# 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.

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**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'.*

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## 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.

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[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)