated they weren't sure and does not address the concerns about preferences.

2.36 In summary, the figures for displacement are inaccurate, have been miscalculated, and the quality of the data in terms of the receptor sites and number of current visitors is very poor (meaning it is hard to be confident of what any uplift might mean). There has been a lack of survey work to accurately identify current visitor use around the area and current levels of use. The visitor surveys focus on a small number of locations but there are many more that have not been surveyed and for which no data exists.

Other visitor assumptions

2.37 There is no information provided to indicate how often and for how long the coast path will be closed and therefore how long the diversion is likely to be in place for. This is a key omission as the diversion will direct the coast path

and visitors through Eastbridge and across the Levels towards the Minsmere Sluice. This is a sensitive area in terms of disturbance and can be very wet and muddy, particularly during the winter. Displacement from here further north (e.g. when the path is waterlogged) would also deflect recreational use to sensitive locations. Without a clear understanding of how often the diversion will be required, and the duration and time of year it will be in place, it is impossible to assess the scale of impact.

2.38 Several assumptions are made within Tables 5.2 and 5.3 of the **Shadow HRA** concerning the behaviour of displaced site users. Item 9 in both tables suggests that new visitors to sites will exhibit the same behaviour and use the same access infrastructure as current site users, and that visitors specifically displaced from Sizewell and Minsmere to Aldeburgh would restrict their activities to the beach frontage around the town. Elsewhere in the same volume of the **Shadow HRA** (Para 8.3.64), it states that any recreational users displaced to Aldeburgh will focus their activities upon the main beach frontage, rather than spread out to nearby European Sites (e.g. the Alde-Ore Estuary). No evidence is provided to back up these assumptions.

2.39 The **Shadow HRA** also seeks to downplay the level of recreational activity occurring either side of the peak construction period, by contrasting it with that period (Para 7.4.73). Nevertheless, the period either side of peak construction will still have increased levels of recreational requirement above the current baseline. The same document also suggests that once construction has ceased many displaced site users will revert back to using Sizewell (Para 7.7.36) although no evidence is provided to support this, and it is considered just as likely that visitors will continue to use their newly adopted recreation sites post-construction.

Overall predictions of visitor numbers

2.40 Predictions of visitor use as a result of both the displacement of existing users and from additional construction workers are set out in the **Recreational Disturbance Assessment** Table 2.1. These should therefore be combined figures for both the construction workers and the displaced visitors. The numbers given bear little resemblance to those in other documents and it is not clear how the totals have been derived.

Screenshots of the top lines of different tables are provided on the following pages and all sites include estimates for Aldeburgh:

Recreational Disturbance Assessment. This claims to give figures for displaced recreational use and visits by construction workers – i.e. the overall increase in recreation use:

Table 2.1: Estimated additional visits to locations in the study area (two scenarios) as a result of displacement of existing users from the Sizewell area and the construction workforce.

Location and estimated number of annual visits	Access point(s) reference	% of survey visitors who gave as alternative location	Based on % of displaced visitors			Based on 500,000 visits to Sizewell area		
			Inc. visits / year	Inc. total visits / day	% inc. over existing visits	Inc. visits / year	Inc. total visits / day	% inc. over existing visits
Alde-Ore Estuary SPA								
Aldeburgh – 150,000	U,V,W	2.92%	9292	25.5	6.2	19,512	53.4	13
Butley – 10,000	DD	0.19%	19	0.05	0.2	950	2.6	9.5

Shadow HRA Recreational Disturbance Evidence Base. This table gives displacement of existing visitors

Table 3.5: Extrapolated visitor numbers for locations given by survey respondees as sites to which they would relocate during construction of SZC

			Most 'realistic' approach			'Precautionary' approach		
Column No.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Location	**% of survey visitors displaced to location**	**Existing visitor numbers to location**	**Extra visits / year**	**Extra visits / day**	**% extra over existing visits**	**Extra visits / yr based on 500,000 visits in Sizewell area**	**Extra visits / day**	**% extra over existing visits**
Aldeburgh	2.92%	150000	4380	12.0	2.9	14600	40	9.7
Butley	0.19%	10000	19	0.05	0.2	950	2.6	9.5

Shadow HRA Recreational Disturbance Evidence Base. This table provides the displacement of construction workers

Table 3.9: Estimated numbers of construction worker visits to locations per year

Locations most likely to visit					Construction workers who have dogs
	*Estimated % who visit location	No. campus or caravan site based workers visits to location/yr**	No. PRS & tourist based worker visits to location/yr***	Total construction worker visits to location/yr	No. PRS & tourist based worker visits to location/yr****
Sizewell Estate and beach (not European Sites)	18%	2125	1275	3401	2486
Aldeburgh	26%	3070	1842	4912	3591
Thorpeness	15%	1771	1063	2834	2072

2.41 It can be seen that Table 2.1 of the **Recreational Disturbance Assessment** gives an increase of either 9,292 visits or a ('precautionary') 19,512. These are apparently displaced visitors and construction workers combined.

2.42 Table 3.5 of the **Shadow HRA Recreational Disturbance Evidence Base** gives totals for visitors that would be displaced: 4,380 and a ('precautionary') 14,600 per annum.

2.43 Table 3.9 of the **Shadow Recreational Disturbance Evidence Base** gives figures for use by construction workers: 8,503 per annum, this is the sum of 4,912 visits by non-dog walkers and 3,591 from dog walkers.

2.44 It can be seen that the figures do not add up. According to the EDF figures the total for Aldeburgh should be 23,103 (i.e.14,600 + 8,503) not the 19,512 referred to in Table 2.1 of the Recreational Disturbance Assessment. The errors are made for all sites, not just Aldeburgh. Even accepting our concerns regarding the approach, level of surveys etc., there are also different figures quoted in different reports with clear errors that undermine the conclusions drawn.

Impacts on nature conservation interest

2.45 Various locations ('amenity and recreation receptors') have been identified in the **Description of non-significant effects** report as experiencing non-significant effects. These include:

- Walberswick and Dingle Marshes;
- Middleton, Westleton and Darsham;
- South of Westleton, and;
- The areas around Thorpeness, Aldeburgh, and Knodishall.

2.46 EDF propose that for these locations, which include European sites, the effect on amenity (i.e. visitor experience) will not be diminished, i.e. for these locations the impacts from noise, use by construction workers, etc, will not affect visitor enjoyment.

2.47 The **Shadow HRA** appears to suggest in the early parts of the document (Table 2.2) that displacement of visitors is not one of the scenarios that is assessed and the only recreational effect listed is that from construction workers (at the bottom of the table).

Sandlings SPA

2.48 Table 5.3 (Item 9) within the **Shadow HRA** also suggests that any adverse effect arising from recreational disturbance upon Sandlings SPA is unlikely to impact SPA bird populations due to the extensive and spatially disparate nature of the habitats within the SPA. However, when considered in combination with the smaller size and number of parking spaces available within proximity to the SPA, it is considered that even a relatively small increase in visitor numbers could lead to a proportionately larger effect upon the fragmented habitat parcels comprising the SPA.

2.49 The percentage populations of Nightjar and Woodlark found within Sandlings SPA is presented as 3% and 9%, respectively, within the **Shadow HRA** (Para 6.3.198), although this has been calculated using the most recent 4-year average rather than the most recent (2018) counts. The recalculated percentages using the 2018 counts are 6% and 10%, respectively. Elsewhere in the document (Para 8.8.435) it is stated that Dunwich Forest, which lies outside of the Minsmere-Walberswick SPA but which supports a Nightjar population considered to be functionally linked with the SPA population, *has the capacity to accommodate a significant level of recreational use without any adverse effects on this species.* No evidence is provided to explain why this is considered to be the case.

2.50 Throughout the **Shadow HRA**, and the majority of supporting documents, recreational impacts upon Woodlark are only considered within the Sandlings SPA, despite the species being distributed across several localities (as evidenced by the desk study information provided within para 1.3.69 of the **Terrestrial Ecology and Ornithology Report – Ornithology Appendix**). Woodlark populations outside of Sandlings SPA (e.g. within Minsmere-Walberswick SPA) are considered likely to be functionally linked to the Sandlings SPA population and any impact upon them should therefore be considered.

Minsmere to Walberswick Heaths and Marshes SAC

2.51 **The Shadow HRA** argues that because there is already a high level of visitor use, any increase will not have an adverse effect. Para 7.7.34 states that there are already 1,114,206 visitors to the SAC. The paragraph then suggests that an additional 20,000 displaced visitors to the SAC would be small and the text also states "*this pressure would be diffuse and spread across a large*

number of potential car-park access points". There are many problems with this approach.

2.52 Firstly, the figure of 20,000 displaced visitors does not match that used elsewhere. For example, the **Recreational Disturbance Assessment**, in Table 2.1 on page 16, gives a total of displaced visitors of 23,172 or 88,623 visiting the Minsmere to Walberswick Heaths and Marshes SAC. These two totals are the sum of the increased visits per year given in the table and calculated by the two methods described.

2.53 To then argue that the increase is small in proportion to the total visitor numbers to the SAC, such that adverse effects can be ruled out, is flawed. Most visitors to the SAC visit the Minsmere RSPB Reserve car-park, Dunwich Cliffs, and other such destination car-parks that are promoted by the RSPB and National Trust. Wardens are present at these locations to meet and greet visitors, and considerable access infrastructure is already in place to manage recreation. The displaced visitors, and indeed the construction workforce, are likely to be pushed to inland car-parks and more informal parking around the periphery of the reserve (for example at numerous locations at Dunwich Heath, around Westleton, or near Eastbridge). Here access is harder to manage as parking, etc, is not necessarily in the control of the conservation organisations and there are numerous footpaths and bridleways that provide access to areas with sensitive habitats.

Minsmere – Walberswick Heaths and Marshes SPA

2.54 Adverse effects are ruled out for Little Tern in the **Shadow HRA** (para 8.8.334) on the basis that management measures are in place to protect Little Terns (through the Little Tern Recovery Project) and subject to this management continuing. The Little Tern Recovery Project was funded through EU Life funds and funding is not secured indefinitely. It is therefore not a sound conclusion to rule out adverse effects on integrity on the basis that existing conservation management by organisations such as the RSPB will continue indefinitely. Given the highly mobile nature of the species, with colonies shifting over time, this assumption is even more open to question. Historically Little Terns have bred in front of Sizewell A and birds will exploit available habitat in areas with low levels of disturbance. Ensuring areas of beach with suitably low levels of recreation use is a challenge which will not be helped by the construction work and deflection of access.

2.55 Adverse effects on Hen Harrier are ruled out in the **Shadow HRA** (para 8.8.458), apparently because the roost sites are not known and confidential and because there is apparently ample habitat for birds to roost in within the SPA where no disturbance is likely. This is hardly a robust conclusion. Roost sites have been monitored for many years and have been in areas with public access. Locating roost sites would have been possible as part of the assessment (while ensuring they remained confidential) and more detailed consideration should have been undertaken.

2.56 Impacts upon Dartford Warbler are not considered in the EIA nor in any of the supporting ornithological survey reports. It is not a qualifying species within any of the SPAs, although this may potentially be seen as historical oversight in light of the important population now established in Suffolk (it is a SPA qualifying species elsewhere in its UK range). The species is also listed on Schedule 1 of the Wildlife and Countryside Act 1981 and is an Amber-listed Bird of Conservation Concern. Under these criteria alone the species should be considered alongside the other bird species identified in para 1.4.70 and Table 1.3 of the **Ornithology Synthesis Report**. It is likely to be present within areas of heath within which site users will potentially be displaced and the populations affected may be of value at the regional, or even national, level. Other non-SPA qualifying species (e.g. Stone-curlew) are considered within designated sites (e.g. Para 14.12.155 to 14.12.156 of the **Terrestrial Ecology and Ornithology Report**), and it is therefore not clear why Dartford Warbler has been excluded from assessment.

2.57 An overarching thread within the ornithological baseline surveys supporting the **Shadow HRA** is the age of the data. Table 1.7 in the **Terrestrial Ecology and Ornithology Report – Ornithology Appendix** provides the survey periods for the most recent ornithological surveys undertaken by Arcadis. Little Tern surveys have not been carried out since 2013, the last Nightjar surveys were in 2014, and breeding and wintering bird surveys have not been undertaken since 2015. Several historic species-specific ornithological surveys carried out in the period 2008 to 2012, and categorised as secondary data within the Ornithology Appendix, are also used to inform the assessment. It is therefore considered that update surveys would be required to accurately inform any impact assessment upon several of the important ornithological receptors identified.

3. The monitoring strategy proposed by EDF and its adequacy

3.1 The **Shadow HRA** (e.g. para 7.7.37) states that "*The Rights of Way and Access Strategy for the EDF Energy estate would be developed to minimise the displacement of people away from the Sizewell C area and to nearby European sites to minimise trampling of vegetation. In addition, the strategy outlines a monitoring programme for recreational displacement to identify local mitigation measures, to be agreed with local land managers, which could be introduced to further reduce recreational disturbance*."

3.2 The above quote would appear to suggest that the strategy includes a monitoring programme. Elsewhere in the **Shadow HRA** the text regarding monitoring is more ambiguous and would suggest that a monitoring programme is yet to be produced. For example para 8.8.434: "*It is proposed that existing recreational management measures at Westleton Heath and other heathland areas within the Minsmere (southern) section of the Minsmere-Walberswick SPA, are enhanced to minimise the potential for any increase in recreational disturbance pressure on breeding nightjar and other breeding birds of heathland habitats. This would be a monitoring and mitigation plan, to be agreed with land managers and would be aligned with the proposed Rights of Way and Access Strategy*."

3.3 Further confusion results from para 8.8.111 which states: "*Mitigation measures have been identified to minimise the ecological effects of increased recreational pressure on habitats and associated species in the Minsmere RSPB Reserve area. A Rights of Way and Access Strategy is being developed to minimise the displacement of existing recreational users from Sizewell C and the likelihood that displaced visitors and construction workers would access the Minsmere-Walberswick SPA for recreation. In addition, the strategy outlines a monitoring programme for recreational displacement to identify local mitigation measures, to be agreed with local land managers, which could be introduced to further reduce recreational disturbance."* This seems to suggest that a strategy is being produced but is not yet available, and that the strategy includes the monitoring programme.

3.4 The **Rights of Way and Access Strategy** does exist; we have checked it for a monitoring programme and there is no programme set out. As such, it would appear that the monitoring of recreation issues has not been

programmed and that no monitoring strategy has so far been produced. It is therefore not possible to rely on monitoring as a means to deliver mitigation.

3.5 We would have expected more detailed visitor survey work as part of the assessment, with for example counts of parked cars at every parking location across the relevant European sites and supporting habitat. This would have provided basic baseline data on visitor numbers which would then provide the foundation for a monitoring strategy. Monitoring data could then be used to identify where changes occur and therefore where mitigation needs to be targeted.

4. The mitigation strategy proposed by EDF and its adequacy.

4.1 The Sizewell C Project would have an impact on various public rights of way (PRoW), including temporary and permanent closures and diversions. A **Rights of Way and Access Strategy** is proposed to resolve these issues. The **Rights of Way and Access Strategy** is referred to in the **Shadow HRA** (e.g. para 8.8.415) as the means by which mitigation will minimise the ecological effects of increased recreational pressure on habitats and associated species.

4.2 The Suffolk Coast Path, the future England Coast Path, and Sandlings Walk will need to be diverted inland for 'temporary periods'. The strategy does not give any indication of how frequently this will happen, the duration, etc. Without this information it is impossible to assess the adequacy of any mitigation to resolve disturbance impacts at Eastbridge and the surrounding vicinity.

4.3 The **Shadow HRA** is ambiguous about the state of mitigation proposals for recreation impacts. For example para 8.8.434: "*It is proposed that existing recreational management measures at Westleton Heath and other heathland areas within the Minsmere (southern) section of the Minsmere-Walberswick SPA, are enhanced to minimise the potential for any increase in recreational disturbance pressure on breeding nightjar and other breeding birds of heathland habitats. This would be a monitoring and mitigation plan, to be agreed with land managers and would be aligned with the proposed Rights of Way and Access Strategy*."

4.4 Exactly what the recreational management measures might be and how they would work to enable a conclusion that adverse effects on integrity can be ruled out is not clear. There appears to be scant detail on such mitigation and nothing in the **Rights of Way and Access Strategy**.

4.5 The **Shadow HRA** (para 8.8.438) seems to indicate that monitoring and mitigation will be linked and triggers have been set to deliver enhanced recreational management: "*mitigation in the form of enhanced recreational management measures is identified for heathland areas within the southern (Minsmere) block of the SPA during the construction period. If the changes in visitor use predicted during construction continue into the operational phase, then it is considered that these mitigation measures should be continued. Subject*

to the above enhanced recreational management, no adverse effects associated with increased recreational pressure are predicted on breeding nightjar using the Minsmere-Walberswick SPA, either directly or indirectly via habitat change."

4.6 It seems therefore that mitigation measures are being relied on and linked to monitoring, without the necessary detail provided to support the application and the conclusions in the **Shadow HRA**.

4.7 There are some mitigation measures described in the **Amenity and Recreation Report** (Section 15.5). These predominantly relate to retaining access provision, diversions to footpaths, and so on, rather than addressing impacts on habitats or species. Measures in the **Amenity and Recreation Report** that have some relevance include:

- A new off-road combined bridleway, cycleway, and footpath linking Sizewell and Gap to the construction accommodation campus (para 15.5.23-15.5.24);
- The provision of 27ha of new access land at Aldhurst Farm. The land here will include a small car park and informal and surfaced footpaths (para 15.5.26-15.5.28);
- Some enhancements to the Kenton Hills car park (para 15.5.25);
- Provision of formal sports facilities to the south of the Alde Valley Academy, including sports pitches (para 15.5.36), and;
- A footpath around the perimeter of the accommodation campus to allow workers to exercise within the campus boundary.

4.8 The **Mitigation Route Map** has been reviewed and does not provide any further detail on additional mitigation to the above that is relevant to recreation impacts upon European sites.

4.9 Additional (and conflicting) information on mitigation for recreational disturbance are provided in the **Terrestrial Ecology and Ornithology Report.** Para 14.12.161 states that it is considered prudent to develop appropriate mitigation for recreational disturbance issues. Para 14.12.162 states that Aldhurst Farm would provide 43ha of open space for informal recreation. In addition to this (para 14.12.163) indicates that local site-based measures "*would be developed as part of a Rights of Way and Access Strategy, in partnership with relevant stakeholders. This strategy would complement measures already outlined in the Suffolk Coast Recreational Disturbance Mitigation Strategy (RAMS) developed by Natural England and local planning authorities in Suffolk*". Such measures appear to be missing from the Rights of Way and Access Strategy.....

4.10 Further confusion arises in the **Planning Statement**, para 6.10.3 of which states: "*SZC Co. will monitor impacts on European Sites relating to recreational displacement during the construction phase as a result of the Sizewell C Project. SZC Co. will provide a European Sites access contingency fund to support measures to access points to European Sites where monitoring identifies a potential risk of harm occurring as a result of additional use of these areas. Measures to be funded could include additional signage and information boards, fencing, as well as training and support for wardens. The European Sites access contingency fund would not be available to support measures at RSPB Minsmere, or National Trust Dunwich Heath and Coastguard Cottages which will be funded through separate resilience funds (see section 6.14)*."

4.11 There appears to be no further detail on these measures. In order to be effective they must be timely, reliable, and achievable. There is no evidence given as to the level of funding that might be provided, what might trigger particular mitigation elements, and how they might be implemented. It is not really clear what training or support for wardens might look like – is this additional staff (and if so how will it be hosted) or simply a training course?

4.12 There is no detailed consideration or assessment as to how effective these measures might be, or how they will serve to allow a conclusion of no adverse effects on integrity to be made, in any of the reports. For example, we would expect to see information on the levels of use, types of visitors, and clear evidence that the mitigation is sufficient to address impacts from recreation use. In fact, the measures seem poorly conceived and inadequate to address the scale of impact that might occur. For example, new greenspace is provided in some parts of the country, such as the Thames Basin Heaths, at 8ha per 1,000 new residents, in order to resolve the issues from increased recreation associated with new development. While this metric is not necessarily transferable to the Suffolk Coast, it would suggest that – for the 7,900 construction workers alone – some 63ha of new greenspace might be necessary. Aldhurst Farm is merely 27ha and no evidence is given as to how it might function as new greenspace.

4.13 Furthermore, in the Thames Basin Heaths, and indeed many other parts of the country where there are new residents (from house building), on-site access management measures are provided alongside new greenspace. For example, increased wardening, fire-fighting resources, education, and awareness raising initiatives, and so on. These appear to be lacking for Sizewell C. There are many areas, such as around Eastbridge, from Eastbridge towards Westleton, and parts of Dunwich Heath and Dunwich

Forest where such measures could help address impacts from increased recreation.

5. Questions for National Trust/RSPB to raise in relation to recreation impacts.

5.1 Recreational disturbance impacts have not been properly assessed, evidence is lacking, and the suggested mitigation is confusing. Given the poor quality of the work done, it seems that a conclusion of no adverse effects on integrity cannot be justified. In some respects, we would advocate that EDF need to review, update, and redo much of the work on recreation impacts, with more original surveys necessary. Possible points to clarify/address include the following:

1. There are errors in the calculations of visitor estimates and discrepancies between the different reports. These need to be explained and clear analysis of the recreation impact issues and necessary mitigation presented. Without this information it is not possible to rule out adverse effects on integrity.

2. There is a lack of detail on assessment of ecological impacts. For example Little Tern, Hen Harrier, and trampling of shingle seem to be poorly addressed. For some of the coastal features there is little indication of how mobile species of dynamic habitats can be protected from disturbance. We would have expected to see much more detailed mapping of visitor flows and numbers (both current and predicted), providing heat maps of footfall. These maps would then be overlaid with ecological data and checked with site managers/local organisations[2].

3. Further information is required concerning the coast path diversion. How often will the diversion of visitors to Eastbridge be in place? How will parking issues be addressed in Eastbridge and how will the diverted path cope with increased use, given that it is prone to waterlogging in the winter?

4. There is a lack of mitigation to resolve recreation impacts at the following locations:

- Eastbridge area (including path to coast);

[2] We understand some checks were made early on in the assessment with relevant organisations, but the expertise of site managers in checking model predictions and pin-pointing where there are concerns with recreation impacts and how they should be addressed has been missed entirely.

- Periphery of Minsmere Reserve, particularly between Eastbridge and Westleton;
- Dunwich Heath;
- Beach at Dunwich, including vegetated shingle below the cliffs and marshes to north;
- Dunwich Forest;
- Walberswick Marshes;
- Beach area at Minsmere and south towards Sizewell;
- Beach area between Thorpeness and Aldeburgh (vegetated shingle);
- North Warren, and;
- Aldringham Walks.

5. As part of a robust mitigation package we would expect to see provision for an increased wardening presence, public education and awareness raising (including a focus on dog fouling and dogs running off-lead), protocols to resolve fire risks, etc. These seem to be alluded to in the **Planning Statement** but nowhere else.

6. There is no comprehensive monitoring programme to address visitor numbers and use. This needs to be drawn up and integrated into mitigation delivery.

6. Conclusions

6.1 We have reviewed the information provided by EDF in relation to visitor use and nature conservation impacts. This information is scattered across numerous reports and we have struggled to find a clear, coherent narrative that identifies the changes in recreation use that might be expected were the proposal to go ahead, the scale of impact and the necessary mitigation that would be required.

6.2 The coastal strip in the vicinity of Sizewell is outstanding in its nature conservation interest and the area supports a range of habitats and species – within a relatively small geographic area – that is unique within the UK. The area is also a popular destination for recreation and draws visitors from the local area and more widely. There are visitor facilities and infrastructure in place at some key locations where, for example, tourist use is focussed. There are also numerous more informal locations where access is currently low key and difficult to manage. The Sizewell C proposal will change the recreation use through the increase in construction workers (some 7,900 workers at peak period) living locally and the displacement of existing visitors, for example as a result of footpath closures, diversions, traffic etc.

6.3 The area around Sizewell includes SAC, SPA and Ramsar sites and a range of qualifying features. There are a number of ways in which recreation impacts could undermine the conservation objectives for the relevant European sites. For example, through increased fire risk, disturbance, trampling, contamination and spread of invasive species. As such there are likely significant effects from recreation and appropriate assessment is necessary.

6.4 The purpose of the appropriate assessment is to undertake an objective scientific assessment of the implications for the European site's qualifying features potentially affected by the project in light of their conservation objectives. The competent authority should conclude that a project would not adversely affect the integrity of a European site, only if it is convinced that this is the case, such that there is no reasonable scientific doubt. In order to reach such a conclusion we would expect detailed survey work to show current levels of recreation, predictions of change and these overlaid with ecological data to show which locations (i.e. particular car-parks and paths) and which species/habitats would affected. Such a granular and detailed level of evidence has not been gathered. Were such information

available, it would allow mitigation measures and long-term monitoring to be designed and targeted to allow adverse effects on integrity to be ruled out.

6.5 Guidance on HRAs is clear that all mitigation measures should be effective, reliable, timely, guaranteed to be delivered and as long-term as they need to be to achieve their objectives (Tyldesley, Chapman, & Machin, 2020). It is for the competent authority, as part of the appropriate assessment, to assess the mitigation measures and the difference they would make to the anticipated project. The information provided by EDF does not provide the necessary level of precision in the baseline data or predictions of change. As a consequence, there is insufficient detail on the mitigation needed. Mitigation measures are not adequately set out or secured.

References

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Appendix: Other points/extra detail.

Note that footprint ref allows cross-reference between rows in this table only.

Footprint ref	DCO Document name & reference	Page, Section, Paragraph reference	Quote of text from document	Issue or concern	Response
	Which document, by whom & reference	***Specific reference to locate the quote from next column – 'from' and 'to' if necessary***	***Copy/paste of the specific section that you have concerns with.***	***Explain why we are concerned with this section – either because it is not acceptable to us and we have a coherent challenge, or it is a significant risk to our position. We will not need to respond to everything we might disagree with.***	***A first draft of some next, notes or bullet points articulating how we might to respond to the issue or concern highlighted.***
1	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 4 – Section 2 - Para 2.1.7	*During the peak year of construction, it has been assumed that a total of 7,900 construction workers would work on the main development site at any one time and 600 construction workers would work on the associated development sites. The 7,900 construction workers at peak construction are assumed to be made up of:* *• 'home based' (2,016 workers); and* *• 'non-home based' (5,884 workers) comprising:* *− 2,400 workers on campus.* *− 600 workers in caravans.* *− 2,884 workers living off site.*	Use of the word assumption throughout, especially with respect to home workers, if used to underpin additional impact assessment.	

Footprint ref	DCO Document name & reference	Page, Section, Paragraph reference	Quote of text from document	Issue or concern	Response
2	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 4 – Section 2 - Para 2.1.8	*In addition, all 600 associated development workers are assumed to be 'home based'.*	Use of the word assumption. If not home-based then these workers will need to be accommodated elsewhere.	
3	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 27 – Table 2.2		Repeat of 'assumed' home worker numbers.	
4	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 84 – Table 5.2 – Item 9	*Additional visitors to these locations would be expected to follow similar behaviours to existing visitors and use the defined path network/beach. Further incursion by people into areas supporting sensitive shingle vegetation would not be expected and additional loss of vegetation as a result of trampling is therefore considered unlikely to arise.*	No indication as to why novel/increased numbers of visitors would be expected to follow the same pattern.	
5	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 84 – Table 5.2 – Item 9	*It is considered that the majority of additional visits undertaken by people displaced from Sizewell, or potentially the RSPB Minsmere Reserve, to Aldeburgh would involve activities on the immediate beach frontage around the town, rather than the estuarine habitats and landscape of the Alde-Ore Estuary Ramsar site.*	No indication as to why people visiting Minsmere (a "wild" site) would swap to the town seafront if displaced. Different pull factors at work potentially.	
6	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 93 – Table 5.3 – Item 9	*Many of these areas, in particular the coastal frontage/beach at Dunwich and Walberswick, are already subject to intense visitor use.*	Leading statement which suggests that no cumulative ecological effect can occur at a heavily used site with	

Footprint ref	DCO Document name & reference	Page, Section, Paragraph reference	Quote of text from document	Issue or concern	Response
				the advent of increased visitor numbers.	
7	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 94 – Table 5.3 – Item 9	Same wording to Footprint ref 5	No indication as to why people visiting Minsmere (a "wild" site) would swap to the town seafront if displaced. Different pull factors at work potentially.	
8	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 94 – Table 5.3 – Item 9	*Such increased recreational pressure is likely to involve activities on the immediate beach frontage at Aldborough, rather than on the estuarine habitats of the Alde-Ore Estuary SPA*	No indication given as to why this would be the case.	
9	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 94 – Table 5.3 – Item 9	*However, despite all this, the potential for an increase in the number of visits to some locations around the Alde-Ore Estuary cannot be discounted and further studies need to be carried out to remove this pathway of effect*.	Cannot rule out disturbance effects on the SPA.	
10	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 95 – Table 5.3 – Item 9	*Sandlings SPA includes a number of discrete areas of heathland, acid grassland and coniferous plantations. Within the 8km displacement buffer zone the SPA component area comprises Aldringham Walks, to the south of Sizewell, and North Warren Nature Reserve located to the west of Thorpeness and north of Aldeburgh. Both of these sites are located away from the immediate coast and are more discrete than the sites at Minsmere and Dunwich. As a result, they have fewer visitor facilities and are accessed via a series*	No explanation of 8km displacement buffer. Suggestion that sites won't be visited because they are not coastal. Smaller size/smaller amount of parking suggests potential for increased impacts arising from relatively	

Footprint ref	DCO Document name & reference	Page, Section, Paragraph reference	Quote of text from document	Issue or concern	Response
			of smaller and informal car parks. Given the extensive and spatially disparate nature of the habitat comprising the SPA is that an adverse effect from Sizewell C at the level of designated SPA populations is considered to be unlikely.	small increase in visitor numbers.	
11	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 125 – Section 6 - Para 6.3.3	*The citation and most recently available population estimates for the SPA show declines in numbers for the breeding qualifying features, other than marsh harrier, whilst recent population estimates for the wintering populations are higher than at citation (Table 6.1). Declines are particularly notable amongst the breeding seabirds, with neither of the two tern species which are qualifying features of the SPA currently being present as breeding species.*	Phrasing here is leading, intimating that quality of designated site has declined. No indication as to why this may be (e.g. increased recreation) or the issues posed to recovery by increased visitor numbers arising from Sizewell C project.	
12	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 127 – Section 6 - Para 6.3.11	Said of Little Tern: *The peak count was eight birds at VP10 (Sudbourne Beach) in early June 2013, at which point a colony attempted to establish. However, this was deserted by the time of the nest survey in late June.*	No indication given as to why colony abandoned. If due to recreation then evidence of potential impact on re-colonising feature of SPA.	
13	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 127 – Section 6 - Para 6.3.13	Said of Little Tern: *Based on the mean maximum alongshore foraging range (3.9km) suggested by Parsons et al. (Ref. 6.43), breeding birds from a colony at Slaughden could be expected to generally forage no further south than Orford Ness and no further north than Thorpeness.*	Mean value is being misinterpreted here. Could easily have birds regularly foraging at distances past this point.	

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14	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 143 – Section 6 - Para 6.3.48	*Given that the mean maximum foraging distance from breeding colonies in the SPA is expected to be around 3.9km alongshore (Ref. 6.43), the nearest VP is likely to be outside the maximum foraging range for little terns in this SPA. However, the greater distance of the Benacre to Easton Bavents SPA little tern colony from the main development site also means that there would be less potential for effects to arise on this SPA little tern population than on those at SPAs closer to the main development site.*	Same misinterpretation of mean foraging range (see Footprint ref 13).	
15	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 143 – Section 6 - Para 6.3.49	*Based on the mean maximum alongshore foraging range (3.9 km) estimated by Parsons et al. (2015 – Ref. 6.43), breeding birds from the colony at Covehithe Broads could be expected to generally forage no further south than Southwold and no further north than Kessingland.*	Same misinterpretation of mean foraging range (see Footprint ref 13).	
16	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 145 – Section 6 - Para 6.3.54	*However, there have been marked declines in the breeding populations of little tern, teal and nightjar, and in the wintering population of hen harrier.*	No indication of why these decreases have occurred. Potentially due (at least partly) to increased levels of recreational pressure/disturbance?	
17	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 148-149 – Section 6 - Para 6.3.66	*Although these survey data are relatively old, there has been relatively little change in the relevant habitats in the Minsmere South Levels and Sizewell Marshes and no substantive increase in bittern numbers within the RSPB Minsmere Reserve since*	Stated change in habitat use. No way of confirming that behaviour and distribution hasn't	

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			these surveys. Therefore, it is likely that these findings remain representative of the current situation.	changed without update surveys.	
18	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 149 – Section 6 - Para 6.3.67	*Other evidence on the use of the Sizewell Marshes by bittern derives from radio-tracking studies undertaken by RSPB in 2000 and 2001, which showed that the Sizewell Marshes were used by first winter birds from the SPA (Ref. 6.73).*	20 year old data from a population which was just starting to recovery. Behaviour/movements potentially different now due to increased population/distribution of territories on site.	
19	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 168 – Section 6 - Para 6.3.107	*The Minsmere South Levels and Sizewell Marshes (which occur outside the SPA – Figure 6.2) comprise habitat that may be used by breeding gadwall, so there is the potential for functional linkage with the SPA gadwall population.*	Misleading wording. Following paragraph makes it clear that both localities are used by breeding Gadwall.	
20	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 168 – Section 6 - Para 6.3.110	*The Minsmere South Levels and Sizewell Marshes (which occur outside the SPA – Figure 6.2) comprise habitat that may be used by breeding shoveler, so there is the potential for functional linkage with the SPA shoveler population.*	Misleading wording. Following paragraph makes it clear that both localities are used by breeding Shoveler.	
21	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 170 – Section 6 - Para 6.3.115	*Thus, surveys of the Kenton Hills and Goose Hill plantations, undertaken specifically for nightjar, recorded no birds in any of the three visits (i.e. 19th May and 23rd June 2014 and 17th May 2015).*	Are 3 visits enough to confirm probable absence? Also these surveys are 5 years old…	
22	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 171 – Section 6 - Para 6.3.118	*Two surveys (each of three hours duration) were undertaken on each survey day, with two hen harrier sightings obtained over the wintering period (in October and November survey) and both involving*	Evidence of Hen Harriers favouring South Levels (for foraging at least).	

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			birds hunting over the Minsmere South Levels (Ref. 6.45)... Four of the records were from the Minsmere South Levels and six from the Sizewell Marshes.		
23	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 182 – Section 6 - Para 6.3.154	*Greater numbers of shoveler were recorded during WeBS counts within the WeBS Sizewell Belts count sector (with peak counts of 10 or more birds in six of the seven years for which data were obtained) than during project-specific surveys of the Sizewell Marshes, which recorded only two birds in this area during the two winters of survey (Table 6.14 and Table 6.15). Such a marked discrepancy between the respective counts is difficult to explain, although it is notable that shoveler were recorded in a relatively low proportion (i.e. 60%) of the WeBS Sizewell Belts counts.*	Potentially evidence of too low a survey effort in project-specific surveys?	
24	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 203 – Section 6 - Para 6.3.197	*Although the SPA is within 0.7km of the main development site at its closest point, the largest blocks of land which comprise the SPA are considerably further from the main development site, at over 9km.*	Still a material consideration though!	
25	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 203 – Section 6 - Para 6.3.198	*Over this period the number of nightjar territories on the Reserve increased from two in 2010 to five in 2018 (with an average of 1.4 territories per year from 2010 to 2014 and of 2.6 from 2014 to 2018), whilst for woodlark they increased from three in 2010 to seven in 2018 (with an average of 4.6 territories per year from 2010 to 2014 and of 6.8 from 2014 to 2018) (RSPB, unpublished data). Therefore, the discrete block of the SPA which is closest to the main*	The author is being disingenuous and using the most recent 4-year average rather than the most recent (2018) counts to calculate percentage of population. Using most recent counts the	

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			development site seems likely to hold approximately 3% and 9% of the total SPA nightjar and woodlark populations, respectively.	percentages come out at 6% and 10% for Nightjar and Woodlark, respectively.	
26	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 258 to 259 – Section 7 - Para 7.4.73	*There is the potential for an increase in visitor numbers or changes in the patterns of use of recreational areas (such as the Alde-Ore Estuary Ramsar site) due to the presence of the Sizewell C Project construction workers. For the purposes of assessment, it is assumed that 7,900 workers would be present for the peak construction period of the Sizewell C Project. They are likely to be on-site for approximately 20% of the overall construction timeline (2.5 years of the 9 to 12 year construction period) and increase the pressure associated with recreational activity. Either side of peak construction the workforce would be lower and, therefore, would generate less demand for informal recreation.*	Assumptions of worker distribution again, and suggestion that either side of peak construction that recreational pressure will still be higher than it is now.	
27	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 259 – Section 7 - Para 7.4.74	*In addition, the construction period could lead to the displacement of a number of existing recreational users through their avoidance of particular areas, e.g. Sizewell Beach, during the construction period. When considered together, these effects are expected to generate an additional 60,000 recreational visits per annum overall, of which 7,000 may be to Aldeburgh, where it is possible to access the Alde-Ore Estuary Ramsar site.*	No indication of where these figures have come from.	

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28	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 259 – Section 7 - Para 7.4.76	*Appendix E of this report indicates that the car park locations that give access to the Ramsar site already receive an estimated 580,000 recreational visits per year, and that any increase due to recreational users displaced from Sizewell would be small (estimated to be an additional 29,000 recreational visits in this case per annum). In addition, this total increase in pressure would be diffuse and spread across a large number of potential car park access points.*	Previously stated that displacement will lead to use of existing heavily used sites – not sure that this fits with diffuse? The numbers stated still comprise a 5% increase in visitor numbers.	
29	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 259 to 260 – Section 7 - Para 7.4.79	*The number of workers for the operation phase would represent a substantial reduction from the levels during construction. The assessment for recreational disturbance during construction concluded that adverse effects would not arise and, as less recreational visits would be generated, it can be concluded that recreational disturbance during the operation of the Sizewell C Project would not have an adverse effect on the vegetated shingle of the Alde-Ore Estuary Ramsar site.*	The workers are still an increase in "population" above current levels, just fewer than in the construction phase…	
30	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 273 – Section 7 - Para 7.7.31	*The Plants and Habitats Synthesis Report as provided in Volume 2, Chapter 14, Appendix 14B1 concludes that any trampling effects are likely to be reversible in time, with vegetation recovering once the trampling pressure is removed.*	Assumption that trampling pressure will be removed and that people's behaviour doesn't change as a result of displacement during construction. Also no confirmation that trampling effects are reversible in reality,	

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				if damage to underlying seedbank/invasive spread/eutrophication occurs as an allied impact. All of this is subsequently highlighted in the remainder of the same paragraph.	
31	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 273 to 274 – Section 7 - Para 7.7.34	*In addition, this pressure would be diffuse and spread across a large number of potential car-park access points. It is estimated that perhaps 20% of the predicted increase in visitor numbers would visit the main RSPB nature reserve (where dog walking is not permitted) and 80% of the predicted increase in visitor numbers would visit the outer areas of the reserve, where dog walking is permitted.*	It's not clear in the shadow HRA how these visits will be spread across numerous car parks, or how this spread has been calculated. Likely to be a few busier and many quieter sites.	
32	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 274 – Section 7 - Para 7.7.35	*There is no automatic correlation between an increase in the number of recreational visits and the potential for the qualifying features of European sites to be detrimentally affected.*	It's arguable that published evidence suggests there is a correlation with "potential for" (even if impacts do not ultimately occur).	
33	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 274 – Section 7 - Para 7.7.35	*It is envisaged that, overall, managed sites with a well-defined path network, such as the core area of the RSPB reserve, where people are easily observed, new recreational users are likely to keep to existing*	How is this justified? Is there any evidence to prove that this is in fact the case?	

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			path networks and would be unlikely to lead to an increase in trampling.		
34	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 274 – Section 7 - Para 7.7.36	*The displacement of existing recreational users is likely to last for the duration of the construction phase, although as people establish new patterns of behaviour and access alternate sites, the changes could become permanent for a proportion of users. For the majority, once construction activities have ceased, a substantial proportion of displaced users are likely to reuse the Sizewell area and be joined by new users.*	No evidence is provided to suggest how likely any of these scenarios are. Increased recreational pressure could remain indefinitely.	
35	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 274 – Section 7 - Para 7.7.37	*As set out earlier, mitigation measures have been established to minimise the requirement for both construction workers and existing recreational users from Sizewell to access the SAC for recreation.*	Assume this refers to the Suffolk RAMS (alongside proposed Rights of Way and Access Strategy for the EDF Energy estate?	
36	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 285 to 290– Section 7 – Table 7.8	Table cumulatively lists 1,100 new dwellings in outline planning applications within 13.7km of Sizewell C, and a minimum of 815 new dwelling allocations within various relevant Plans within 8.6km.	Table identifies potential for in-combination effect with Sizewell C, but not for adverse in-combination effect. This is presumably due to existing RAMS Strategy (mitigation??)	
37	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 301 to 306 – Section 7 – Table 7.10	See Footprint ref 37	See Footprint ref 36.	

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38	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 344 – Section 8 – Para 8.3.64	*Aldeburgh was identified as the most likely site near to the Alde-Ore Estuary SPA that users could be displaced to, with smaller predicted increases to other locations. Increased visitor use in and around Aldeburgh would be unlikely to impinge directly upon the estuary, with the focus of any additional activity likely to be the main beach frontage.*	No evidence provided here to confirm limitation to Aldeburgh beachfront.	
39	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 346 – Section 8 – Para 8.3.73	*Any residual effects of visitor displacement from Sizewell C post-construction, and recreational use of the local area by operational workers, are predicted to be so small as to be undetectable in the context of the likely future drivers of trends in recreational use of the Suffolk Coast (population growth, initiatives to promote tourism and the increasing popularity of outdoor recreation) and the predicted numbers of annual visitor trips to the Suffolk Coast in the vicinity of the main development site.*	Is this a material consideration when assessing the impact of the Sizewell Project?	
40	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 494 – Section 8 – Para 8.8.422	*It is also unlikely that SPA birds rely on suitable habitat near to the main development site for foraging because the main breeding sites within the SPA are over 1km from the main development site. Although nightjar have been recorded foraging at distances of up to 3.1km from their nests, most foraging is generally much closer to the nest and studies of radio-tracked birds in southeast England recorded a mean maximum distance of 747m from the territory centres*	Would argue that it is less likely, but not unlikely.	

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41	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 496 – Section 8 – Para 8.8.434	*It is proposed that existing recreational management measures at Westleton Heath and other heathland areas within the Minsmere (southern) section of the Minsmere-Walberswick SPA, are enhanced to minimise the potential for any increase in recreational disturbance pressure on breeding nightjar and other breeding birds of heathland habitats. This would be a monitoring and mitigation plan, to be agreed with land managers and would be aligned with the proposed Rights of Way and Access Strategy.*	Not currently clear what this would entail.	
42	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 496 – Section 8 – Para 8.8.435	*It is considered that Dunwich Forest – outside the SPA but with a functionally linked breeding population of nightjar - has the capacity to accommodate a significant level of recreational use without any adverse effects on this species.*	Why? No evidence for this statement provided.	
43	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 565 – Section 8 – Para 8.11.23	*Estimated increases in visitor numbers to locations associated with the SPA are shown in Table 8.31. The largest estimated increase is at Thorpeness Village. Most visitors relocating here might be expected to access the beach and village. Although there is access to the Sandlings SPA to the west (Aldringham Walks) this is a 4-5km round trip.*	Confirmation that people will not access areas away from the beach?	
44	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 566 – Section 8 – Para 8.11.26	Said of Nightjar*: It is also stated that the population size at classification may have been unusually high due to the extensive area of open habitat suitable for nesting that was created following a gale in 1987 that felled most trees; and a more realistic target is being modelled.*	If this is the case, then it increases the importance/proportion of the population within those parcels closest to the Sizewell C site.	

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45	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 566 – Section 8 – Para 8.11.26	*Disturbance due to human activity is identified as a potential issue for nightjar if an increase in development locally leads to an increase in recreational pressure (Ref. 6.109), suggesting it is not currently considered to be a limiting factor.*	This interpretation is open to question.	
46	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 566 – Section 8 – Para 8.11.27	*The Sizewell C visitor survey data and presence of several entry points to open access land indicate that the Sandlings SPA is already subject to considerable visitor use. There are extensive path networks and access to woodland and open habitats. The main activity undertaken by visitors is dog-walking (Ref. 8.139). Nevertheless, as described above RSPB data show that the nightjar population within the RSPB's Aldringham Walks and North Warren reserve has increased in recent years*.	Not clear that visitor survey data shows high levels of use within Aldringham Walks and North Warren Reserve, specifically?	
47	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 566 – Section 8 – Para 8.11.28	*No change in the behaviour of users or the pattern of use is considered likely to arise.*	Based on what data? Increased site use may cause existing users to spread out more within the site.	
48	5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment 1 of 5 (revision 1.0)	Page 568 – Section 8 – Para 8.11.36	*Subject to the implementation of enhanced management measures for recreational access at Aldringham Walks and North Warren, an increase in recreational pressure during the construction of Sizewell C is not predicted to adversely affect the ability of the Sandlings SPA to achieve the conservation objectives for breeding nightjar, either directly or indirectly, via effects on habitats.*	How will these be enforced? Increasing population is a sign of recovery and increased disturbance should therefore be avoided.	

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49	6.3 Volume 2 Main Development Site: Chapter 14 – Terrestrial Ecology and Ornithology	Page 46 – Para 14.7.36	*The Plants and Habitats Synthesis Report (Appendix 14B1 of this volume) concludes that any trampling effects are likely to be reversible with vegetation recovering once the trampling pressure is removed*	Assumption of non-continuation of use at end of 10-year period or change in structure in the interim.	
50	6.3 Volume 2 Main Development Site: Chapter 14 – Terrestrial Ecology and Ornithology	Page 47 – Para 14.7.44	*Once construction activities have ceased, a substantial proportion of displaced users would likely reuse the Sizewell area and be joined by new users.*	Assumption.	
51	6.3 Volume 2 Main Development Site: Chapter 14 – Terrestrial Ecology and Ornithology	Page 59 – Para 14.7.108	*In addition, this total increase in pressure would be diffuse and spread across a large number of potential car-park access points.*	Evidence for this?	
52	6.3 Volume 2 Main Development Site: Chapter 14 – Terrestrial Ecology and Ornithology	Page 157 to 162 – Table 14.23	No mention of Dartford Warbler anywhere, despite other non-qualifying species (with respect to designated sites) included in table.	Unsure why this species is absent. Presumably present on heaths within ZoI and of importance at a county (regional/national?) level and prone to disturbance.	
53	6.3 Volume 2 Main Development Site: Chapter 14 – Terrestrial Ecology and Ornithology	Page 170 to 177 – Table 14.25	No recreational disturbance effect indicated for Hobby	Potential disturbance effects near nest sites, where they occur following displacement of visitors	
54	6.3 Volume 2 Main Development Site: Chapter 14 – Terrestrial Ecology and Ornithology	Page 208 – Para 14.12.154	*For example, a well-used site, with wide, clearly defined access tracks, in which visitors behave in a similar manner and remain on the path network,*	What about species like Dartford Warbler, etc, where an increase in	

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			could potentially have the capacity to absorb many additional visits.	passes along paths has been shown to affect breeding success?	
55	6.3 Volume 2 Main Development Site: Chapter 14 – Terrestrial Ecology and Ornithology	Page 208 – Para 14.12.155	*For example, the RSPB has indicated that disturbance to the core RSPB Minsmere Reserve is unlikely as dogs are not allowed and access is managed, but the outlying heath and grassland areas are more vulnerable to recreational disturbance and in particular ground nesting species such as stone curlew. An increase in recreational disturbance is likely to last for the duration of the construction phase. In the absence of mitigation, a significant effect could occur.*	Still no mention of Dartford Warbler, although Stone Curlew (a non-qualifying species) gets a namecheck.	
56	6.3 Volume 2 Main Development Site: Chapter 14 – Terrestrial Ecology and Ornithology	Page 211 – Para 14.12.168 – 5th bullet	*Recreational pressure. Once the proposed development is operational, access to the EDF Energy estate and the beach would return to conditions similar to the existing situation and no displacement of recreational users is expected.*	No mention of potential permanent increase in visitor levels at novel sites post-construction, either through retained practise or/and increased population (workers stay on scenario).	
57	6.3 Volume 2 Main Development Site: Chapter 14 – Terrestrial Ecology and Ornithology	Throughout		Entire report only talks about Woodlark breeding within Sandlings SPA. Are they not present elsewhere (e.g. Westleton) and	

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				comprise supporting populations?	
58	6.3 Volume 2 Main Development Site: Chapter 14 – Terrestrial Ecology and Ornithology – Appendix 14B2: Ornithology Synthesis Report	Page 50 – Para 1.4.137	No mention of Dartford Warbler, or of Woodlark away from Sandlings SPA, with respect to recreational disturbance		
59	6.3 Volume 2 Main Development Site: Chapter 14 – Terrestrial Ecology and Ornithology – Appendix 14B2: Ornithology Synthesis Report	Page 52 – Para 1.4.142	*Little terns have historically nested at Sudbourne Beach, near Slaughden. Sudbourne Beach is potentially accessible via a car park south of the village of Aldeburgh. The Recreational Evidence Base concludes that any increase in visitor numbers as a result of potential displacement from Sizewell C (estimated at 2.9 - 13% for this location) would not increase the disturbance pressure at this site. This takes account of existing access management measures, including prohibition of dogs on the beach between 1 May and 30 September, signage, fencing and vehicle barriers.*	No indication as to why no increased impact assumed upon Little Terns.	
60	6.3 Volume 2 Main Development Site: Chapter 14 – Terrestrial Ecology and Ornithology – Appendix 14A7: Ornithology Part 1 of 2	Page 18 – Table 1.7 – Breeding bird surveys row		Only single monthly visits carried out, with 2 in total in 2015.	
61	6.3 Volume 2 Main Development Site: Chapter 14 – Terrestrial Ecology and Ornithology – Appendix 14A7: Ornithology Part 1 of 2	Page 37 – para 1.3.69	*Within the wider landscape, woodlark have been reported from "Sizewell" in the desk-study (likely to be within the survey area), RSPB Minsmere Reserve, Eastbridge, Aldringham Common, Thorpeness, Leiston and Sizewell Common. RSPB reported woodlark present within RSPB Minsmere Reserve*	First mention I've found anywhere of Woodlark outside of Sandling SPA. Impacts of recreation don't appear to have been considered in these other locations.	

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			(peak count of 22 birds) and RSPB North Warren Reserve (peak count of 53 birds) (Ref. 1.32). RSPB also provided data for 2014 and 2015. A total of 34 woodlark records were recorded in RSPB Minsmere Reserve, with a peak count of 21 pairs in 2015. Other records of woodlark were from within the wider Minsmere to Walberswick Heaths and Marshes SPA at Dingle Marshes, where four records were reported, a peak count of nine pairs was recorded in 2014, and Snape, where six records were reported with a peak count of 10 pairs.		
62	6.3 Volume 2 Main Development Site: Chapter 14 – Terrestrial Ecology and Ornithology – Appendix 14A7: Ornithology Part 1 of 2	Page 37 – para 1.3.74	*No woodlark was recorded by Arcadis during either the breeding bird surveys or the Winter bird surveys between 2014 and 2015.*	Evidence of Arcadis surveyors missing species during their surveys, or of reduced survey effort?	
63	6.3 Volume 2 Main Development Site: Chapter 14 – Terrestrial Ecology and Ornithology – Appendix 14A7: Ornithology Part 1 of 2	Appendix – Sizewell – First Interim Bird Report - Feb 2008 – page 25 (page 210 of pdf)	*Surveys for woodlark are best carried out between February and June, and if a three visit strategy is adopted as was undertaken for the national survey in 1997 (Wotton, 1997), only one territory mapping visit would fall within the survey period that this report covers (April to July inclusive).*	Indication that Woodlark survey effort not within optimum period to record the species.	
64	EN010012-001884-SZC_Bk6_ES_V2_Ch15_Amenity_and_Recreation_Appx15A_15J_Part_1_of_3	Appendix A, page 6 (page 7 of pdf), para 2.1.2	Research and field based questionnaires identified that the approximate median1 distance likely to be travelled by people to reach a location for recreational activities is 8km. This was defined through review of selected published reports on recreational visitor surveys in landscapes of a	Use of term buffer zone and receptor zone is confusing. Not clear why the median is used. Would imply half of use not accounted for.	

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			similar type to that within the area around the Sizewell C site, in particular either heathland landscapes or estuary landscapes associated with European habitat designations, including SPA and SAC designations. The evidence base for this is set out in the Sizewell C Proposed Nuclear Development HRA Evidence Plan Volume II (of II), Appendix 3.5 SZC-EP-W4-002 Disturbance due to potential increase in recreational pressure (EDF Energy October 2014). As such, this zone is judged to be the appropriate extent of the catchment area for visitors that have the potential to be displaced by changes to PRoW and access areas within the Indicative Main Development Site during construction and operation of Sizewell C. The Displacement Zone captures a number of settlements which have been used to define the Buffer Zone (see below).	Furthermore, if someone lives 8km away and chooses to visit somewhere else instead of Sizewell, then that means they might visit somewhere 16km away from the power station, not 8....	
65	EN010012-001768-SZC_Bk5_5.10_V1_Shadow_HRA_Report_Part_4_of_5	Appendix E: Recreational Disturbance Assessment page 19 (page 324 of pdf) para 3.2.9	Dolman (2010) (Ref. 3.12) studied recreational disturbance and predation, and the potential for interaction between these two factors, on breeding nightjar and woodlark. The study site was Thetford Forest, part of the Breckland SPA in Norfolk and Suffolk.	Para fails to point out that the visitor use of Breckland sites is very different (much lower) than Suffolk coastal sites. Same issue relevant to para 3.2.15	
66	EN010012-001768-SZC_Bk5_5.10_V1_Shadow_HRA_Report_Part_4_of_5	Appendix E: Recreational Disturbance Assessment	For example, a well-used site, with wide, clearly defined access tracks, in which visitors tend to behave in a similar	Implies birds will adapt to disturbance and become habituated. Evidence that birds can	

Footprint ref	DCO Document name & reference	Page, Section, Paragraph reference	Quote of text from document	Issue or concern	Response
		page 27 (page 332 of pdf) para 3.2.9	manner (such as remaining on paths) could potentially have the capacity to absorb significant numbers of additional visits. In such situations, the existing ecological interests may be adapted and habituated to this pattern of recreational usage and significant increases....	habituate is scant and as for adaptation...	
67	6.3 Volume 2 Main Development Site Chapter 14 Terrestrial Ecology and Ornithology Appendix 14B1 Plants and Habitats Synthesis Report APP DOC 250	Para 1.3.49, page 17 (Page 20 of pdf)	States use of 500,000 figure is precautionary as an estimate of visitor use. " This approach is considered to be precautionary in that it assumes that visitor numbers can be extrapolated to provide a figure for the total number of visits over the year, whereas in reality, many of the visitors recorded during the survey are likely to visit the Sizewell area only a few times during a year."	Argument made makes no sense. Many visitors might visit only a few times per year. However, on each day there will be a different tranche of occasional visitors. As the 500,000 is derived by extrapolating counts of people on a given day it is not precautionary.	
68	6.3 Volume 2 Main Development Site: Chapter 14 – Terrestrial Ecology and Ornithology	14.12.93	The main breeding areas for nightjar within the Minsmere-Walberswick SPA are over 1 km from the main development site, where the predicted peak noise levels from construction activities are considerably below the noise threshold where disturbance could occur.	Nightjar are likely to forage considerable distances from heaths and not sure impacts for foraging nightjar are addressed anywhere?	


National Trust
shifting
shores
Playing our part
at the coast

Love the coast…

94%

of people agree that

'It's important to me that Britain's coast is kept beautiful for future generations to enjoy'

90%

of people agree that

'It's important that the planning system works to protect the beauty of our coastline'

70%

of people agree that

'I am concerned about the impact of climate change and extreme weather for our coast' [1]

Contents

Foreword

There can be no doubt that sea levels are rising and coastlines are changing.

Average sea levels globally have been increasing since the beginning of the twentieth century, with rates accelerating in recent years. The oceans act as a global thermometer, rising as they warm, and as glaciers and polar ice sheets melt.

Here in the UK, sea levels are now on average around 15 centimetres higher than they were in 1901. This will increase the impacts of storms and tidal surges like those witnessed most recently during the extreme winter of 2013-14.

Precisely by how much sea levels will rise in the future is, of course, uncertain. But between 50 centimetres and one metre of sea level rise is likely for the UK by the end of the century with further increases beyond.

This means we can expect that our coastline will experience increased erosion and flooding. This will have major implications for the people who live and work there, and change the landscape for the millions who visit every year.

Managing a changing coastline will be challenging and require new approaches that work with, not against, nature. And coastal adaptation will be made even more difficult if we, as a society, make short-sighted decisions that store up costs and risks for future generations.

Climate change creates an imperative for long-term decision making, nowhere more so than on the coast. And there can be few organisations in the world so expert at taking a long-term view than the National Trust.

So we are very fortunate indeed that some 775 miles of our most treasured and dramatic coastline is under their long-term care and that the Trust is, as this report so aptly demonstrates, facing up to the challenges ahead.

Lord Krebs of Wytham Kt FRS
Chair of the Adaptation Sub-Committee of the Committee on Climate Change

Playing our part

The coast is at the heart of what we do

We care for and share with everyone 775 miles of dramatic, diverse and ever-changing coastline around England, Wales and Northern Ireland.[2]

Ten years ago the National Trust investigated how the coastline was likely to change over the next 100 years. Out of this research came our first Shifting Shores report in 2005,[3] which had one clear message – as a nation we can no longer rely solely on building our way out of trouble on the coast.

Since then we have seen some important strides forward in public policy. But there's much more to be done. And as our understanding of climate change increases so too does the enormous challenge we face in managing the coast.

Shifting Shores committed the Trust to working with natural processes and adapting to coastal change – for instance by rolling back, moving buildings and infrastructure out of harm's way, and creating new space for nature.

Ten years on the message is even clearer. We have made our plans, now we must move from saying to doing – or run the risk of storing up problems for future generations.

In 2013 and 2014, a succession of winter storms and extreme tides saw the erosion and flooding that we thought would happen over the next five to 15 years occurring almost overnight.

This is a stark warning that coastal 'defence' as the only response to managing coastal change looks increasingly less plausible. As our strategy to 2025 *Playing our part* states: 'Climate change poses the single biggest threat to the places we look after. So we're actively adapting, managing coastal change and the impacts of severe weather.'[4]

We must learn how to adapt and take the longer view. Above all we need to understand the forces of nature at work, so that we make well-informed choices about whether and where to continue maintaining hard defences or to adapt and work with natural processes.

Where we can, recreating a naturally functioning shoreline will free us from the sea defence cycle of construct, fail and reconstruct.

The Trust is on the frontline of change affecting both the natural and historic environment, but we can only meet these challenges by working with others – with coastal communities, partner organisations and people who care as much as we do about the coast.

The coming years will be critical to the future wellbeing of our coast.

Left: Freshwater West, Pembrokeshire

The Environment Agency[5]
estimates that over

700
properties
in England
could be lost to
coastal erosion
by around 2030

and that there are

247,000
business and
residential properties at
high risk
of flooding

With so many special and stunning coastal places in our care, we are underlining our commitment to playing our part by:

- Taking the long view
- Adapting to change
- Working with others
- Working with nature
- Sharing our love of the coast.

Shifting Shores – Playing our part at the coast looks at how far we have come, and how best to nurture a healthy, adaptable coastline for future generations to value and enjoy.

In short, we must:

- Be driven by long-term sustainable plans, not short-term engineered defences
- See coastal adaptation as a positive force for good
- Take action now – move from saying to doing
- Work closely with communities – with everyone having their say
- Act across boundaries – join forces with partners and people
- Innovate – have the courage to try out new ideas
- Aspire to a healthy coastline, shaped by natural forces.

Phil Dyke
Coast and Marine Adviser
National Trust

How far have we come?

Dramatic scenes such as this one of the railway line damaged by the winter storms in early 2014 at Dawlish in Devon, have brought into sharp focus the need for urgent action. The extreme weather events in recent years and the impact of climate change mean that we must now implement our plans for adaptation, and wherever possible create a natural, sustainable coastline that we can all be proud of.

For many years, the default response to flooding and erosion along the coast has been to 'hold the line' and build our way out of trouble. In some places defence is of course necessary, but increasingly we must view adaptation as having an equal role in the long-term health of the coastline.

Over the past decade, through both Shifting Shores and our own practical experience, we have been promoting discussion at a national, regional and local level about the importance of working with natural coastal processes and adapting to change.

Now is a good time to reflect on the lessons we're learning about adaptation and to consider how well the Trust itself is doing.

More widely, we also want to understand how far national and local government and other key players have moved towards an adaptive approach.

Right: Dawlish, Devon

The latest evidence

The Trust commissioned CH2M – leading independent environmental and engineering consultants – to examine how far we, and others, have come. The results have informed the recommendations contained within this report.[6]

This new research reveals that we are ignoring the known risks of flood and erosion at the coast.

In England in 2005 the number of buildings at medium to high risk from coastal change was 117,000. By 2014 this had grown to 129,000 – an increase of 10%.

New houses and businesses are therefore still being built in areas prone to coastal change. It is likely that the same picture will emerge for Wales and Northern Ireland.

The research also shows that in the 10 years since our first Shifting Shores report, a range of potentially helpful public policies have been agreed. But it also suggests that these strategic policies are not yet informing practice on the ground.

For example, since 2010 Local Planning Authorities in England have been able to create Coastal Change Management Areas (CCMAs) through their local plans. These allow councils to ensure new development doesn't take place in areas at risk of erosion and flooding – and could inform plans to adapt or relocate existing 'at risk' properties, and the people who live in them.

Yet only 29 of England's 94 coastal planning authorities are currently using CCMAs. While a further 35 councils do have some form of policy on coastal change, it seems that the remaining 30 – almost a third – do not.

We also asked CH2M to look at our own performance over the last 10 years. This revealed that even within an organisation like ours, which is committed to working towards an adaptive response, that progress can be slow.

We must make a step change and embrace an adaptive approach in the day-to-day management of our coastal sites rather than pushing the difficult decisions into the future for someone else to deal with.

The research highlights that the Trust is a significant player at the coast, and that we need to lead by example and step up to the challenges of coastal change management.

Above: Brook Bay, Isle of Wight

On the ground

Looking back at National Trust places in earlier Shifting Shores reports, some good progress has been made.

At Mount Stewart in Northern Ireland we have plans to enable this beautiful garden to adapt in response to climate change and sea level rise. But Northern Ireland still needs a shoreline planning framework.

On the Welsh coast, many sections of the coastal path lost in the winter storms of 2013 and 2014 have been reinstated.

But, despite Wales having a footpath along its entire coastline, there is still no easy-to-apply mechanism in legislation to ensure the trail can be rolled back in a timely way as sections vulnerable to erosion fail.

At Studland on the Isle of Purbeck in Dorset, we've worked with the local community to develop a shared understanding of coastal change issues, and new future-proof beach huts are being designed which are more resilient to extreme weather.

Along the coast at Birling Gap in East Sussex, architectural plans for new buildings are being drawn up so that we can roll back in advance of the existing buildings being lost due to coastal erosion.

But at many of our coastal places we know we still need to do more to develop a longer-term vision around what adaptation will look like.

Adaptation in action

Around the coast our vision is becoming a reality. But as the pace of change accelerates, we must increasingly put our plans for adaptation into action and create a healthy coastline shaped by natural forces.

We care for all kinds of coastal areas from cliffs, beaches and dunes to estuaries and islands. As these six case studies show, our actions are very much guided by our first-hand experience and knowledge.

Taking the long view

Mount Stewart, Northern Ireland

Over the last decade, we've been harnessing support, gathering information and looking at the options open at Mount Stewart on the shores of Strangford Lough. It takes time to understand how best to adapt to the changes, but now we are able to act.

As the world changes around it, we want Mount Stewart to remain the special place it's always been. Almost 100 years ago, Lady Londonderry created the extraordinary gardens. To protect her jewel of a garden within its own microclimate, she enhanced an existing Sea Plantation on the shores of the lough. Frost is a rarity here and exotic plants such as New Zealand Christmas trees flourished.

But a recent climate change study has revealed that over time the Sea Plantation will struggle to do its job. We can now plot the scale and pace of flooding, erosion, rising ground water and saline intrusion, and highlight the impact they will have on heritage features in the garden. As lough levels rise so salt water will creep up the garden – reaching the Italian Garden and Lily Wood by the turn of the century.

'We have 80 years to future-proof the garden,' said Jon Kerr, General Manager at Mount Stewart. 'Land not at risk from extreme weather and flooding has been acquired and the planned relocation of the car park would allow the current space to be planted up as a dense shelterbelt – taking over some of the role of the Sea Plantation.'

Adapting to change

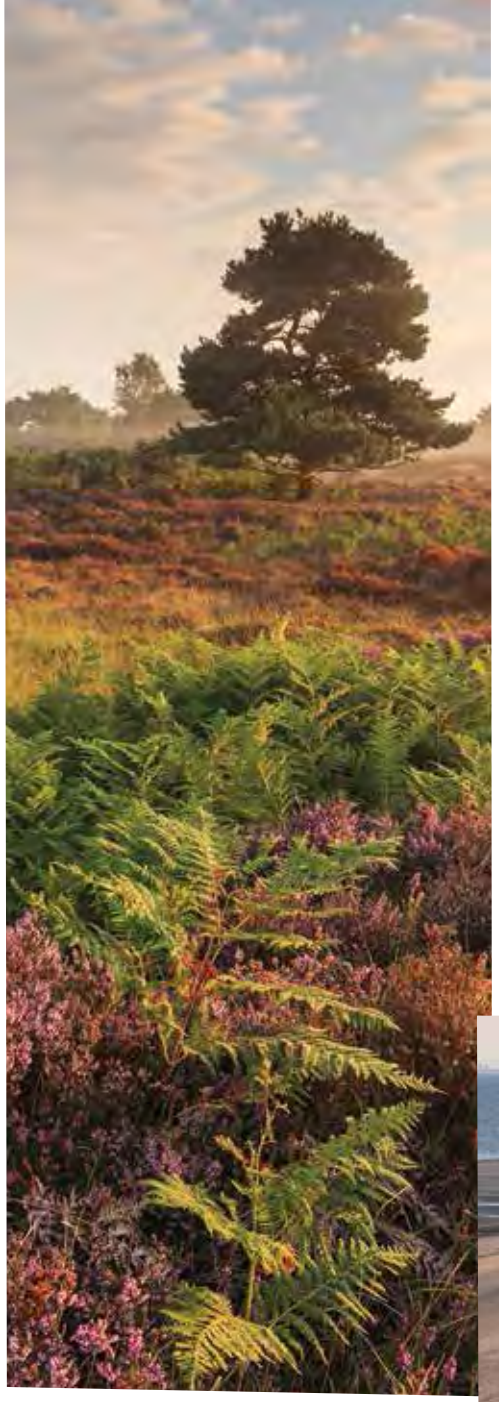
Dunwich Heath, Suffolk

This year, the Trust acquired another precious stretch of coastal heathland adjacent to Dunwich Heath. This is all part of long-term plans to create new habitats and secure the future of this constantly changing stretch of Suffolk coastline.

Re-named Mount Pleasant Heath, these 15 hectares (36 acres) of heathland have been incorporated into Dunwich Heath. People can now explore further afield and the wildlife already calling this land home has a secure future.

We've worked with RSPB Minsmere on a shared vision for this part of the Suffolk coast, and also with WREN, a not-for-profit business that awards grants for community, biodiversity and heritage projects.

Dr Helen Dangerfield, Head of Conservation, East of England, said: 'We know this part of the Suffolk coast is subject to constant change, and as erosion gradually reshapes the coastline it's vital that we plan ahead and create places for people to explore and for wildlife to thrive in well into the future.'



Working with others

Formby, Liverpool

Formby is the fastest eroding property in the Trust's care. It's predicted to lose 400 metres in the next century – changing this much-loved stretch of Sefton coastline forever.

The Trust cares for just one stretch of the historic coast, and we cannot work alone. The challenge here is to work not only with nature but equally with our partners, so that we can skilfully adapt to rapid changes in the long-term and on a landscape scale.

Kate Martin, Area Ranger for Formby said: 'Everything we plan to do at Formby affects our neighbours, as their plans affect us. There is a balance to be struck so that people and nature can co-exist. It's home to rare dune and woodland species such as natterjack toads and the iconic red squirrels.'

Formby is a complex coastal site, sitting on the edge of major urban areas, and a magnet for visitors. It needs significant investment to meet the high standards of land and nature conservation management the Trust believes in, and also to let us try out innovative ideas for adaptation.

We can all be fearful of future change at the coast, so we are involving the local community at every stage of our plans. We are developing a coastal adaptation strategy, working with our key partners, in which is embedded our desire to maintain a healthy coastline shaped by natural forces.

If we act now, Formby should offer great outdoor experiences and enhance the quality of life of the urban communities of Liverpool, central Lancashire and Greater Manchester for generations to come.

Left: Garden at Mount Stewart, Northern Ireland.
Above: The new area of heathland at Dunwich Heath, Suffolk.
Right: Sunset at Formby, Liverpool.

Working with nature

Gupton Farm, Freshwater West, Pembrokeshire

The far-reaching vision for Gupton Farm is breathing new life into one of Wales' most treasured and beautiful stretches of coastline.

Gupton Farm lies next to Freshwater West, one of the country's most famous beaches, and embraces wonderful wetlands and flower-rich grassland. Working with the local community, partners and neighbours, the landscape-scale Freshwater West Project is gradually restoring and extending reed beds, fen meadows and dune grasslands.

The effects of climate change are a reality, and as General Manager Jonathan Hughes said: 'Large parts of the farm are only 50 centimetres above high tides, and the wetlands will probably be tidal by the end of the century.

'But we see this as an opportunity, not a threat. As the meadows get wetter we need livestock and a farming system that can cope. Combining wildlife management with public access and food production, we hope the farm will eventually become a nature-lover's paradise.'

As the coast changes, so sustainable land management will see farming and wildlife adapt and thrive hand-in-hand. Wild flowers are returning and the rare shrill and moss carder bees have been spotted. We also hope to see more unusual birds including the grasshopper warbler and hen harrier; and increasing numbers of otters.

People will explore this spectacular coastline along new way-marked trails and with our new bird hide be able to get even closer to nature.

Sharing our love of the coast

Godrevy, Cornwall

In a recent nationwide survey, 70% of people questioned named Cornwall as the place they would most like to visit. [1]

Godrevy is the seaside experience we all seek – big beaches, easy access, surf, sand and fun – a coastal portal to paradise.

More than 300,000 people are drawn to Godrevy each year. Set at the eastern end of St Ives Bay, this breathtaking sandy beach is popular with everyone – from surfers and families to walkers and nature watchers, and those who simply want to sit and admire the view.

'We want people to have a great time at Godrevy,' said Bill Makin, General Manager, 'but recent winter storms have brought home to us the increasing threat to access. Knowing that we could lose the current access road, coastal path and beach access, makes it all the more important that we work with others and take on board people's views.'

The Trust-owned private road is, in places, just three to four metres from the cliff edge and inland it skirts a Site of Special Scientific Interest and crosses a Scheduled Ancient Monument. We urgently need to find new ways to adapt to this shifting shoreline while keeping it as a special place for generations to come.

Making space for nature and people

Dunsbury Farm, Isle of Wight

In the future, the Military Road that reaches this far western corner of the Isle of Wight will slip into the sea. And the land we care for at Compton and Brook Bay will be lost too.

Tony Tutton, General Manager for the Isle of Wight said: 'This year we've taken Dunsbury Farm into our care. In anticipating these changes we're now looking to create a landscape rich in wildlife, which is both healthy and beautiful well into the future. In rolling back the Compton Bay coast we can make space for nature and people.'

At the moment we're losing coastline at the rate of 1.5 metres or more a year. And the Military Road (A3055), a nineteenth century coastal road on the south west coast of the Island has been threatened by coastal retreat for decades.

Opposite page: Freshwater West, Pembrokeshire; Rock pooling at Godrevy, Cornwall. Above: Dunsbury Farm, Isle of Wight; Left: Fishing at Godrevy, Cornwall; Right: Sunset over Dunsbury Farm, Isle of Wight.

Our other farm at Compton plays an important part in the management of the downs and coast. The Galloway herd here has provided unbroken grazing for 50 years. Now the two farms can be combined to make a viable agricultural unit, and we can continue to offer great access for people to enjoy this remarkable corner of the island.

And we can only achieve all this if we work with other like-minded people. Together we can take on landscape-scale projects, improving habitats for farmland wildlife such as linnets, yellowhammers and Glanville fritillary butterflies.

The way forward

The impacts of climate change at the coast are becoming more apparent and widespread through increased erosion and flooding.

Hard coastal defences such as concrete walls have a limited lifespan, and will be increasingly prone to failure. As they fail we need to make decisions about whether or not to replace them.

We must also acknowledge that sea defences often cause unwelcome side effects such as beach lowering in front of sea walls.[7] And, as a consequence of groynes, the starving of sediment supply to neighbouring areas.

Taking a longer view, we'll look to change land use in places we already own, and work with others beyond our boundaries to stitch together existing coastal habitats. This is in the hope that if they are bigger, more joined up and better managed they'll be more resilient to the impacts of a changing climate, and offer a coast that continues to be rich in wildlife.

Earlier in the report, we outlined our key actions for the future.

This is how they would look in practice.

Long-term sustainable plans not short-term engineered defences

Traditionally, engineers have led on the management of coastal change – on the assumption that we could engineer solutions.

Recent research[6] identifies the disconnect between technical coastal change management and land use planning. As we make the switch from building our way out of trouble at the coast to planning our way out, this break in the system must be addressed.

There is good science and evidence at the heart of shoreline planning in England and Wales, but we need to make it accessible, informative and relevant to forward planning and economic development. If we fail to do this we'll simply be storing up problems for the future.

Coastal adaptation – a positive force for good

Projections show with increasing confidence that sea level rise will lead to increased erosion and flooding – bringing into further question the wisdom of relying solely on engineering solutions. But to compound this, new developments are still being built in locations that are vulnerable to coastal erosion and flooding.

We need to rethink our approach to coastal protection. We must embrace adaptive responses to managing coastal change as an equally valid approach to engineering responses – investing in adaptation where it's shown to be the best approach.

As we identified in 2005, there is also a continuing need for innovation in financial products and mechanisms. For example, with compensation and insurance that helps manage risks to property and enables vulnerable communities and the environment to adapt cost effectively.

Take action now – move from saying to doing

Despite the wake-up call of violent storms in the past few winters, our research [6] paints a picture of the gap between the creation of shoreline management plans and their implementation.

There is a sense that a mechanism might be missing, and that this could be resolved by harnessing 'Coastal Change Management Areas' – in England within local plan-making, and in Wales with the development of a coastal adaptation toolkit.

In Northern Ireland we still need to demonstrate the value of shoreline planning and monitoring – where currently a co-ordinated approach is lacking.

Murlough, Northern Ireland

Work closely with communities – with everyone having their say

Throughout our 2015 Coast campaign, we captured people's passion for the coast and why it is valued.

But we never underestimate the challenge people face when their properties are damaged by coastal erosion or flooding. Any form of realignment of the coast can create uncertainty and even hostility.

We want to work with communities – ask them what they want and believe is best and most effective, raise awareness of the challenges that face us all, and involve them in the decisions that need to be made.

Act across boundaries – join forces with partners and people

Natural processes take no account of property ownership boundaries. We realise that we can only achieve our goals in partnership with other landowners and stakeholders.

Achieving a coherent coastal planning and management policy is difficult due to the number of different bodies that have a role. But finding solutions that benefit all, such as large-scale realignment projects, requires a strong partnership approach.

Innovate – have the courage to try out new ideas

Along with others, we are trialling innovative approaches to coastal management and demonstrating the real power of adaptation. Currently, many of the ideas of roll back and realignment are in their infancy and still viewed with some suspicion.

There will always be a place for defence, but on National Trust coastline our approach will be adaptive and focused on 'moving out of harm's way'. We want this land to function in a natural way.

Coastal adaptation should be valued and resourced as an effective form of 'coast protection'. We need to find innovative ways of financing coastal adaptation schemes and compensation.

Aspire to a healthy coastline, shaped by natural forces

Increased flooding and erosion bring a real threat to our unique and much-loved coastline and coastal wildlife. We must anticipate coastal change and look to create new habitats further inland where nature can flourish, and which people can share.

It's vital that we create space for natural processes to function and for habitats and species to migrate. Creating new habitats takes time, and we must act quickly and make tough decisions where we know areas are at risk. We also need to look at how we manage our land and work with partners.

‘Postcards’ from the coast

Adapting to change is about more than the National Trust

Many organisations and communities around the country are also making a long-term commitment to working with the grain of nature to shape our future coastline.

Moving assets

New building techniques enable properties to be moveable to a new location when threatened by erosion. For example these chalet buildings developed by Bourne Leisure at Corton in Suffolk.

Innovative funding for coastal adaptation

Co-financed by Welsh Government and local authorities the £150 million capital value Coastal Risk Management Programme brings forward work identified in the Shoreline Management Plans. Innovative applies both to the financial model and to a vision for transformative projects that enable adaptation and deliver wider benefits for current and future generations. Potential projects are being scoped now in preparation for delivery 2018–2021.

Living with a changing coast

Building on the success of Defra’s Coastal Pathfinder projects, the cross-channel Living with a Changing Coast (LiCCo) project sought to explore our relationship with the ever-changing coast, to understand the impacts of climate change at seven project sites and to work with communities to explore how they could adapt to those impacts. The sites were: Poole Harbour and the Exe Estuary in England and the Saire Valley, Orne Estuary, Veys Bay, Saane Valle and Sienne Harbour in Normandy, France.

Beach debris removal

Debris and derelict coastal defences were removed from a section of beach at Happisburgh as part of the Pathfinder programme to make the beach cleaner, safer, and more attractive. North Norfolk District Council worked with the Happisburgh Liaison Group which included members of the community, Parish Council, RNLI and Lighthouse Trust and was one of a suite of projects to improve the location and manage coastal blight.

New habitats for nature and protecting homes

360 homes at serious risk of coastal flooding now have improved protection, plus a new nature reserve next door. The Environment Agency built 7km of floodbank near Selsey, West Sussex, then breached the shingle beach. This created 183 hectares (452 acres) of saltmarsh and mudflats replacing those being lost elsewhere through coastal squeeze. Managed by the RSPB, Medmerry has already hosted breeding black-winged stilts.

What we need to do

Above: Godrevy, Cornwall

National Trust challenges

Looking after our special coastal places is implicit in our strategy to 2025 – *Playing our part* – **giving us the confidence to tackle the coastal change challenges we face.**

- ❏ By 2020 we will have coastal adaptation strategies in place as a framework to inform community engagement and decision making for all our 80 coastal hotspots.

We will also…

- ❏ Seek to build strong relationships with vulnerable communities, stakeholders and partnerships to realise coastal adaptation projects
- ❏ Build coastal adaptation into our long-term business planning – recognising that the challenges of managing coastal change will play out over decades not years
- ❏ Provide training on coastal change management and adaptation to ensure our people have the right knowledge and skills.

The wider challenges

The National Trust is not alone in facing the risks to our coast. In our view, these key challenges need to be addressed by all those concerned with coastal management:

- ❏ Value and resource coastal adaptation as an effective approach to managing coastal change
- ❏ Ensure effective joint working across government departments and agencies, to turn coastal adaptation policies and strategies into tangible practice on the ground
- ❏ Empower local authorities to lead on coastal adaptation – ensuring they have the right policies, tools and resources to achieve this
- ❏ Develop a consistent Coastal Vision for sustainable management at both regional and local levels – linking the needs of people and nature
- ❏ Review how coastal groups (such as coastal forums) can best work and be effective in supporting governments and the relevant agencies at all levels
- ❏ Support innovation in coastal risk management – so that those at risk of flooding or erosion have a wider range of choices to manage their risk – a Pathfinder approach
- ❏ Maintain active and on-going engagement with coastal communities at risk
- ❏ Develop new financial products and mechanisms that help manage risk to property, and enable vulnerable communities and the environment to adapt cost effectively.

The wider challenges

What others need to do

For England, this means:

Long-term planning

- ❏ Ensure Shoreline Management Plans (SMPs) are implemented through local plans, with widespread use of Coastal Change Management Areas (CCMAs) and improved reporting
- ❏ Make SMPs more user friendly for local authority planners
- ❏ Refine guidance for implementing SMPs, to avoid difficult decisions being deferred – and so that policies can be reviewed in response to storm events
- ❏ Develop a performance measure on coastal adaptation to sit alongside the existing Environment Agency performance measure on coastal erosion
- ❏ Maintain strategic coastal monitoring to provide an evidence base for decision making on coastal protection and adaptation.

Government co-ordination and innovation

- ❏ Develop a national policy and delivery framework for a clear Coastal Vision that supports adaptive coastal change management – on an equal footing with engineered defences
- ❏ Ensure local authorities have the lead role in driving adaptive coastal change management and giving support to local communities – and that the funds are in place to support them in playing this role
- ❏ Revise planning guidance to make CCMAs a requirement for local plans, where risk areas are identified
- ❏ Undertake a review of the role and function of coastal groups
- ❏ Provide greater detail on coastal risk/change management in planning guidance – including for Neighbourhood Plans
- ❏ Promote regional coastal forums as a vehicle to ensure coastal change management is considered within the context of wider issues
- ❏ Defra to develop an 'innovative funding' approach on coastal adaptation similar to the scheme being developed by Welsh Government.

Left: Formby, Liverpool

For Wales, this means:

Long-term planning

- ❏ Develop a coastal adaptation toolkit for use by local authorities, partner organisations and communities
- ❏ Review role and function of coastal groups
- ❏ Establish a target or performance measure against which progress in moving the coastal adaptation agenda forward can be partially assessed
- ❏ Re-establish a coastal monitoring observatory – to provide evidence and trend data to inform coastal change management decision making.

Government co-ordination and innovation

- ❏ Review Technical Advice Notes (TANs 14&15) on planning for the coastal zone and flood and erosion risk management
- ❏ As part of a review of Wales' Flood and Coastal Erosion Risk Management (FCERM) strategy, develop a national policy to support adaptive coastal change management and a framework for implementation
- ❏ Make addressing coastal change and the implementation of SMPs a requirement within the development of local plans
- ❏ Implement the Coastal Risk Management Programme, and seek to ensure outcomes demonstrating adaptation
- ❏ Develop guidance on implementation of SMPs – turning policy into actions and including a review process to monitor progress and guidance around how SMP policy change is managed in response to storm events
- ❏ Ensure coastal change management and adaptation are reflected in relevant emerging legislation.

Right: Freshwater West, Pembrokeshire

For Northern Ireland, this means:

Long-term planning

- ❏ Establish Shoreline Plans which involve central government, local councils and all coastal stakeholders to ensure sustainable adaptive management of the coast
- ❏ Ensure Local Development Plans identify where development may be permitted in the coastal zone, to prevent future developments in erosion or flood-risk prone areas
- ❏ Develop a coastal adaptation toolkit for use by local councils, partner organisations and communities.

Above: Mount Stewart, Northern Ireland

Government co-ordination and innovation

- ❏ Integrate responsibilities for coastal management into one government department to provide clarity, leadership and strategic direction
- ❏ Establish a forum to enable central and local government, coastal communities and all relevant stakeholders to co-ordinate on shoreline planning activity.

Knowledge-led approach

- ❏ Address the urgent need for research to understand past and present erosion and flood issues around the coast to include:
  - Map coastal erosion and coast flood zones (Coastal classification)
  - Undertake Lidar surveys of the whole coast to establish baseline topography
  - Establish coastal cell information to understand what happens at a local level
- ❏ Establish co-ordinated coastal monitoring programmes to provide evidence and trend data, and to observe and inform coastal change decision making.

A vision for the coast

As a nation, we love and value our coast. But we want a natural coastline, not one ringed in concrete.

In 1965 our hugely successful Neptune Coastal Campaign was launched with a clear message to all lovers of the coast – help us save our precious shoreline from development and industrialisation.

Thanks to the generosity of thousands of people we have raised vital funds to support our work in caring for the coast. In 2015 we marked the 50-year anniversary milestone with a Coastal Festival – celebrating past successes and looking to the future.

For the coast to flourish, it must be healthy and rich in wildlife. At the same time we must ensure its intrinsic beauty and cultural heritage is protected, and that it can be accessed and enjoyed by both local people and visitors. We also believe land can and should be productive – as long as it doesn't jeopardise these other aims.

Where possible, our principle is to work with nature and natural processes – the action of waves, weather, tides and changes in sea level – to adapt to a changing climate and shoreline.

We want to support and work closely with our neighbours, other landowners, local authorities, government agencies and conservation organisations. By working together we make sure the whole coastline is somewhere we can all enjoy and be proud of.

Our vision is for…

- The coastline to be clean and healthy, and shaped by natural forces
- The sheer beauty and diversity of our coastline to continue to inspire and refresh people
- Wildlife to be rich and abundant, not squeezed into narrow margins
- People to access and enjoy every stretch of coastline, not just land managed by the National Trust
- A coast that is alive with history, where heritage is understood and valued
- Coastal resources put to good use, contributing to the economy of coastal communities in a way that's both sensitive and sustainable.

Glossary

Adaptation – a process by which we can respond or adjust to environmental change, in this instance the natural process of coastal change, which is being accelerated by climate change.

Beach lowering – the lowering of beach levels in front of coastal defence structures increases wave action and often undermines the defence. This causes an adverse impact such as loss of amenity and often contributes to the failure of the defence.

CCMA – Coastal Change Management Area. Introduced by the Government in 2010, CCMAs can be created by local planning authorities to incorporate Shoreline Management Plan thinking into their local plans to guard against new permanent development being sited in areas at risk of coastal erosion and flooding.

Coastal squeeze – habitat loss which arises due to the high water mark being fixed by defence or development and the low water mark migrating landwards in response to sea level rise.

FCERM – Flood and Coastal Erosion Risk Management. This is the mechanism for delivering adopted Shoreline Management Plans led by the local authority but delivered by multiple agencies/bodies. They aim to reduce the risk of flooding and/or erosion to vulnerable properties and infrastructure.

Landscape scale – enlarging, improving and joining up areas of land to create a connected ecological network for the benefit of both wildlife and people.

Managed re-alignment – allows an area that is not currently exposed to flooding by the sea to become flooded by removing frontline coastal protection. Note – can also occur as a consequence of 'force majuere' i.e. unmanaged re-alignment.

Pathfinder – exploration of novel ideas to inform innovation of policy and practice.

Roll back – the relocation of buildings, infrastructure, shoreline and habitats away from areas at risk of flooding or erosion.

Shoreline Management Plan (SMP) – the formal public process (England and Wales) that brings together information (physical, socio-economic and environmental) leading to confirmation of an agreed policy for each section of shoreline (e.g. Hold the Line, Managed Re-alignment etc) Also known as Estuary Plans in larger estuaries – typically on the east coast of England.

SSSI – Site of Special Scientific Interest. An area in the UK with special wildlife or geology that is protected for conservation purposes from any kind of development.

Uncertainty – a situation where the current state of knowledge is such that the order or nature of things is not fully understood and thus absolute outcomes cannot be defined or guaranteed.

References

[1] Research carried out by YouGov Plc for the National Trust. Total sample size was 5,047 adults in England, Wales and Northern Ireland. Fieldwork was undertaken between 3 and 7 July 2015. The survey was carried out online. The figures have been weighted and are representative of all adults in England, Wales and Northern Ireland (aged 18+)

[2] For more information see our *Mapping our Shores* report, which celebrates our Neptune coastline campaign and reflects on the benefits to coastal landscapes of National Trust ownership and a properly functioning planning system over the last 50 years

[3] National Trust *Shifting Shores – Living with a changing coastline* 2005

[4] *Playing our part* – National Trust strategy to 2025 (2015)

[5] Environment Agency report *Managing flood and coastal erosion risks in England* (1 April 2014 to 31 March 2015)

[6] CH2M report *Public policy and adaptive approaches to coastal change management: How are we doing?* October 2015

[7] *Marine Climate Change Impacts Partnership Annual Report Card 2007-08* http://www.mccip.org.uk/annual-report-card.aspx

Photography

Cover image: Gupton, Freshwater West, Pembrokeshire.
How far have we come? (page 6) – Dawlish, showing damage to the railway tracks and road © Andy Styles Photography.
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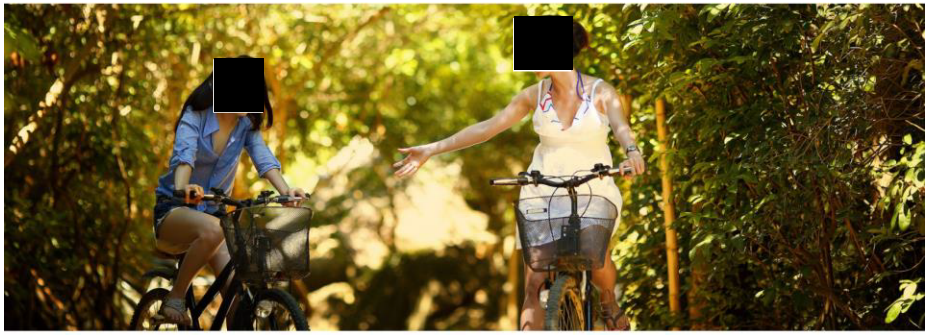

Monitor of Engagement with the Natural Environment – The national survey on people and the natural environment

Headline report 2019:

Analysis of latest results (March 2018 to February 2019) and ten years of the survey from 2009 to 2019

September 2019

For further information see:
https://www.gov.uk/government/collections/monitor-of-engagement-with-the-natural-environment-survey-purpose-and-results

Foreword

Natural England produces a range of reports providing evidence and advice to assist us in delivering our duties.

Since 2009, Natural England has carried out the Monitor of Engagement with the Natural Environment (MENE) survey. The data enables Natural England, the Department for Environment, Food and Rural Affairs (Defra), partners and data users to:

- Understand how people use, enjoy and are motivated to protect the natural environment;
- Monitor changes in use of the natural environment over time, at a range of different spatial scales and for key groups within the population;
- Inform on-the-ground initiatives to help them link more closely to people's needs, and;
- Evaluate the impact and effectiveness of related policy initiatives.

National Statistics Designation Statement

The statistics derived from MENE have been designated as National Statistics. This status means that statistics meet the highest standards of trustworthiness, quality and public value, and it is Natural England's responsibility to maintain compliance with these standards.

These statistics last underwent a full assessment against the Code of Practice for Statistics in 2014. See Assessment Report 269 Statistics on Engagement with the Natural Environment. **Since that assessment by the Office for Statistics Regulation, we have continued to comply with the Code of Practice for Statistics and have made the following improvements:**

- Implemented a thorough quality checking process and in partnership with suppliers to ensure the quality assurance procedure is robust.
- Changed elements of our reports and data releases so that statistics are more accessible for users. We have developed a dashboard that will provide local level data analysis, as well as making improvements so that data is easier to download and use.

For information on improvements we have made to the MENE data series please see the MENE Technical Report **LINK.**

Once designated as National Statistics it is a statutory requirement that the Code of Practice shall continue to be observed. For further details see **https://www.statisticsauthority.gov.uk/Code-of-Practice/**

MENE review

This report provides the results from the tenth and final year of the MENE survey. Over the last 18 months Natural England has been working with Defra and stakeholders to review MENE to ensure data collection incorporates the developing knowledge base, innovations in method and asks questions to help meet future evidence and policy needs. A new people and nature survey, which builds on MENE, will begin collecting data in 2020.

The lead analyst for this publication is Dr Rose O'Neill
Rose.ONeill@naturalengland.org.uk

For information on Natural England publications contact the Natural England Enquiry Service on 0845 600 3078 or e-mail MENE@naturalengland.org.uk

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Introduction

The MENE headline report

This report presents the headline findings for the tenth and final year of MENE fieldwork (from March 2018 to February 2019). It includes analysis of ten years of data (from 2009 to 2019) as appropriate. Further analysis is available in the accompanying Excel file – **CLICK HERE**

Background

MENE aimed to better understand the relationship between people and the natural environment.

The objectives of the survey were to:

- Provide estimates of the number of visits to the natural environment by the adult population (16 years and over) residing in England.
- Measure the extent of participation in visits to the natural environment and identify the barriers and drivers that shape participation.
- Provide robust information on the characteristics of visitors and visits to the natural environment.
- Measure other ways of using and enjoying the natural environment.
- Identify patterns in use and participation for key groups within the population and at a range of spatial scales.

Since 2009, 468,370 adults from across England participated in face-to-face interviews for MENE.

Survey scope

The main focus of the survey was to understand people's experiences of the natural environment – where they go, what they do, why and how they benefit from these 'visits'.

The survey defined visits to the natural environment as shown in the box below. The wording used aimed to make clear that 'visits' included time spent in urban nature close to home, as well as more rural and wild places.

"Now I am going to ask you about occasions in the last week when you spent your time out of doors.
By out of doors we mean open spaces in and around towns and cities, including parks, canals and nature areas; the coast and beaches; and the countryside including farmland, woodland, hills and rivers.This could be anything from a few minutes to all day. It may include time spent close to your home or workplace, further afield or while on holiday in England.
However this does not include:
- *routine shopping trips or;*
- *time spent in your own garden."*

In addition to understanding these 'visits' to the natural environment, the survey aimed to capture other ways of engaging with the natural world. This included questions about time spent in the garden, volunteering, watching nature programmes on television, environmental attitudes and other pro-environmental behaviours.

A note on statistical significance

Please note that any trends or variations between results highlighted in the text are statistically significant unless stated otherwise. This means that differences between results – for example comparisons of two population groups – are unlikely to be the result of sampling error or chance.

Questionnaire change and calibration exercise

Between 2015/16 and 2016/17, a number of changes were made to MENE. Questions related to visits taken by respondents, the place visited and activities undertaken were changed, resulting in a loss in the comparability for these measures. A calibration exercise was undertaken to allow for the subsequent three years of results to be compared with those from previous years.

This change primarily impacted upon visit based results (i.e. volumes of visits and visit characteristics) while other respondent based results (e.g. proportions of population taking visits in last year) were not affected.

All of the visit based results for the 2016-2019 period have been presented using this calibration approach to enable comparability. See the MENE technical report for full details.

Further publications from the survey

This report forms one part of a larger family of outputs from the survey.

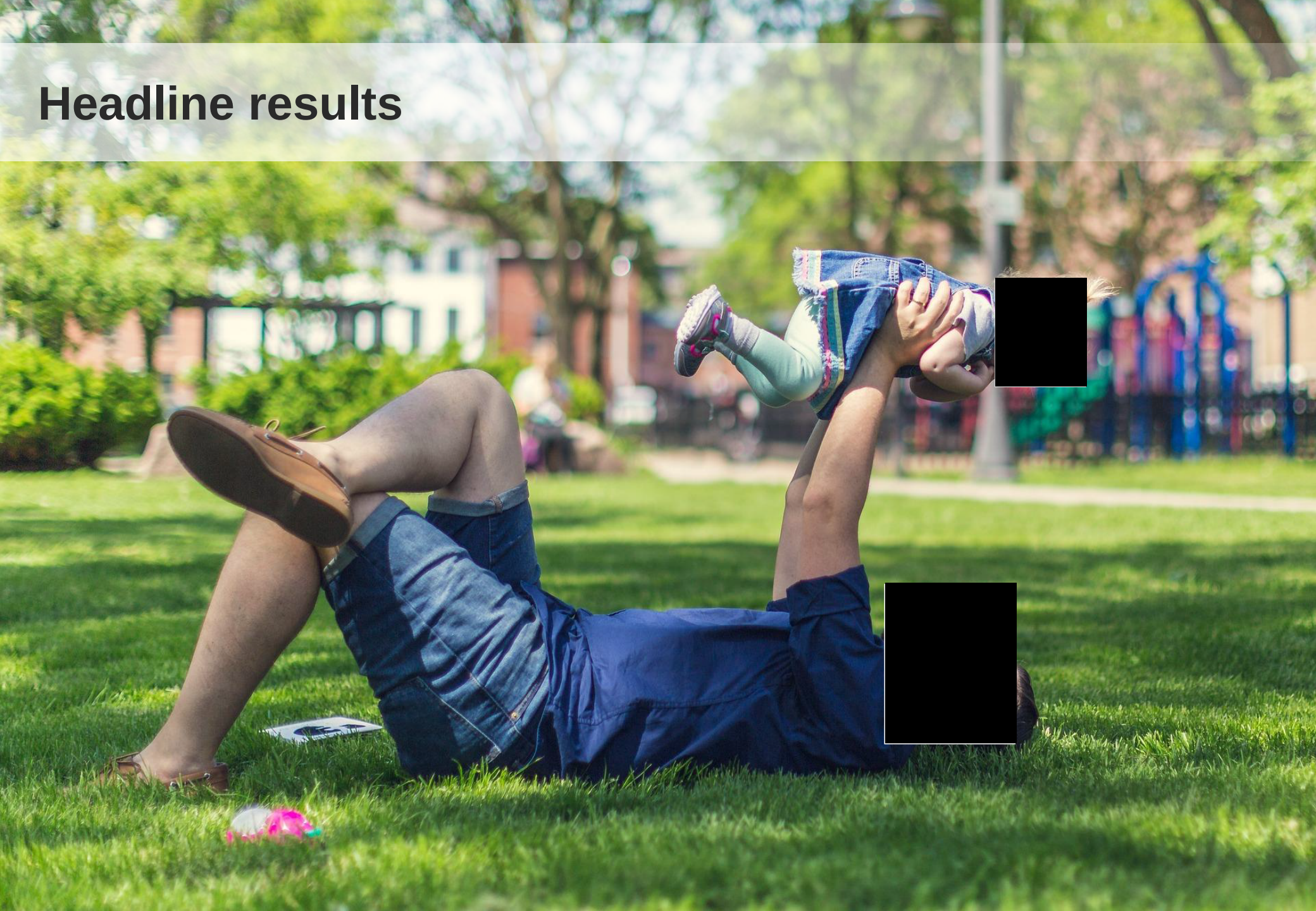
Published alongside this report are:

- A Technical Report providing full details of the survey methodology.
- Data tables in Excel providing more detailed survey results (note links to this file in related report sections).
- A Thematic Report providing a summary of some of the key insights and learnings obtained from MENE over its 10 years.
- A Local Authority Interactive Dashboard.
- SPSS, .CSV and Excel data files that allow detailed analysis of the MENE dataset.

Please see GOV.UK for further outputs from the survey: https://www.gov.uk/government/collections/monitor-of-engagement-with-the-natural-environment-survey-purpose-and-results

Further data for each of the headline areas features in this report is available in the accompanying Excel file – CLICK HERE.

Headline results



Contents

Summary of key statistics for 2018/19

Between March 2018 and February 2019, adults living in England took nearly 4 billion visits to the natural environment. This equates to around 90 visits per year per person or 1.7 visits per week (based on a population of 44.9 million[1]).

Two thirds of adults (65%) reported that they normally spent time in the natural environment at least once a week and 89% agreed with the statement *'spending time out of door is an important part of my life.'*

Nine in ten adults agreed that they were concerned about damage to the natural environment. This has remained at a fairly constant level over the last decade (88% in 2009/10). For the last five years, we have tracked awareness and concern about biodiversity loss in England. This has increased significantly over this time, from 49% adults both aware of biodiversity loss and concerned about it in 2014/15, rising to 62% in 2018/19.

Further data for each of the headline areas is available in the accompanying Excel file
CLICK HERE

Figure 1 **Summary of key 2018/19 statistics**

↑ Arrows indicate statistically significant increase since baseline (2009/10 for all items except biodiversity loss, which was introduced in 2014/15) .

Visiting the natural environment

Total annual visits	**3,988 million** ↑
Average annual visits per person	**90** ↑
Average visits per person per week	**1.7** ↑
% visit at least once a week	**65%** ↑
% visit less than once a month or never	**16%**
% choose to walk through local parks or green spaces on way to other places	**56%** ↑
% choose to walk or cycling instead of using car when they can	**44%** ↑
% enjoy wildlife in their garden	**39%**

Caring for and protecting the natural environment

% *"Spending time out of doors is an important part of my life."* (agree)	**89%**
% *"I am concerned about damage to the natural environment."* (agree)	**90%**
% *Aware and concerned about the consequences of biodiversity loss in England*	**62%** ↑
% undertaken any pro-environmental behaviours	**87%**

Motivations for visiting the natural environment

(% of visits taken. Note: Total is over 100% as more than one reason can be selected)	
Health and exercise	**56%** ↑
Relaxing and unwinding	**38%** ↑
Time with family	**21%**
To entertain children	**15%**

Benefits from visiting the natural environment

% who agree in relation to last visit…	
"I enjoyed it"	**97%**
"It made me feel calm and relaxed"	**88%**
"It made me feel refreshed and revitalised"	**90%** ↑
"I felt close to nature"	**80%** ↑

Visits to the natural environment – where people go, what they do and how they benefit.

1.

Our green and natural places are getting busier, especially in towns and cities.

The annual total of visits to the natural environment increased from an estimated 2.9 billion visits in 2009/10 to almost 4 billion in 2018/19 (Figure 2).

This change reflects an increase in the population (a 7% increase between 2009 and 2019[1]) as well as an increase in the average number of visits taken per person per week (from 1.3 to 1.7).

Figure 2 shows the total number of visits to green spaces in towns and cities almost doubled in the ten years to 2018/19.

Figure 3 shows that in 2018/19, visits to green spaces in towns and cities comprised 52% of all taken, up 11 percentage points since 2009/10. The proportions of visits to the coast and countryside decreased over time absolute visit numbers remained fairly constant.

In interpreting trend data relating to the volumes of visits taken, users should note that we have applied a calibration factor to results from 2016 onwards, to enable year-on-year comparisons after changes in question wording. See further details on page 4 and a full explanation in the MENE technical report.

Figure 2 **Estimated annual visits to natural environment, total and by type of place visited** (Billions, 2009/10 to 2018/19)

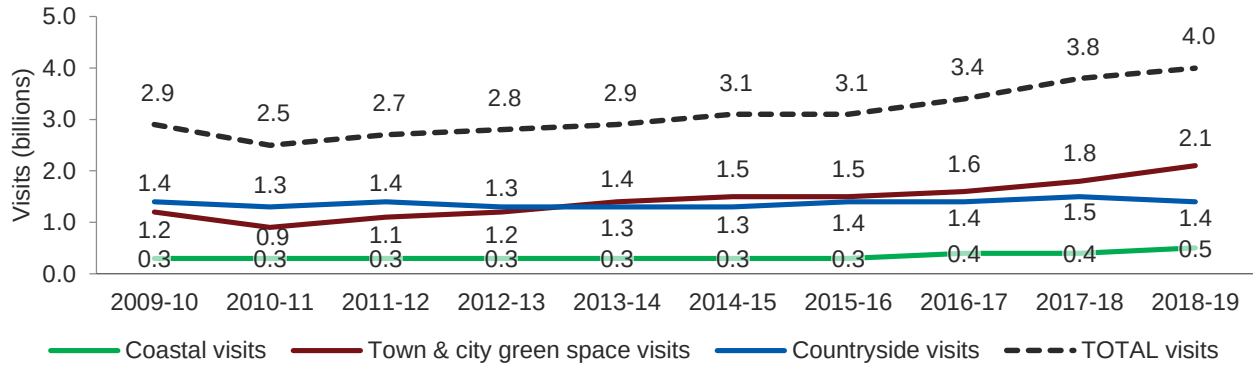
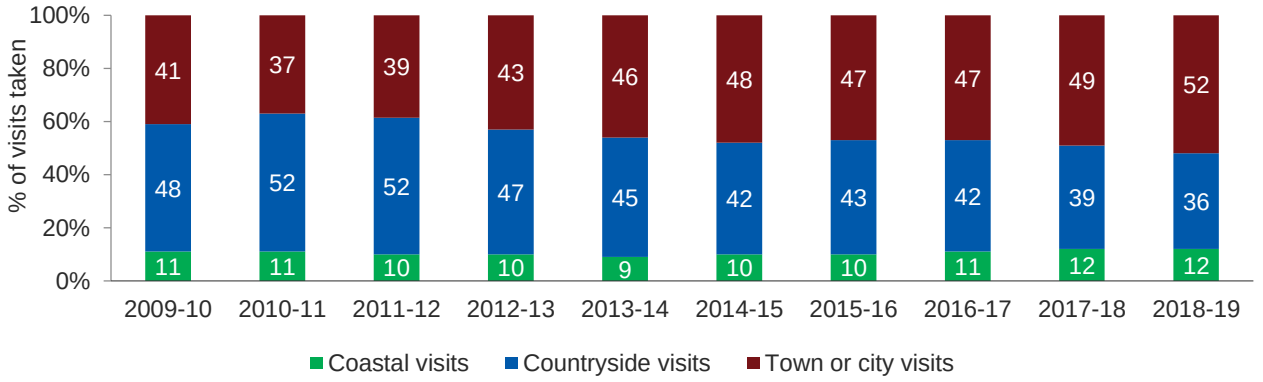


Figure 3 **Percentage of visits to natural environment by general type of place visited** (% of visits taken to natural environment, 2009/10 to 2018/19)



Q2 Which of the following best describes where you spent most of your time on this visit?

2.

Parks and playing fields are the natural places with the greatest growth in visitors over the last decade.

Figure 4 illustrates the specific types of place included in visits taken in 2018-19.

By far the largest share of all visits were taken in parks in towns and cities (36% of all visits equalling around 1.5 billion visits).

Figure 5 shows how the share of visits taken to different types of place changed over the ten years from 2009 to 2019.

Over the ten years to 2018/19, an increasing share of visits were taken to parks in towns and cities and playing fields while the share of visits to woodland and farmland decreased marginally. In volume terms, the number of visits to farmland decreased from 209 million in 2009/10 to 142 million in 2018/19. Visits to woodland increased marginally from 317 million to 369 million.

Figure 4 **Places included on visits to the natural environment** (% of visits 2018/19)

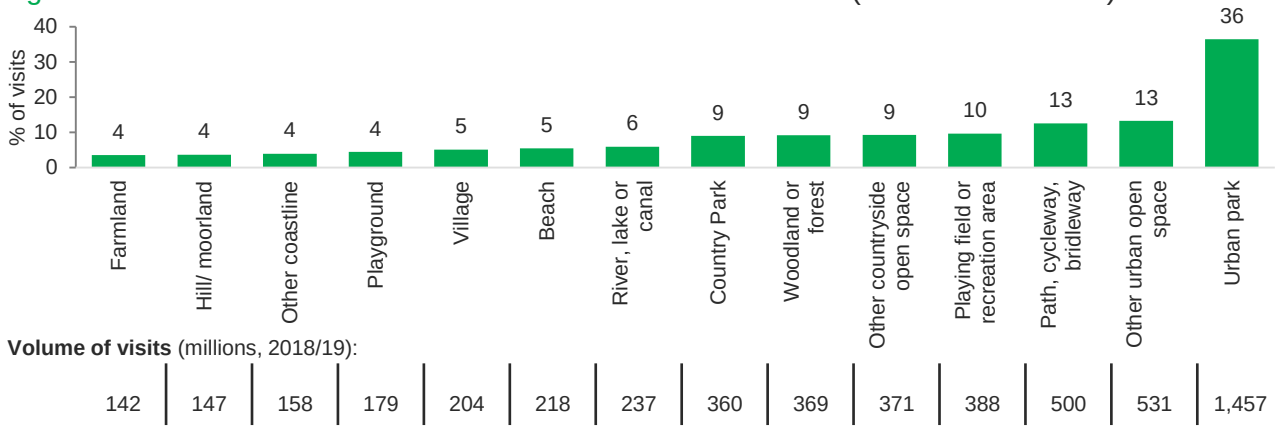
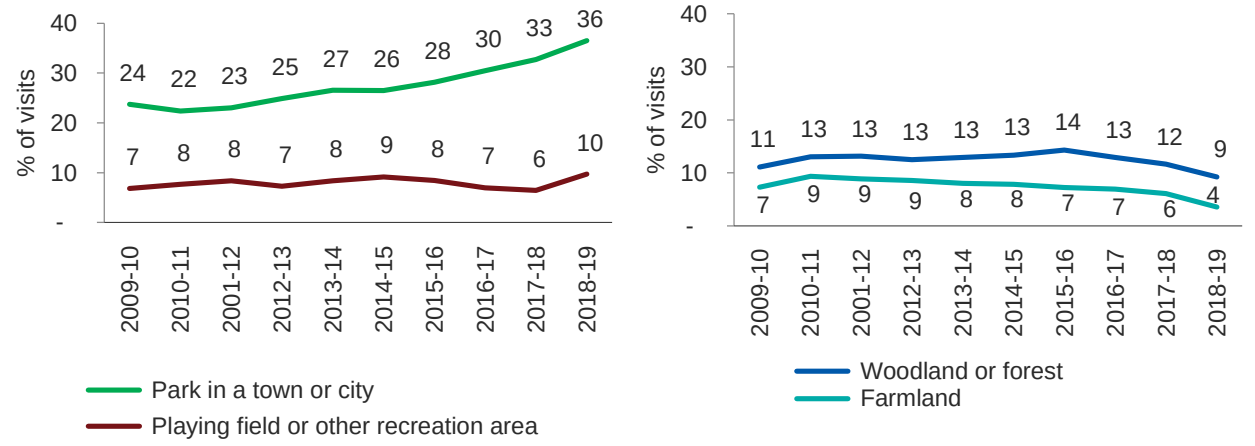


Figure 5 **Places included on visits to the natural environment – greatest increases and decreases in share of visit** (% of visits 2018/19)



Q5 Which of the following list of types of place best describe where you spent your time during this visit?

3.

Natural places are visited for a diversity of reasons and provide many benefits to those who visit.

Figure 6 shows the range of reasons for visiting different types of place in 2018/19.

Visits to playing fields, woodland, rivers and other inland waterways were more likely to be motivated by health and exercise compared to other destinations. Time with family and relaxation were associated with visits to the beach.

Figure 7 shows proportions of adults strongly agreeing with statements relating to the outcomes they experienced from the places they visited.

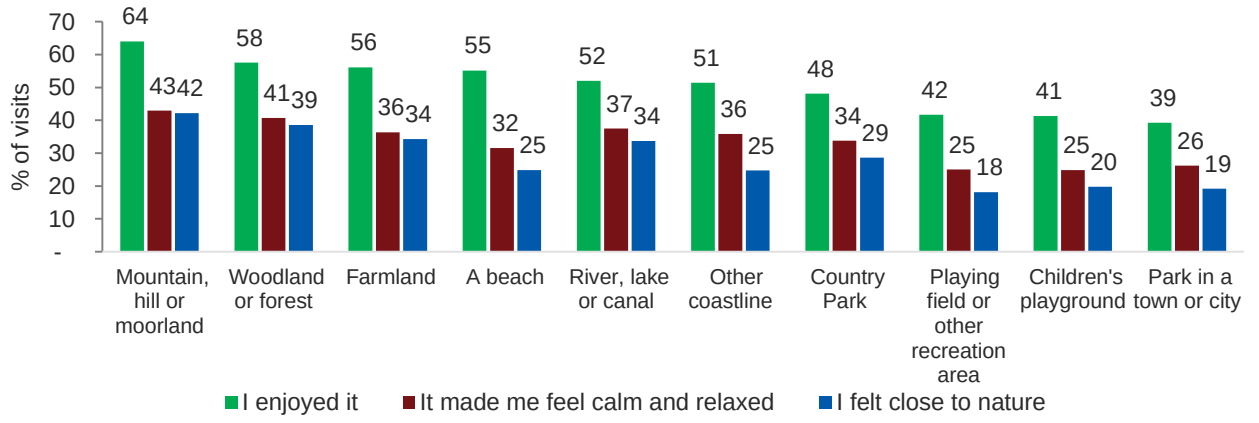
Visits to more rural locations, such as mountain and hills, woodland, farmland and beaches, tended to result in the highest levels of enjoyment, relaxation and feeling close to nature.

Figure 6 **Visit motivations by place visited** (% of visits 2018/19)

	Park in town or city	Playing field or recreation area	Woodland or forest	Country Park	River, lake or canal	Beach
Motivations						
Health/exercise	57%	79%	70%	57%	68%	61%
Relax & unwind	42%	49%	40%	40%	46%	47%
To exercise a dog	35%	50%	53%	39%	42%	32%
Enjoy scenery	25%	43%	34%	39%	46%	49%
Time with family	22%	30%	28%	27%	27%	36%

Q12 Which of the following, if any, best describe your reasons for this visit?

Figure 7 **Positive visit outcomes by place visited**
(% of visits 'strongly agree' with statements cumulative data 2009/10 to 2018/19)



E1) Thinking of this visit, how much do you agree or disagree with the following statements?

4.

Having local green spaces was important to nearly everyone, yet perceptions of quality and accessibility varied across the population.

In 2018/19, the majority of the population (94%) agreed that having open green spaces close to home was important (see data in accompanying Excel).

Since 2013/14, respondents have rated their local greenspaces on the basis of their perceptions of accessibility and quality.

Figure 8 shows that the vast majority agreed that local greenspaces were within easy walking distance, of a high enough standard to want to spend time there and easy to get into and around. However less than a third agreed strongly and this proportion has declined over time.

Figure 9 shows that people strongly agreeing that 'my local greenspaces are within easy walking distance' are more likely to be aged between 35 and 64, those from white backgrounds, those who live in the most affluent areas and those who live in more rural areas.

Figure 8 **Perceptions of local green spaces – Strongly Agree, Agree and Disagree responses** (see accompanying Excel for full range or responses provided)
(% of adults, 2013/14 to 2018/19)

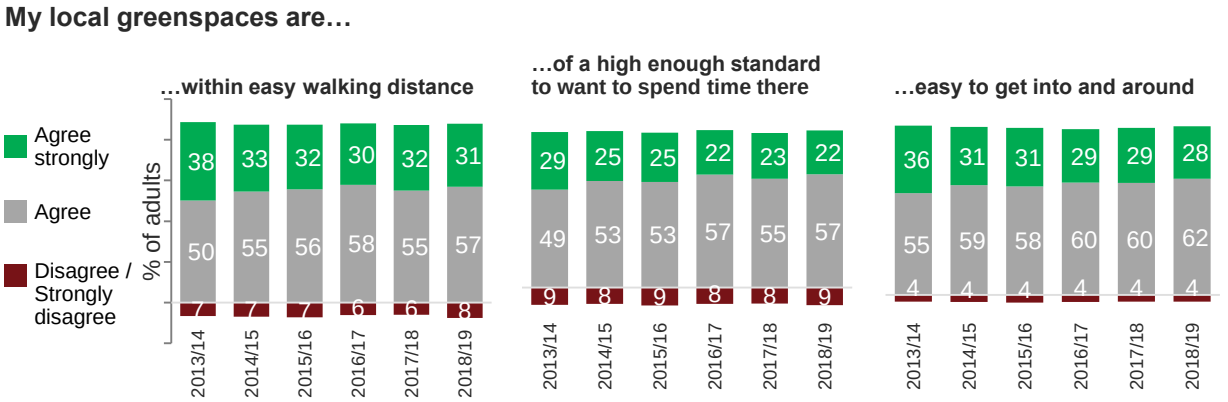
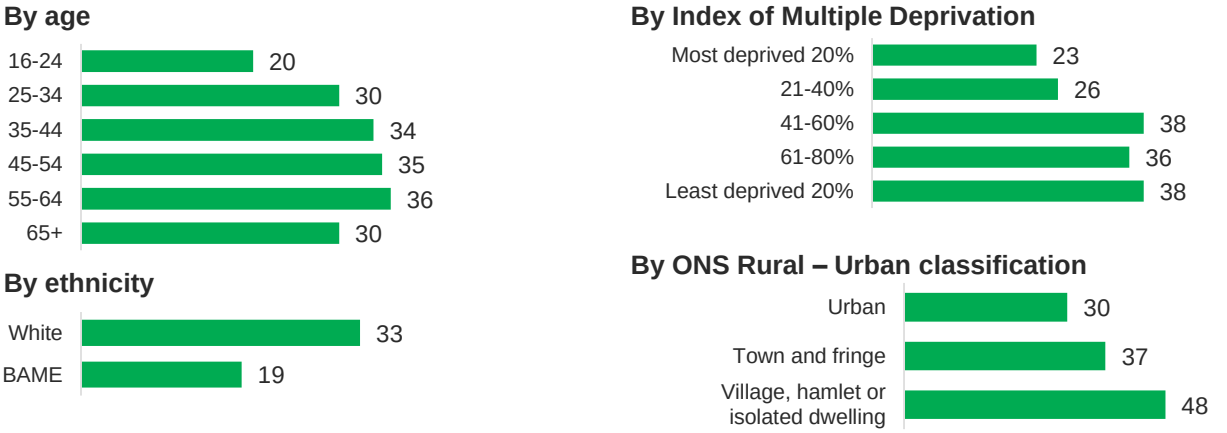


Figure 9 **Local greenspaces are 'within easy walking distance' Strongly Agree responses**
(% of adults, 2018/19)



E6 How much do you agree or disagree with the following statements relating to your nearest greenspace areas?

5.

Most visits to nature were taken on foot and, over time, visits close to home have increased the most.

In 2018/19, 44% of visits were taken within 1 mile of respondent's homes, 24% were within 1 to 2 miles and 17% were within 3 to 5 miles (see accompanying Excel for full data).

Figure 10 shows how over the last decade, the total number of visits taken within a mile has increased, while visits of other distances have remained relatively constant.

Figure 11 shows that in 2018/19, almost two thirds of visits were taken on foot, with almost a third by car. Very few reported using public transport or bicycle to get to natural places (Figure 11). These proportions have been constant over the last decade (see accompanying Excel).

Figure 12 shows that the average distance travelled on journeys taken by car has decreased somewhat over time from around 15 miles to just over 10.

Figure 10 **Visits to natural environment by distance** (Billions, 2009/10 to 2018/10)

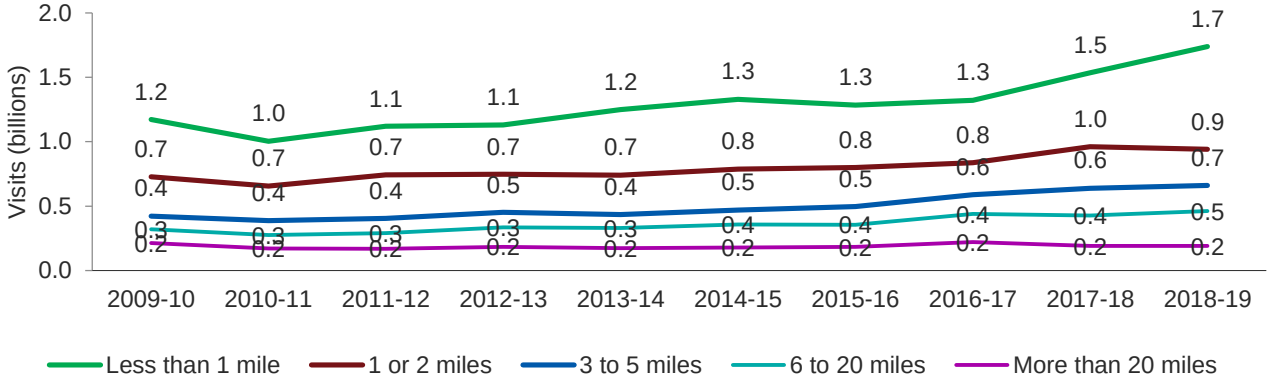
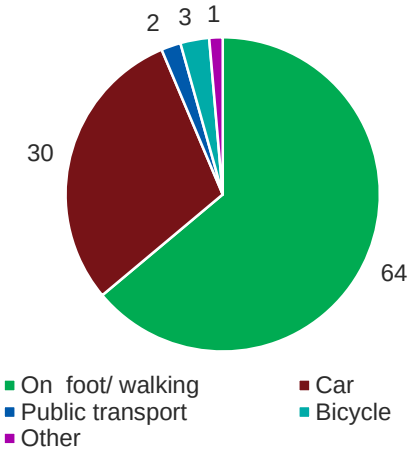
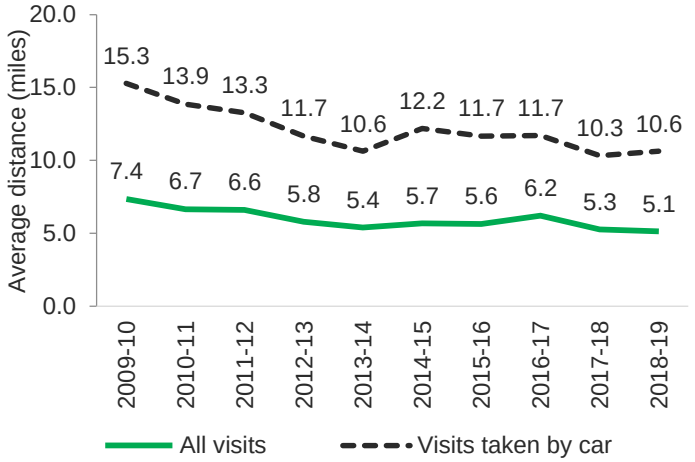


Figure 11 **Percentage of visits to natural environment by transport mode** (% of visits taken to natural environment 2018/19)



Q11 What form of transport did you use on this journey?

Figure 12 **Average distance travelled on visits – total and those taken by car** average distance in miles , 2009/10 to 2018/19)



Q8 Approximately how far, in miles, did you travel to reach this place? By that I mean the one way distance from where you set off to the place visited.

6.

The natural environment was the setting for a wide range of activities.

Figure 13 shows that the majority of visits to the natural environment taken in 2018/19 involved walking, with similar proportions walking with or without a dog.

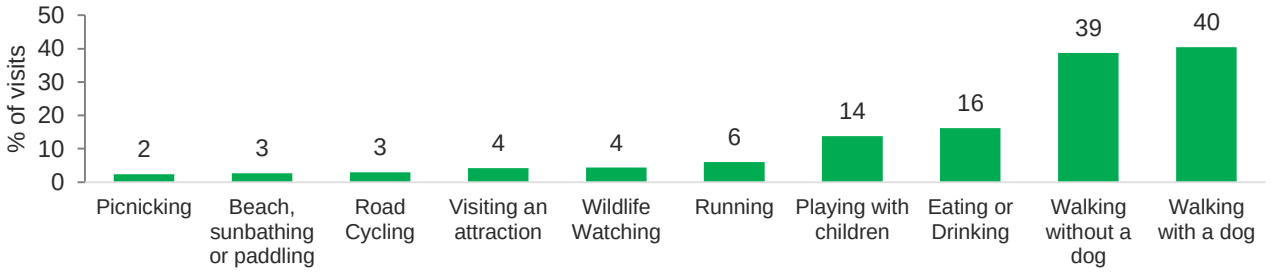
Other popular activities included eating and drinking out, playing with children, running and wildlife watching.

Figure 14 illustrates the range of reasons for visiting. Health and exercise was the motivation for the majority of visits.

Visits to the natural environment which included wildlife watching, visiting attractions or running tended to result in the highest levels of enjoyment, relaxation and feeling close to nature (Figure 15).

Note that in interpreting trend data relating to the volumes of visits taken, users should be aware of method changes in 2016 which may impact on the comparability of results. See page 4 and in detail in the MENE technical report.

Figure 13 **Activities undertaken on visits to the natural environment** (% of visits 2018/19)



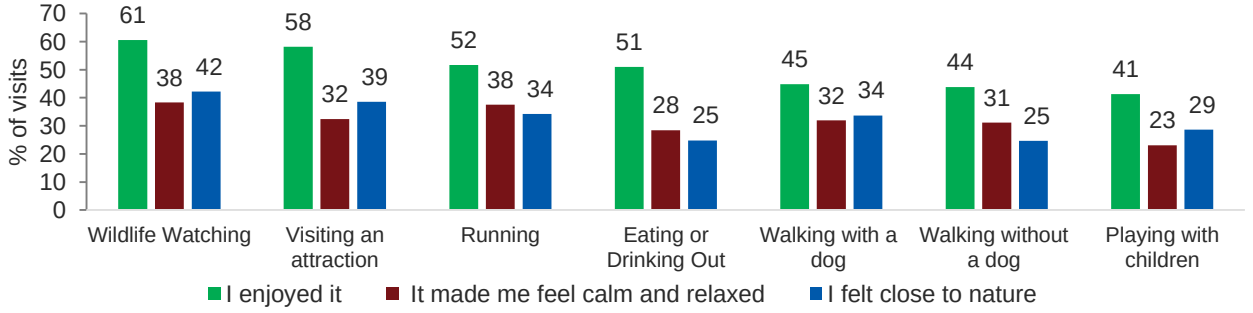
Q4 Which of these activities, if any, did you undertake?

Figure 14 **Reasons for visits by activities undertaken** (% of visits 2018/19)

	Walking a dog	Walking without a dog	Eating & drinking out	Playing with children	Running	Wildlife watching	Visiting an attraction*
Health/exercise	68%	59%	47%	55%	92%	64%	24%
Relax & unwind	53%	30%	37%	45%	59%	53%	37%
Enjoy scenery	34%	26%	31%	28%	30%	43%	36%
Time with family	27%	11%	32%	60%	13%	37%	33%

Q12 Which of the following, if any, best describe your reasons for this visit?
** Only includes visits to attraction within visits to the outdoors (see survey scope on page 3)*

Figure 15 **Positive visit outcomes by activities undertaken** (% of visits 'strongly agree' with statements cumulative data 2009/10 to 2018/19)



E1 Thinking of this visit, how much do you agree or disagree with the following statements?

7.

Health and exercise was the most common reason for spending time outside, with a substantial increase over the last decade.

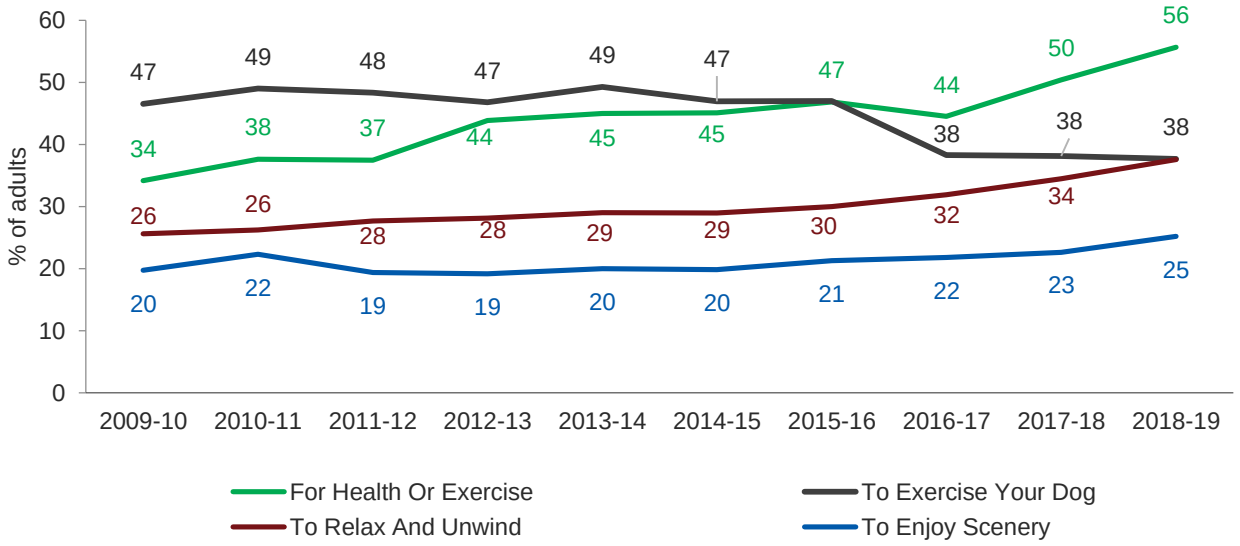
Figure 16 shows how the reasons people provide for spending time in the natural environment has changed over the course of the survey.

There has been a notable increase in the share of visits taken for health or exercise reasons – rising from around a third of visits in 2009/10 to over half in 2018/19.

During this period relaxation and enjoying scenery also increased in importance as reasons for taking visits while the proportion of visits taken to exercise a dog declined. In absolute terms the numbers of visits taken for dog walking has remained fairly consistent.

Figure 17 shows how health and exercise is more likely to be a motivation for older people. The proportion of visits motivated by health and exercise also varied by place visited, with paths, playing fields and other open spaces having the highest proportions of these visits.

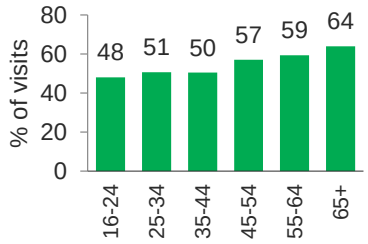
Figure 16 **Reasons for taking visits to natural environment**
(% of adults, 2009/10 to 2018/19)



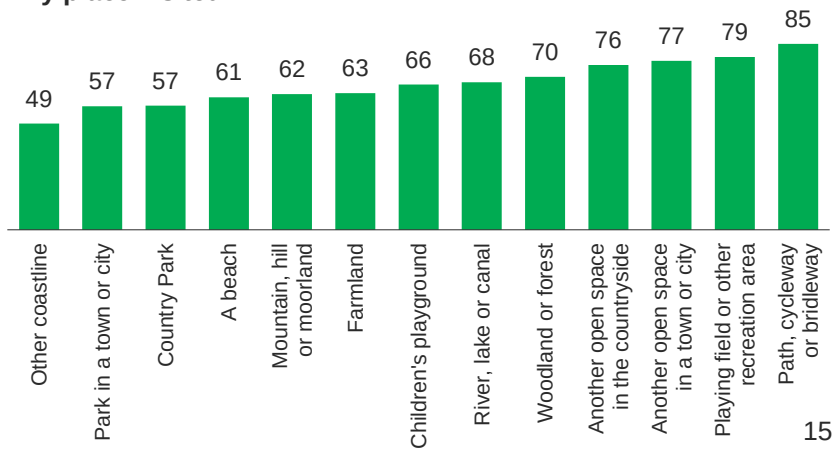
Q12 Which of the following, if any, best describe your reasons for this visit?

Figure 17 **Percentage of visits taken for health or exercise** (% of adults, 2018/19)

By age



By place visited



8.

100 million visits were taken to National Parks each year on average and 170 million visits within Areas of Outstanding Natural Beauty.

Figure 18 shows the age and social economic groups for visitors to National Parks and Areas of Outstanding Natural Beauty, and for comparison, all visits to the natural environment (i.e. including areas outside these designated areas). This shows that visitors to National Parks and Areas of Outstanding Natural Beauty (AONBs) are more likely to be older and from more affluent socio-economic groups.

Figure 19 shows that visitors to National Parks and AONBs are also more likely to own or have access to a car (more than 9 in ten visitors). Note that the proportion of visitors to the natural environment who have access to a car (83%) is higher than the proportion of people with access to a car across the entire English population (76%).

This suggests that there is more to be done to enable people without cars to access natural environments, generally, as well as in National Parks and AONBs.

Figure 18 **Visitors to National Parks and AONBs by age and socio-economic group** (% visits, 2009/10 to 2018/19 combined)

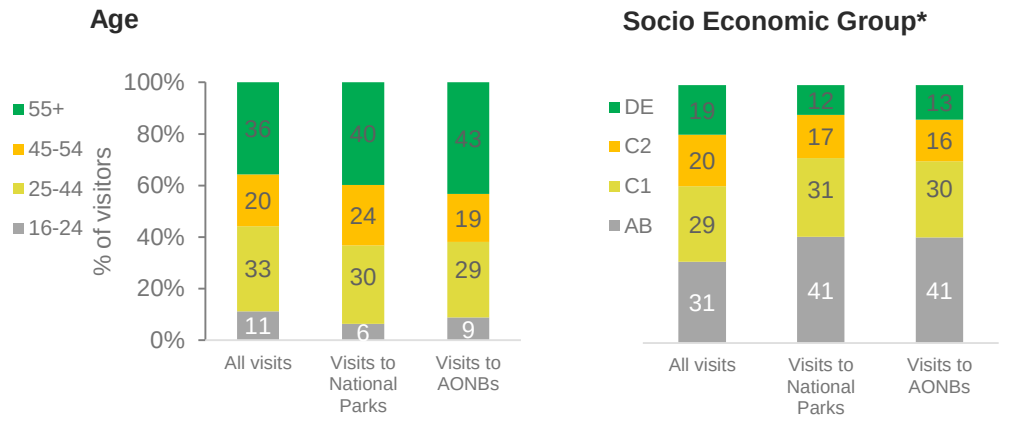
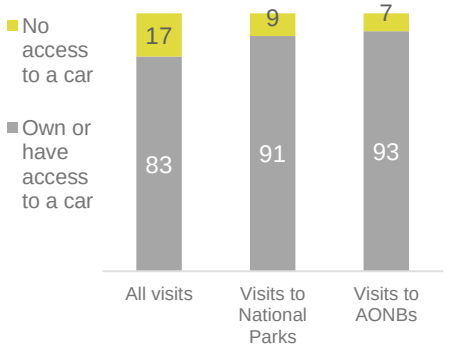


Figure 19 **Visitors to National Parks and AONBs by car access or ownership** (% visits, 2009/10 to 2018/19 combined)



*Socio-economic groups are defined as:
AB - Higher & intermediate managerial, administrative, professional occupations.
C1 - Supervisory, clerical & junior managerial, administrative, professional occupations.
C2 - Skilled manual occupations.
DE - Semi-skilled & unskilled manual occupations or unemployed.

How often do adults in England spend time outdoors?

9.

There's a notable increase in adults spending time outdoors at least once a week, up from 54% to 65% over the decade.

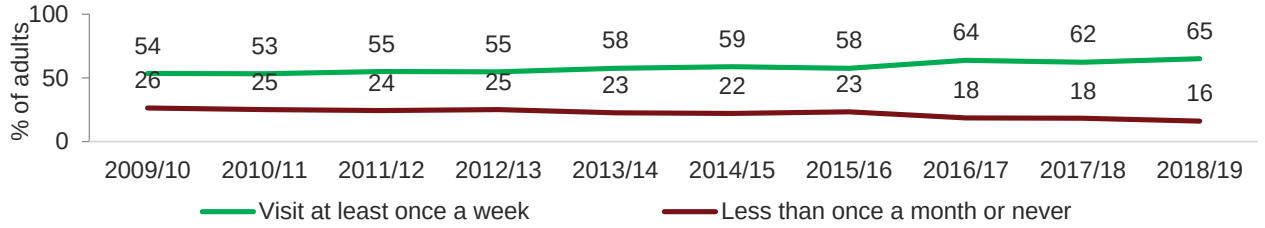
In 2018/19, 16% adults spent time outside at least daily, 26% several times a week and 23% once a week (see Excel for full details). Figure 20 shows the proportion spending time outside weekly has increased.

The proportion of the population who visit nature infrequently (less than once a month or never) has decreased by ten percentage points over the ten year period to 16% in 2018/19. Of this, 6% never visit, a decrease from 10% in 2009/10 (see Excel for details).

Figure 21 shows how frequency varied across key demographics, with larger proportions of infrequent visitors in the oldest age groups, lower socio economic groups and people from black, Asian and minority ethnic (BAME) backgrounds.

Figure 22 shows that people who spend time outside infrequently are more likely to report poor health and lower levels of life satisfaction.

Figure 20 **Frequency of visits** (% of adults, 2009/10 to 2018/19)



Q17 Now thinking about the last 12 months, how often, on average, have you spent your leisure time out of doors, away from your home?

Figure 21 **Frequency of visits by key demographics** (% adult population – 2018/19)

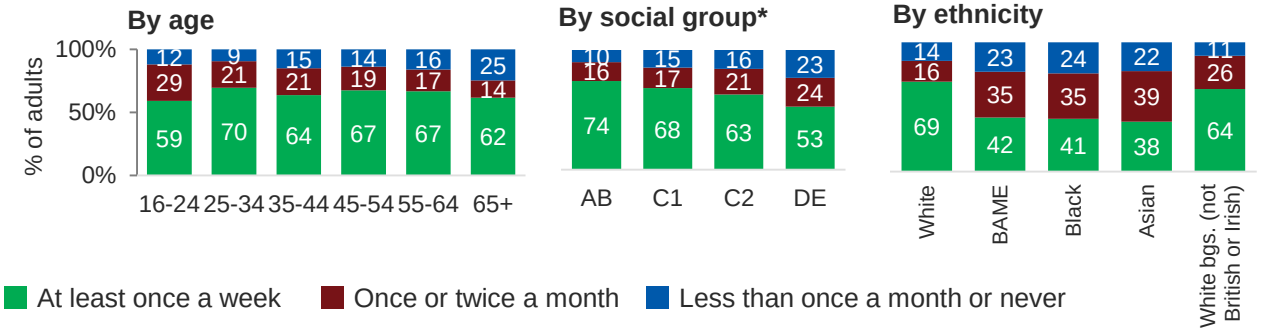
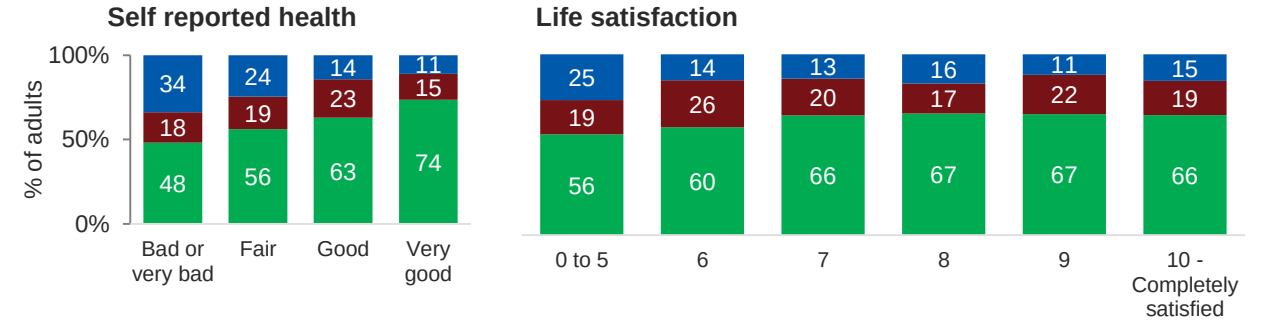


Figure 22 **Frequency of visits by health & life satisfaction** (% of adults in each group – 2018/19)



**Social groups are defined as follows: AB=Higher & intermediate managerial, administrative, professional occupations, C1=Supervisory, clerical & junior managerial, administrative, professional occupations, C2=Skilled manual occupations, DE=Semi-skilled & unskilled manual occupations, Unemployed and lowest grade occupations

10.

The proportion of the population spending time outside every week varied by population group and spatially across the country.

The MENE data was analysed on the basis of where people live according to the ONS Rural-Urban Classification[2]. Figure 23 shows that the proportion of people spending time outside frequently was highest in towns and the urban fringe and lowest in urban areas.

Figure 2 (page 9) shows that urban greenspaces had the highest overall numbers of visitors. This suggests that these are the most used spaces because of the sheer numbers of people living in the 'catchment area'. Figure 23 suggests that on a 'per capita' basis it is people living in towns and the peri-urban fringe that most frequently go outside.

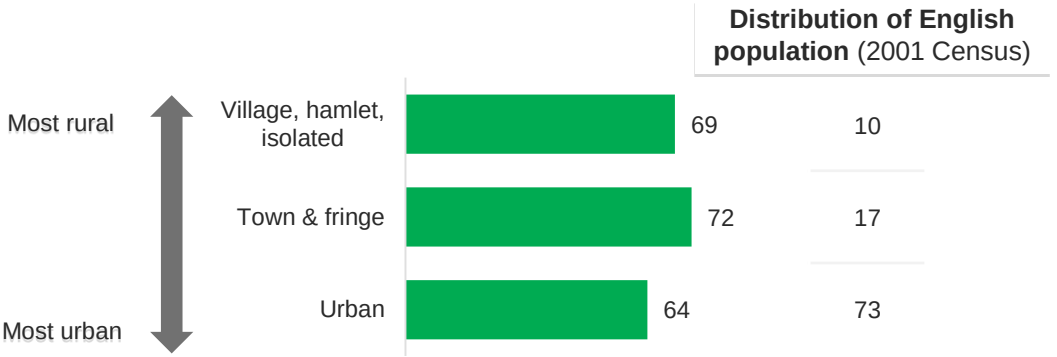
Figure 24 shows that adults in the most deprived areas are least likely to spend time outside once a week.

Figure 25 (overleaf) illustrates variations across the country. To explore geographical variation more fully we have published a new Local Authority interactive dashboard and a full list of statistics for local authorities in the Excel sheet.

To access the Local Authority Dashboard please **CLICK HERE**.

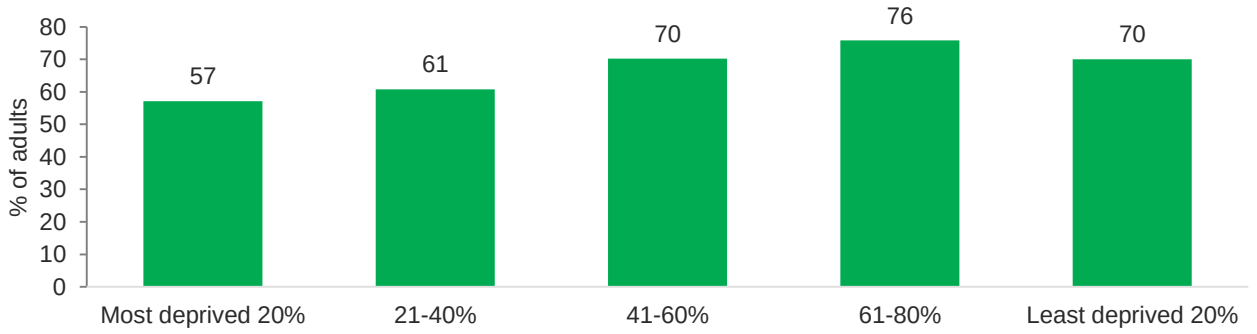
To access statistics for local authorities **CLICK HERE.**

Figure 23 **Proportion of population visiting at least once a week by ONS Rural – Urban classification** (% adult population, 2018/19)



Q17 Now thinking about the last 12 months, how often, on average, have you spent your leisure time out of doors, away from your home?

Figure 24 **Proportion of population visiting at least once a week by Index of Multiple Deprivation** % adult population, 2018/19)



Q17 Now thinking about the last 12 months, how often, on average, have you spent your leisure time out of doors, away from your home?

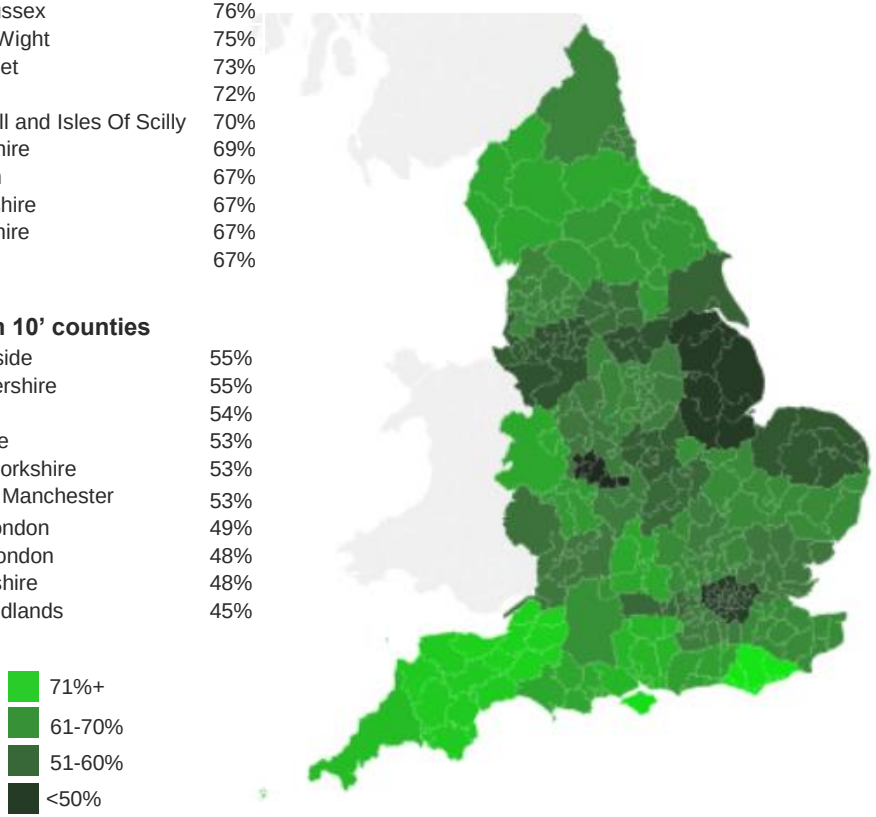
Figure 25 **Proportion of population visiting at least once a week by county** (% adult population, countries 2009/10 to 2018/19 combined)

‘Top 10’ counties

East Sussex	76%
Isle Of Wight	75%
Somerset	73%
Devon	72%
Cornwall and Isles Of Scilly	70%
Hampshire	69%
Durham	67%
Oxfordshire	67%
Shropshire	67%
Dorset	67%

‘Bottom 10’ counties

Merseyside	55%
Leicestershire	55%
Norfolk	54%
Cheshire	53%
South Yorkshire	53%
Greater Manchester	53%
Inner London	49%
Outer London	48%
Lincolnshire	48%
West Midlands	45%



Q17 Now thinking about the last 12 months, how often, on average, have you spent your leisure time out of doors, away from your home?

Environmental attitudes and behaviours

11.

Nine in ten adults in England were concerned about damage to the natural environment.

In 2018/19, the proportion of adults that agreed with the statement *"I am concerned about damage to the natural environment"* was 90%. This has remained at a fairly constant level over the last decade (88% in 2009/10).

The proportion who strongly agreed was highest in 2018/19 at 37% (see accompanying Excel for data).

Figure 26 shows the spatial variation of people who are strongly concerned about damage to the natural environment. A similar pattern is shown on Figure 27, which shows the proportion of people who agree that spending time outdoors is an important part of their life.

Figure 26 ***"I am concerned about damage to the natural environment"*** **by region** (% strongly agree, 2018-19)

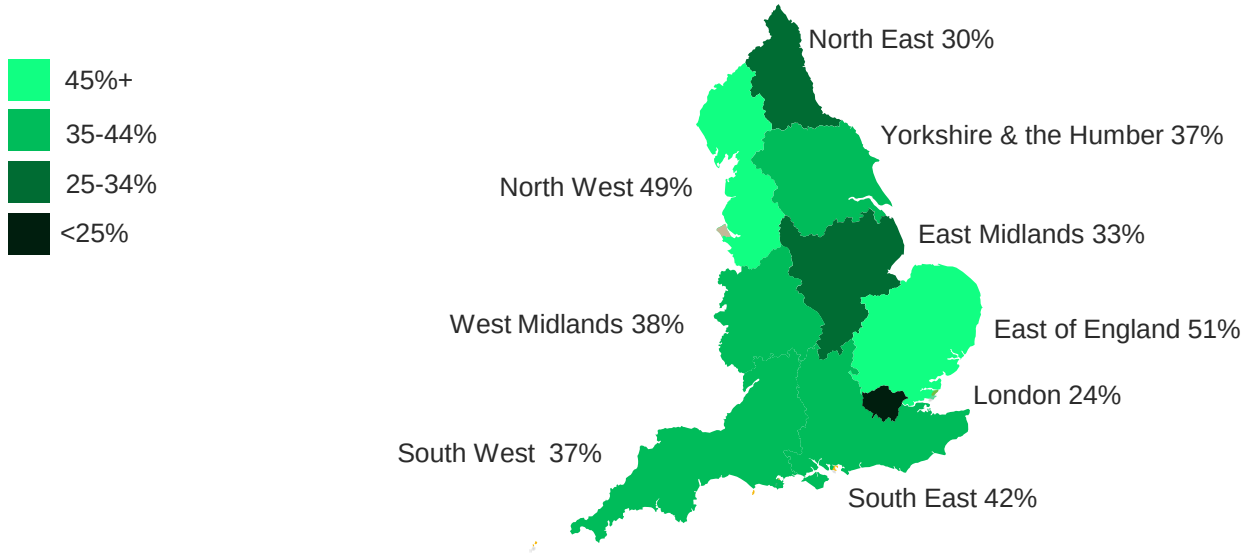
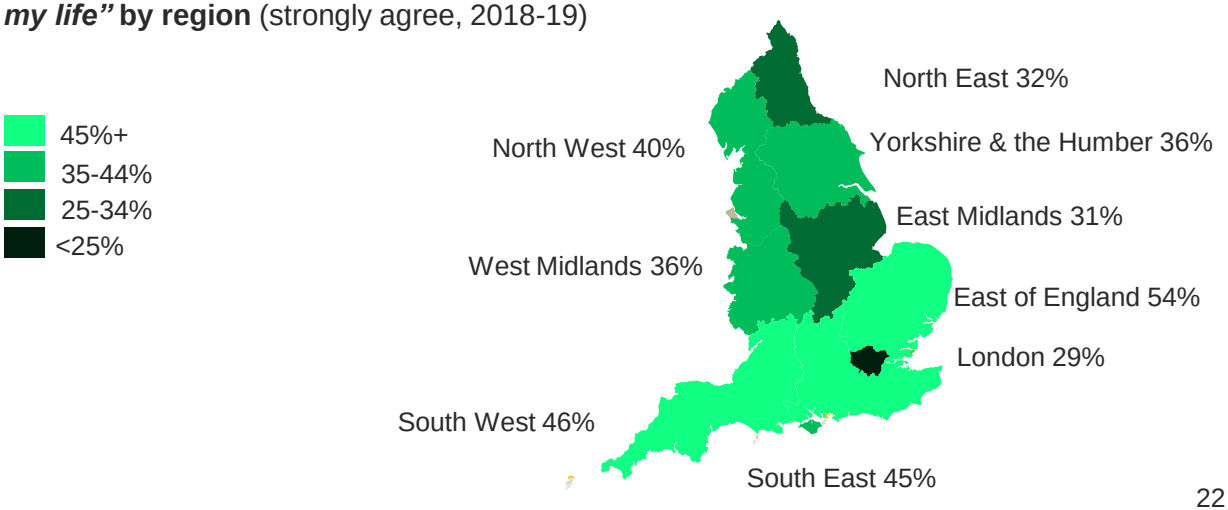


Figure 27 ***"Spending time out of doors is an important part of my life"*** **by region** (strongly agree, 2018-19)



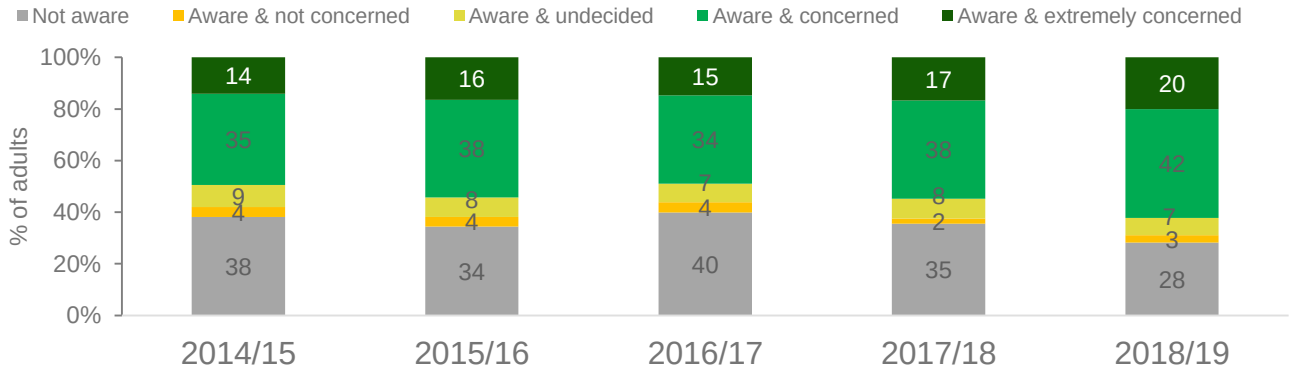
12.

Public awareness and concern about biodiversity decline was at a high, up 13 percentage points in five years.

MENE has tracked awareness and concern for biodiversity decline since 2014. Figure 28 shows levels of awareness of, and concern about, biodiversity decline in England. This has increased significantly over this time, from 49% adults both aware of biodiversity loss and concerned about it in 2014/15, rising to 62% in 2018/19.

Figure 29 shows people's intentions to change their lifestyles to protect the environment. In 2018/19, 34% stated they intend to make changes, or would like to, with younger people more likely than older people to be included in these groups. 54% stated that they were not likely to make changes; this group was more likely to include over 65s.

Figure 28 **Awareness and concern at Biodiversity loss** (% of adults 2014/15 to 2018/19)

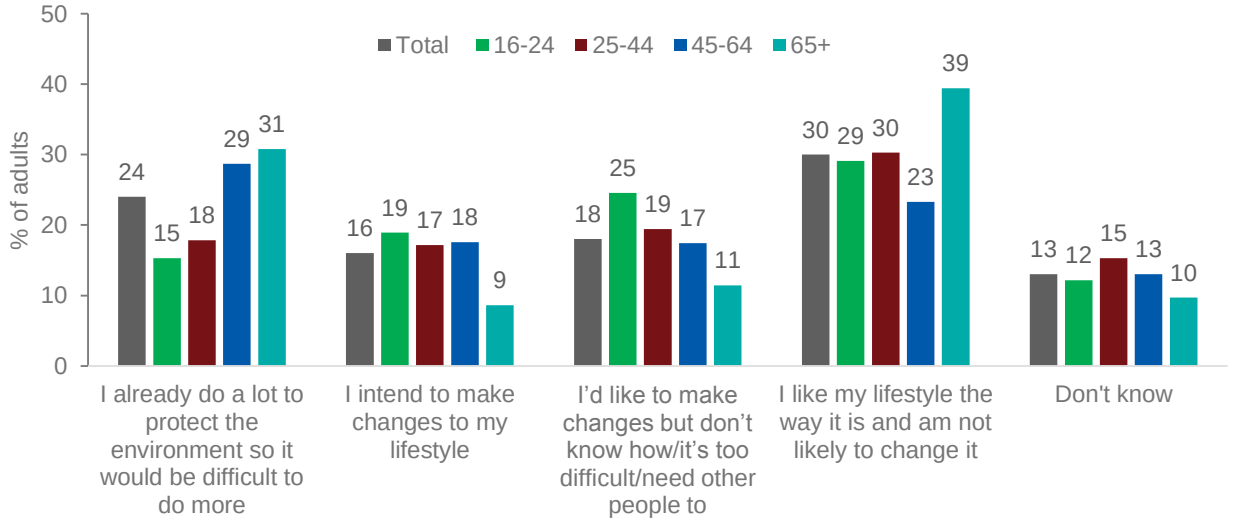


Q1c NEW Thinking about the variety of life in England in the next 50 years, which of the following statements do you most agree with?
Q2 NEW How concerned are you about the consequences of a loss of variety of life in England?

- **Not aware** – expect variety of life in England to 'not change' or be 'more varied' at Q1a
- **Aware & undecided** – expect variety of life in England to be less varied at Q1a and neither concerned nor unconcerned or don't know at Q2
- **Aware & Not concerned** – expect variety of life in England to be less varied at Q1a and either not at all concerned or not concerned at Q2.
- **Aware & concerned** - expect variety of life to be less varied in England at Q1a and concerned at Q2.
- **Aware & extremely concerned** - expect variety of life to be less varied in England at Q1a and extremely concerned at Q2.

Note: *the results of this indicator differ from the England biodiversity awareness indicator published by Defra as the latter related to levels of awareness and engagement rather than awareness and concern.*

Figure 29 **Changing lifestyle to protect environment – by age** (% of adults 2018/19)



E5 Which of these statements best describes your intentions?

13.

Most of the population takes at least one action to protect the environment

The MENE survey asks about participation in 12 actions that are commonly acknowledged as helping to protect the environment. Overall, 87% undertook one or more of these pro-environmental actions. Levels of participation in the activities recorded have remained at fairly constant levels over time (Figure 30), with 'household actions' such as recycling, the most common.

In 2018/19, 35% of adults took part in one or more 'social actions' to support environmental protection or nature conservation (encouraging others, signing a petition, donating money, joining a membership organisation or volunteering time), broadly unchanged over time (34% in 2014/15).

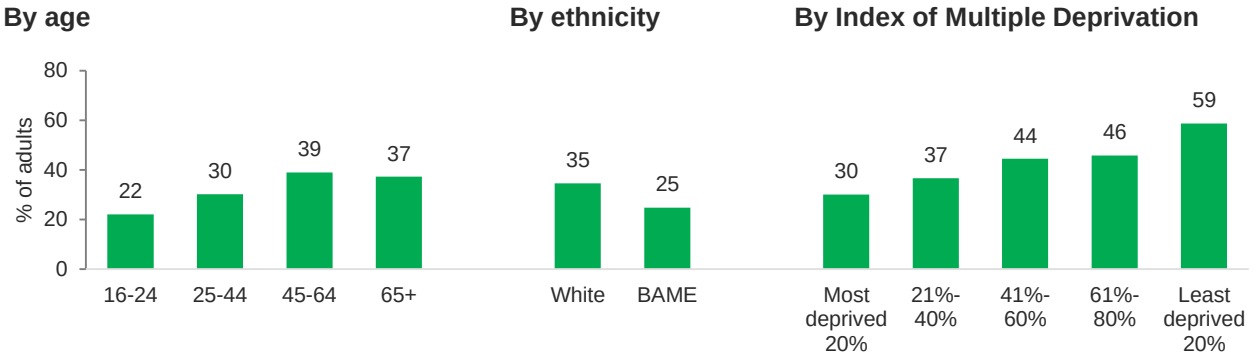
Figure 29 (page 23) compares overall levels of involvement in such 'social actions' by age, ethnicity and levels of deprivation. This shows that older people, those from white backgrounds and those living in the least deprived areas were more likely to have undertaken one or more of this group of activities.

As illustrated on the previous page (Figure 27), many people, especially in the younger age groups would like to do more to protect the natural environment but need more information or support. This suggests that there is an opportunity to increase levels of participation.

Figure 30 **Pro-environmental activities undertaken** (% of adults, 2018/19 and 2014/15)

E4 Thinking about the last 12 months, which of the following environment-related activities did you do? Please choose all that apply.
E8) Thinking about your garden or communal garden, which of the following statements, if any, do you agree with?

Figure 31 **Net social actions** (% of adults who undertook one or more of the social actions listed in Figure 30 by age, ethnicity and IMD, 2018/19)



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1. ONS 2018. Population Estimates. Available at: https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates
2. ONS 2011. Rural – Urban Classifications. Available at: www.ons.gov.uk/methodology/geography/geographicalproducts/ruralurbanclassifications
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