Royal Haskoning

Sizewell Power Station ISFSI and Car Park Extension

Ecological Scoping Report

September 2008

Entec UK Limited

Report for

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Document Revisions

No.	Details	Date

Executive Summary

Purpose of this Report

This report has been produced for the purpose of defining the proposed scope of the Environmental Impact Assessment (EIA) for the new independent spent fuel storage installation (ISFSI) and west car park extension at Sizewell 'B' Power Station, Suffolk. The scheme and the relevant policies and guidance are described briefly. The report then lists the main sources of information used and summarises the existing baseline information available. It then uses this information, in combination with the results of a targeted Phase 1 Habitat Survey, to define the scope of the assessment.

The aim of the scoping report is to inform and seek to establish the formal view of statutory consultees with regard to the ornithological and terrestrial ecological information that would be necessary to form the basis for an EIA of the proposed development. With this in mind, we would like to establish:

- whether there are other ecological issues that should be taken into account;
- whether they think there are any other ecological receptors that could be significantly affected and that should therefore be taken into account;
- whether they have any comments on the programme and methodologies for survey and assessment set out here.

Contents

1. Introduction

1.1 Scheme Description

The proposed development comprises two components;

- the creation of a new independent spent fuel storage installation (ISFSI) to the south of the existing Sizewell 'B' Power Station (located on an existing car park); and
- a car park extension to the north of the existing western car park servicing Sizewell 'B' (to replace the car park lost as a result of the ISFSI).

The location of the proposed development site is shown in **Figure 1.1**.

1.2 Policy Context and Guidance

In addition to taking into account The Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999, particular regard would also be given to the requirements of, and advice given in:

- PPS9, which sets out planning policies on the protection of biodiversity and geological conservation (PPS9 replaces Planning Policy Guidance 9 [PPG9] "Nature Conservation" (1994), which has been formally cancelled). PPS9 lists several key principles to ensure that the potential impacts of planning decisions on biodiversity (and geological conservation) are fully considered. These include:
  - planning decisions should be based on contemporary environmental information;
  - planning decisions should aim to maintain and enhance, restore or add to biodiversity, with appropriate weight given to designated sites, protected species and biodiversity within the wider environment;
  - the aim of planning decisions should be to prevent harm to biodiversity.
- The companion guide to PPS9 dealing with good practice when considering biodiversity and geological conservation (Planning for Biodiversity and Geological Conservation – a Guide to Good Practice);
- The Conservation (Natural Habitats, &*c*) Regulations 1994 (as amended);
- Wildlife and Countryside Act 1981, as amended;
- The UK Biodiversity Action Plan (UK BAP); and
- The Suffolk Local Biodiversity Action Plan (LBAP).

The approach taken in regard to the ecology aspects of the EIA (the ecological impact assessment or EcIA) will be based on the Institute of Ecology and Environmental Management (IEEM) *Guidelines for Ecological Impact Assessment in the United Kingdom*, 2006. Entec has been a key contributor to the development of these guidelines, which have been endorsed by organisations including Natural England (NE), the Wildlife Trusts, the Environment Agency and the Institute of Environmental Management and Assessment (IEMA).

EcIA is a structured process through which habitats and species that need to be considered as part of an assessment are identified through scoping, desk study, and field surveys. It follows that the focus of the assessment can change as the process advances, with some issues assuming greater prominence than was initially envisaged and others being effectively scoped out. The Environmental Statement resulting from the EcIA does not consider effects on all species and habitats. Rather, it aims to establish the ecological receptors of greatest biodiversity value that could be affected by a development. The significance of the effect on any biodiversity receptor will be determined by consideration of the biodiversity value, conservation status, legal and policy status of the receptor, in combination with the predicted nature and scale of the effect upon it. The scale of effect on valued receptors will be quantified wherever possible.

The value of an ecological resource or feature will be determined within a defined and appropriate geographical context, e.g. a resource may be defined as of international, national, regional, or local importance, or may be important only in terms of its immediate zone of influence. The value of areas of habitat and plant communities will be measured against published criteria where available. In assigning value to species, it is necessary to consider distribution and status, including a consideration of population trends based on available historical records. Rarity is an important consideration because of its relationship with threat and vulnerability. Some species are inherently rare, so it is necessary to look at rarity in the context of status. A species that is rare and declining may be assigned a higher level of importance than one that is rare but known to have a stable population.

1.3 Appropriate Assessment

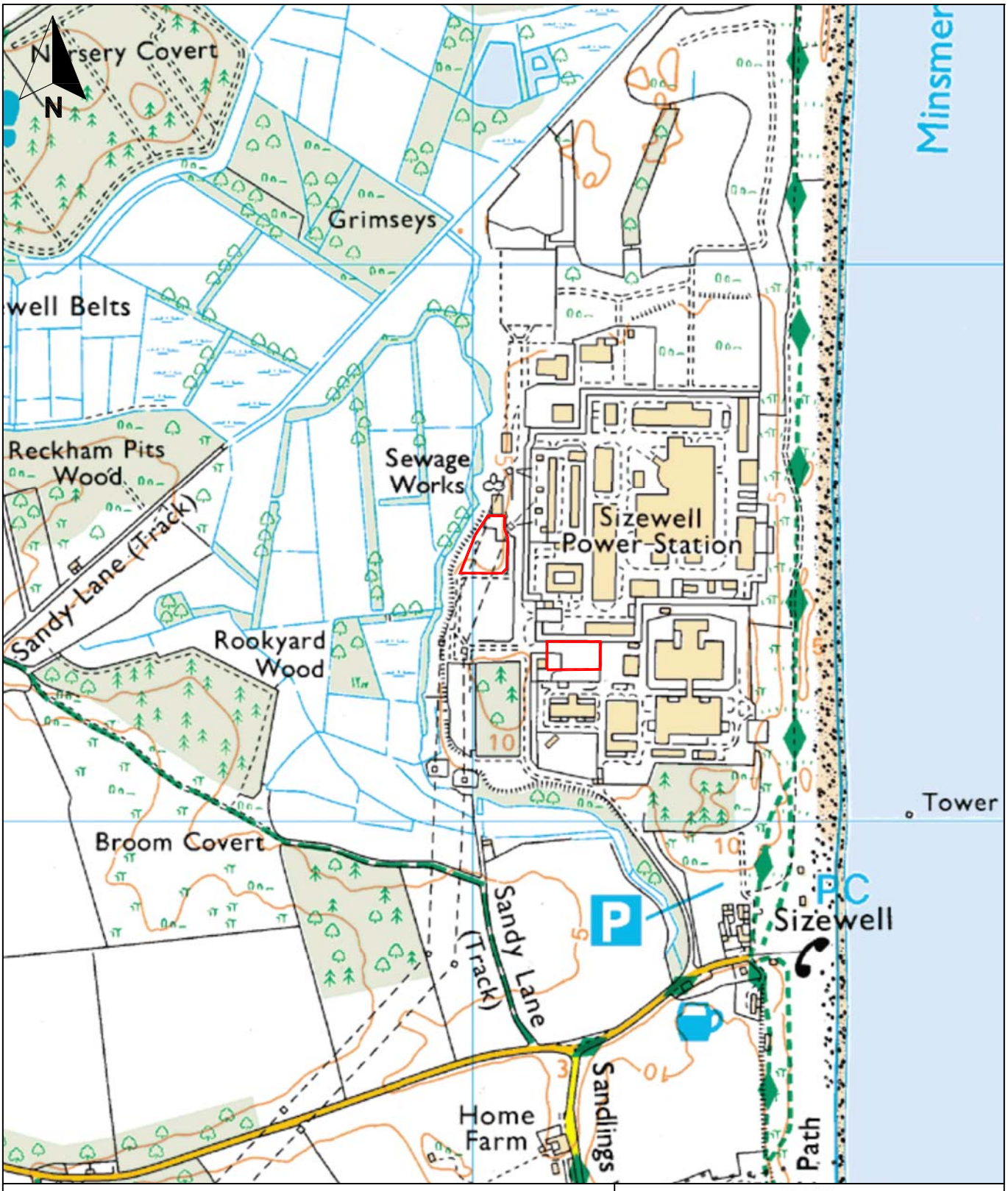
Under Regulation 48(1) of the Habitats Regulations (the primary legal instrument by which the EU Habitats Directive is transposed into UK law), an appropriate assessment of the implications for the designated site in view of its conservation objectives must be undertaken before consent can be given for a project that:

- either alone or in combination with other plans or projects would be likely to have a *significant effect* on a European Site, and
- is not directly connected with the management of the site for nature conservation,

A European Site is any Special Protection Area (SPA) and any Special Area of Conservation (SAC), and as a matter of Government policy potential SPAs, candidate SACs and listed Ramsar Sites are treated for development consenting purposes as if they were already fully designated.

Several European Sites occur within 2km proposed development (see below). However, based on the location of the development in relation to the existing Power Station, the relatively limited extent of the development and the likely construction methodologies, it is considered

that no likely significant effects could occur on the nearby European Sites. Therefore, an appropriate assessment is not required in relation to this scheme.



Key

Proposed Development Site Boundary

0 m 500 m

Scale 1:10,000 @ A4

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Sizewell Power Station ISFSI and Car Park Extension

Figure 1.1
Proposed Development Site Boundary

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2. Baseline Information

2.1 Sources of Baseline Information

A considerable amount of baseline ecological survey work has been conducted on the BE Estate at Sizewell during the past twenty-five years and this has been augmented more recently by detailed ecological survey work and desk study carried out by Entec in relation to the new nuclear build proposals at Sizewell. This scoping report draws on the information relevant to the current development proposals, that were collated for the new nuclear build scheme, which used the following main sources of information;

- the Multi-Agency Geographical Information System website (www. magic.gov.uk);
- Suffolk Wildlife Trust (SWT);
- Suffolk Biological Records Centre (SBRC);
- Royal Society for the Protection of Birds (RSPB);
- Natural England (NE);
- British Energy (including the Integrated Land Management Plan [ILMP] and studies undertaken by ecological consultants, SWT, the Environment Agency, universities and colleges, special interest groups and individuals; and
- the National Biodiversity Network (www.searchnbn.net).

2.2 Existing Baseline Information

2.2.1 Designated Sites for Nature Conservation

It is necessary to ascertain the proximity of statutorily designated sites of conservation importance to a proposed development in order that potential effects on these can be considered. Given the scale of the proposed development, it is considered effects on designated sites further than 2km from the scheme are highly unlikely and therefore a 2km search area around the works areas has been used. The positions of the designated sites in relation to the works areas are illustrated on **Figure 2.1**.

Internationally Designated Sites

The Minsmere to Walberswick Ramsar Site is approximately 1km to the north of the proposed works (car park extension). The site was designated on the basis of its mosaic of marine, freshwater, marshland and associated habitats and the transitional areas in between. It contains the largest continuous stand of reedbed in England and Wales and includes rare transitional communities from brackish to fresh water. It also supports nine nationally scarce plants and at least 26 red data book invertebrates. These include a population of the narrow-mouthed whorl

snail (*Vertigo angustior)* (a Habitats Directive Annex II and British Red Data Book Endangered Species). The Ramsar designation includes the same qualifying species and habitats as the coincident Minsmere and Walberswick SPA and SAC. The full citation is included as **Appendix A** of this report.

European Designated Sites

The closest site of European Importance for its habitats and bird populations is the Minsmere to Walberswick SPA approximately 1km to the north of the proposed works area (car park extension). The designation covers the same area as the Minsmere to Walberswick Ramsar Site and was classified on the basis of its breeding and wintering bird interest:

A further site of European importance for its bird populations, Sandlings SPA, is approximately 1km to the south-west of the proposed works (nearest to the ISFSI). This site qualifies under Article 4.1 of the EC Birds Directive 974/409/EEC) by supporting breeding nightjar and woodlark, both of which are listed on Annex 1 of the Directive. SPA Citations are contained in **Appendix B** of this report.

The Minsmere to Walberswick SAC, which covers the same area as the Ramsar Site and SPA, was primarily designated due to the presence of two habitats listed on Annex 1 of the Habitats Directive: annual vegetation of drift lines and European dry heath. A further Annex 1 habitat, perennial vegetation of dry stony banks, is present but was not a primary reason for site selection. Other habitats within the SAC include coastal sand dunes, beaches, shingle, marshes, fen, heath, scrub and mixed woodland. The full citation is contained in **Appendix C** of this report.

Nationally Designated Sites

Sizewell Marshes SSSI, which covers an area of 104 hectares, lies entirely within the Sizewell Estate, and is located ~30m from the edge of the development (nearest to the car park extension). It was designated on the basis of the large area of lowland unimproved wet meadow it contains. Associated with the wet meadows are outstanding assemblages of invertebrates and breeding birds and several nationally scarce plant species. The SSSI is on an area of deep fen peat with a permanently high water table. There is an extensive ditch system and the area is prone to flooding. The SSSI citation is included in **Appendix D** of this report.

Other SSSIs within 2km of the site are Minsmere to Walberswick Heaths and Marshes SSSI and Leiston to Aldeburgh SSSI. Minsmere to Walberswick Heaths and Marshes SSSI (parts of which have been classified as SPA and designated as an SAC) is approximately 200m to the north of the proposed new build power station (and adjacent to the proposed new access road at its closest point). The SSSI covers over 2,325 hectares and is managed by a variety of conservation organisations including Natural England. RSPB, SWT and The National Trust. The SSSI contains a complex series of habitats, notably mudflats, shingle beach, reedbeds, heathland and grazing marsh, which combine to create an area of exceptional scientific interest.

Leiston to Aldeburgh SSSI, part of which is also designated as the Sandlings SPA, is approximately 1,750m to the south and south-west of the proposed new build at its nearest point. The SSSI contains a rich mosaic of habitats including acid grassland, heath, scrub, woodland, fen, open water and vegetated shingle. This mix of habitats in close juxtaposition, together with the associated transition communities between habitats, is unusual in the Suffolk Coast and Heaths Natural Area. The variety of habitats present support a diverse breeding and overwintering bird community, a high number of dragonfly species and many scarce plants.

The citations for both Leiston to Aldeburgh SSSI and Minsmere to Walberswick Heaths and Marshes SSSI are contained in **Appendix D** of this report.

2.2.2 Non-statutory Designated Sites

Severn non-statutory designated sites are present within 2km of the proposed development sites (illustrated in **Figure 2.2**). These include areas adjoining statutory designations which, while valued, do not meet the criteria for SAC, SPA or SSSI status and in this case are termed Wildlife Sites and Suffolk Wildlife Trust (SWT) Reserves. Those of most relevance to the assessment are Sizewell Levels and Associated Areas Wildlife Site and Wildlife Trust Reserve; Suffolk Shingle Beaches Wildlife Site and Sizewell Rigs Wildlife Site.

Sizewell Levels and Associated Areas Wildlife Site is adjacent to the Sizewell Marshes SSSI and covers wet meadows, scrub and birch / alder woodland in this area. Some of the Wildlife Site, and all of the Sizewell Marshes SSSI, are part of a SWT Reserve. Suffolk Shingle Beaches Wildlife Site is a designation that covers all areas of shingle not currently protected under national or European designations. A kittiwake colony of approximately 200 occupied nests is present at Sizewell Rigs, the cooling water structure offshore from Sizewell 'A'.

Locally designated sites of nature conservation interest (such as Wildlife Sites) are recognised by the Local Planning Authority as a material planning consideration under Policy AP15 of the Suffolk Coast Local Plan. Under Policy AP14, where a development may result in the loss, or significant alteration of important habitats[1], or pose a threat to rare or vulnerable species (especially those protected by law) or a threat to species or habitats identified in National or Local Biodiversity Action Plans, the replacement or retention of important wildlife habitats will be sought through conditions or legal agreement.

2.2.3 Ornithology

A large amount of detailed ornithological information has been collected from the area surrounding the existing Power Stations e.g. from SWT winter bird surveys, incidental records and from intensive and detailed bird surveys by Entec currently on-going within the BE estate in relation to the new nuclear power station proposals. These surveys have indicated that the areas of greatest ornithological interest are within the Marshes and along the coastal zone, which support both species and aggregations of species that are considered to be of nature conservation importance.

Given the small size and location of the proposed development areas (i.e. away from the coast and marshes and within the built Power Station security fence), it is considered unlikely these areas would support a significant bird community or be used extensively by species present in the marshes or along the coast. However, habitat does exist that could be used for nesting and foraging by common species.

[1] These are considered to include heathland, woodland, dunes, water meadows, streams, ponds, reedbeds, green lanes, trees and hedges.

2.2.4 Habitats and Vegetation

An Extended Phase 1 Habitat survey of the development areas was completed on the 8th September 2008, with the aim of informing the proposed scope of the assessment. The results of the survey are illustrated in **Figure 2.3a and b** and summarised below.

The site of the proposed car park extension comprises a large, open area of poor semi-improved grassland, that has either regenerated or been re-seeded following the construction of the Power Station and which has remnant, scattered calcareous species around the edges. This area is bordered to the west and south by dense and scattered scrub and scattered trees and to the east by planted non-native shrubs. Tall ruderal plants also occur throughout the site, there are scattered log piles in the western area and an area of hard-standing is present to the north of the site. The eastern part of the grassland and herb sward is short and disturbed by fairly extensive grazing by rabbits and trampling. The western side is less disturbed and damper with a more complex sward structure. A wooded valley occurs to the west of the site, with the main Sizewell 'B' Power Station (and associated hard-standing) to the east.

Although the grassland area supports a number of species, at low densities, suggestive of calcareous or coastal habitats, the predominant species are more indicative of improvement and are commonly found throughout Suffolk and the UK.

The site of the new ISFSI is primarily an existing car park and therefore comprises predominantly hard-standing. The current site boundary overlaps with a small electricity substation building which is surrounded by gravel and hard-standing. Adjacent to this part of the proposed development area are further areas of hard-standing, amenity grassland and a small strip of introduced shrub (located to the west).

2.2.5 Protected and Notable Species

Badger

Existing baseline information indicates badgers are present in the surrounding area, with a known sett located in woodland on the wider BE estate. The western part of the development site (the proposed new car park) and surrounding habitats provide suitable habitat for badger, but no evidence of this species was found.

Great crested newt

There are no discrete pools within the site, but the extensive ditch system associated with the Sizewell Marshes lies adjacent to the site and this area has some potential to support great crested newts. The ditches were not systematically surveyed for newts as part of the EIA for the decommissioning work for Sizewell 'A' and there has been no historical survey or sampling programme commissioned by BE. The indications are that due to a combination of factors (predominantly the presence of fish, the year round presence of water birds, the variable rate of flow and the salinity of some of the dykes) the ditches are sub-optimal for newts. However, a systematic survey for great crested newts across the BE estate was undertaken in relation to the new build development proposals in 2007. This resulted in no great crested newts being recorded and therefore it is reasonable to conclude this species does not occur in the vicinity of the development site and will not be considered further.

Bats

Work undertaken on the Sizewell Estate by the Suffolk Bat Group has found that common and soprano pipistrelle, Natterer's bat and barbastelle are among the species that occur locally. Noctule and Daubenton's bat were recorded during surveys undertaken by Bioscan in 1991, and brown long-eared bat was also recorded by Cresswell Associates in association with the decommissioning EIA for Sizewell 'A' in 2005. Leisler's and serotine bats were also recorded during the surveys undertaken by Entec in 2007 for the potential new build development.

The building within the boundary of the new ISFSI site provides the only potentially suitable roosting location for bats within the development areas, as there are no other buildings or mature trees present. The substation building is flat roofed and well built, so there are few gaps a bat could use to enter or exit the building. However, potential entry/exit points (which appear to be for ventilation) do exist above the building doors. Overall the building is considered to have low potential to support a roost.

In addition, there is potential for the proposed development areas to be used infrequently by foraging bats (particularly the western proposed car park area which is currently grassland), but they are unlikely to be used extensively given their small size.

Otter and water vole

Sizewell Marshes is regarded as a key site for water vole in Suffolk. Surveys have been undertaken of the Sizewell Belts as part of the UK Key Sites Project since 2001, with twelve transects (located throughout the Sizewell Marshes) monitored by Royal Holloway University (RHU) on an annual basis. Water vole was confirmed as present on all but one of the water courses sampled during a survey undertaken by Entec 2007 (in relation to the proposed new nuclear build).

Otter signs are regularly found around watercourses throughout the estate and there have also been occasional sightings of family groups, suggesting that the species may breed in the Sizewell Belts. Otter was confirmed as present on four out of 20 ditches surveyed by Entec 2007 (in relation to the proposed new nuclear build).

There is no potential for water vole or otter to occur within the proposed development area, as watercourses are absent. The nearest watercourse is located approximately 40 to the west of the proposed car park extension site. However, the development is considered to be sufficient distance from this watercourse to prevent any potentially significant effects on water vole and otter and these species are not considered further.

Reptiles

Surveys of Leiston Common and Goose Hills (commissioned by BE) and records held by Suffolk Biological Records Centre suggest that adder (a Suffolk BAP species), grass-snake and slow-worm are widespread within the estate. A reptile survey undertaken by Entec in 2007 (in relation to the new nuclear build proposals) found that all four common reptile species were recorded within the survey areas (which are located to the north of the existing Power Station) with exceptional populations of adders and slow worms, a good population of common lizard and a low population of grass snake present.

The western development area at the site (the car park extension area) and the surrounding habitats are considered to provide suitable habitat for reptiles and common lizard were observed during the Extended Phase 1 Habitat survey.

Invertebrates

The description for Sizewell Marshes SSSI (located to the west of the development area) states that the site is of exceptional interest for its invertebrate fauna and that it supports a wide range of taxa, including many nationally rare or scarce species. Invertebrate taxa have not been 'systematically' surveyed within the BE Estate, with the last focussed invertebrate work undertaken by Bioscan in 1991, which concentrated on aquatic and terrestrial invertebrates present in the Sizewell Marshes SSSI. Additionally SWT undertake annual butterfly transects (since 2004), monitor the numbers of larval pits dug by ant lions (a Suffolk BAP species) at Walk Barns and conduct occasional moth trapping in conjunction with the Suffolk Moth Group.

The results of the invertebrate surveys undertaken by Entec in 2007 (in relation to the potential new build proposals) indicated that the areas to the north of the existing Power Station that had been reinstated were of some limited value for invertebrates, but that the semi-natural habitats along the coast and within the grazing marsh support a more species-rich assemblage.

It is therefore likely that the western proposed development area would be comparable to those areas surveyed previously and would support a comparatively limited range of invertebrate species.

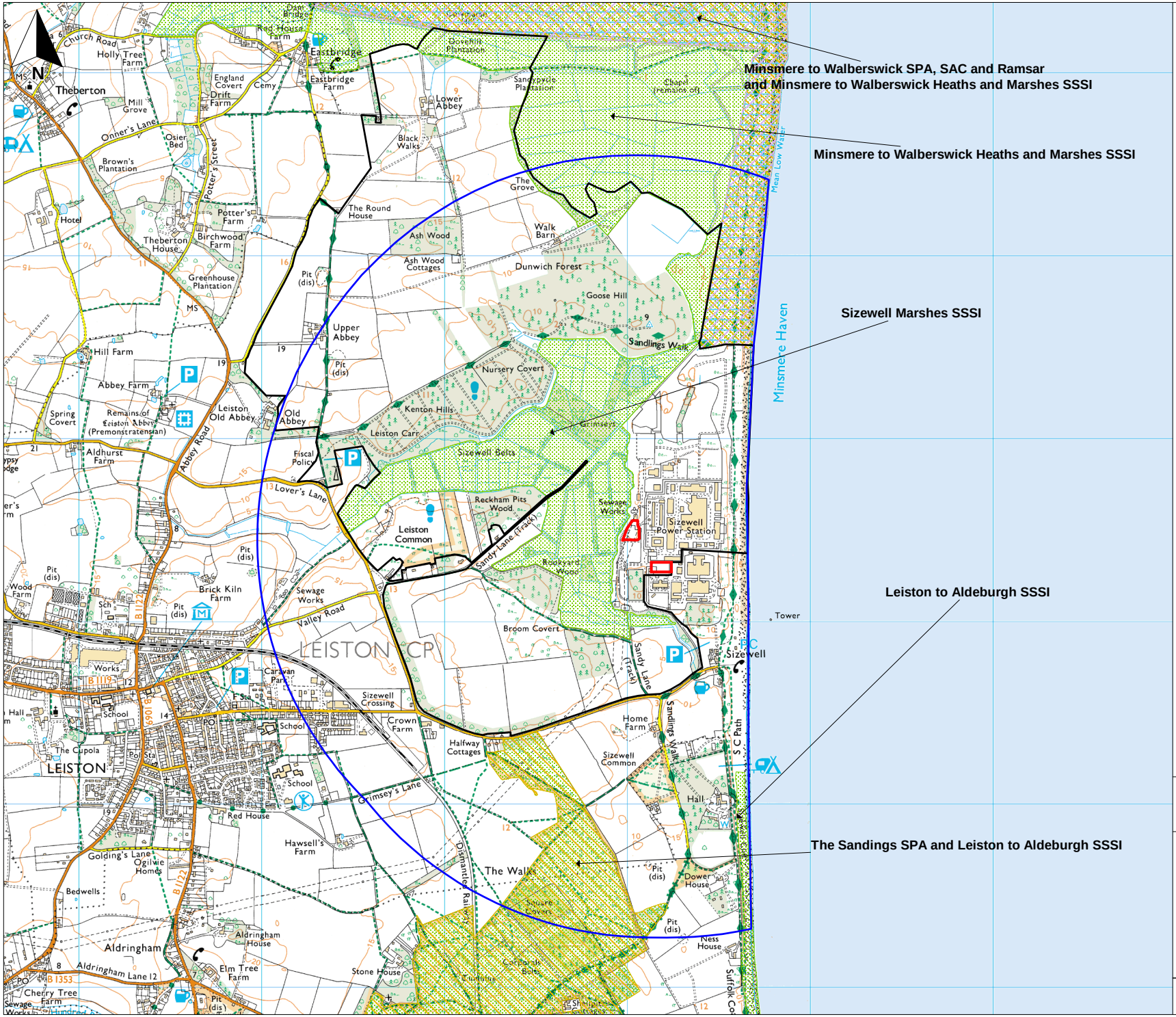

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Figure 2.1
Statutory Protected Sites

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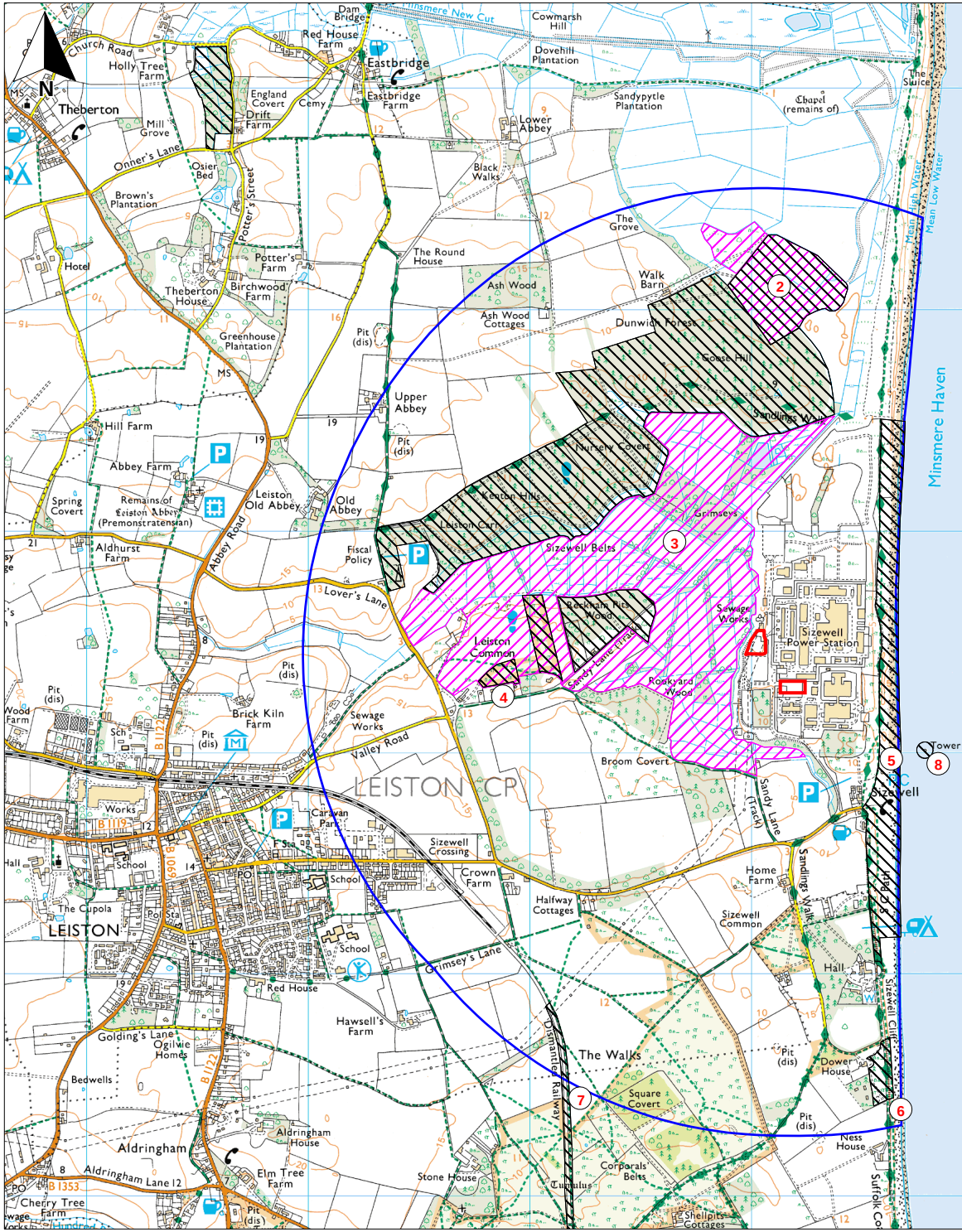

Key

- Site Boundary
- 2km boundary from Site
- County Wildlife Trust
- Suffolk Wildlife Trust
- (2) Sites

1. Minsmere Valley
2. Southern Minsmere Levels
3. Sizewell Levels and associated areas
4. Lelston Common
5. Suffolk shingle beaches
6. Dower House
7. Disused railway line (Aldringham-Aldeburgh)
8. Sizewell Rigs

0 km 1 km

Scale 1:20,000 @ A3

ROYAL HASKONING

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Sizewell Power Station ISFSI
and Car Park Extension

Figure 2.2
Non-statutory Designated Sites

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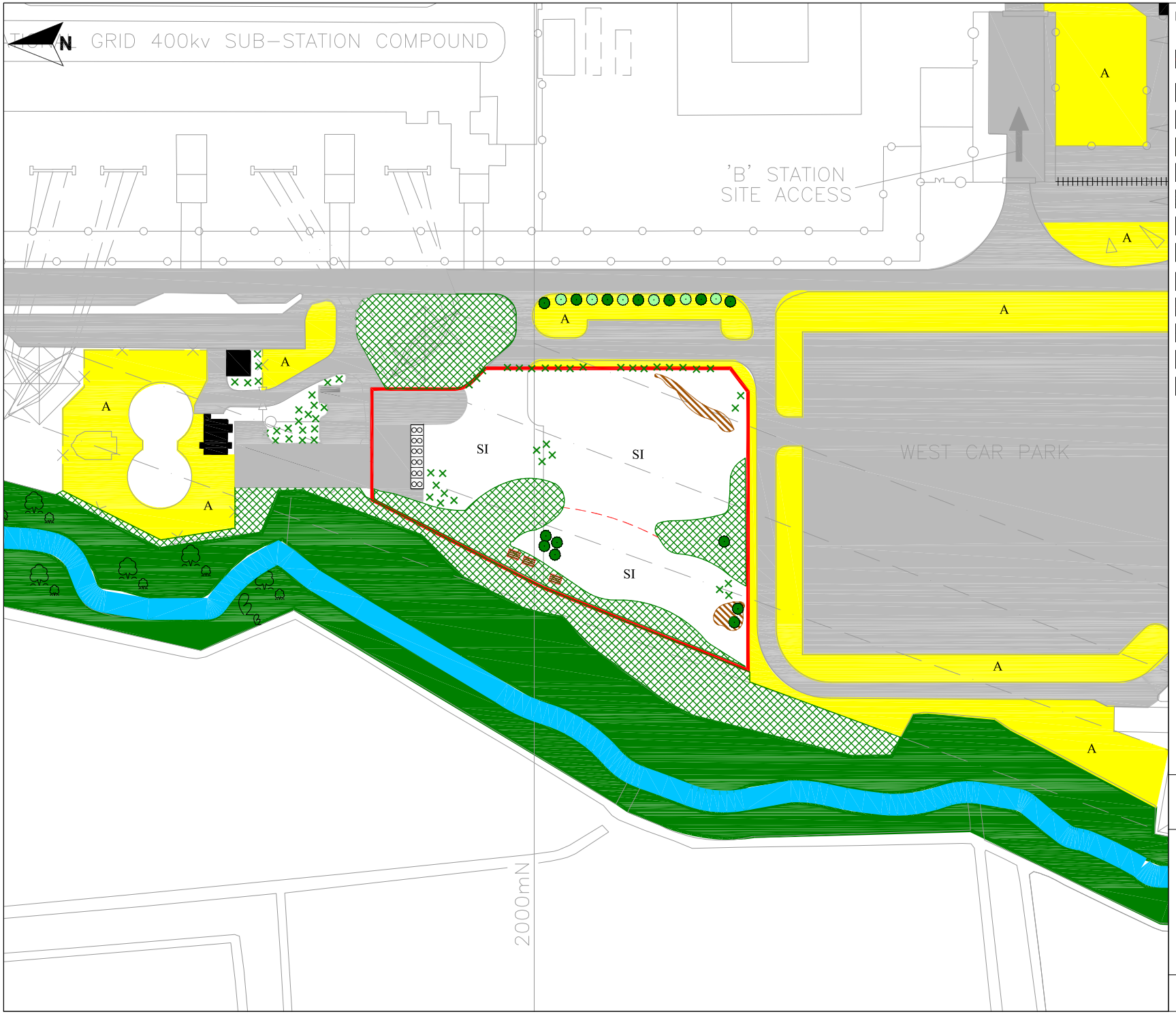

Key

- Proposed development site boundary
- Structure / building
- Hardstanding
- A — Amenity grassland
- SI — Poor semi-improved grassland
- Dense scrub
- Scattered scrub
- Broadleaved woodland
- Mixed connifer and broadleaf trees
- Grassland division
- Fence
- Wooden log piles
- Oil drums on wooden pallets

0 m — 50 m

Scale 1:1000 @ A3

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Figure 2.3a
Phase 1 Habitat Map
Proposed Car Park Extension Area

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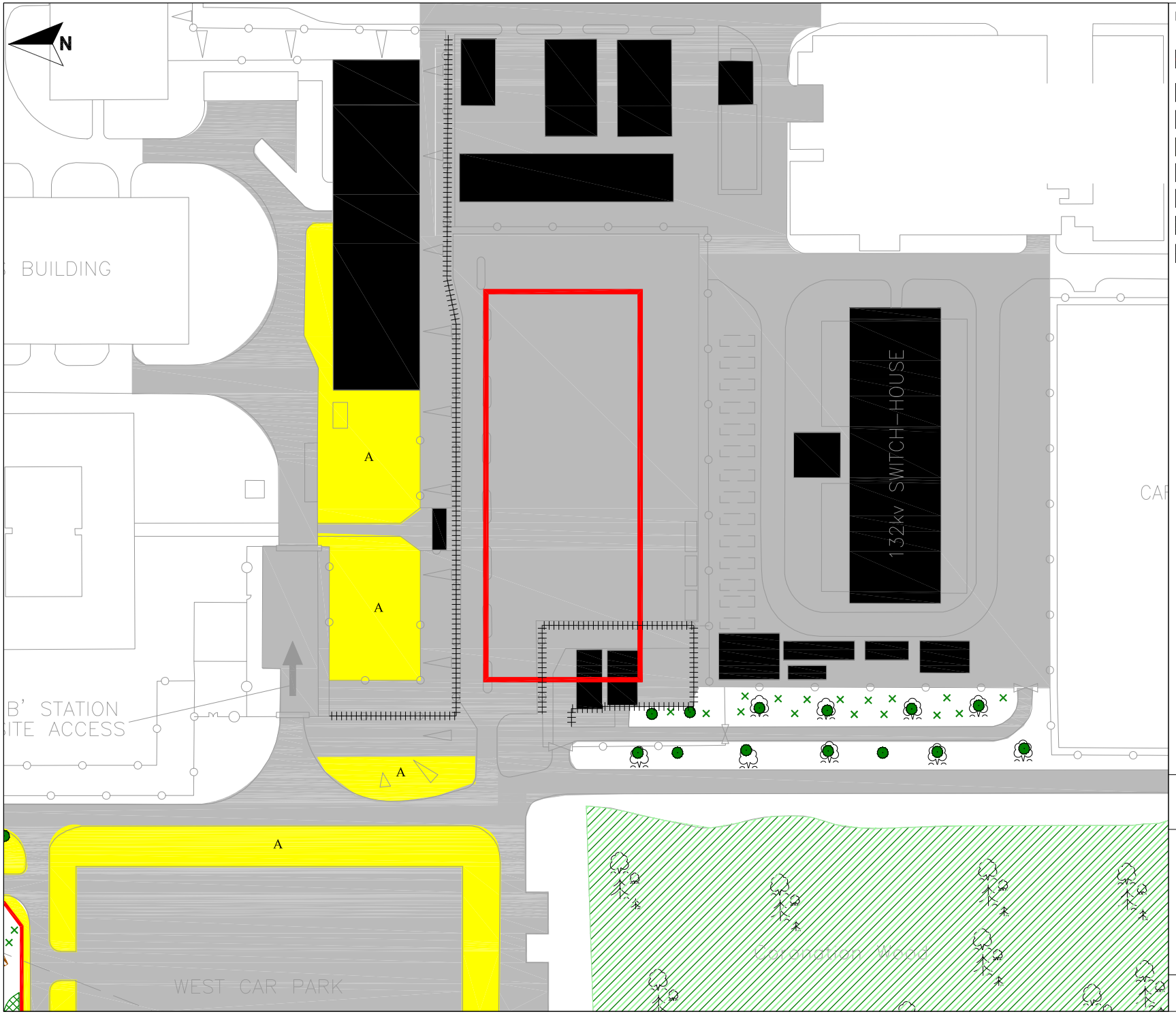

Key

- Proposed development site boundary
- Structure / building
- Hardstanding
- A — Amenity grassland
- Scattered scrub
- Scattered trees
- Mixed woodland plantation
- Fence

0 m — 50 m

Scale 1:1000 @ A3

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Figure 2.3b
Phase 1 Habitat Map
Proposed ISFSI Location

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3. Proposed Scope of the Assessment

The existing baseline information summarised above has been used to determine the scope of the ecological and ornithological assessment for the proposed development, insofar as it can be determined at this stage of EIA process. The proposed scope is detailed in Table 3.1. Within the table it is also highlighted where further survey work is considered necessary.

Table 1.1 Summary of Proposed Scope of Assessment

Receptor	Changes and potential effects	Could the change be significant and why?	Next steps in the EIA process
Construction and permanent land use change			
Internationally designated sites (Ramsar, SPA and SAC)	Increased noise levels affecting components, especially birds, of the Ramsar and SPA. Increased dust deposition affecting growth/survival of plants. Decrease in water quality from polluted site run-off affecting designated features	No The development is considered to be located at a sufficient distance from the internationally designated sites to prevent significant affects.	None
Nationally designated sites (SSSI)	Increased noise levels affecting reasons for designation (e.g. birds). Increased dust deposition affecting growth/survival of plants. Decrease in water quality from polluted site run-off affecting designated features.	Yes The Sizewell Marshes SSSI is located ~30m from the western development area.	Assessment within the EIA of affects on receptor. Consultation with Natural England. Implementation of environmental management measures during construction to minimise noise, dust and run-off potential.
Non - statutory designated sites (e.g. LWS)	Increased noise levels affecting components of LWS. Increased dust deposition affecting growth/survival of plants. Decrease in water quality from polluted site run-off.	Yes Sizewell Levels and Associated Areas Wildlife Site lies ~30m from the western development area.	Assessment within the EIA of affects on receptor. Consultation with County Ecologist and SWT. Implementation of environmental management measures during construction to minimise noise, dust and run-off potential.
Habitats	Permanent loss of habitats and temporary disturbance	No The habitats recorded at the site comprise commonly found species typical of disturbed and/or re-seeded areas.	Investigation into potential to manage adjacent habitat (currently dense scrub) to create further areas of comparable grassland.

Receptor	Changes and potential effects	Could the change be significant and why?	Next steps in the EIA process
Birds	Permanent loss of habitat. Destruction of birds nests during breeding season	No It is considered unlikely the development areas would be used extensively by birds, including those part of the SPA and SSSI designation. However, there is likely to be some loss of potential nesting habitat (which is plentiful in the surrounding area) and therefore there is a requirement to comply with the legislation that relates to this species group.	Commitment in ES to clear vegetation outside breeding bird season (March to August inclusive) or to be supervised by an ecologist.
Badger	Permanent loss of foraging habitat. Disturbance or destruction of setts	No There are no setts currently within the proposed development site or adjacent to it and no evidence of badger usage for foraging has been found. However, the site has the potential to support badger and may become more extensively used before construction. Therefore, there is a requirement to comply with the legislation that relates to this species	Commitment in ES to re-survey of the site prior to construction to determine whether any new setts have been constructed.
Bats	Disturbance and/or destruction of a roost Loss of foraging habitat	Unknown Given the small size of the potential foraging habitat affected and the extensive alternative areas available in the wider landscape it is considered unlikely a significant effect would occur on foraging bats. The status of bats within the substation building is currently unknown.	If the substation building will be affected by the works, an internal inspection of the building to assess its potential to support bats is recommended, with the potential requirement for emergent surveys if significant potential is found. Consultation with Natural England may also be required.
Reptiles	Death / injury of reptiles. Loss of foraging / hibernating habitat.	Yes The habitat within and adjacent to the western development area is suitable for reptiles, but the species composition and population status of any reptiles present is currently unknown. There is also a requirement to comply with the legislation that relates to reptiles.	Reptile survey of the suitable habitats within and adjacent to the site, comprising a minimum of 12 survey visits and following recognised methodology (Froglife Advice Sheet 10 – Reptile Survey, 1999). Assessment within the EIA of affects on receptor. Consultation with Natural England.
Invertebrates	Permanent loss of habitat affect BAP or notable species	No The habitat within the site is considered to be of some limited value to invertebrates comparable to previous survey work, but unlikely to significantly affect any BAP or notable species	Investigation into potential to manage adjacent habitat (currently dense scrub) to create further areas of comparable grassland, which could be utilised by displaced invertebrates.

Receptor	Changes and potential effects	Could the change be significant and why?	Next steps in the EIA process
New infrastructure and operation			
Designated sites	Increased disturbance from noise affecting components, especially birds, of the Ramsar and SPA. Changes in water quality from site run-off affecting designated features.	No The proposed development areas are located within the existing Power Station compound and therefore are unlikely to add significantly to the current noise level when in use. The proposed new car park will be located adjacent to an existing car park.	None

4. Summary

In summary, a review of the existing baseline information and data collected during the site visit has resulted in a scope that will encompass the following elements:

- designated sites (both national and local);
- reptiles; and
- roosting bats.

The remaining habitats and species that occur at the site, or had potential to occur based on the desk study information, (e.g. introduced shrub, water vole and invertebrates), have been scoped out of the EIA assessment.

The following legally protected species, which have the potential to occur at the proposed development site, will also be considered within the EIA:

- breeding birds (non-SPA); and
- badgers.

Appendix A
Minsmere to Walberswick Ramsar Citation

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Information Sheet on Ramsar Wetlands (RIS)

Categories approved by Recommendation 4.7, as amended by Resolution VIII.13 of the Conference of the Contracting Parties.

Note for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.
2. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers are strongly urged to provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of maps.

1. Name and address of the compiler of this form:

FOR OFFICE USE ONLY.

DD MM YY

Designation date | Site Reference Number

Joint Nature Conservation Committee
Monkstone House
City Road
Peterborough
Cambridgeshire PE1 1JY
UK
Telephone/Fax: +44 (0)1733 – 562 626 / +44 (0)1733 – 555 948
Email: RIS@JNCC.gov.uk

2. Date this sheet was completed/updated:
Designated: 05 January 1976

3. Country:
UK (England)

4. Name of the Ramsar site:
Minsmere–Walberswick

5. Map of site included:

Refer to Annex III of the *Explanatory Notes and Guidelines*, for detailed guidance on provision of suitable maps.

a) hard copy (required for inclusion of site in the Ramsar List): *yes* ✓ -or- *no*

b) digital (electronic) format (optional): Yes

6. Geographical coordinates (latitude/longitude)**:**
52 18 55 N 01 38 02 E

7. General location:

Include in which part of the country and which large administrative region(s), and the location of the nearest large town.

Nearest town/city: Southwold

Composite site situated on the coast of Suffolk, between Southwold in the north and Sizewell in the south.

Administrative region: Suffolk

8. Elevation (average and/or max. & min.) (metres)**:**
Min. -1
Max. 24
Mean 9

9. Area (hectares)**:** 2018.92

10. Overview:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

This composite, Suffolk coastal site contains a complex mosaic of habitats, notably, areas of marsh with dykes, extensive reedbeds, mudflats, lagoons, shingle and driftline, woodland and areas of lowland heath. The site supports the largest continuous stand of reed in England and Wales and demonstrates the nationally rare transition in grazing marsh ditch plants from brackish to fresh water. The combination of habitats create an exceptional area of scientific interest supporting nationally scarce plants, British Red Data Book invertebrates and nationally important numbers of breeding and wintering birds.

11. Ramsar Criteria:

Circle or underline each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11).

1, 2

12. Justification for the application of each Criterion listed in 11. above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

Ramsar criterion 1

The site contains a mosaic of marine, freshwater, marshland and associated habitats, complete with transition areas in between. Contains the largest continuous stand of reedbeds in England and Wales and rare transition in grazing marsh ditch plants from brackish to fresh water.

Ramsar criterion 2

This site supports nine nationally scarce plants and at least 26 red data book invertebrates.

Supports a population of the mollusc *Vertigo angustior* (Habitats Directive Annex II; British Red Data Book Endangered), recently discovered on the Blyth estuary river walls.

An important assemblage of rare breeding birds associated with marshland and reedbeds including: *Botaurus stellaris, Anas strepera, Anas crecca, Anas clypeata, Circus aeruginosus, Recurvirostra avosetta, Panurus biarmicus*

13. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) biogeographic region:

Atlantic

b) biogeographic regionalisation scheme (include reference citation):

Council Directive 92/43/EEC

14. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Soil & geology	acidic, neutral, shingle, sand, peat, nutrient-poor, mud, alluvium
Geomorphology and landscape	lowland, coastal, valley, floodplain, shingle bar, intertidal sediments (including sandflat/mudflat), open coast (including bay), estuary, lagoon
Nutrient status	mesotrophic
pH	circumneutral
Salinity	brackish / mixosaline, fresh, saline / euhaline
Soil	no information
Water permanence	usually permanent
Summary of main climatic features	Annual averages (Lowestoft, 1971–2000) (www.metoffice.com/climate/uk/averages/19712000/sites/lowestoft.html) Max. daily temperature: 13.0° C Min. daily temperature: 7.0° C Days of air frost: 27.8 Rainfall: 576.3 mm Hrs. of sunshine: 1535.5

General description of the Physical Features:

Minsmere – Walberswick comprises two large marshes, the tidal Blyth estuary and associated habitats. This composite coastal site contains a complex mosaic of habitats, notably areas of marsh with dykes, extensive reedbeds, mudflats, lagoons, shingle, woodland and areas of lowland heath. It supports the largest continuous stand of common reed *Phragmites australis* in England and Wales, and demonstrates the nationally rare transition in grazing marsh ditch plants from brackish to fresh water.

15. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, general land use, and climate (including climate type).

Minsmere – Walberswick comprises two large marshes, the tidal Blyth estuary and associated habitats. This composite coastal site contains a complex mosaic of habitats, notably areas of marsh with dykes, extensive reedbeds, mudflats, lagoons, shingle, woodland and areas of lowland heath.

16. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

No special values known

17. Wetland types

Marine/coastal wetland

Code	Name	% Area
E	Sand / shingle shores (including dune systems)	12.4
F	Estuarine waters	2.5
G	Tidal flats	12.9
H	Salt marshes	7.2
J	Coastal brackish / saline lagoons	1
M	Rivers / streams / creeks: permanent	4
U	Peatlands (including peat bogs swamps, fens)	30
Other	Other	30

18. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site.

This composite Suffolk coastal site contains a complex mosaic of habitats notably, areas of marsh with dykes, extensive reedbeds, mud flats, lagoons, shingle, woodland and areas of lowland heath. The site supports the largest continuous stand of reed *Phragmites australis* in England and Wales and nationally rare transition in grazing marsh ditch plants from brackish to fresh water. The combination of habitats create an exceptional area of scientific interest supporting nationally scarce plants, RDB invertebrates and nationally important numbers of breeding and wintering birds.

19. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in **12**. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Nationally important species occurring on the site.

Higher Plants.

This is one of few sites nationally for red-tipped cudweed *Filago lutescens* (RDB2) which occurs on light, sandy soils.

The nationally rare species *Corynephorus canescens* (RDB3) occurs on coastal dune habitat.

The site supports a range of nationally scarce plant species characteristic of heathland, wetland and coastal habitats, and the transitions between them. *Althaea officinalis, Myriophyllum verticillatum, Ruppia cirrhosa, Sium latifolium, Sonchus palustris, Ceratophyllum submersum, Ranunculus baudotii,* and *Carex divisa* (all nationally scarce) are associated with reedbeds, grazing marsh or ditches. *Hordeum marinum* occurs on sea-walls, *Lathyrus japonicus* on coastal shingle, and *Crassula tillaea* on heathland.

20. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in **12**. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Species currently occurring at levels of national importance:

Species regularly supported during the breeding season:

Eurasian marsh harrier , *Circus aeruginosus*, Europe	16 pairs, representing an average of 10.5% of the GB population (5 year mean 1993-1997)
Mediterranean gull , *Larus melanocephalus*, Europe	2 apparently occupied nests, representing an average of 1.8% of the GB population (Seabird 2000 Census)
Black-headed gull , *Larus ridibundus*, N & C Europe	2558 apparently occupied nests, representing an average of 1.9% of the GB population (Seabird 2000 Census)
Little tern , *Sterna albifrons albifrons*, W Europe	20 apparently occupied nests, representing an average of 1% of the GB population (Seabird 2000 Census)

Species with peak counts in spring/autumn:

Great bittern , *Botaurus stellaris stellaris*, W Europe, NW Africa	3 individuals, representing an average of 3% of the GB population (5 year peak mean 1998/9-2002/3 - spring peak)
Eurasian teal , *Anas crecca*, NW Europe	3083 individuals, representing an average of 1.6% of the GB population (5 year peak mean 1998/9-2002/3)

Ruff , *Philomachus pugnax*, Europe/W Africa	10 individuals, representing an average of 1.4% of the GB population (5 year peak mean 1998/9-2002/3)
Black-tailed godwit , *Limosa limosa islandica*, Iceland/W Europe	846 individuals, representing an average of 5.4% of the GB population (5 year peak mean 1998/9-2002/3 - spring peak)
Spotted redshank , *Tringa erythropus*, Europe/W Africa	15 individuals, representing an average of 11% of the GB population (5 year peak mean 1998/9-2002/3)
Common greenshank , *Tringa nebularia*, Europe/W Africa	9 individuals, representing an average of 1.5% of the GB population (5 year peak mean 1998/9-2002/3)

Species with peak counts in winter:

Greater white-fronted goose , *Anser albifrons albifrons*, NW Europe	212 individuals, representing an average of 3.6% of the GB population (5 year peak mean for 1996/7-2000/01)
Gadwall , *Anas strepera strepera*, NW Europe	261 individuals, representing an average of 1.5% of the GB population (5 year peak mean 1998/9-2002/3)
Northern shoveler , *Anas clypeata*, NW & C Europe	238 individuals, representing an average of 1.6% of the GB population (5 year peak mean 1998/9-2002/3)
Hen harrier, *Circus cyaneus*, Europe	15 individuals, representing an average of 2% of the GB population (5 year peak mean 1985/6-1989/90)
Water rail , *Rallus aquaticus*, Europe	5 individuals, representing an average of 1.1% of the GB population (5 year peak mean 1998/9-2002/3)
Pied avocet , *Recurvirostra avosetta*, Europe/Northwest Africa	329 individuals, representing an average of 9.6% of the GB population (5 year peak mean 1998/9-2002/3)
European golden plover , *Pluvialis apricaria apricaria*, P. a. altifrons Iceland & Faroes/E Atlantic	4503 individuals, representing an average of 1.8% of the GB population (5 year peak mean 1998/9-2002/3)
Common redshank , *Tringa totanus totanus*,	1386 individuals, representing an average of 1.1% of the GB population (5 year peak mean 1998/9-2002/3)
Lesser black-backed gull , *Larus fuscus graellsii*,	905 individuals, representing an average of 1.4% of the GB population (5 year peak mean 1998/9-2002/3)

Species Information

Nationally important species occurring on the site.

Invertebrates.

Ethmia bipunctella, Aleochara inconspicua, Philonthus dimidiatipennis, Deltote bankiana, Cephalops perspicuus, Erioptera bivittata, E. meijerei, Gymnancycla canella, Pisidium pseudosphaerium, Archanara neurica, Heliothis viriplaca, Pelosia muscerda, Photedes brevilinea, Senta flammea, Herminea tarsicrinalis, Haematopota grandis, Tipula marginata, Podalonia affinis, Arctosa fulvolineata, Eucosma catroptana, E.maritima, Melissoblaptes zelleri, Pima boisduvaliella, Acrotophthalmus bicolor, Limonia danica, Telmaturus tumidulus, Vertigo angustior (a Habitats Directive Annex II species (S1014)).

21. Social and cultural values:

e.g. fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values.

Aesthetic
Aquatic vegetation (e.g. reeds, willows, seaweed)
Environmental education/ interpretation
Livestock grazing
Non-consumptive recreation
Scientific research
Tourism

22. Land tenure/ownership:

Ownership category	On-site	Off-site
Non-governmental organisation (NGO)	+	+
Local authority, municipality etc.	+	
National/Crown Estate	+	
Private	+	+
Other	+	

23. Current land (including water) use:

Activity	On-site	Off-site
Nature conservation	+	+
Tourism	+	+
Recreation	+	+
Current scientific research	+	
Cutting of vegetation (small-scale/subsistence)	+	
Permanent arable agriculture		+
Grazing (unspecified)	+	
Flood control	+	
Transport route	+	+
Non-urbanised settlements	+	+

24. Factors adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

Explanation of reporting category:

1. *Those factors that are still operating, but it is unclear if they are under control, as there is a lag in showing the management or regulatory regime to be successful.*
2. *Those factors that are not currently being managed, or where the regulatory regime appears to have been ineffective so far.*

NA = Not Applicable because no factors have been reported.

Adverse Factor Category	Reporting Category	Description of the problem (Newly reported Factors only)	On-Site	Off-Site	Major Impact?
Erosion	2	Coastal squeeze within the Blyth Estuary	+		+

Recreational/tourism disturbance (unspecified)	2	Trampling damage to vegetated shingle and driftline communities, and disturbance of little tern nesting habitat	+		+

For category 2 factors only.
What measures have been taken / are planned / regulatory processes invoked, to mitigate the effect of these factors?
Erosion - English Nature provides advice to the Environment Agency and coastal local authorities in relation to flood and coastal protection management. This will inform the development of the Suffolk Estuaries strategies and the second generation shoreline management plan.

Recreational/tourism disturbance (unspecified) - English Nature to work with owners/occupiers and regulatory authorities to develop a strategy to manage visitor pressure on Suffolk vegetated shingle. These measures are likely to include temporary fencing and provision of boardwalks as well as measures to increase visitor awareness about the sensitivity of the shingle habitat, for example by interpretation, wardening.

Is the site subject to adverse ecological change? YES

25. Conservation measures taken:

List national category and legal status of protected areas, including boundary relationships with the Ramsar site; management practices; whether an officially approved management plan exists and whether it is being implemented.

Conservation measure	On-site	Off-site
Site/ Area of Special Scientific Interest (SSSI/ASSI)	+	
National Nature Reserve (NNR)	+	
Special Protection Area (SPA)	+	
Land owned by a non-governmental organisation for nature conservation	+	
Management agreement	+	
Site management statement/plan implemented	+	
Area of Outstanding National Beauty (AONB)	+	+
Environmentally Sensitive Area (ESA)	+	+
Special Area of Conservation (SAC)	+	

26. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

No information available

27. Current scientific research and facilities:

e.g. details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

Fauna.

Numbers of migratory and wintering wildfowl and waders are monitored annually as part of the national Wetland Birds Survey (WeBS) organised by the British Trust for Ornithology, Wildfowl & Wetlands Trust, the Royal Society for the Protection of Birds and the Joint Nature Conservation Committee.

Flora.

NVC and vegetation monitoring, bird and invertebrate surveys/monitoring carried out on EN's NNRs, NT, SWT, RSPB reserves.

28. Current conservation education:

e.g. visitor centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

Facilities at National Trust and Royal Society for the Protection of Birds reserves.

29. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

Activities, Facilities provided and Seasonality.

A popular area for tourists as it is an AONB and contains Minsmere bird reserve and Dunwich heath, both with toilets/shop/cafe. There are more visitors in the summer, however it well used throughout the year by walkers and bird watchers.

30. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept. of Agriculture/Dept. of Environment, etc.

Head, Natura 2000 and Ramsar Team, Department for Environment, Food and Rural Affairs, European Wildlife Division, Zone 1/07, Temple Quay House, 2 The Square, Temple Quay, Bristol, BS1 6EB

31. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Site Designations Manager, English Nature, Sites and Surveillance Team, Northminster House, Northminster Road, Peterborough, PE1 1UA, UK

32. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see **13** above), list full reference citation for the scheme.

Site-relevant references

Axell, HE (1977) *Minsmere: portrait of a bird reserve*. Hutchinson, London

Barne, JH, Robson, CF, Kaznowska, SS, Doody, JP, Davidson, NC & Buck, AL (eds.) (1998) *Coasts and seas of the United Kingdom. Region 7 South-east England: Lowestoft to Dungeness*. Joint Nature Conservation Committee, Peterborough. (Coastal Directories Series.)

Batten, LA, Bibby, CJ, Clement, P, Elliot, GD & Porter, RF (1990) *Red Data Birds in Britain. Action for rare, threatened and important species*. Poyser, London, for Nature Conservancy Council and Royal Society for the Protection of Birds

Bratton, JH (ed.) (1991) *British Red Data Books: 3. Invertebrates other than insects*. Joint Nature Conservation Committee, Peterborough

Burgess, N, Evans, C & Sorensen, J (1990) Heathland management for nightjars. *RSPB Conservation Review*, **4**, 32-35

Council of Europe (1980) *Minsmere Nature Reserve, United Kingdom*. Council of Europe, Strasbourg (European Diploma Series, No. 18)

Covey, R (1998) Chapter 6. Eastern England (Bridlington to Folkestone) (MNCR Sector 6). In: *Benthic marine ecosystems of Great Britain and the north-east Atlantic*, ed. by K. Hiscock, 179-198. Joint Nature Conservation Committee, Peterborough. (Coasts and Seas of the United Kingdom. MNCR series)

Cranswick, PA, Waters, RJ, Musgrove, AJ & Pollitt, MS (1997) *The Wetland Bird Survey 1995–96: wildfowl and wader counts*. British Trust for Ornithology, Wildfowl and Wetlands Trust, Royal Society for the Protection of Birds & Joint Nature Conservation Committee, Slimbridge

Day, JCU & Wilson, J (1978) Breeding bitterns in Britain. *British Birds*, **71**, 285-300

Doody, JP, Johnston, C & Smith, B (1993) *Directory of the North Sea coastal margin*. Joint Nature Conservation Committee, Peterborough

ESL (1997) *National Vegetation Classification Survey of Walberswick NNR*. ESL, Lincolnshire

Evans, C, Marrs, R & Welch, G (1993) The restoration of heathland on arable farmland at Minsmere RSPB Nature Reserve. *RSPB Conservation Review*, **7**, 80-84

McLeod, CR, Yeo, M, Brown, AE, Burn, AJ, Hopkins, JJ & Way, SF (eds.) (2004) *The Habitats Directive: selection of Special Areas of Conservation in the UK*. 2nd edn. Joint Nature Conservation Committee, Peterborough. www.jncc.gov.uk/SACselection

Musgrove, AJ, Pollitt, MS, Hall, C, Hearn, RD, Holloway, SJ, Marshall, PE, Robinson, JA & Cranswick, PA (2001) *The Wetland Bird Survey 1999–2000: wildfowl and wader counts*. British Trust for Ornithology, Wildfowl and Wetlands Trust, Royal Society for the Protection of Birds & Joint Nature Conservation Committee, Slimbridge. www.wwt.org.uk/publications/default.asp?PubID=14

National Rivers Authority (1996) *Southwold Town Marshes Water Level Management Plan*. National Rivers Authority, Ipswich

National Rivers Authority (1996) *Tinker's Marsh Water Level Management Plan*. National Rivers Authority, Ipswich

National Rivers Authority (1996) *Westwood and Dingle Marshes Water Level Management Plan*. National Rivers Authority, Ipswich

Ratcliffe, DA (ed.) (1977) *A Nature Conservation Review. The selection of biological sites of national importance to nature conservation in Britain*. Cambridge University Press (for the Natural Environment Research Council and the Nature Conservancy Council), Cambridge (2 vols.)

Royal Society for the Protection of Birds (1994) *Minsmere management plan*. Royal Society for the Protection of Birds

Shirt, DB (ed.) (1987) *British Red Data Books: 2. Insects*. Nature Conservancy Council, Peterborough

Smith, K, Welch, G, Tyler, G, Gilbert, G, Hawkins, I & Hirons, G (2000) Management of RSPB Minsmere reedbeds and its impact on breeding bitterns. *British Wildlife*, **12**(1), 16-21

Stewart, A, Pearman, DA & Preston, CD (eds.) (1994) *Scarce plants in Britain*. Joint Nature Conservation Committee, Peterborough

Stroud, DA, Chambers, D, Cook, S, Buxton, N, Fraser, B, Clement, P, Lewis, P, McLean, I, Baker, H & Whitehead, S (eds.) (2001) *The UK SPA network: its scope and content*. Joint Nature Conservation Committee, Peterborough (3 vols.) www.jncc.gov.uk/UKSPA/default.htm

Suffolk Wildlife Trust (1993) *National Vegetation Classification of the saltmarsh of the Deben, Alde–Ore and Blyth estuaries, Suffolk*. Suffolk Wildlife Trust, Ashbocking

Wiggington, M (1999) *British Red Data Books. 1. Vascular plants*. 3rd edn. Joint Nature Conservation Committee, Peterborough

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Please return to: **Ramsar Secretariat, Rue Mauverney 28, CH-1196 Gland, Switzerland**
Telephone**: +41 22 999 0170** • Fax: **+41 22 999 0169** • email: **ramsar@ramsar.org**

Appendix B
Minsmere to Walberswick SPA Citation

Entec

NATURA 2000

STANDARD DATA FORM

FOR SPECIAL PROTECTION AREAS (SPA)
FOR SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE (SCI)
AND
FOR SPECIAL AREAS OF CONSERVATION (SAC)

1. Site identification:

1.1 Type J

1.2 Site code UK9009101

1.3 Compilation date 199205

1.4 Update 199902

1.5 Relationship with other Natura 2000 sites

U	K	0	0	1	2	8	0	9

1.6 Respondent(s) International Designations, JNCC, Peterborough

1.7 Site name **Minsmere–Walberswick**

1.8 Site indication and designation classification dates

date site proposed as eligible as SCI	
date confirmed as SCI	
date site classified as SPA	199205
date site designated as SAC	

2. Site location:

2.1 Site centre location

longitude	**latitude**
01 38 02 E	52 18 55 N

2.2 Site area (ha) 2018.92

2.3 Site length (km)

2.5 Administrative region

NUTS code	Region name	% cover
UK403	Suffolk	100.00%

2.6 Biogeographic region

Alpine	Atlantic	Boreal	Continental	Macaronesia	Mediterranean
	X				

3. Ecological information:

3.1 Annex I habitats

Habitat types present on the site and the site assessment for them:

Annex I habitat	% cover	Representativity	Relative surface	Conservation status	Global assessment

3.2 Annex I birds and regularly occurring migratory birds not listed on Annex I

		Population					Site assessment		
		Resident	Migratory						
Code	Species name		Breed	Winter	Stage	Population	Conservation	Isolation	Global
A056	*Anas clypeata*		23 P			B		C	
A056	*Anas clypeata*			98 I		C		C	
A052	*Anas crecca*		73 P			B		C	
A051	*Anas strepera*			93 I		C		C	
A051	*Anas strepera*		24 P			B		C	
A041a	*Anser albifrons albifrons*			67 I		C		B	
A021	*Botaurus stellaris*		7 I			A		B	
A224	*Caprimulgus europaeus*		24 P			C		C	
A081	*Circus aeruginosus*		16 P			B		B	
A082	*Circus cyaneus*			15 I		C		C	
A132	*Recurvirostra avosetta*		47 P			B		B	
A195	*Sterna albifrons*		28 P			C		C	

4. Site description:

4.1 General site character

Habitat classes	% cover
Marine areas. Sea inlets	
Tidal rivers. Estuaries. Mud flats. Sand flats. Lagoons (including saltwork basins)	14.0
Salt marshes. Salt pastures. Salt steppes	8.0
Coastal sand dunes. Sand beaches. Machair	3.0
Shingle. Sea cliffs. Islets	3.0
Inland water bodies (standing water, running water)	4.0
Bogs. Marshes. Water fringed vegetation. Fens	15.0
Heath. Scrub. Maquis and garrigue. Phygrana	23.0
Dry grassland. Steppes	
Humid grassland. Mesophile grassland	
Alpine and sub-alpine grassland	
Improved grassland	7.0
Other arable land	2.0
Broad-leaved deciduous woodland	16.0
Coniferous woodland	5.0
Evergreen woodland	
Mixed woodland	
Non-forest areas cultivated with woody plants (including orchards, groves, vineyards, dehesas)	
Inland rocks. Screes. Sands. Permanent snow and ice	
Other land (including towns, villages, roads, waste places, mines, industrial sites)	
Total habitat cover	**100%**

4.1 Other site characteristics

Soil & geology:

Acidic, Mud, Nutrient-poor, Peat, Sand, Shingle

Geomorphology & landscape:

Coastal, Estuary, Floodplain, Intertidal sediments (including sandflat/mudflat), Lagoon, Lowland, Open coast (including bay), Shingle bar

4.2 Quality and importance

ARTICLE 4.1 QUALIFICATION (79/409/EEC)

During the breeding season the area regularly supports:

Botaurus stellaris (Europe - breeding)	35% of the GB breeding population 5 year mean, 1993-1997
Caprimulgus europaeus	0.7% of the GB breeding population Count, as at 1990
Circus aeruginosus	10.2% of the GB breeding population 5 year mean, 1993-1997
Recurvirostra avosetta (Western Europe/Western Mediterranean - breeding)	10.4% of the GB breeding population Count, as at early 1990s
Sterna albifrons (Eastern Atlantic - breeding)	1.2% of the GB breeding population 5 year mean, 1992-1996
Over winter the area regularly supports:	
Circus cyaneus	2% of the GB population 5 year peak mean, 1985/6-1989/90

ARTICLE 4.2 QUALIFICATION (79/409/EEC)

During the breeding season the area regularly supports:

Anas clypeata (North-western/Central Europe)	2.3% of the population in Great Britain Count, as at 1990
Anas crecca (North-western Europe)	4.9% of the population in Great Britain Count, as at 1990
Anas strepera (North-western Europe)	3.1% of the population in Great Britain Count, as at 1990
Over winter the area regularly supports:	
Anas clypeata (North-western/Central Europe)	1% of the population in Great Britain 5 year peak mean 1991/92-1995/96
Anas strepera (North-western Europe)	1.1% of the population in Great Britain 5 year peak mean 1991/92-1995/96
Anser albifrons albifrons (North-western Siberia/North-eastern & North-western Europe)	1.1% of the population in Great Britain 5 year peak mean 1991/92-1995/96

4.3 Vulnerability

The site is actively managed to prevent scrub and tree invasion of the heathlands grazing marshes amd reedbeds. Much of the land is managed by conservation organisations and positively by private landowners through ESA and Countryside Stewdardship schemes. The coastline is going to be pushed back by natural processes, this is being addressed in the Shoreline Management Plan. Alternative sites for reed bed creation are being sought to help off set the possible future natural losses.

5. Site protection status and relation with CORINE biotopes:

5.1 Designation types at national and regional level

Code	% cover
UK01 (NNR)	27.6

UK04 (SSSI/ASSI)	100.0

NATURA 2000

STANDARD DATA FORM

FOR SPECIAL PROTECTION AREAS (SPA)
FOR SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE (SCI)
AND
FOR SPECIAL AREAS OF CONSERVATION (SAC)

1. Site identification:

1.1 Type A

1.2 Site code UK9020286

1.3 Compilation date 200108

1.4 Update

1.5 Relationship with other Natura 2000 sites

1.6 Respondent(s) International Designations, JNCC, Peterborough

1.7 Site name **Sandlings**

1.8 Site indication and designation classification dates

date site proposed as eligible as SCI	
date confirmed as SCI	
date site classified as SPA	200108
date site designated as SAC	

2. Site location:

2.1 Site centre location

longitude	**latitude**
01 26 33 E	52 04 44 N

2.2 Site area (ha) 3391.8

2.3 Site length (km)

2.5 Administrative region

NUTS code	Region name	% cover
UK403	Suffolk	100.00%

2.6 Biogeographic region

Alpine	Atlantic	Boreal	Continental	Macaronesia	Mediterranean
	X				

3. Ecological information:

3.1 Annex I habitats

Habitat types present on the site and the site assessment for them:

Annex I habitat	% cover	Representativity	Relative surface	Conservation status	Global assessment

3.2 Annex I birds and regularly occurring migratory birds not listed on Annex I

		Population				Site assessment			
		Resident	Migratory						
Code	Species name		Breed	Winter	Stage	Population	Conservation	Isolation	Global
A224	*Caprimulgus europaeus*		109 P			B		C	
A246	*Lullula arborea*		154 P			B		C	

4. Site description:

4.1 General site character

Habitat classes	% cover
Marine areas. Sea inlets	
Tidal rivers. Estuaries. Mud flats. Sand flats. Lagoons (including saltwork basins)	
Salt marshes. Salt pastures. Salt steppes	
Coastal sand dunes. Sand beaches. Machair	
Shingle. Sea cliffs. Islets	
Inland water bodies (standing water, running water)	1.5
Bogs. Marshes. Water fringed vegetation. Fens	0.9
Heath. Scrub. Maquis and garrigue. Phygrana	14.6
Dry grassland. Steppes	11.5
Humid grassland. Mesophile grassland	
Alpine and sub-alpine grassland	
Improved grassland	0.1
Other arable land	
Broad-leaved deciduous woodland	10.6
Coniferous woodland	57.6
Evergreen woodland	
Mixed woodland	1.4
Non-forest areas cultivated with woody plants (including orchards, groves, vineyards, dehesas)	
Inland rocks. Screes. Sands. Permanent snow and ice	
Other land (including towns, villages, roads, waste places, mines, industrial sites)	1.8
Total habitat cover	**100%**

4.1 Other site characteristics

Soil & geology:

Geomorphology & landscape:

4.2 Quality and importance

ARTICLE 4.1 QUALIFICATION (79/409/EEC)

During the breeding season the area regularly supports:

Caprimulgus europaeus	3.2% of the GB breeding population Count as at 1992
Lullula arborea	10.3% of the GB breeding population Count as at 1997

ARTICLE 4.2 QUALIFICATION (79/409/EEC)

4.3 Vulnerability

Sandlings SPA comprises six SSSIs. Sandlings Forest SSSI, the largest of these, is dominated by commercial forestry. Within the forest, large areas of open ground suitable for woodlark and nightjar were created by storm damage in 1987. Maintenance of open areas in the future relies on clear felling as the main silvicultural practice and the maintenance of some areas earmarked for woodlark and nightjar habitat. These objectives are included in the East Anglia Forest District Strategic Plan.

On the heathland SSSIs, lack of traditional management has resulted in the heathland being subjected to sucessional changes with the consequent spread of bracken, shrubs and trees. This is being addressed through habitat management work under the Countryside Stewardship Scheme and Tomorrows Heathland Heritage, and is resulting in the restoration of more typical heathland habitat favourable to both nightjar and woodlark.

Human influences on the site include the frequent presence of travellers' caravans. This is a longstanding problem, and a variety of mechanisms are utilised to keep them from the heathland; the digging of trenches and construction of earth barriers around the borders of sites is proving effective.

5. Site protection status and relation with CORINE biotopes:

5.1 Designation types at national and regional level

Code	% cover
UK04 (SSSI/ASSI)	100.0

Appendix C
Minsmere to Walberswick SAC Citation

Minsmere to Walberswick Heaths and Marshes

Site details

Location of Minsmere to Walberswick Heaths and Marshes SAC/SCI/cSAC

Country	England
Unitary Authority	Suffolk
Grid Ref*	TM468682
Latitude	52 15 22 N
Longitude	01 37 02 E
SAC EU code	UK0012809
Status	Designated Special Area of Conservation (SAC)
Area (ha)	1265.52

* This is the approximate central point of the SAC. In the case of large, linear or composite sites, this may not represent the location where a feature occurs within the SAC.

General site character

Coastal sand dunes. Sand beaches. Machair (5%)
Shingle. Sea cliffs. Islets (15%)
Bogs. Marshes. Water fringed vegetation. Fens (20%)
Heath. Scrub. Maquis and garrigue. Phygrana (40%)
Mixed woodland (20%)

Boundary map and associated biodiversity information on the NBN Gateway.

Natura 2000 data form for this site as submitted to Europe (PDF format, size 30kb).

Interactive map from MAGIC (Multi-Agency Geographic Information for the Countryside).

Annex I habitats that are a primary reason for selection of this site

1210 Annual vegetation of drift lines

This site is one of two representatives of **Annual vegetation of drift lines** on the east coast of England. It occurs on a well-developed beach strandline of mixed sand and shingle and is the best and most extensive example of this restricted geographical type. Species include those typical of sandy shores, such as sea sandwort *Honckenya peploides* and shingle plants such as sea beet *Beta vulgaris* ssp. *maritima*.

4030 European dry heaths

Lowland **European dry heaths** occupy an extensive area of this site on the east coast of England, which is at the extreme easterly range of heath development in the UK. The heathland is predominantly NVC type H8 *Calluna vulgaris – Ulex gallii* heath, usually more characteristic of western parts of the UK. This type is dominated by heather *Calluna vulgaris*, western gorse *Ulex gallii* and bell heather *Erica cinerea*.

Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site

1220 Perennial vegetation of stony banks

Annex II species that are a primary reason for selection of this site

Not applicable.

Annex II species present as a qualifying feature, but not a primary reason for site selection

Not applicable.

Many designated sites are on private land: the listing of a site in these pages does not imply any right of public access.

Appendix D
SSSI Citations

COUNTY: SUFFOLK SITE NAME: SIZEWELL MARSHES

DISTRICT: SUFFOLK COASTAL

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981 as amended

Local Planning Authority: SUFFOLK COUNTY COUNCIL, Suffolk Coastal District Council

National Grid Reference: TM 466638 Area: 104.33 (ha.) 257.80 (ac.)

Ordnance Survey Sheet 1:50,000: 156 1:10,000: TM 46 SE

Data Notified (Under 1949 Act): – Date of Last Revision: –

Date Notified (Under 1981 Act): 1987 Date of Last Revision: 1992

Other Information:
The site has been extended at the 1992 revision.

Description and Reasons for Notification:
Sizewell Marshes are important for their large area of lowland, unimproved wet meadows which support outstanding assemblages of invertebrates and breeding birds. Several nationally scarce plants are also present.

The site occupies a low-laying basin of deep fen peat. The water table is permanently high, with the area being prone to flooding, and there is an extensive network of ditches across the site.

In the areas of unimproved wet meadow the principal grass species are Sweet Vernal-grass *Anthoxanthum odoratum*, Crested Dog's-tail *Cynosurus cristatus*, Rough-stalked Meadow-grass *Poa trivialis* and Yorkshire-fog *Holcus lanatus*. There are many other typical species including Marsh Pennywort *Hydrocotyle vulgaris*, Ragged Robin *Lychnis flos-cuculi*, Large Bird's-foot-trefoil *Lotus uliginosus*, Marsh-orchids *Dactylorhiza* spp., Bogbean *Menyanthes trifoliata*, Bog Pimpernel *Anagallis tenella*, Yellow Iris *Iris pseudacorus*, sedges *Carex spp*. and rushes *Juncus spp*. The nationally scarce Marsh Dock *Rumex palustris* and Greater Water-parsnip *Sium latifolium* are also present. It is considered that these communities are representative of the *Juncus subnodulosus – Cirsium palustre* fen-meadow and the *J. effusus/acutiflorus – Galium palustre* rush-pasture, as described in the National Vegetation Classification. In addition, several areas of reedbed dominated by Common Reed *Phragmites australis* and alder carr occur.

The extensive ditch system supports a diverse aquatic flora which includes the nationally scarce Soft Hornwort *Ceratophyllum submersum*, Fen Pondweed *Potamogeton coloratus* and Whorled Water-milfoil *Myriophyllum verticillatum*. The variety of ditch depths and widths, together with their fringing vegetation provide an important contribution to the site's habitat value for invertebrates and birdlife.

Sizewell Marshes are of exceptional interest for their invertebrate fauna, supporting a wide range of taxa and many nationally rare or scarce species. These include terrestrial and aquatic beetles (Coleoptera), flies (Diptera), moths (Lepidoptera), dragonflies (Odonata) and spiders (Araneae).

The breeding bird assemblage is also of national significance with many species that are typical of wet grassland and associated habitats, including Shoveler, Gadwall, Teal, Snipe and Lapwing.

COUNTY: SUFFOLK SITE NAME: MINSMERE-WALBERSWICK HEATHS AND MARSHES

DISTRICT: SUFFOLK COASTAL/WAVENEY

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981, as amended

Local Planning Authority: SUFFOLK COASTAL DISTRICT COUNCIL, Waveney District Council, Suffolk County Council

National Grid Reference: TM 475645 Area: 2325.89 (ha.) 5747.27 (ac.)
TM 467772

Ordnance Survey Sheet 1:50,000: 156 1:10,000: TM 46 NE-NW-SW
TM 47 NE-NW-SE-SW

Date Notified (Under 1949 Act): See below Date of Last Revision: 1972

Date Notified (Under 1981 Act): 1989 Date of Last Revision: 1993

Other Information:
This site amalgamates Minsmere Level SSSI (notified in 1954), Walberswick SSSI (notified in 1954) and Brick Kiln Walks SSSI (notified in 1972).

Much of this site has been designated a Special Protection Area under EC Directive 79/409 on the Conservation of Wild Birds, and as a Wetland of International Importance under the Ramsar Convention.

Much of the site is included within 'A nature conservation review' by Ratcliffe (1977). It is within the Suffolk Coast and Heaths Area of Outstanding Natural Beauty.

Parts of the site are owned and/or managed as nature reserves and are listed below

Walberswick National Nature Reserve (English Nature)
Westleton Heath National Nature Reserve (English Nature)
Minsmere Reserve (Royal Society for the Protection of Birds)
Dunwich Heath (National Trust)
Norman Gwatkin Reserve (Suffolk Wildlife Trust)

Description and Reasons for Notification:
This composite site is situated on the coast of Suffolk between Southwold in the north and Sizewell in the south. It contains a complex series of habitats, notably mudflats, shingle beach, reedbeds, heathland and grazing marsh, which combine to create an area of exceptional scientific interest.

The tidal mudflats of the River Blyth estuary form sheltered feeding grounds for wildfowl and shorebirds, notably wigeon, shelduck, redshank and dunlin. Saltmarsh, dominated by sea purslane *Halimione portulacoides*, but also composed of sea

lavender *Limonium vulgare*, sea aster *Aster tripolium* and common cord-grass *Spartina anglica* fringes the southern shore of the estuary. Other saltmarsh species include glasswort *Salicornia* spp., sea rush *Juncus maritimus*, common saltmarsh grass *Puccinellia maritima* and sea couch-grass *Elymus pycnanthus*.

Shingle beach forms the coastline at Walberswick and Minsmere. This is subject to sea erosion and human disturbance but, nevertheless, it supports a variety of scarce shingle plants including sea pea *Lathyrus japonicus*, sea campion *Silene maritima* and small populations of sea kale *Crambe maritima*, grey hair-grass *Corynephorus canescens* and yellow horned-poppy *Glaucium flavum*. A narrow strip of yellow dune extends southwards at Minsmere behind which is a strip of dune grassland. A series of shallow, brackish lagoons and saltmarsh occurs behind the shingle beach between Walberswick and Dunwich.

Extensive reedbeds, consisting largely of pure stands of reed *Phragmites australis*, occur at Minsmere and Walberswick. These developed on former grazing marshes which were flooded as a war-time defence measure in 1940. Both marshes contain shallow pools of open water and are intersected by deep water channels. The reedbeds are an important habitat for birds and insects. There are large breeding populations of reed warbler and bearded tit. Other notable breeding species include marsh harrier, bittern, cetti's warbler, garganey and water rail. The marshes have a rich insect fauna; particularly moths, which includes a number of rare species: notably *Archanara neurica*, *Photedes brevilinea* and *Senta flammea*.

At Minsmere, a 20 hectare area of shallow lagoons and islands has been created for wading birds and wildfowl. This area is renowned for its breeding colony of avocets; shoveler, gadwall, teal and shelduck also breed.

Large blocks of grazing marsh are found near Eastbridge and Southwold. These marshes support a high number of species of breeding waterfowl such as snipe, redshank, gadwall, shoveler and black-tailed godwit. Dykes within the marshes contain very diverse aquatic plant communities, with brackish and freshwater types represented. Many nationally rare and scarce invertebrates such as the soldier fly *Odontomyia ornata* are found east of Eastbridge, as are a number of nationally scarce plants including sea barley *Hordeum marinum* and whorled water-milfoil *Myriophyllum verticillatum*. The marshes west of Eastbridge support a mosaic of different unimproved wetland communities including fen-meadow characterised by blunt-flowered rush *Juncus subnodulosus* and marsh thistle *Cirsium palustre*, reed beds, swamps dominated by lesser pond sedge *Carex acutiformis*, marshes dominated by meadowsweet *Filipendula ulmaria* with some angelica *Angelica sylvestris*, and alder *Alnus glutinosa* woodland.

High land at Minsmere, Westleton and Walberswick forms part of the East Suffolk Sandlings and is composed of infertile sands and gravels. This supports large areas of lowland heath, bracken, dry acidic grassland, woods and scrub.

Lowland heath, dominated by ling *Calluna vulgaris* but also containing bell heath *Erica cinerea* and cross-leaved heath *E. tetralix*, occupies a large continuous tract of about 400 ha at Minsmere, Dunwich and Westleton Heath with smaller areas at

Walberswick. This heathland provides a valuable habitat for two nationally decreasing birds, the. nightjar and woodlark.

Patches of unimproved acid grassland in which red fescue *Festuca rubra* and common bent *Agrostis capillaris* predominate, occur through the site but areas dominated by wavy hair-grass *Deschampsia flexuosa*, purple moor-grass *Molinia caerulea* and sand sedge *Carex arenaria* also occur. A variety of other acid grassland plants is also present, of which heath bedstraw *Galium saxatile* and sheep's sorrel *Rumex acetosella* are common. Scarce species include bird's-foot clover *Trifolium ornithopodioides* and mossy stonecrop *Crassula tillaea* together with a small colony of red-tipped cudweed *Filago lutescens*. There are also substantial areas dominated by bracken *Pteridium aquilinum* or gorse *Ulex europaeus* and *U. gallii*.

Mature plantation woodland, chiefly of oak *Quercus robur* or Scots pine *Pinus sylvestris* but also including sycamore *Acer pseudoplatanus* and sweet chestnut *Castanea sativa*, occur at Minsmere and Walberswick. Naturally regenerated woods of birch *Betula pendula* and Scots pine have arisen on former heathland and alder *Alnus glutinosa*, sallow *Salix* spp. and birch woodlands are also present on wet ground. This woodland and scrub provides important additional habitat diversity for birds and invertebrates.

COUNTY: SUFFOLK SITE NAME: LEISTON-ALDEBURGH

DISTRICT: SUFFOLK COASTAL

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981

Local Planning Authorities: SUFFOLK COASTAL DISTRICT COUNCIL, Suffolk County Council

National Grid Reference: TM 461595 Area: 534.34 (ha.) 1,319.82 (ac.)

Ordnance Survey Sheet 1:50,000: 156 1:10,000: TM 45 NE, TM 46 SE

Date Notified (Under 1949 Act): 1955 Date of Last Revision: –

Date Notified (Under 1981 Act): 1986 Date of Last Revision: 1999

Other Information:
Part RSPB and Suffolk Wildlife Trust reserves.
The site was named 'North Warren and Thorpeness Mere', before the 1999 boundary revision.

Description and Reasons for Notification:
Leiston-Aldeburgh contains a rich mosaic of habitats including acid grassland, heath, scrub, woodland, fen, open water and vegetated shingle. This mix of habitats in close juxtaposition and the associated transition communities between habitats is unusual in the Suffolk Coast and Heaths. The variety of habitats support a diverse and abundant community of breeding and overwintering birds, a high number of dragonfly species and many scarce plants.

The heathland of North Warren, Aldringham Common, The Walks and Thorpeness Common is a fragment of the once extensive Sandlings heaths of coastal Suffolk and is of varying composition. There are patches of sand sedge *Carex arenaria* and heather *Calluna vulgaris* dispersed within acid grassland. Bracken *Pteridium aquilinum* and scrub, notably gorse *Ulex europaeus* and *U. gallii* also form part of the heathland. The short sward acidic grassland is dominated by sheep's-fescue *Festuca ovina* and common bent *Agrostis capillaris* with some bare patches, bryophytes and lichens. There is a varied associated flora including lady's bedstraw *Galium verum*, sheep's sorrel *Rumex acetosella* and the nationally scare mossy stonecrop *Crassula tillea* and clustered clover *Trifolium glomeratum*.

On the vegetated shingle there is a gradual transition between the strandline community and the shingle heath resulting from increasing stability and distance from tidal influence. On the open shingle, sea-kale *Crambe maritima* and yellow horned-poppy *Glaucium flavum* are frequent with the irregularly occurring sea spurge *Euphorbia paralias.* The stable shingle areas support many species including early hair-grass *Aira praecox*, the nationally scarce sand catchfly *Silene conica*, dune fescue

Vulpia fasciculata, bur medick *Medicago minima*, suffocated clover *Trifolium suffocatum* and sea pea *Lathyrus japonicus*.

Thorpeness Mere is a shallow, eutrophic water body on a peat substrate. The adjacent areas of swamp and carr woodland are hydrologically dependant on the mere. To the south of the mere, grey willow *Salix cinerea* woodland surrounds a fragmentary mosaic of fen communities, mostly reed dominant *Phragmites australis* with nettle *Urtica dioica*, hemp-agrimony *Eupatorium cannabinum* and wild parsnip *Pastinaca sativa*. In the fen meadow areas there is a richer suite of species including a large colony of adder's tongue *Ophioglossum vulgatum*.

Church Farm Marshes south of the mere consists of grassland that is mostly a mix of creeping bent *Agrostis stolonifera*, Yorkshire-fog *Holcus lanatus* and perennial rye-grass *Lolium perenne* with frequent crested dog's-tail *Cynosurus cristatus*. It is dissected by ditches dominated by spiked water-milfoil *Myriophyllum spicatum* and fennel pondweed *Potamogeton pectinatus* with water-crowfoot *Ranunculus baudotii* in the shallow margins.

The Fens area is dominated by common reed *Phragmites australis* with occasional lesser bulrush *Typha angustifolia*, yellow iris *Iris pseudacorus*, great willowherb *Epilobium hirsutum*, purple-loosestrife *Lythrum salicaria* and nationally scarce marsh sow-thistle *Sonchus palustris*. Water mint *Mentha aquatica* is present in the understorey with cleavers *Galium aparine* and bittersweet *Solanum dulcamara* frequent in the drier areas. Surrounding, and in many places merging into the fen, is grey willow *Salix cinerea* woodland and alder *Alnus glutinosa* woodland with a field layer containing a mix of remnant swamp species.

Many species of bird regularly breed using the great mix of habitats available. These include nightjar, woodlark and skylark on the dry grassland and heath. The scrub and woodland supports tree pipit, turtle dove, bullfinch and nightingale. The marshes, the open water and their margins, in particular, support a diverse range of breeding birds, including water rail, marsh harrier, gadwall and grasshopper warbler. The site is also attractive to wintering waterfowl including Bewick's swan and bittern and regularly supports important populations of white-fronted goose, gadwall and teal.

The variety of water bodies and terrestrial habitats provides suitable breeding and hunting areas for many species of dragonfly and damselfly, including the nationally scarce hairy dragonfly *Brachytron pratense.*