The Sizewell C Project

5.10 Shadow Habitats Regulations Assessment Volume 1: Screening and Appropriate Assessment Part 5 of 5

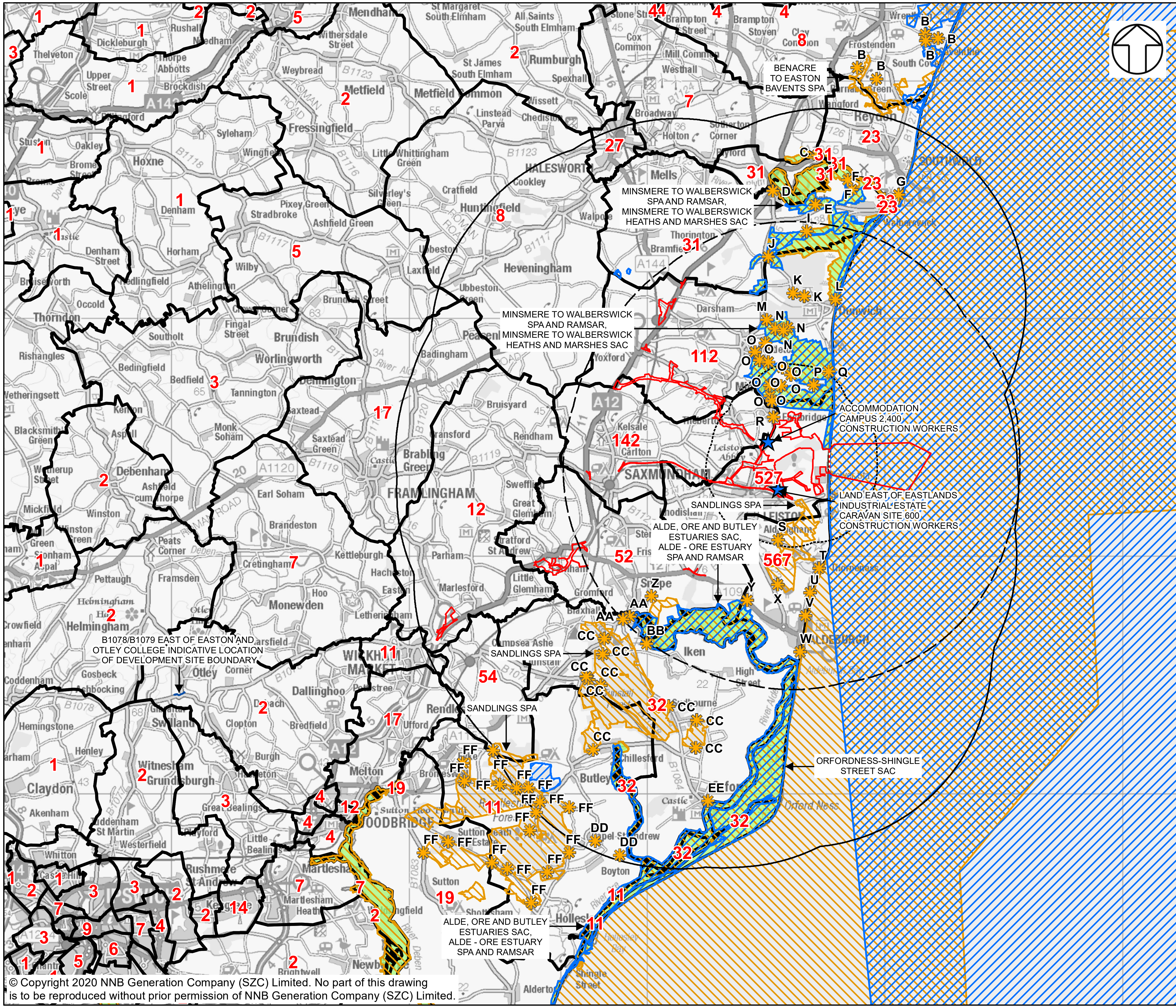
Revision: 1.0

Applicable Regulation: Regulation 5(2)(g)

PINS Reference Number: EN010012

May 2020

Planning Act 2008
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009



NOTES

KEY

- SIZEWELL C AND ASSOCIATED DEVELOPMENT SITE BOUNDARIES
- DEMARCATION LINE
- B1078/B1079 EAST OF EASTON AND OTLEY COLLEGE INDICATIVE LOCATION OF DEVELOPMENT SITE BOUNDARY
- ZONE OF PHYSICAL CHANGE (2KM BUFFER AROUND MAIN DEVELOPMENT SITE)
- DISPLACEMENT ZONE (8KM BUFFER AROUND MAIN DEVELOPMENT SITE)
- BUFFER ZONE (STUDY AREA) (8KM BUFFER AROUND SETTLEMENTS IN DISPLACEMENT ZONE)
- ACCESS SITE LOCATIONS AT EUROPEAN SITES

EUROPEAN SITES

- SPECIAL AREA OF CONSERVATION (SAC)
- SPECIAL PROTECTION AREA (SPA)
- RAMSAR
- CONSTRUCTION WORKERS ACCOMMODATION LOCATIONS
- 55 GEOGRAPHICAL DISTRIBUTION OF NON-HOME BASED (NHB) CONSTRUCTION WORKERS IN PRIVATE RENTAL AND TOURIST ACCOMMODATION SECTORS BY WARD AT PEAK NUMBERS DURING SZC CONSTRUCTION PERIOD. MODELLED BY QUOD USING A GRAVITY MODEL.

2011 MERGED WARDS HAVE BEEN USED FOR THE GRAVITY MODEL, AS THEY PROVIDE THE LATEST CONSISTENT ADMINISTRATIVE GEOGRAPHY FOR THE UK AND ARE ATTRIBUTED WITH THE ACCOMMODATION AND POPULATION DATA USED AS INPUTS TO THE MODEL. IT IS ACKNOWLEDGED THAT WARD BOUNDARIES HAVE BEEN REVIEWED IN EAST AND WEST SUFFOLK FOLLOWING ADMINISTRATIVE BOUNDARY CHANGES, RESULTING IN MINOR CHANGES TO THE BOUNDARIES SHOWN ON THIS MAP.

NOT PROTECTIVELY MARKED

DOCUMENT:
SIZEWELL C
SHADOW HRA REPORT
APPENDIX E
RECREATIONAL EVIDENCE

DRAWING TITLE:
MODELLED DISTRIBUTION OF NON HOME BASED CONSTRUCTION WORKERS IN PRIVATE RENTAL AND TOURIST ACCOMMODATION AT PEAK

DRAWING NO:
FIGURE 011

DATE:	DRAWN:	SCALE :
JAN 2020	V.W.	1:150,000 @A3

SCALE BAR
0 1 2 3 4 5 KM

Appendix B: Maps of RSPB Minsmere

RSPB Minsmere Trail Map downloaded on 19 November 2019 from: https://www.rspb.org.uk/globalassets/downloads/documents/reserves/minsmere-trail-guide.pdf

RSPB Public Access Map

Minsmere

Finding your way around

To discover what makes Minsmere special, start exploring today.

The trails take you through a variety of different habitats, bringing you closer to some of Minsmere's most interesting wildlife, from impressive red deer to tiny insects, familiar blue tits to elusive bitterns. Families will love the short loop through the woods to our Wild Zone, build a den area and Discovery Centre. Extend the walk further by strolling to the Wildlife Lookout to see what's about.

Most of the paths are easy access, apart from the beach, Woodland trail and the section between Bittern and Island Mere hides. A mobility scooter is available to borrow from reception.

Coast trail

A 2 mile (3.4 km) circular walk.

This path takes you through the North Bushes, where tired migrant birds refuel, and along the North Wall, which affords great views over the reedbeds. There are five hides overlooking the lagoons – known as the Scrape – where gulls, terns and avocets nest, migrant wading birds feed and hundreds of ducks spend the winter. Head south from the sluice to scan the Minsmere Levels, then return through the reedbeds. The walk should take about two hours.

Island Mere trail

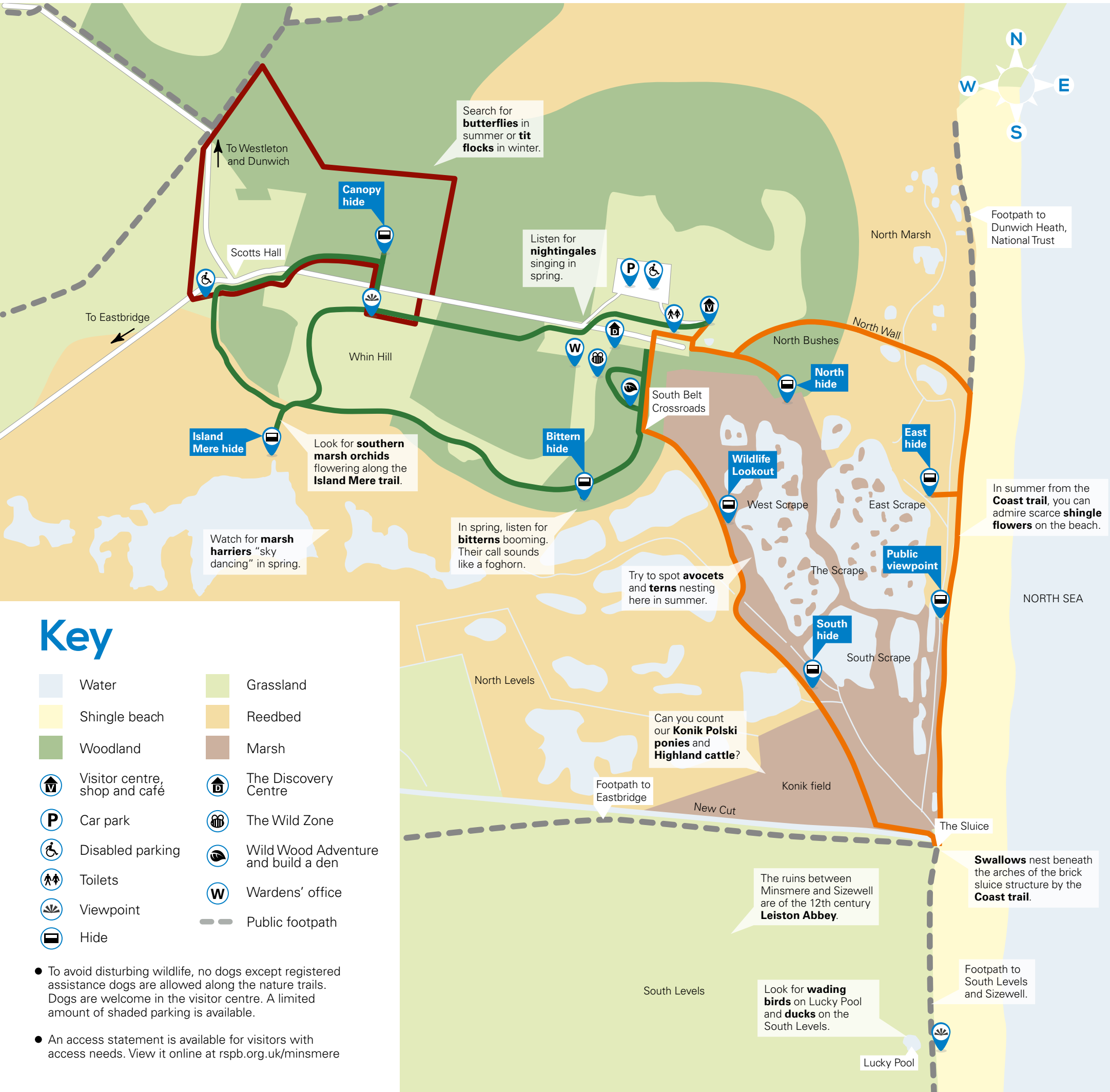
A 1.5 mile (2.4 km) circular walk.

A lovely walk through oak woodland to raised hides overlooking the reedbeds. Listen to the chorus of birdsong in spring or spot tit and finch flocks in winter. Look out for red deer too. Bittern hide offers superb views from five metres above the reeds, while Island Mere hide is spacious with great views of the mere. Return via Canopy hide, which is great for watching insects in summer, and relax in the skywatching seats on Whin Hill before returning to the visitor centre. Allow two hours to complete the walk.

Woodland trail

A 1 mile (1.5 km) circular walk.

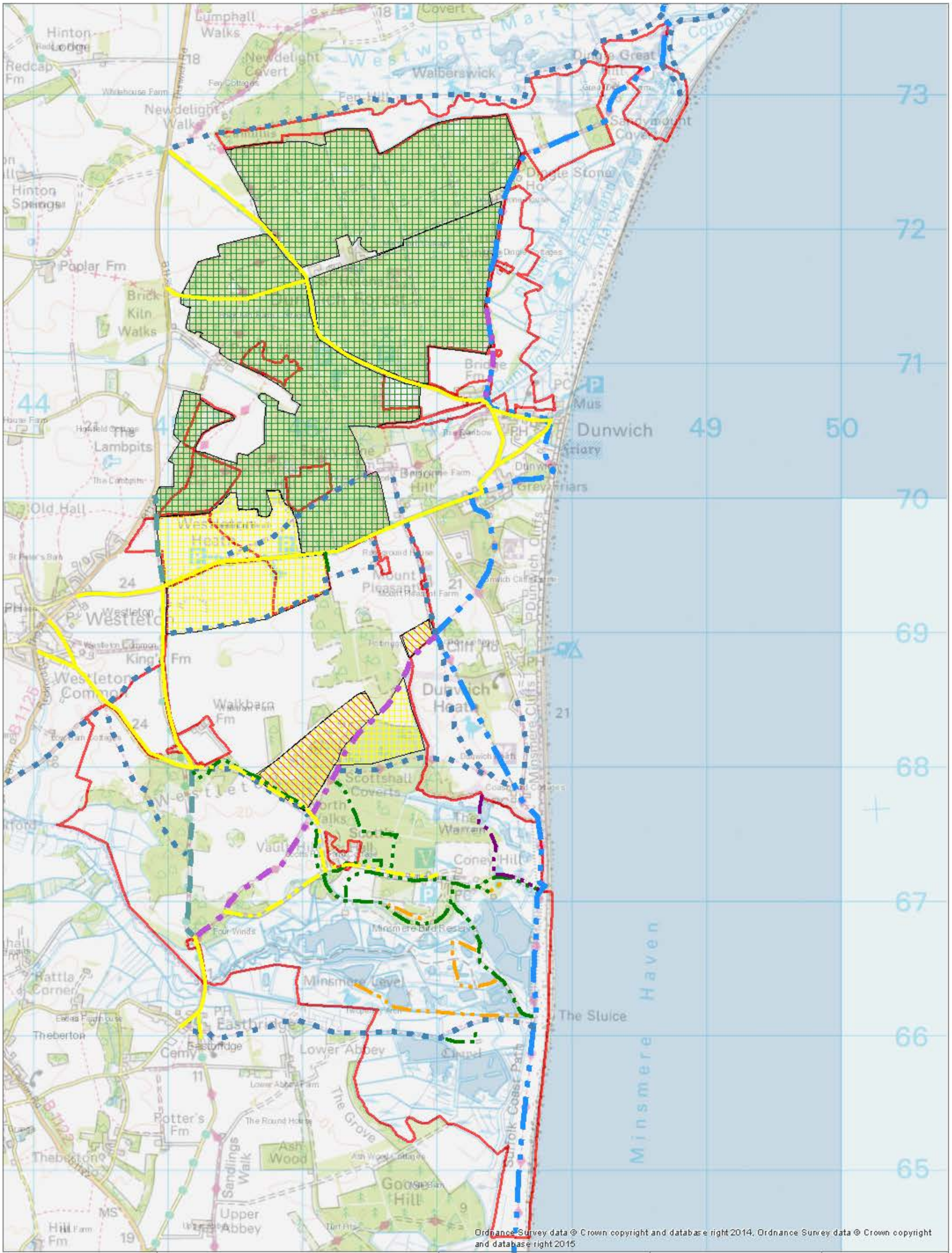
This unsurfaced path takes you deep into Minsmere's woodlands. There you can search for bluebells in May and insects in summer, including beautiful white admiral and purple hairstreak butterflies, Norfolk and southern hawker dragonflies, and a variety of hoverflies. The path links up with the public bridleway from Eastbridge to Dunwich to allow further exploration. It should take you about one hour to complete the trail circuit.



Key

- Water
- Shingle beach
- Woodland
- Visitor centre, shop and café
- Car park
- Disabled parking
- Toilets
- Viewpoint
- Hide
- Grassland
- Reedbed
- Marsh
- The Discovery Centre
- The Wild Zone
- Wild Wood Adventure and build a den
- Wardens' office
- Public footpath

- To avoid disturbing wildlife, no dogs except registered assistance dogs are allowed along the nature trails. Dogs are welcome in the visitor centre. A limited amount of shaded parking is available.
- An access statement is available for visitors with access needs. View it online at rspb.org.uk/minsmere



Map 7: Public Access

Legend:

- Potential future coastal path route
- Seasonal visitor trails
- Permissive vehicle access
- Permissive paths
- Public road
- Bridleway
- Byway open to all traffic (BOAT)
- Public footpath
- Suffolk Coast Path
- Open Access Land with seasonal closure
- Open Access Land
- FC Open Access Land
- RSPB Reserves - Public (UK)

Acknowledgements & notes:

Created by: RSPB

N

0 0.2 0.4 0.8 km

Map scale = 1:24,741 Date printed: 11/11/2015

rspb giving nature a home

Appendix C: Existing Visitor Survey Data Of RSPB Minsmere

Royal Society for the Protection of Birds (RSPB). Minsmere Visitor Satisfaction Survey 2017

Royal Society for the Protection of Birds (RSPB). Minsmere Visitor Survey Data 2014-2015 and 2015-2016

Royal Society for the Protection of Birds (RSPB). Minsmere Visitor Numbers and Targets by Category 2014-2019

Visitor Satisfaction Survey

ID ID

234 (100.0%)

Month Month

April 2017	0 (0.0%)
May 2017	24 (10.3%)
June 2017	37 (15.8%)
July 2017	35 (15.0%)
August 2017	58 (24.8%)
September 2017	67 (28.6%)
October 2017	13 (5.6%)
November 2017	0 (0.0%)
December 2017	0 (0.0%)
January 2018	0 (0.0%)
February 2018	0 (0.0%)
March 2018	0 (0.0%)

Site	Reserve
Arne	0 (0.0%)
Belfast Lough	0 (0.0%)
Bempton Cliffs	0 (0.0%)
Blacktoft Sands	0 (0.0%)
Burton Mere (Dee Estuary)	0 (0.0%)
Conwy	0 (0.0%)
Coombes Valley	0 (0.0%)
Dungeness	0 (0.0%)
Fairburn Ings	0 (0.0%)
Frampton Marsh	0 (0.0%)
Ham Wall	0 (0.0%)
Lake Vyrnwy	0 (0.0%)
Lakenheath Fen	0 (0.0%)
Leighton Moss	0 (0.0%)
Loch Garten	0 (0.0%)
Loch Leven	0 (0.0%)
Lochwinnoch	0 (0.0%)
Mersehead	0 (0.0%)
Minsmere	234 (100.0%)
Newport Wetlands	0 (0.0%)
Old Moor (Dearne Valley)	0 (0.0%)
Pagham Harbour	0 (0.0%)
Pulborough Brooks	0 (0.0%)
Radipole Lake	0 (0.0%)
Rainham Marshes	0 (0.0%)
Rathlin Island (Seabird Centre)	0 (0.0%)
Rye Meads	0 (0.0%)
Saltholme	0 (0.0%)
Sandwell Valley	0 (0.0%)
South Stack Cliffs	0 (0.0%)
Strumpshaw Fen	0 (0.0%)
The Lodge	0 (0.0%)
Titchwell Marsh	0 (0.0%)
Ynys-hir	0 (0.0%)
St. Aidans	0 (0.0%)
Middleton Lakes	0 (0.0%)
Sherwood Forest	0 (0.0%)

Q1 How frequently do you visit this reserve?

This is my first visit	62 (26.7%)
Weekly or more often	9 (3.9%)
Every 2 - 3 weeks	14 (6.0%)
Once a month	16 (6.9%)
Every 2 - 3 months	34 (14.7%)
Every 4 - 5 months	18 (7.8%)
Every 6 - 11 months	30 (12.9%)
Once a year	29 (12.5%)
Less often	20 (8.6%)

Q2 How long have you spent on the reserve today?

Less than an hour	5 (2.2%)
1 - 2 hours	15 (6.6%)
2 - 3 hours	61 (26.8%)
3 - 4 hours	50 (21.9%)
4 - 5 hours	48 (21.1%)
5 - 6 hours	27 (11.8%)
6+ hours	22 (9.6%)

Q3 Which, if any, of the following describes the reason for your visit to this reserve?

I came here for a walk in the countryside / to enjoy the scenery	27 (14.5%)
I came here to explore / look for nature in general	45 (24.2%)
I came here specifically to bird watch today	89 (47.8%)
I came here for the visitor centre / shop / cafe	8 (4.3%)
Other	17 (9.1%)
Other,please specify	16 (100.0%)

Q4 What have you done, or plan to do, as part of your visit today?

Followed the trails	195 (84.1%)
Looked around the visitor centre/displays	127 (54.7%)
Bought something to eat or drink for the reserve's cafe/kiosk	213 (91.8%)
Took part in an event	14 (6.0%)
Looked around / bought something from the shop	129 (55.6%)

Q5 Thinking about your visit overall, how satisfied or dissatisfied are you with your visit?

Very satisfied	184 (79.7%)
Satisfied	43 (18.6%)
Neither satisfied nor dissatisfied	1 (0.4%)
Dissatisfied	2 (0.9%)
Very dissatisfied	1 (0.4%)

Q6 How would you rate the reserve on the following?

	Very Good	Good	Neither good nor bad	Poor	Very poor	Don't know
Standard of maintenance and upkeep	162 (72.6%)	57 (25.6%)	3 (1.3%)	0 (0.0%)	0 (0.0%)	1 (0.4%)
Friendliness of staff	190 (85.6%)	31 (14.0%)	1 (0.5%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Quality of the facilities for my group	107 (59.1%)	51 (28.2%)	6 (3.3%)	0 (0.0%)	0 (0.0%)	17 (9.4%)
Quality of facilities for visitors with disabilities	38 (22.5%)	32 (18.9%)	9 (5.3%)	0 (0.0%)	1 (0.6%)	89 (52.7%)
Visit here today in terms of overall quality of experience	151 (70.6%)	61 (28.5%)	1 (0.5%)	1 (0.5%)	0 (0.0%)	0 (0.0%)

Q7 How far would you agree or disagree with the following statements regarding your visit to this reserve today?

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know
I am likely to visit this reserve again	187 (83.9%)	27 (12.1%)	4 (1.8%)	1 (0.4%)	0 (0.0%)	4 (1.8%)
I learnt something new about nature / wildlife	77 (38.9%)	60 (30.3%)	52 (26.3%)	6 (3.0%)	2 (1.0%)	1 (0.5%)
I feel I have experienced nature / wildlife today	122 (68.2%)	48 (26.8%)	9 (5.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
My visit has met my expectations	150 (70.8%)	54 (25.5%)	5 (2.4%)	3 (1.4%)	0 (0.0%)	0 (0.0%)

Q8 Are you currently a member of the RSPB?

Yes	180 (80.0%)
No	45 (20.0%)

Q9 Which of the following best describes you personally?

I am local to this area (within 10 miles)	22 (9.9%)
I am holidaying within the local area (within 10 miles)	63 (28.3%)
I am holidaying but not within the local area	34 (15.2%)
I have travelled from home but do not live within 10 miles of the reserve	104 (46.6%)

Q10 Which of the following age groups do you fit into?

24 or younger	10 (4.5%)
25-34	7 (3.2%)
35 - 44	13 (5.9%)
45 - 54	28 (12.7%)
55 - 64	73 (33.2%)
65 - 74	76 (34.5%)
75+	13 (5.9%)

Q11 Who did you visit the reserve with today?

By myself	9 (4.0%)
With another adult	153 (67.7%)
With a group of adults	40 (17.7%)
With child(ren) under 16 either by myself or with other adults	24 (10.6%)

Q12 Finally, which postcode area do you live in?

219 (100.0%)

Minsmere

M1 How did you arrive at the reserve today?

Public transport	0 (0.0%)
Car (Petrol/diesel)	0 (0.0%)
Car (electric powered)	0 (0.0%)
Motor bike	0 (0.0%)
Bicycle	0 (0.0%)
On foot	0 (0.0%)

M2 Do you, or a member of your party, have a disability or a long-term health condition which affects your day to day activities?

Yes	0 (0.0%)
No	0 (0.0%)
Would prefer not to answer	0 (0.0%)

M3 Thinking about your visit today, how far would you agree or disagree with the statements below?

	Strongly agree	Slightly agree	Neither	Slightly disagree	Strongly disagree	Not applicable
I have gained new knowledge about the work of the RSPB	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
My visit today has given me more confidence to connect with nature	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
I have developed my understanding about the managementof this reserve	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
I have had an enjoyable visit	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
I intend to make a return visit to this reserve	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)

M4 If you live locally, do you agree or disagree with the following statements?

	Strongly agree	Slightly agree	Neither	Slightly disagree	Strongly disagree	Not applicable
The reserve provides great facilities for the local community	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
The reserve provides local school children with the chance to connect with nature	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
The events programme regularly includes something that interests me	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
The reserve plays an important part in the life of the local community	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)

M5 Thinking about your visit today, what did you enjoy most?

0 (0.0%)

M6 And finally, how could we improve your visit for next time?

0 (0.0%)

Your Opinions Matter!

Minsmere Combined Data 2014/15

We would like to know about your visit here today, so we can make it even better for the next time! The survey is easy to complete and should only take a few minutes. Once you have completed the survey, please return it to a member of staff or volunteer.

N5 Serial Number

1206 (100%)

Q1 Please enter today's date: 1204 (100%)

Q2 What time did you arrive today? 1193 (99%)

Q3 Approximately, how long did/will you spend visiting this reserve today?

Less than 1 hour	19 (2%)	3 - 6 hours	871 (72%)
1 - 2 hours	203 (17%)	6 or more hours	107 (9%)

Q4 How often do you visit the following places...

	Never visited before	*Weekly*	*Monthly*	*Quarterly*	*Yearly*	*Less than yearly*
Nature reserves (including non-RSPB)	*36 (3%)*	*141 (12%)*	*365 (30%)*	*375 (31%)*	*136 (11%)*	*87 (7%)*
Other RSPB nature reserves	77 (6%)	35 (3%)	200 (17%)	348 (29%)	222 (18%)	189 (16%)
This particular nature reserve	235 (19%)	48 (4%)	165 (14%)	269 (22%)	219 (18%)	209 (17%)

Q5 What were the main triggers for visiting this reserve today?

Have visited before so knew about the reserve	335 (64%)	Tourist information centre	7 (1%)
RSPB website	50 (10%)	Recommended by friends/family/other	77 (15%)
RSPB reserve leaflet	10 (2%)	Radio advert	3 (1%)
RSPB posters	2 (0%)	Television advert	36 (7%)
RSPB birds magazine	55 (11%)	Local press advert	6 (1%)
Brown road signs	10 (2%)	National press advert	3 (1%)
RSPB signs	10 (2%)	Other website advert	5 (1%)
Saw it on the map	23 (4%)		

Q5 **What were the main triggers for visiting this reserve today?**

Have visited before so knew about the reserve	509 (74%)	Tourist information centre	3 (0%)
RSPB website	59 (9%)	Recommended by friends/family/other	114 (17%)
RSPB reserve leaflet	15 (2%)	Radio advert	2 (0%)
RSPB posters	3 (0%)	Television advert	19 (3%)
RSPB birds magazine	41 (6%)	Local press advert	4 (1%)
Brown road signs	12 (2%)	National press advert	3 (0%)
RSPB signs	8 (1%)	Social media i.e Facebook/Twitter etc	10 (1%)
Saw it on the map	15 (2%)	Other website advert	16 (2%)

Q6 **Have you done, or are you planning to do, any of the following activities today? Please tick all that are applicable.**

Go for a walk/follow a trail	1079 (89%)	Look around the Visitor Centre/displays	852 (71%)
Take part in an organised event	75 (6%)	Look around/buy something from the reserve's shop	796 (66%)
Look for plants or other wildlife	699 (58%)	Buy something to eat or drink from the reserve's cafe/kiosk	1148 (95%
Visit one or more hides	1024 (85%)		
Watch for birds	1089 (90%)	Walk the Dog	0 (0%)

Q7 **Thinking about your visit today, please rate the reserve for each of the following:**

	Excellent	*Good*	*OK*	*Poor*	*Very poor*	*Don't know*
Standard of maintenance and upkeep	740 (61%)	432 (36%)	21 (2%)	0 (0%)	0 (0%)	2 (0%)
Friendliness and welcome of staff	929 (77%)	248 (21%)	15 (1%)	3 (0%)	0 (0%)	0 (0%)
Quality of facilities for families	433 (36%)	380 (32%)	38 (3%)	1 (0%)	1 (0%)	288 (24%)
Quality of facilities for visitors with disabilities	227 (19%)	267 (22%)	82 (7%)	8 (1%)	3 (0%)	535 (44%)
Visit here today in terms of overall quality of experience	754 (63%)	407 (34%)	22 (2%)	0 (0%)	0 (0%)	1 (0%)

Q8 **As a result of your visit today, how likely are you to support the RSPB in the following ways:**

	Already done	*Very likely*	*Likely*	*Unlikely*	*Not likely at all*	*Don't know*
Visit another RSPB reserve	632 (52%)	305 (25%)	156 (13%)	21 (2%)	6 (0%)	26 (2%)
Recommend visiting RSPB reserves to a friend	491 (41%)	425 (35%)	184 (15%)	10 (1%)	4 (0%)	22 (2%)
Become a member	838 (69%)	30 (2%)	67 (6%)	103 (9%)	33 (3%)	46 (4%)
Volunteer with the RSPB	71 (6%)	37 (3%)	119 (10%)	415 (34%)	201 (17%)	154 (13%)
Buying an RSPB product e.g. buying from the online catalogue	320 (27%)	141 (12%)	312 (26%)	185 (15%)	55 (5%)	71 (6%)
Take part in community fundraising activities to support the RSPB	45 (4%)	41 (3%)	170 (14%)	433 (36%)	194 (16%)	144 (12%)
Consider other ways to support the RSPB	86 (7%)	68 (6%)	341 (28%)	253 (21%)	107 (9%)	176 (15%)

Q9 **Thinking about your experience today, how far would you agree or disagree with the statements below?**

	Strongly agree	*Slightly agree*	*Neither*	*Slightly disagree*	*Strongly disagree*	*Not applicable*
There was lots for me to do	854 (71%)	241 (20%)	37 (3%)	8 (1%)	2 (0%)	18 (1%)
There was lots for families to do	480 (40%)	223 (18%)	38 (3%)	7 (1%)	5 (0%)	371 (31%)
It was peaceful and gave me a place to relax	897 (74%)	217 (18%)	38 (3%)	24 (2%)	2 (0%)	8 (1%)
My visit today has inspired me about the work of the RSPB	467 (39%)	340 (28%)	237 (20%)	16 (1%)	15 (1%)	52 (4%)
I have gained new knowledge or understanding as a result of my visit	452 (37%)	361 (30%)	226 (19%)	25 (2%)	16 (1%)	49 (4%)
Visiting this RSPB reserve gave me the chance to get close to wildlife	904 (75%)	211 (17%)	35 (3%)	8 (1%)	1 (0%)	7 (1%)

Q10 **Please tell us which of the following statements sound like you personally**

	Yes, this sounds like me!	*No, this doesn't sound like me.*
I spend somewhere between 6 - 20 hours per week outdoors? (excluding work)	963 (80%)	182 (15%)
Spending time outdoors is a very important part of my life	1120 (93%)	51 (4%)
Having green open spaces close to where I live is very important to me	1161 (96%)	14 (1%)
I believe regularly engaging with nature is a fundamental part of a child's happy and healthy upbringing	1129 (94%)	23 (2%)
I would be prepared to make changes to my lifestyle to help the environment	1035 (86%)	84 (7%)
I would be interested in finding out what I can do to help/support local environmental issues	697 (58%)	353 (29%)
I am likely to sign a petition about an issue affecting nature/the environment	978 (81%)	141 (12%)
I would consider actively helping with a project to support nature/the environment	688 (57%)	365 (30%)

Q11 **Which of the following statements best describes you personally?**

I live within 10 miles of this reserve 108 (9%)

I have come from home more than 10 miles away on a day trip to visit this reserve 546 (45%)

I am holidaying in the area and staying near to this reserve 448 (37%)

I am holidaying elsewhere but made a day trip to visit this reserve 70 (6%)

Q12 **Are you currently a member of the RSPB?**

Yes 897 (74%)

No 293 (24%)

Q13 **Please describe the group you are visiting with today:**

Visiting on my own 50 (4%)

Visiting with one other adult 732 (61%)

Visiting with three or more adults 266 (22%)

Visiting with a child/children under 16 ..... 266 (22%)

Q14 **What is your age group?**

<25 ..... 49 (4%)

25-29 ..... 14 (1%)

30-34 ..... 42 (3%)

35-44 ..... 155 (13%)

45-54 ..... 193 (16%)

55-64 ..... 311 (26%)

65-74 ..... 272 (23%)

75-84 ..... 57 (5%)

85+ 1 (0%)

In which Postcode and County do you normally live? (Please write in)

Postcode: 1155 (96%)

County: 1131 (94%)

Q16

Please sum up the most memorable aspects of your visit here today in three words

1037 (86%)

s17 Q17. Do you live in the local area?

Yes	0 (0%)
No	0 (0%)

s18 Q18. What is your ethnicity?

English/Welsh/Scottish/Northern Irish British	0 (0%)
Irish	0 (0%)
Asian or Asian British Indian	0 (0%)
Asian or Asian British Pakistani	0 (0%)
Asian or Asian British Bangladeshi	0 (0%)
Asian other	0 (0%)
Chineses	0 (0%)
Black or Black Brisith African	0 (0%)
Black or Black Brisith Caribbean	0 (0%)
Black other	0 (0%)
Mixed - White / Asian	0 (0%)
Mixed - White / Black Caribbean	0 (0%)
Mixed - White / Black African	0 (0%)
Mixed - other	0 (0%)
Arab	0 (0%)
Other	0 (0%)

Q21 Q20. Thinking about your visit today, what did you enjoy the most?

1056 (88%)

s18 Other

0 (0%)

Q17 Q16. How did you arrive today?

Public transport	7 (1%)
Motor Bike	5 (0%)
Car (petrol/diesel)	1090 (90%)
Bicycle	16 (1%)
Car (electric powered)	7 (1%)
On foot	38 (3%)

Q18 Q17. Do you, or a member of your party, have a disability or a long term health condition which affects your day to day activities?

Yes	178 (15%)
No	970 (80%)
Would prefer not to answer	31 (3%)

Q19 Q18. I have gained new knowledge about the work of the RSPB

	Strongly agree	*Slightly agree*	*Neither*	*Slightly disagree*	*Strongly disagree*	*Not applicable*
I have gained new knowledge about the work of the RSPB	235 (19%)	359 (30%)	373 (31%)	51 (4%)	36 (3%)	60 (5%)
My visit today has given me more confidence to connect with nature	236 (20%)	286 (24%)	405 (34%)	39 (3%)	42 (3%)	96 (8%)
I have developed my understanding about the management of this reserve	205 (17%)	387 (32%)	363 (30%)	51 (4%)	37 (3%)	62 (5%)
I learnt something new about the history of this res...	140 (12%)	174 (14%)	231 (19%)	35 (3%)	26 (2%)	38 (3%)

I have had an enjoyable visit	1087 (90%)	77 (6%)	6 (0%)	1 (0%)	0 (0%)	1 (0%)
I intend to make a return visit to this reserve	995 (83%)	119 (10%)	39 (3%)	5 (0%)	1 (0%)	7 (1%)

Q20 **Q19. The reserve provides great facilities for the local community**

	Strongly agree	*Slightly agree*	*Neither*	*Slightly disagree*	*Strongly disagree*	*Not local*
The reserve provides great facilities for the local community	337 (28%)	61 (5%)	17 (1%)	1 (0%)	2 (0%)	286 (24%)
The reserve provides local school children with the change to connect with nature	348 (29%)	38 (3%)	15 (1%)	2 (0%)	1 (0%)	288 (24%)
The events programme regularly includes something that interests me	179 (15%)	114 (9%)	83 (7%)	7 (1%)	3 (0%)	295 (24%)
The reserve plays an important part in the life of the local community	269 (22%)	87 (7%)	30 (2%)	1 (0%)	5 (0%)	295 (24%)

Q22 **Q21. And finally, how could we improve your visit for next time?**

828 (69%)

Thank you for your valued contribution to our survey today!

Your Opinions Matter!

Minsmere 2015 - 2016

We would like to know about your visit here today, so we can make it even better for the next time! The survey is easy to complete and should only take a few minutes. Once you have completed the survey, please return it to a member of staff or volunteer.

Q1 **Please enter today's date:** 754 (99%)

Q2 **What time did you arrive today?** 755 (99%)

Q3 **Approximately, how long did/will you spend visiting this reserve today?**

Less than 1 hour	10 (1%)	3 - 6 hours	514 (68%)
1 - 2 hours	91 (12%)	6 or more hours	138 (18%)

Q4 **How often do you visit the following places...**

	Never visited before	*Weekly*	*Monthly*	*Quarterly*	*Yearly*	*Less than yearly*
Nature reserves (including non-RSPB)	*20 (3%)*	*113 (15%)*	*209 (28%)*	*224 (29%)*	*77 (10%)*	*57 (8%)*
Other RSPB nature reserves	55 (7%)	27 (4%)	135 (18%)	203 (27%)	146 (19%)	107 (14%)
This particular nature reserve	194 (26%)	25 (3%)	83 (11%)	149 (20%)	138 (18%)	123 (16%)

Q5 **What were the main triggers for visiting this reserve today?**

Have visited before so knew about the reserve	488 (64%)	Tourist information centre	9 (1%)
RSPB website	67 (9%)	Recommended by friends/family/other	121 (16%)
RSPB reserve leaflet	28 (4%)	Radio advert	0 (0%)
RSPB posters	4 (1%)	Television advert	69 (9%)
RSPB birds magazine	57 (8%)	Local press advert	5 (1%)
Brown road signs	18 (2%)	National press advert	1 (0%)
RSPB signs	8 (1%)	Social media i.e Facebook/Twitter etc	14 (2%)
Saw it on the map	30 (4%)	Other website advert	16 (2%)

Q6 **Have you done, or are you planning to do, any of the following activities today? Please tick all that are applicable.**

Go for a walk/follow a trail	668 (88%)	Look around the Visitor Centre/displays	526 (69%)
Take part in an organised event	43 (6%)	Look around/buy something from the reserve's shop	497 (65%)
Look for plants or other wildlife	495 (65%)	Buy something to eat or drink from the reserve's cafe/kiosk	700 (92%)
Visit one or more hides	671 (88%)		
Watch for birds	702 (92%)	Walk the Dog	0 (0%)

Q7 **Thinking about your visit today, please rate the reserve for each of the following:**

	Excellent	*Good*	*OK*	*Poor*	*Very poor*	*Don't know*
Standard of maintenance and upkeep	496 (65%)	235 (31%)	13 (2%)	0 (0%)	0 (0%)	0 (0%)
Friendliness and welcome of staff	595 (78%)	142 (19%)	11 (1%)	0 (0%)	0 (0%)	1 (0%)
Quality of facilities for families	267 (35%)	221 (29%)	21 (3%)	2 (0%)	0 (0%)	190 (25%)
Quality of facilities for visitors with disabilities	137 (18%)	183 (24%)	57 (8%)	6 (1%)	2 (0%)	316 (42%)
Visit here today in terms of overall quality of experience	512 (67%)	217 (29%)	10 (1%)	0 (0%)	1 (0%)	1 (0%)

Q8 **As a result of your visit today, how likely are you to support the RSPB in the following ways:**

	Already done	*Very likely*	*Likely*	*Unlikely*	*Not likely at all*	*Don't know*
Visit another RSPB reserve	396 (52%)	203 (27%)	97 (13%)	7 (1%)	1 (0%)	15 (2%)
Recommend visiting RSPB reserves to a friend	274 (36%)	304 (40%)	109 (14%)	7 (1%)	3 (0%)	10 (1%)
Become a member	538 (71%)	8 (1%)	38 (5%)	71 (9%)	22 (3%)	32 (4%)
Volunteer with the RSPB	45 (6%)	40 (5%)	82 (11%)	259 (34%)	125 (16%)	87 (11%)
Buying an RSPB product e.g. buying from the online catalogue	181 (24%)	81 (11%)	192 (25%)	136 (18%)	47 (6%)	43 (6%)
Take part in community fundraising activities to support the RSPB	37 (5%)	31 (4%)	111 (15%)	266 (35%)	122 (16%)	92 (12%)
Consider other ways to support the RSPB	46 (6%)	50 (7%)	218 (29%)	152 (20%)	68 (9%)	122 (16%)

Q9 **Thinking about your experience today, how far would you agree or disagree with the statements below?**

	Strongly agree	*Slightly agree*	*Neither*	*Slightly disagree*	*Strongly disagree*	*Not applicable*
There was lots for me to do	517 (68%)	139 (18%)	26 (3%)	8 (1%)	3 (0%)	25 (3%)
There was lots for families to do	274 (36%)	128 (17%)	29 (4%)	7 (1%)	2 (0%)	265 (35%)
It was peaceful and gave me a place to relax	573 (75%)	121 (16%)	21 (3%)	17 (2%)	1 (0%)	9 (1%)
My visit today has inspired me about the work of the RSPB	333 (44%)	197 (26%)	133 (18%)	8 (1%)	6 (1%)	34 (4%)
I have gained new knowledge or understanding as a result of my visit	323 (43%)	216 (28%)	122 (16%)	14 (2%)	6 (1%)	29 (4%)
Visiting this RSPB reserve gave me the chance to get close to wildlife	596 (78%)	105 (14%)	19 (3%)	4 (1%)	3 (0%)	4 (1%)

Q10 **Please tell us which of the following statements sound like you personally**

	Yes, this sounds like me!	*No, this doesn't sound like me.*
I spend somewhere between 6 - 20 hours per week outdoors? (excluding work)	634 (83%)	95 (13%)
Spending time outdoors is a very important part of my life	702 (92%)	33 (4%)
Having green open spaces close to where I live is very important to me	726 (96%)	8 (1%)
I believe regularly engaging with nature is a fundamental part of a child's happy and healthy upbringing	700 (92%)	17 (2%)
I would be prepared to make changes to my lifestyle to help the environment	638 (84%)	62 (8%)
I would be interested in finding out what I can do to help/support local environmental issues	457 (60%)	209 (28%)
I am likely to sign a petition about an issue affecting nature/the environment	596 (78%)	115 (15%)
I would consider actively helping with a project to support nature/the environment	441 (58%)	232 (31%)

Q11 **Which of the following statements best describes you personally?**

I live within 10 miles of this reserve 54 (7%)

I have come from home more than 10 miles away on a day trip to visit this reserve 303 (40%)

I am holidaying in the area and staying near to this reserve 311 (41%)

I am holidaying elsewhere but made a day trip to visit this reserve 68 (9%)

Q12 **Are you currently a member of the RSPB?**

Yes 559 (74%)

No 185 (24%)

Q13 **Please describe the group you are visiting with today:**

Visiting on my own 46 (6%)

Visiting with one other adult 502 (66%)

Visiting with three or more adults 145 (19%)

Visiting with a child/children under 16 ..... 120 (16%)

Q14 **What is your age group?**

<25 ..... 20 (3%)

25-29 ..... 7 (1%)

30-34 ..... 18 (2%)

35-44 ..... 95 (13%)

45-54 ..... 135 (18%)

55-64 ..... 187 (25%)

65-74 ..... 180 (24%)

75-84 ..... 42 (6%)

85+ 2 (0%)

In which Postcode and County do you normally live? (Please write in)

Postcode: 731 (96%)

County: 723 (95%)

Q16

Please sum up the most memorable aspects of your visit here today in three words

663 (87%)

Q17 Q16. How did you arrive today?

Public transport	5 (1%)
Motor Bike	2 (0%)
Car (petrol/diesel)	671 (88%)
Bicycle	13 (2%)
Car (electric powered)	3 (0%)
On foot	42 (6%)

Q18 Q17. Do you, or a member of your party, have a disability or a long term health condition which affects your day to day activities?

Yes	119 (16%)
No	603 (79%)
Would prefer not to answer	18 (2%)

Q19 Q18. I have gained new knowledge about the work of the RSPB

	Strongly agree	*Slightly agree*	*Neither*	*Slightly disagree*	*Strongly disagree*	*Not applicable*
I have gained new knowledge about the work of the RSPB	167 (22%)	221 (29%)	213 (28%)	20 (3%)	23 (3%)	50 (7%)
My visit today has given me more confidence to connect with nature	164 (22%)	184 (24%)	239 (31%)	14 (2%)	21 (3%)	68 (9%)
I have developed my understanding about the management of this reserve	145 (19%)	250 (33%)	210 (28%)	21 (3%)	22 (3%)	44 (6%)
I have had an enjoyable visit	685 (90%)	40 (5%)	6 (1%)	2 (0%)	0 (0%)	1 (0%)
I intend to make a return visit to this reserve	611 (80%)	78 (10%)	16 (2%)	9 (1%)	4 (1%)	15 (2%)

Q20 Q19. The reserve provides great facilities for the local community

	Strongly agree	*Slightly agree*	*Neither*	*Slightly disagree*	*Strongly disagree*	*Not local*
The reserve provides great facilities for the local community	160 (21%)	34 (4%)	11 (1%)	2 (0%)	0 (0%)	186 (24%)
The reserve provides local school children with the change to connect with nature	168 (22%)	22 (3%)	6 (1%)	0 (0%)	0 (0%)	195 (26%)
The events programme regularly includes something that interests me	89 (12%)	40 (5%)	44 (6%)	6 (1%)	0 (0%)	199 (26%)
The reserve plays an important part in the life of the local community	137 (18%)	30 (4%)	26 (3%)	0 (0%)	1 (0%)	192 (25%)

Q21 Q20. Thinking about your visit today, what did you enjoy the most?

664 (87%)

Q22 **Q21. And finally, how could we improve your visit for next time?**

523 (69%)

Thank you for your valued contribution to our survey today!

Period **Survey period**

Summer 15 ..... 598 (79%)

Winter 15/16 ..... 162 (21%)

Visitor numbers and targets by category

		April	May	June	July	August	September	October	November	December	January	February	March	Total
Member adults	2014	7566	10088	8770	7362	7626	6920	**8031**	4484	3144	3940	4327	5290	77548
	2015	**9514**	**11828**	**9854**	7202	8096	**7664**	7945	4028	3270	**4037**	4546	**6423**	84407
	2016	8266	10576	9152	**7632**	**9559**	7094	7868	**4854**	**3668**	3919	**4625**	6344	83557
	2017	9807	9917	7497	7276	7161	6703	7583	4004	2539	4038	6107	4498	77130
	2018	7798	9953	7122	5738	6638	6357	7001	4132	3145	3719	5342	5517	72462
Member children	2014	775	853	410	618	1484	**337**	779	179	229	244	556	277	6741
	2015	**890**	**1307**	457	**691**	1585	304	766	153	219	283	524	**578**	7757
	2016	808	641	**851**	686	**1593**	329	**911**	**204**	**345**	**294**	**596**	239	7497
	2017	1313	593	348	652	1346	324	759	152	193	303	857	263	7103
	2018	913	725	311	515	1304	368	635	215	294	242	614	232	6368
Total members	2014	8341	10941	9180	7980	9110	7257	**8810**	4663	3373	4184	4883	5567	84289
	2015	**10404**	**13135**	**10311**	7893	9681	**7968**	8711	4181	3489	**4297**	5070	**7001**	92141
	2016	9074	11217	10003	**8318**	**11152**	7423	8779	**5058**	**4013**	4213	**5221**	6583	91054
	2017	11120	10510	7845	7928	8507	7027	8342	4156	2732	4340	6964	4761	84232
	2018	8711	10678	7433	6253	7942	6725	7636	4347	3439	3961	5956	5749	78830
Non member adults	2014	1276	1852	2450	2137	2546	1587	1399	600	436	442	729	840	16294
	2015	**1881**	**2219**	**2975**	**2627**	3066	1788	1384	524	484	424	**896**	**1333**	19601
	2016	1514	2111	2778	2421	**3222**	**1817**	**1724**	**602**	**520**	**536**	793	1000	19038
	2017	2159	1848	1590	1669	2427	1469	1395	601	270	472	1078	698	15676
	2018	1550	1880	1702	1616	2024	1424	1418	546	458	392	882	910	14802
Non member children	2014	326	**409**	167	287	838	108	256	46	68	46	**200**	74	2825
	2015	**355**	349	171	**392**	881	78	260	**47**	72	58	186	**156**	3005
	2016	303	212	**362**	327	**890**	**124**	**296**	46	**78**	**63**	183	61	2945
	2017	548	229	119	280	648	98	279	20	25	58	246	58	2608
	2018	328	178	94	210	557	110	299	48	71	49	168	71	2183
Total non members	2014	1602	2261	2617	2424	3384	1695	1655	646	504	488	929	914	19119
	2015	**2236**	**2568**	**3146**	**3019**	3947	1866	1644	571	556	482	**1082**	**1489**	22606
	2016	1817	2323	3145	2748	**4139**	**1941**	**2020**	**648**	**598**	**599**	976	1061	22015
	2017	2707	2077	1709	1949	3075	1567	1674	621	295	530	1324	756	18284
	2018	1878	2058	1796	1826	2581	1534	1717	594	529	441	1050	981	16985
Centre only	2014	557	685	704	609	835	545	758	770	801	**721**	681	751	8417
	2015	**745**	**734**	808	713	**927**	677	747	821	861	694	**791**	**803**	9321
	2016	686	602	**864**	**761**	787	**734**	**933**	**850**	**901**	681	565	646	9010
	2017	814	722	644	794	729	796	745	755	827	685	554	565	8630
	2018	626	671	609	564	827	656	750	763	749	624	595	598	8032
Total visitors	2014	10500	13887	12501	11013	13329	9497	11223	6079	4678	5393	6493	7232	111825
	2015	**13385**	**16437**	**14265**	11625	14555	**10511**	11102	5573	4906	**5497**	**6943**	**9293**	124092
	2016	11577	14142	14007	**11827**	**16051**	10098	**11732**	**6556**	**5512**	5493	6762	8290	122047
	2017	14641	13309	10198	10671	12301	9390	10761	5532	3864	5555	8842	6082	111146
	2018	11215	13407	9838	8643	11350	8915	10098	5704	4717	5026	7603	7328	103844
Cumulative total 2014		**10500**	**24387**	**36888**	**47901**	**61230**	**70727**	**81950**	**88029**	**92707**	**98100**	**104593**	**111825**	
Cumulative total 2015		***13385***	***29822***	***44087***	***55712***	***70267***	***80778***	***91880***	***97453***	***102359***	***107856***	***114799***	***124092***	
Cumulative total 2016		***11577***	***25719***	***39726***	***51553***	***67604***	***77702***	***89434***	***95990***	***101502***	***106995***	***113757***	***122047***	
Cumulative total 2017		***14641***	***27950***	***38148***	***48819***	***61120***	***70510***	***81271***	***86803***	***90667***	***96222***	***105064***	***111146***	
Cumulative total 2018		***11215***	***24622***	***34460***	***43103***	***54453***	***63368***	***73466***	***79170***	***83887***	***88913***	***96516***	***103844***	

Appendix D: Assessment of the proportion of long-term rental properties allowing tenants to keep a dog

Research note of the Sizewell C Evidence Base for EDF Energy, Stephen Jenkinson, January 2016

ACCESS & COUNTRYSIDE MANAGEMENT
stephen jenkinson

Assessment of the proportion of long-term rental properties allowing tenants to keep a dog

Research note for the Sizewell C evidence base for EDF Energy

27 January 2016

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CONTENTS

1 PURPOSE

This preliminary research aimed to identify the proportion of properties available on long-term lets that would accept a tenant with a dog. This was done to help better assess the degree to which workers employed on the Sizewell C development would be likely to walk dogs on Natura 2000 sites in the area.

2 METHOD

On 16th January 2016 a search was undertaken using the largest on-line lettings agency website (www.rightmove.co.uk) to identify letting agents and available properties within a 20 mile radius of Saxmundham.

Saxmundham was chosen as the centre of the search, as opposed to Leiston or Sizewell, to reduce the potential for the survey to be associated with the Sizewell development, while still giving an accurate representation of the local letting situation around Sizewell.

As most on-line letting descriptions were not clear as to which properties would accept one or more dogs, on 17th January 2016 a mystery shopper email was sent to the 18 local letting agents identified. On the pretext of a dog-owning male worker considering the feasibility of temporarily taking a job in the area, this asked for their views on the proportion of properties that would accept: "*one well behaved dog*"… "*on a let of 6 to 24 months*" … "*ideally as close to Saxmundham as possible, but would include Ipswich, Lowestoft, Stowmarket, Woodbridge, Harleson, Diss, Bungay, Beccles etc"*.

The 20 mile search radius was chosen to include all the Natura 2000 sites being studied in the Sizewell C project, as well as: coastal and inland properties; a reasonable car commuting distance; properties in both town and country settings.

3 RESULTS

As of 27January 2016, 11 letting agents had responded by email.

The responses revealed that:

- Published descriptions of specific properties are intentionally unclear on whether one or more dogs are allowed, as landlords' views on pets can change depending on the state of the letting market, the type of tenant and duration of tenancy.
- Two respondents gave a percentage figure for lets allowing one or more dogs.
- Four respondents used a descriptive term (such as "most" "nearly all" or "roughly half"); in these cases an appropriate indicative figure has been derived for comparison purposes.
- Five respondents would only state that dog acceptance varies on a case by case basis. These have been excluded from the comparative numerical summary.

The key content from all 11 responses is shown below, to illustrate the nature of the responses and the derived numerical values.

Key elements of letting agent response	% of lets allowing one dog
"… nearly all will state 'No' … but landlords do sometimes change their minds."	20%*
Two properties offered as taking dogs.	(no figure derived)
"… roughly half…"	50%*
"I think it is very much a call to check on each property. Sometimes landlords say no to pets."	(no figure derived)
"…it is an issue for approximately 70% of our landlords…"	30%
"… around 25% of rental properties marketed would be willing to accept a pet.."	25%
"The majority of rental properties state… will not accept pets…"	20%*
"… contact us and we will inform you of the pet situation."	(no figure derived)
"… check on a case by case basis."	(no figure derived)
"…therefore it is always best to ask…"	(no figure derived)
"Most landlords with us will accept dogs in houses and bungalows (not flats)"	80%*

Note: * indicates % derived from description

Summary: lets accepting one dog

Total responses:	11 letting agents
Numeric responses (explicit or derived):	6
Mean:	37%
Median:	50%
Range:	+/- 30%

4 CONCLUSION

While there was a reluctance by 45% of letting agents to express any descriptive or numerical indication of the proportion of landlords allowing one dog, from the 55% of respondents giving some indication, it is submitted that the following can be concluded:

- The mean figure of 37% is held to be representative of the proportion of long-term let properties accepting one dog, within a 20 mile radius of Sizewell, within the limitations of this study.
- Without a more detailed study asking letting agents about specific properties, only an indicative figure can be derived from this study.
- Commission-based letting agents were understandably keen to be optimistic, and so the above figures are held to have a bias towards being more positive in relation to lets with pets.

Appendix E: Regional Pet Population Analysis 2019

Screen grab from the Pet Food Manufacturers' Association website taken on 19 November 2019 (PFMA, 2019) at: https://www.pfma.org.uk/pet-population-2019

Regional Pet Population 2019

This chart gives the percentage of households in each region who own at least one of the major pet species (average of the last three years).

	Indoor Fish	Outdoor Fish	Cats	Dogs	Rabbits	Guinea Pigs	Indoor Birds	Hamsters	Sample
North-East	7	3	15	36	1	0	2	1	749
North-West	7	3	17	27	2	0	2	1	1925
Yorks & Humb	6	2	16	23	3	1	1	1	1454
East Midland	8	5	19	29	2	1	2	1	1249
West Midland	9	5	18	28	2	1	1	0	1464
East of England	7	5	18	23	1	1	1	1	1587
London	5	2	14	9	1	0	0	0	2044
South East	7	5	20	21	2	1	1	1	2331
South West	7	4	21	25	1	1	1	1	1402
Wales	8	3	18	29	2	0	1	2	827
Scotland	6	1	14	24	1	0	1	1	1499
Northern Ireland	7	7	12	31	3	0	1	0	497
UK	7	7	17	25	1	1	1	1	17028

Dog Population 2019 ›
Cat Population 2019 ›
Number of cats and dogs per Household 2019 ›
Small Animal Population 2019 ›
Bird Population 2019 ›
Regional Pet Population 2019 ›
Families with pets 2019 ›

Appendix F: Sizewell B Relocated Facilities – Shadow HRA Report

SIZEWELL B RELOCATED FACILITIES

Shadow Habitats Regulations Assessment Report

EDF ENERGY

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CONTENTS

TABLES

FIGURES

1. INTRODUCTION

1.1.1 EDF Energy Nuclear Generation Limited[1], herein referred to as 'EDF Energy (NGL)', sought planning permission from East Suffolk Council (ESC) for the demolition and relocation of a number of existing facilities at Sizewell B nuclear power station (known as the Sizewell B Relocated Facilities Project and herein referred to as the 'Proposed Development'). The facilities that would be relocated, demolished or replaced are ancillary to the process of electricity generation and have a broad range of functions.

1.1.2 On the 1st April 2019, ESC was created, covering the former districts of Suffolk Coastal District Council (SCDC) and Waveney District Council (WDC). As such, all the pre-application consultation and engagement prior to the submission of the planning application in April 2019 was carried out with SCDC and is, therefore, referred to as such within the documentation submitted with the planning application for the Proposed Development.

1.1.3 At the time of submission, EDF Energy NGL, included an Habitats Regulations Assessment (HRA) Screening Report as part of the planning application, however, feedback from Natural England following consultation indicated that a Shadow HRA would be required. East Suffolk Council requested EDF Energy provide this prior to planning permission being issued.

1.1.4 Given the proximity of the Proposed Development to sites of European and international importance for nature conservation, it has been considered that the Proposed Development has the potential to affect one or more such sites (hereafter referred to as 'European sites'). EDF Energy (NGL) is, therefore, required to provide information to allow HRA to be undertaken by the 'competent authority' under The Town and Country Planning Act 1990.

1.1.5 A HRA is a requirement under the Conservation of Habitats and Species Regulations 2017 and the Conservation of Offshore Marine Habitats and Species Regulations 2017 where a project could affect European sites and species designated for their nature conversation importance.

1.1.6 This report, referred to as a 'Shadow HRA', provides the information required for a HRA to be undertaken for the Proposed Development and considers all elements of the project. It covers 'European site scoping' and 'likely significant effect (LSE) screening' and presents the outcomes of the screening process with respect to the Proposed Development's potential to have a LSE on those European sites scoped in to the process.

[1] EDF Energy Nuclear Generation Limited (company number 03076445), part of the EDF Energy group.

1.1.7 For those sites and interest features screened in, this report further provides information for an Appropriate Assessment to enable the competent authority to determine whether the Proposed Development, both alone or in-combination with other plans or projects, would have an adverse effect on the integrity of these European sites.

1.1.8 It provides the following:

- a summary of the main components of the Proposed Development (**Section 2)**;
- a description of the HRA process (**Section 3**);
- the findings of the European site scoping stage and summary information on the European sites taken through into the screening stage (**Section 4**);
- the finding of the LSE screening stage for the Proposed Development alone and in-combination with other plans and projects (**Section 5**);
- a description of baseline conditions for those sites and species screened in (**Section 6**);
- information for Appropriate Assessment (**Section 7**);
- conclusions (**Section 8**); and
- a list of references.

2. SUMMARY OF THE PROPOSED DEVELOPMENT

2.1 Introduction

2.1.1 Sizewell B power station is situated on the Suffolk coast, north-east of Ipswich and south of Lowestoft. It is located just to the north of the Sizewell A power station, currently being decommissioned. Sizewell B power station is expected to operate until 2035, with the potential for an extension of its lifetime to 2055.

2.1.2 The Proposed Development (defined by the development site boundary as shown in **Figure 2.1**) is approximately 30.87 hectares (ha) in area, located within the administrative area of ESC, within the County of Suffolk. The approximate Ordnance Survey Grid Reference for the centre of the Site is TM 47167 63488. The Site is largely flat, with levels approximately 5 m and 10 m above ordnance datum (AOD).

2.1.3 A number of existing Sizewell B nuclear power station facilities need to be relocated from the area of land that has been nominated as a suitable site for the development of the proposed Sizewell C power station. The facilities have a broad range of functions, including industrial, workplace, education, cultural and infrastructure. The existing site layout is shown on **Figure 2.1** with the facilities to be relocated shown on **Figure 2.2**. Note that ESC has not resolved to grant consent for the footpath (no. 10 and 11 on Figure 2.2) between the outage car park (no. 13) and coronation wood (no. 6) shown on the drawings and, therefore, this will not be brought forward as shown on the drawings.

2.1.4 It is intended that the new facilities would replicate the existing building area provision on a like-for-like basis, where appropriate. However, in a number of cases there is a requirement to increase the building area of the new facilities in order to meet current regulations and industry standards.

2.1.5 The Proposed Development would take place in two distinct phases. Phase One would include the relocation of the Outage Store within the Sizewell B station perimeter, construction of the Coronation Wood Development Area including Training Centre, Laydown Area, Replacement Car Park and Western Access Road, and the Outage Car Park in Pillbox Field and the demolition of the existing Visitor Centre, Operations Training Building, Outage Store and Civils Workshop and Store.

2.1.6 Phase Two would include the remaining construction and demolition works, including the construction of a new Visitors Centre and an ‘Outline Development Zone’.

2.1.7 The subsections below include a brief outline of the proposed works to be carried out in each Phase. Chapter 3 of the **Sizewell B Relocated Facilities Environmental Statement** contains a full description of the proposed works for each Phase.

2.2 Phase One

2.2.1 The proposed works in Phase One would comprise:

- Coronation Wood clearance;
- Coronation Wood Development Area construction, including the construction of the Western Access Road, Training Centre, Laydown Area and Replacement Car Park;
- Outage Store construction, following demolition of the existing general store, in which the excavation of the basement will broach the groundwater table;
- temporary relocation of the existing Visitor Centre to the refurbished Training Centre;
- construction of Outage Car Park and associated access; and
- Northern Area Demolition Part 1.

2.3 Phase Two

2.3.1 The proposed works in Phase Two would comprise:

- temporary site access modifications to be constructed prior to decommissioning of existing facilities;
- construction of Outline Development Zone;
- construction of a new Visitor Centre; and
- Northern Area Demolition Part 2.

2.3.2 The proposed works in Phase Two would provide for the relocation of the administration, storage, welfare and canteen facilities as part of the Outline Development Zone. The building materials and appearance would be in keeping with the existing ancillary buildings. The buildings would be operational for seven days a week, on a 24-hour basis.

2.3.3 Foundations for the Outline Development Zone would likely include ground bearing solutions.

2.4 Operation of the Proposed Development

2.4.1 Operating regimes and activities associated with the new facilities would be the same as the displaced existing facilities.

2.4.2 Lighting would be provided by LED sources as they provide more precise light control than alternative sources, in addition to their efficiency and longevity. Luminaires would be selected to reflect the environment in which they are located, and the activities undertaken around them. Details of operational lighting are provided within the Lighting Strategy submitted with the planning application and subject to a planning condition associated with the proposed planning permission, which will require artificial lighting

to be in accordance with an approved scheme to be submitted and approved to the Local Planning Authority.

2.4.3 It is proposed that surface water run-off from the facilities within the Coronation Wood Development Area (Training Centre, Visitor Centre, Laydown Area, Replacement Car Park and Western Access Road) would drain through infiltration techniques, such as heavy-duty permeable block paving. Surface water run-off from the Outage Car Park within Pillbox Field would also drain through infiltration techniques. This approach would ensure that no additional impervious areas are added to the existing site wide drainage network.

2.4.4 The landscape strategy aims to reduce as far as practicable the visibility of the proposed facilities in views from the west and south, including consideration of light spill. It is planned to integrate the new facilities within their setting, with the design informed by both the woodland and industrial context. Native and locally occurring plant species would be specified, whilst surfaced areas would be in keeping with the existing power station complex.

Figure 2.1 Existing Site Layout Plan

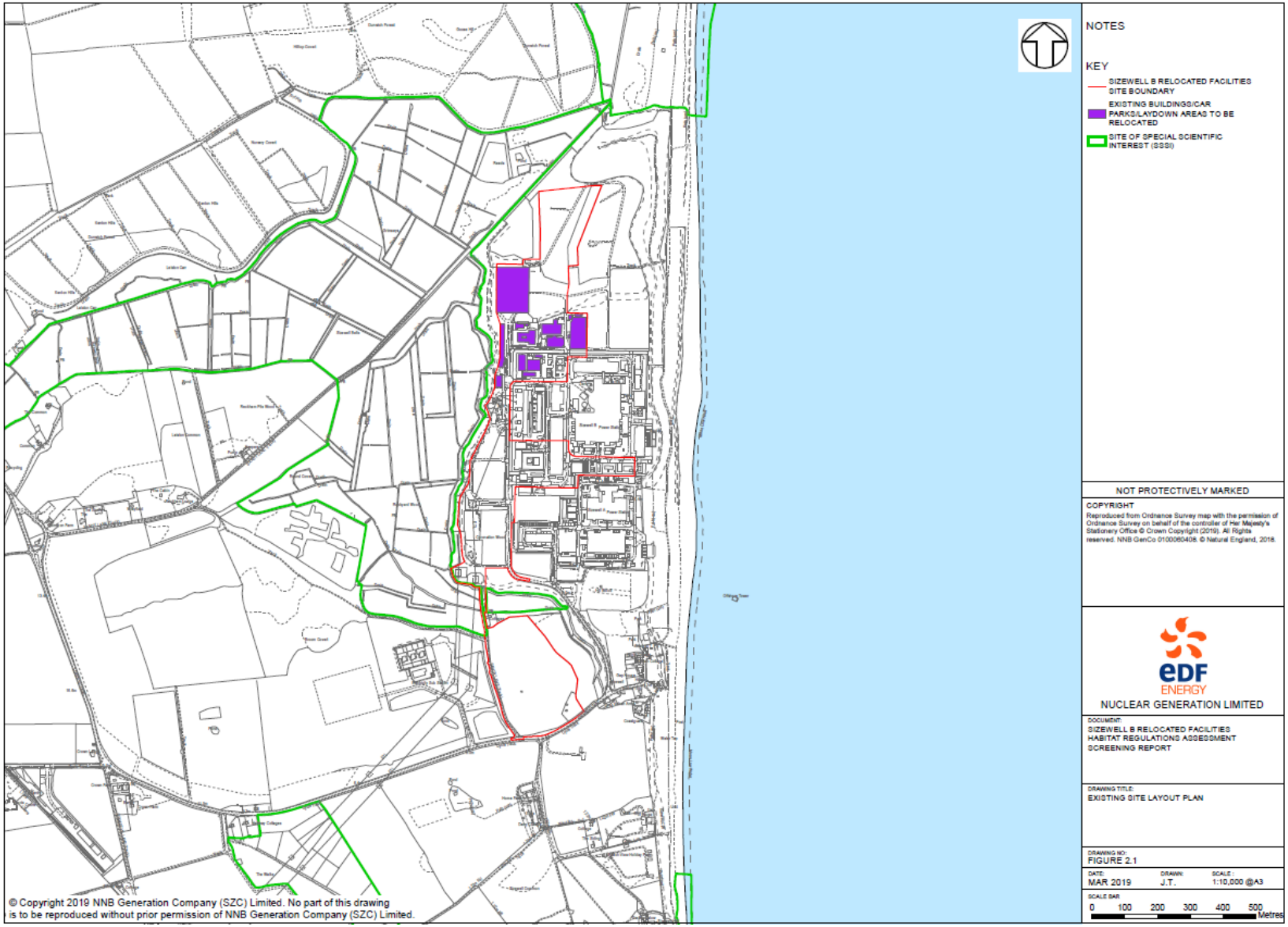
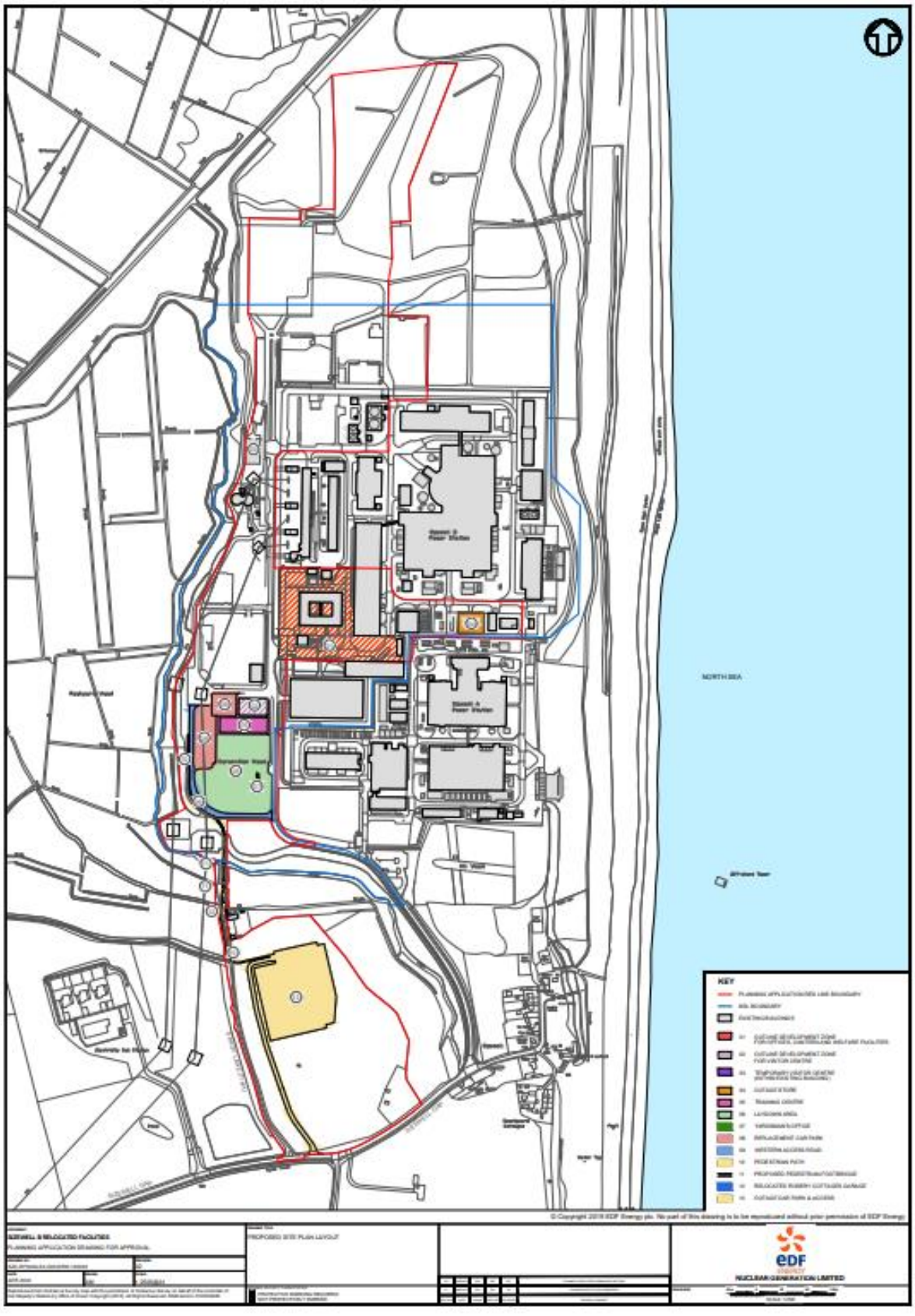


Figure 2.2 Proposed Site Layout Plan



3. THE HABITATS REGULATIONS ASSESSMENT PROCESS

3.1 Introduction

3.1.1 This section provides details of the principles of the HRA process and describes the approach adopted by EDF Energy (NGL) to the Shadow HRA.

3.2 The HRA process

a) The Directives and Regulations

3.2.1 European Union (EU) obligations in respect of habitats and species are met through Council Directive 92/43/EEC (the Habitats Directive) on the conservation of natural habitats and of wild fauna and flora, which requires Member States to schedule important wildlife sites through the European Community as Special Areas of Conservation (SACs) and to give protection to habitats and species listed in the Directive as being threatened or of Community Interest.

3.2.2 The EU meets its obligations for birds through Directive 2009/147/EC (the Birds Directive) on the conservation of wild birds. This provides a framework for the conservation and management of wild birds in Europe through the designation of Special Protection Areas (SPAs). Of particular relevance is the requirement to identify and designate SPAs for rare or vulnerable species listed in Annex I of the Directive, as well as for all regularly occurring migratory species, paying particular attention to the protection of wetlands of international importance. Together with other Sites of Community Importance (SCIs)[2], SACs and SPAs form a network of protected areas known as *Natura 2000*.

3.2.3 Under the National Planning Policy Framework (NPPF) (Ministry of Housing, Communities & Local Government (MHCLG), 2019), internationally designated Ramsar sites[3] are to be treated in the same way as European sites in terms of HRA. For the purposes of this report, 'European sites' is taken to include Ramsar sites along with SACs and SPAs.

3.2.4 The Habitats Directive is transposed into UK law by the Conservation of Habitats and Species Regulations 2017 (the 'Habitats Regulations') and the Conservation of Offshore Marine Habitats and Species Regulations 2017 (the 'Offshore Habitats Regulations'). The Habitats Regulations incorporate all SPAs into the definition of European sites and, consequently, the protections afforded to European sites under the Habitats Directive apply to SPAs designated under the Birds Directive.

[2] for example, candidate SACs or proposed SPAs.

[3] Sites listed under '*The Convention on Wetlands of International Importance, especially as Waterfowl Habitat*', (Ramsar, Iran, 1971).

3.2.5 The HRA process helps meet the requirements of Article 6(3) of the Habitats Directive (replicated in Regulation 63(1) of the Habitats Regulations) which states that any plan or project, which is not directly connected with or necessary to the management of an European site, but would be likely to have a significant effect on such a site, either on its own or in-combination with other plans or projects, will be subject to an 'appropriate assessment' of its implications for the European site in view of the site's 'conservation objectives'.

3.2.6 Subject to the provisions of Article 6(4) of the Habitats Directive, the 'competent authority' will agree to the plan or project only having ascertained that it will not adversely affect the integrity of the European site(s) concerned.

b) A four-stage process

3.2.7 Although the Proposed Development is not considered to be a Nationally Significant Infrastructure Project (NSIP), the guidance provided in Advice Note 10 (Planning Inspectorate, 2017) is still relevant to developments that are not categorised as an NSIP. The HRA process typically follows a four-staged approach, as detailed in Advice Note 10:

1. **Screening:** The process of identifying potentially relevant European sites, and whether the proposed project is likely to have a significant effect on the qualifying interest features of the European site, either alone or in-combination with other plans and projects. If it is concluded at this stage that there is no potential for LSE, there is no requirement to carry out subsequent stages of the HRA.

2. **Appropriate Assessment (AA):** Where a LSE for a European site(s) cannot be ruled out, either alone or in-combination with other plans and projects, assessment of the potential effects of the project on the integrity of the European site(s), in view of its qualifying interest features and associated conservation objectives, is required. Where it is concluded that there would be an adverse effect on site integrity (or where such an effect cannot be discounted) an assessment of mitigation options is carried out and mitigation measures (where available) are proposed to address the effects. If, having considered mitigation, the potential for adverse effects on integrity remains, the HRA must progress to Stages 3 and 4.

3. **Assessment of Alternative Solutions:** Identifying and examining alternative ways of achieving the objectives of the project to establish whether there are solutions that would avoid, or have a lesser effect, on the European site(s).

4. **Imperative reasons of overriding public interest (IROPI):** Where no alternative solution exists, the next stage of the process is to assess whether the project is necessary for IROPI and, if so, the identification of compensatory measures needed to maintain the overall coherence of the *Natura 2000* network.

3.3 Stage 1 LSE Screening

3.3.1 In respect of Stage 1 (Screening), a recent ruling (April 2018) by the Court of Justice of the European Union (CJEU) referred to as People Over Wind and Sweetman v Coillte Teoranta (C-323/17) provided "…it is not appropriate, at the screening stage, to take account of the measures intended to avoid or reduce the harmful effects of the plan or project on that site".

3.3.2 In the context of this Shadow HRA Report, the phrase "…measures intended to avoid or reduce the harmful effects..." is interpreted as meaning any mitigation measures that are not clearly an integral part of the project design. As such, no mitigation measures (outwith those that form a fundamental part of the Proposed Development) were taken into account when undertaking the LSE screening exercise.

3.3.3 There is no explicit definition of LSE in the legislation and in the context of HRA it is typically taken as any effect that may reasonably be predicted as a consequence of the project that may significantly adversely affect the conservation or management objectives of the features for which a site was designated, excluding trivial or inconsequential effects (English Nature, 1999). That is, the term 'likely' infers the presence of a risk that a significant effect could occur. By definition, this assessment is based on the consideration of a number of factors, for example, the spatial extent and duration of an identified effect, and other considerations such as the availability of appropriate mitigation. When considering such effects, a precautionary approach is adopted.

3.3.4 The conservation status of a natural habitat, as defined in the Habitats Directive, means the *"sum of the influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species within the territory referred to in Article 2".* The conservation objectives for a SAC or SPA are considered when identifying LSE. The conservation status of a natural habitat is taken as 'favourable' when:

- its natural range and the area it covers within that range are stable or increasing;
- the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future; and
- the conservation status of its typical species is favourable.

3.3.5 According to the *Waddenzee judgement* (Judgement of 7.9.2004 – Case C - 127/02) (paragraph 45) an AA will be required if a LSE cannot be excluded on the basis of objective information (paragraph 45) and, where the plan or project is likely to undermine the site's conservation objectives, the assessment of that risk must be made in the light *inter alia* of the characteristics and specific environmental conditions of the site concerned by such a plan or project (paragraph 49). The *Sweetman opinion* (Opinion of Advocate General 22.10.2012 – Case C-258/11) states that the question of whether an AA should be carried out is simply whether the plan or project concerned is *capable* of having a significant effect (paragraphs 46-47).

3.3.6 In addition to screening, although not referred to in the Habitats Directive or national legislation, it is becoming common practice to undertake a pre-screening site selection exercise in order to identify the European sites and the qualifying interest features to be taken forward into the screening stage; referred to as 'scoping' (**Section 4**).

3.4 Stage 2 Appropriate Assessment

a) Introduction

3.4.1 In respect of Stage 2 (AA), the integrity of a European site is defined as "*the coherence of the site's ecological structure and function, across its whole area, which enables it to sustain the habitat, complex of habitats and/or populations of species for which the site has been designated*" (European Commission, 2000). An adverse effect on integrity, therefore, is likely to be one which prevents the site from making the same contribution to favourable conservation status for the relevant feature as it did at the time of designation.

3.4.2 Furthermore, the *Kilkenny judgement* (Judgement of 7.11.2018 – Case C-461/17 paragraph 40) states that an AA must identify and examine the implications of the proposed project for species present in a European site, including species for which the site has been listed and those for which it has not, provided those implications are liable to affect the conservation objectives of the site. It further states that an AA must identify and examine the implications of the proposed project for species and habitats outside the boundaries of the European site in question, again, provided that those implications are liable to affect the conservation objectives of the site.

3.4.3 Regulation 63 of the Habitats Regulations requires the competent authority to make an appropriate assessment of any plan or project which is likely to have a significant effect on a European site, either alone or in-combination with other plans or projects. In line with the Habitats Regulations, the term 'in-combination' is used herein to describe the interactions of within-project activities and the potential for the Proposed Development (as a whole) to interact with other plans and projects.

b) Alone assessment

3.4.4 The approach taken to the assessment of the effects of the Proposed Development on European sites and mobile species has included:

- Collection of baseline environmental information over a number of years through survey and other research and information gathering work. This work is critical to understanding how cause and effect pathways may link to receptors.
- Technical liaison with the team preparing the Environmental Impact Assessment (EIA) to share knowledge in respect of key HRA topic areas.
- Scoping of European sites and LSE screening for those European sites and interest features scoped in to the assessment.

3.4.5 For the alone assessment, the Shadow HRA considers all potential cause and effect pathways between the Proposed Development and the relevant qualifying interest features of screened in European sites, including potential effects on:

- habitats, vegetation, invertebrates and mobile species – qualifying interest features of SACs and Ramsar sites (which are not also designated as SPAs);
- birds – qualifying interest features of SPAs and Ramsar sites, including rare and vulnerable birds (as listed on Annex I of the Birds Directive), regularly occurring migratory species and species forming designated assemblages (including those species that are designated as a feature of an SPA or Ramsar site and that may be affected outside of the boundaries of a European site);
- supporting species and habitats – in those cases where there are potential effects on qualifying interest features through indirect effects (e.g. prey species).

3.4.6 The assessment has been undertaken for both the construction and operational phases of the project. The approach taken to the assessment varies based on the nature of the interest feature (habitats, birds, marine mammals and fish) and is detailed in **Section 7**.

c) In-combination assessment

3.4.7 For each European site (and combination of potential effects and interest features) considered, alone assessment is followed by in-combination assessment; before a conclusion is reached regarding the combined implications of the Proposed Development for the integrity of the site. The following text sets out at a high level the approach taken to the in-combination assessment.

Rationale for identifying other plans and projects

3.4.8 The approach taken to the identification of other plans and projects was based upon the advice provided by the Department of Communities and Local Government (DCLG) (2006b), which states:

> *"In most cases, detailed consideration of the combined effects of the development proposed together with other developments will be limited to those others that are already begun or constructed [present and past] or those that have not been commenced but have a valid planning permission [reasonably foreseeable].*
>
> *Often, future developments in the vicinity of a project site will be included in the baseline scenario as 'committed development'. But in the context of EIA the term 'committed development' conventionally refers to development for which consent has been granted."*

3.4.9 Whilst there is no legal definition of what constitutes a plan or project for the purposes of the Habitats Regulations, PINS Advice Note 10 (PINS, 2017) advises that the following should be taken into account:

- projects that are under construction;
- permitted application(s) not yet implemented;
- submitted application(s) not yet determined;
- all refusals subject to appeal procedures not yet determined;
- projects on the National Infrastructure's programme of projects; and
- projects identified in the relevant development plan (and emerging development plans - with appropriate weight being given as they move closer to adoption) recognising that much information on any relevant proposals will be limited.

Over-lapping and discrete effects

3.4.10 Spatially, in-combination assessment takes account of effects that are over-lapping (i.e. a spatial interaction exists and the effects from two or more plans and projects will coincide) as well as discrete; that is, in the context of the Habitats Regulations in-combination effects can include the effects of different plans and projects on the same habitat/species, at different locations within a European site (e.g. loss the same habitat at disparate locations).

3.4.11 In respect of temporal effects, some of these may be of a short-term nature and would, from an ecological perspective, represent 'pulse' type disturbances that have no long-term effect. However, it is possible that such short-term effects could be significant and, consequently, they have been assessed accordingly. Other effects may be of a long-term nature and, even when the activity causing the identified impact ceases, the ecological response may still be manifest in the system (e.g. recovery of some species communities from disturbance/damage).

Past projects

3.4.12 With respect to 'past' projects, a useful ground rule in in-combination assessment is that the environmental effects of schemes that have been completed should be included within the environmental baseline (and hence implicitly taken account of in the HRA process). Consequently, completed projects are excluded from the scope of in-combination assessment. However, it is acknowledged that the environmental effects of recently completed projects may not be fully manifested and that these effects need to be taken into account in the assessment. For the purposes of this in-combination assessment, the existing effects and influences of Sizewell A and Sizewell B have been taken to be included within the environmental baseline.

3.4.13 In the event that 'past' projects refer to past consents not yet implemented (for example), these have been considered as part of the in-combination assessment.

Current projects

3.4.14 Projects that are currently being constructed ('present' projects) or that are in the planning process (where sufficient information is publicly available), as well as ongoing activities that have the potential to influence the same environmental parameters as the Project are the focus of in-combination assessment. Where such data is available, quantitative assessment of potential effects and their environmental significance will be provided. More weight is given to those projects that are at a more advanced stage in the planning process, as more confidence accompanies the assessment of potential combined effects.

Future projects

3.4.15 Future plans or projects for which sufficient information is available (i.e. 'reasonably foreseeable' projects) will be considered as part of the in-combination assessment. Future plans or projects for which sufficient information is not available on which to base a reliable assessment, which are unlikely to be submitted or receive consent until after the proposed development has been completed, cannot reasonably be assessed as part of an in-combination assessment. However, the applicants for such projects will be required to take the effect of the Proposed Development into account in their own application.

3.4.16 In the absence of publicly available data, it is not possible to undertake a detailed in-combination assessment, but it is possible to make judgements regarding potential impacts on the basis of the characteristics of the other projects being considered (where these are known) and whether there is the potential for the effects of the various projects to interact spatially and temporally. It is not appropriate to consider worst-case scenarios in this context, as this would introduce the risk that the assessment would become over precautionary and unrealistic.

3.5 Stages 3 and 4

3.5.1 Following Appropriate Assessment, where a risk to the integrity of the European site is identified, it must then be considered (at **Stage 3**) whether any 'alternative solutions' exist that would be capable of delivering the same overall objective as the original proposal in a way that would not adversely affect the integrity of a European site. If such an alternative is identified, then it should be pursued. If such an alternative is not identified, then the competent authority must consider whether the plan or project, in spite of a negative assessment of the implications for the European site, must nevertheless be undertaken for 'imperative reasons of overriding public interest' (IROPI) (**Stage 4**).

3.5.2 Furthermore, if IROPI can be demonstrated, for the project to proceed 'compensatory measures' necessary to ensure that the overall coherence of *Natura 2000* is protected will need to be implemented. Therefore, following the demonstration of IROPI in Stage 4, compensatory measures must be demonstrated to be available and deliverable.

4. SCOPING OF EUROPEAN SITES

4.1 Cause and effect pathways 'scoped in'

4.1.1 EDF Energy (NGL) undertook a scoping exercise in 2016 as part of the EIA for the Proposed Development. As part of the scoping exercise the identification of potential effect pathways from the Proposed Development to sensitive receptors were identified. Those effect pathways that were determined to be potentially relevant to European sites are described below.

During construction and demolition:

- direct habitat loss and alteration;
- potential exposure of sensitive habitats and species to the generation of dust;
- potential disturbance of sensitive species due to noise;
- potential disturbance of sensitive species due to artificial light; and
- potential exposure of sensitive species to visual disturbance.

During operation:

- noise, visual and artificial lighting effects on sensitive species associated with buildings and car parking.

4.1.2 Following a review of these effects against the latest project development description (refer to **Design and Access Statement** submitted with the planning application), to ascertain that there have been no significant changes since 2016, they were scoped in to the assessment. Since submission of the planning application, ESC has not resolved to grant consent for the footpath (no. 10 and 11 on Figure 2.2) between the outage car park (no. 13) and coronation wood (no. 6) shown on the drawings and, therefore, this will not be brought forward as described within the Design and Access Statement.

4.2 European sites 'scoped in'

4.2.1 The Zone of Influence (ZoI) of the Proposed Development comprises the area of land within and adjacent to the site boundary, as well as those areas and resources that may be affected by the activities arising from it during its lifespan.

4.2.2 The scoping exercise first identified the European sites within a search area of 10 km from the Proposed Development. On the basis of the nature of the Proposed Development (much of which would be located on existing hardstanding) and its distance to each of the sites and their qualifying features; however, the ZoI was subsequently decreased to 5 km. As such, the following sites are located within the Proposed Development's ZoI:

- Minsmere to Walberswick Heaths and Marshes SAC;
- Minsmere-Walberswick SPA;
- Minsmere-Walberswick Ramsar site;
- Outer Thames Estuary SPA; and
- Sandlings SPA.

4.2.3 These European sites are listed in **Table 4.1** below, which show the distance of each site to the closest point of the site boundary of the Proposed Development. Distances from each designated site to specific activities, e.g. demolition of buildings, may differ and these are dealt with on an individual basis within the assessment presented in **Section 5.3** and **Section 7**. The location of each 'scoped in' designated site is shown on **Figure 4.1**.

Table 4.1 List of European sites and distance from the site boundary

No.	Site Name	Designation	Distance to the Proposed Development site boundary*
1	Minsmere to Walberswick Heaths and Marshes	SAC	200 m north
2	Minsmere-Walberswick	SPA	200 m north
3	Minsmere-Walberswick	Ramsar site	200 m north
4	Outer Thames Estuary	SPA	500 m east
5	Sandlings	SPA	700 m south west

* Distances have been measures from the edge of the European site to the closest edge of the Proposed Development's site boundary. The distances between the European site and actual construction/operational activities vary from the ones found in this table and are described within the screening and appropriate assessment sections.

4.2.4 **Table 4.2** sets out the qualifying interest features for each of these sites. Bird count data was obtained from *The Status of UK SPAs in the 2000s: the Third Network Review* (Stroud *et al.*, 2016). For those species not covered within the Third Review, data from the Second Review (Stroud *et al.*, 2001) was used instead.

Figure 4.1 European and Ramsar sites scoped in to the screening process

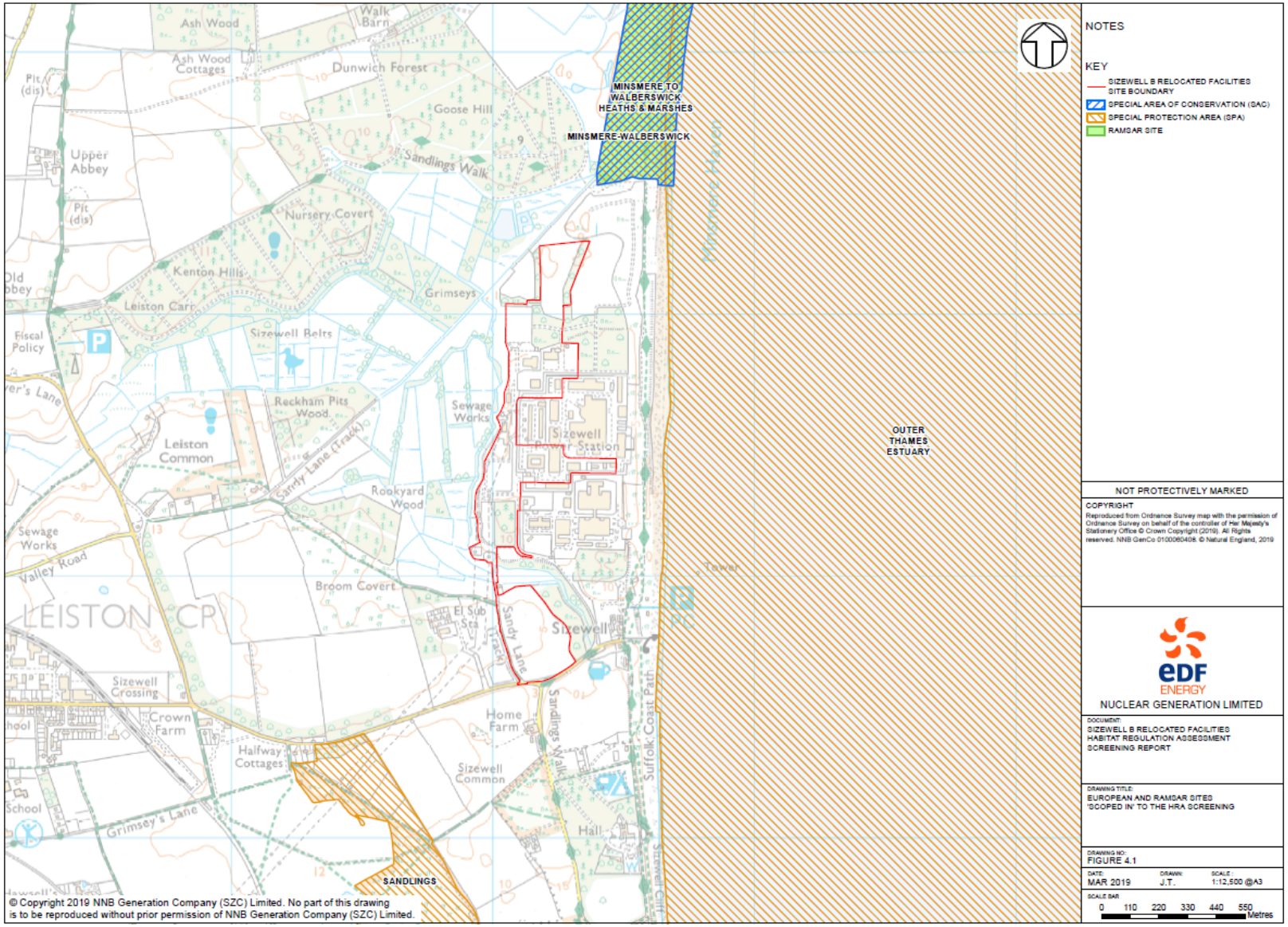


Table 4.2 List of European sites scoped into the Shadow HRA and their qualifying interest features

No.	Site name	Description	Qualifying interest features
1	Minsmere to Walberswick Heaths and Marshes SAC UK0012809	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*. Lowland European dry heaths occupy an extensive area of the site, which is at the extreme easterly range of heath development in the UK. The heathland is predominantly National Vegetation Classification (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 stellata*.	Annex 1 habitats that are a primary reason for selection of this site: • Annual vegetation of drift lines • European dry heaths Annex 1 habitats present as a qualifying feature, but not a primary reason for selection of this site: • Perennial vegetation of stony banks
2	Minsmere-Walberswick SPA UK9009101	The site 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, mud-flats, 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. There are nationally important numbers of breeding and wintering birds. In particular, the reedbeds are of major importance for breeding bittern *Botaurus stellaris* and marsh harrier *Circus aeruginosus*. A range of breeding waders (e.g. avocets *Recurvirostra avosetta*) and heathland birds occur in other areas of the SPA. The shingle beaches support important numbers of breeding little tern *Sterna albifrons*, which feed substantially outside the SPA in adjacent marine waters. The site is also important for wintering bitterns and raptors.	The site qualifies under Article 4.1 of the Birds Directive (2009/147/EC) by supporting populations of European importance listed in Annex 1 of the Directive. During the breeding season: • Avocet *Recurvirostra avosetta*, 126 pairs representing at least 8.4% of the breeding population in Great Britain (Rare Breeding Birds Panel (RBBP) 5-year mean, 2005-2009). • Bittern *Botaurus stellaris*, 7 individuals representing at least 35.0% of the breeding population in Great Britain (5-year mean, 1993-1997). • Little tern *Sterna albifrons*, 30 pairs representing at least 1.6% of the breeding population in Great Britain (count as at 2010). • Marsh harrier *Circus aeruginosus*, 16 pairs representing at least 10.0% of the breeding population in Great Britain (5-year mean, 1993-1997).

No.	Site name	Description	Qualifying interest features
			• Nightjar *Caprimulgus europaeus*, 39 pairs representing at least 0.7% of the breeding population in Great Britain (count as at 1990). Over winter: • Bittern *Botaurus stellaris*, 14 individuals representing at least 14.0% of the wintering population in Great Britain (count as at 1998). • Hen harrier *Circus cyaneus*, 15 individuals representing at least 2.0% of the wintering population in Great Britain (5-year peak mean, 1985/6-1989/90). This site also qualifies under Article 4.2 of the Birds Directive (2009/147/EC) by supporting populations of European importance of migratory species. During the breeding season: • Gadwall, Anas Strepera, 24 pairs representing 4% of the breeding population in Great Britain (count as at 1990). • Shoveler *Anas clypeata*, 23 pairs representing 2.3% of the breeding population in Great Britain (count as at 1990). • Teal *Anas crecca*, 73 pairs representing 4.9% of the breeding population in Great Britain (count as at 1990). Over winter: • Gadwall *Anas stellata*, 93 individuals representing at least 1.1% of the population in Great Britain (5-year peak mean 1991/92-1995/96). • Shoveler *Anas clypeata,* 98 individuals representing 1% of the population in Great Britain (5-year peak mean 1991/92-1995/96). • White fronted goose *Anser albifrons albifrons,* 67 individuals representing 1.1% of the population in Great Britain (5-year peak mean 1991/92-1995/96).

No.	Site name	Description	Qualifying interest features
3	Minsmere-Walberswick Ramsar site UK11044	This 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 creates an exceptional area of scientific interest supporting nationally scarce plants, British Red Data Book invertebrates and nationally important numbers of breeding and wintering birds.	The site qualifies as a Ramsar under the following criteria: • Ramsar criterion 1 – the site contains a mosaic of marine, freshwater, marshland and associated habitats complete with transition areas in between. It also contains the largest continuous stand of reedbed in England and Wales, and rare transition in grazing marsh ditch plants from brackish to fresh water. • Ramsar criterion 2 – the site supports nine nationally scarce plants and at least 26 red data book invertebrates. It supports a population of the mollusc narrow-mouthed whorl snail *Vertigo angustior* (Habitats Directive Annex II; British Red Data Book Endangered), recently discovered on the Blyth estuary river walls. • Ramsar criterion 2 – the site supports an important assemblage of rare breeding birds associated with marshland and reedbeds including: bittern *Botaurus stellaris,* gadwall *Anas strepera*, teal *Anas crecca*, shoveler *Anas clypeata*, marsh harrier *Circus aeruginosus*, avocet *Recurvirostra avosetta* and bearded tit *Panurus biarmicus*.
4	Outer Thames Estuary SPA UK9020309	The Outer Thames Estuary SPA consists of areas of shallow and deeper water, high tidal current streams and a range of mobile sediments. Large areas of mud, silt and gravelly sediments form the deeper water channels, the main ones of which form the approach route to the ports of London and as such are continually disturbed by shipping and maintenance dredging. Sand in the form of sandbanks separated by troughs predominates in the remaining areas and the crests of some of the banks are exposed at mean low water. In the northern part of the site the main sandbanks are (north to south) Middle Cross Sand, Scroby Sands, Helm Sand, Newcombe Sand, Aldeburgh Napes, Aldeburgh Ridge, North Ship Head and Bawdsey Bank. In the southern part of the site the main sandbanks are Red Sand, Kentish Flats, West and East Barrow, Sunk Sand, Shingles, Long Sand, Margate Sand and Kentish Knock.	The site qualifies under Article 4.1 of the Directive (79/409/EEC) as it is used regularly by 1% or more of the Great Britain population of the following species listed in Annex I in any season: • Red-throated diver *Gavia stellata*, 6,466 individuals representing 38% of the Great Britain population (1989 – 2006/07). During the breeding season: • Little tern *Sterna albifrons,* representing 19.64% of the Great Britain population (2011 – 2015). • Common tern *Sterna hirundo,* representing 2.66% of the Great Britain population (2011 – 2015). Over winter:

No.	Site name	Description	Qualifying interest features
		The seabed along the coast of Norfolk and Suffolk coast is of a similar composition to that in the main estuary with large shallow areas of mud, sand, silt and gravely sediments but, in the absence of main port areas within this area, there is less disturbance through shipping or dredging. The main sandbanks in this area are (from north to south) Dunwich Bank, Sizewell Bank, Aldeburgh Napes, Aldeburgh Ridge and Whiting Ridge. The seabed and waters of the site provide an important habitat in the non-breeding season for red-throated divers *Gavia stellata* which visit the area to feed on the fish populations.	• Red-throated diver *Gavia stellata*, 6,466 individuals representing 38% of the Great Britain population (1989 – 2006/07).
5	Sandlings SPA UK9020286	The Sandlings SPA lies between the Deben Estuary and Leiston. In the 19th century, the area was dominated by heathland developed on glacial sandy soils. During the 20th century, large areas of heath were planted with blocks of commercial conifer forest and others were converted to arable agriculture. Lack of traditional management has resulted in the remnant areas of heath which have survived successional changes and the consequent spread of bracken *Pteridium aquilinum*, shrubs and trees. The recent conservation management work, however, is resulting in their restoration. The heaths support both acid grassland and heather-dominated plant communities with dependent invertebrate and bird communities of conservation value. Woodlark *Lullula arborea* and nightjar *Caprimulgus europaeus* have also adapted to breeding in the large blocks of conifer forest, using areas that have recently been felled and recent plantation, as well as areas managed as open ground.	The site qualifies under Article 4.1 of the Birds Directive (2009/147/EC) by supporting populations of European importance of species listed on Annex I of the Directive. During the breeding season: • Nightjar *Caprimulgus europaeus*, 81 pairs representing at least 1.8% of the breeding population in Great Britain (count as at 2004). • Woodlark *Lullula arborea*, 73 pairs representing at least 2.3% of the breeding population in Great Britain (count as at 2006).

4.3 Conservation objectives

4.3.1 Natural England, which has a statutory responsibility to provide conservation advice for all protected areas (SACs, SPAs, and Ramsar sites) in England and within English territorial waters, is in the process of updating its conservation advice. This is to ensure that all conservation advice is clear, easily understood and meets the needs of those that use it. Consequently, the assessment included herein has been undertaken based on the generic conservation objectives available.

4.3.2 The following generic conservation objectives apply to the Minsmere to Walberswick Heaths and Marshes SAC:

With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features'), and subject to natural change;

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring:

- *The extent and distribution of qualifying natural habitats and habitats of qualifying species,*
- *The structure and function (including typical species) of qualifying natural habitats,*
- *The structure and function of the habitats of qualifying species,*
- *The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely,*
- *The populations of qualifying species, and*
- *The distribution of qualifying species within the site.*

4.3.3 For the Minsmere to Walberswick and Sandlings SPAs, the following generic conservation objectives apply:

With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change:

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:

- *The extent and distribution of the habitats of the qualifying features*
- *The structure and function of the habitats of the qualifying features*
- *The supporting processes on which the habitats of the qualifying features rely*

- *The population of each of the qualifying features, and*
- *The distribution of the qualifying features within the site.*

4.3.4 Draft advice under Regulation 35(3) of the Habitats Regulations and Regulation 18 of the Offshore Habitats Regulations for the Outer Thames Estuary SPA provides the following conservation objective:

- *The conservation objective for the Outer Thames Estuary Special Protection Area is, subject to natural change, to maintain or enhance the red-throated diver population (*Gavia stellata*) and its supporting habitats in favourable condition.*

4.3.5 Red-throated diver will be considered to be in favourable condition only when both of the following two conditions are met:

i. *The size of the red-throated diver population is at, or shows only non-significant fluctuation around, the mean population at the time of designation of the SPA to account for natural change; and*

ii. *The extent of the supporting habitat within the site is maintained.*

4.3.6 For Ramsar sites, as the provisions of the Habitats Regulations relating to HRAs extend to Ramsar sites, Natural England considers the Conservation Advice packages for the overlapping European site designations (i.e. SACs and SPAs) to be, in most cases, sufficient to support the management of the Ramsar interests. Hence Defra and Natural England have not produced separate Conservation Advice packages for Ramsar sites.

5. SCREENING OF POTENTIAL EFFECTS

5.1 Determination of LSE

a) The 'LSE test'

5.1.1 This section sets out the background to the determination of LSE in respect of the test set out in the Habitats Regulations and the proposed approach to this aspect of the HRA process for the Proposed Development.

5.1.2 It provides information on the LSE test, including definitions of what constitutes likely significant effect as determined through case law. It then highlights how the Shadow HRA has approached the determination of LSE, taking into account the various requirements set out in guidance and previous practice.

5.1.3 The 'LSE test' is the process of identifying potentially relevant European sites (addressed in this case through 'scoping'; see **Section 4**) and the likely effects of a project on the qualifying interest features of a European site, either alone or in-combination with other plans and projects, and considering whether the effects are likely to be significant.

5.1.4 The HRA screening process uses the threshold of LSE to determine whether effects on European sites should be the subject of further assessment. The Habitats Regulations do not define the term LSE but Natural England's predecessor defined it as *"any effect that may reasonably be predicted as a consequence of a plan or project that may affect the conservation objectives of the features for which the site was designated, but excluding trivial or inconsequential effects"* (English Nature, 1999).

5.1.5 Determining whether an effect is likely to be significant and, where there is a LSE, the implications for the integrity of a European or Ramsar site, involves the application of professional judgement. This professional judgement must be based on an adequate evidence base and on sound reasoning. Case law, notably the Waddenzee Case (Case C-127/02) and the Sweetman Case (Case C-258/11), has made clear (a) that the threshold for determining whether an effect is likely to be significant is set very low, and that unless it can be convincingly argued that, with or without mitigation, the effect is trivial or inconsequential, then (b) an assessment of the implications of that effect for the integrity of the European or Ramsar site must be undertaken. Case law also makes it clear that judgements must be precautionary and that the absence of evidence for the significance of an effect is not an acceptable reason for concluding that a plan or project will not have an adverse effect on site integrity.

5.1.6 Similarly, clarification has been provided through case law on the meaning of 'a likely significant effect' (Bagmoor Wind Ltd v The Scottish Ministers, 2012). In this case, it was ruled that the word 'likely' in the Habitats Regulations should not be interpreted as referring to the probability of a significant effect but rather as a description of the existence of a risk of a significant effect (i.e. the possibility). Consequently, if the possibility of a significant effect cannot be excluded on the basis of objective information, an appropriate assessment will be required.

5.1.7 In the *Bagmoor Wind* case it was also suggested that, where the absence of a risk of a likely significant effect can only be established after detailed investigation or expert opinion, it is an indicator that there is an existence of a risk and the competent authority must move from screening to appropriate assessment.

5.1.8 Although not the topic of this section, it is important to note that the existence of a risk to achieving the conservation objectives of a site as a result of project-related effects does not automatically equate to an adverse effect on the integrity of the site. The risk needs to be examined in detail to the point that no reasonable scientific doubt remains as to the absence of an adverse effect.

b) Mitigation

5.1.9 Where the potential for a LSE is highlighted, it is possible that the effect could be completely avoided by the application of one or more avoidance (mitigation) measures. However, in line with the *People Over Wind* and *Sweetman v Coillte Teoranta* (C-323/17) ruling referred to in **Section 3**, with the exception of mitigation measures that form an integral part of the Project's design, no additional measures intended to avoid or reduce an effect have been taken into account as part of the LSE screening exercise set out herein (i.e. mitigation measures have not been used as a basis for screening effects out).

c) In-combination

5.1.10 The in-combination component of the LSE test needs to focus only on those plans or projects that could potentially interact with the project under consideration. In this respect, the in-combination check must consider whether:

- the effects of the plans and projects, in combination, would make the effects of the project more likely to occur, or more likely to occur at significant levels, that alone would be unlikely to either occur or be significant;
- the effects of the plans and projects, in combination, would make insignificant effects significant; and
- the effects of the plans and projects, in combination, would generate new or different effects that would not occur if the plans and projects proceeded alone.

5.1.11 The approach taken to the in-combination assessment for the Proposed Development, including the selection of appropriate plans and projects for consideration in the assessment process, is set out in **Section 5.4**.

5.2 Effect pathways

5.2.1 The test for LSE requires that consideration is given to potential causes and effects (i.e. any likely effect pathways). Information on the project is needed to identify the potential causes of effects and information on the European site(s) is needed to identify any potential implications related to these effects. In the absence of a potential effect pathway, it can be concluded that no LSE would arise. In respect of this aspect, it is also important to ensure that the potential for a risk is credible rather than hypothetical.

5.2.2 Within this assessment, each potential effect is considered using information from surveys undertaken to inform the HRA process, published literature (where available), other available baseline data, modelling outputs and professional judgement. Where a potential effect has been identified but no LSE is predicted, the evidence and reason for reaching this conclusion are provided.

5.2.3 **Table 5.1** outlines the environmental 'effect' categories adopted for the LSE screening exercise and their definitions for the construction/demolition and operational phases of the Proposed Development. These are based on the cause-effect pathways agreed during the 2016 scoping exercise carried out for the EIA.

5.2.4 The judgement as to whether a significant effect is likely has been based on the best readily available information. The information required for determining whether a LSE could arise varies from project to project, but it is the subsequent AA (would an adverse effect on site integrity arise) stage that forms the more in-depth assessment (in most cases).

5.2.5 The effects of the Proposed Development have been considered with respect to all qualifying interest features of the scoped in European sites in order to determine whether an LSE may arise. In line with the precautionary principle, where there is uncertainty or information is lacking in relation to the capacity of an effect to undermine a site's conservation objectives, it has been assumed that there could be an effect and LSE has not been ruled out.

Table 5.1 Screening categories

Screening category	Definition	
	Construction and demolition	Operation
Direct habitat loss and/or fragmentation	The direct loss or fragmentation of designated habitats (not species) due to land take.	As for construction and demolition.
Exposure of sensitive habitats and species to dust	Relates to the potential direct effects due to the generation of dust by earthworks, machinery and vehicles on sensitive species and habitats.	Not applicable to the operation phase.
Disturbance of sensitive species due to noise	Relates to potential indirect effects, including displacement, on qualifying features through disturbance due to noise from machinery.	Relates to potential indirect effects resulting from operational noise. The level of operational noise generated is expected to be similar to that generated due to the current operation of the facilities; however, the location of noise generation would move due to the relocation of existing facilities to other locations with the Sizewell B power station site.
Disturbance of sensitive species due to artificial light	Relates to potential indirect effects, including displacement, on qualifying features from disturbance due to lighting of the site and equipment.	Relates to potential indirect effects, including displacement, resulting from disturbance due to lighting arrangements associated with buildings and car parking.
Exposure of sensitive species to visual disturbance	Relates to potential indirect effects, including displacement, on qualifying features from visual disturbance due to an increase in workforce and the movement of vehicles and machinery.	Relates to potential indirect effects resulting from visual disturbance. The level of visual disturbance generated is expected to be similar to that generated due to the current operation of the facilities; however, the location of such visual disturbance would move due to the relocation of existing facilities to other locations with the Sizewell B site.

5.3 Screening for LSE

a) Introduction

5.3.1 For an effect on a receptor (in this case a 'qualifying feature') to occur, the receptor needs to be sensitive to the change that would occur as a result of the activity and be vulnerable to the effect within the 'impact zone'. The impact zone can be determined based on a number of methods, including modelling, to predict the direct and indirect area of effect, or ZoI, of the activity. Based on existing knowledge, it is possible to screen out the potential for some effects to occur on certain qualifying features either because they would not be vulnerable to any changes occurring as a result of the Proposed Development and/or they would not be sensitive to any changes that could occur.

5.3.2 The potential changes/effects identified in **Table 5.1** have been investigated, for the construction and demolition, and operational phases of the Proposed Development, to determine their likely ZoIs and, together with existing knowledge of the sensitivity of the qualifying features of the European sites scoped in to the assessment, it has been possible to conclude that all or some qualifying features for some of the scoped in European sites can be 'screened out' of further assessment. The following sections provide the rationale behind this.

b) Habitat Loss and Fragmentation

5.3.3 The Proposed Development does not directly overlap any of the European sites that have been scoped in to the screening process (**Table 4.2**); therefore, no direct loss of designated habitats would occur.

5.3.4 A breeding bird survey was carried out in Coronation Wood in April to June 2014 and in 2015 (EDF Energy, 2016), which would be removed as part of the Proposed Development. The survey identified that Coronation Wood supported a limited assemblage of breeding birds characteristic of grassland and scrub habitat, such as house sparrow, song thrush, starling, linnet and marsh tit, none of which are qualifying features of the European sites scoped into the assessment (**Table 4.2**).

5.3.5 For the Outer Thames Estuary SPA, no habitat suitable for use by its qualifying features (e.g. red-throated diver or tern species present in the non-breeding season) is present within the Proposed Development's ZoI.

5.3.6 For the Sandlings SPA, there are no areas of heath or conifer clear-fell that would support ground nesting woodlark or nightjar (qualifying features of the Sandlings SPA) within or near the Proposed Development.

5.3.7 A number of qualifying species of the Minsmere-Walberswick SPA and Ramsar site have been recorded using the Sizewell Marshes SSSI, which borders the Proposed Development site. These are marsh and hen harriers, gadwall, shoveler, teal, bittern and white-fronted goose. The Sizewell Marshes SSSI does not support suitable habitat for the remaining qualifying species of the SPA (avocet, nightjar and little tern) and Ramsar site (**Table 4.2**). Although the Sizewell Marshes SSSI includes reedbed habitats, which can support bearded tits, this species is not referred to as a notified feature in the SSSI citation and there are few records of the species from breeding bird

surveys of the Sizewell Marshes between 2011 and 2017 (SWT 2017). Therefore, the site is not considered to be of importance for this species.

5.3.8 Consequently, no removal from or fragmentation of qualifying habitat would occur in the Minsmere to Walberswick Heaths and Marshes SAC nor those habitats which support the bird interest features of the SPA and Ramsar sites scoped in to the assessment.

5.3.9 Therefore, no LSE has been identified due to habitat loss and fragmentation in the European sites scoped in to this Shadow HRA.

c) Potential disturbance from airborne noise

5.3.10 European sites that may be affected by airborne noise disturbance are those with birds as an interest feature, i.e. SPAs and Ramsar sites (**Table 4.2**).

5.3.11 With regard to ornithological receptors, airborne noise disturbance effects can result in effects of varying severity depending on a range of factors. These include the nature, duration and sound level of the disturbance source. Airborne noise disturbance may influence the survival of individual birds or reduce the function of a protected site, both within its boundary and through effects on habitats beyond site boundaries which may be functionally linked to the protected site.

5.3.12 Responses of birds to airborne noise disturbance could include: increased vigilance, causing birds to look up repeatedly, interfering with ongoing activities such as feeding or roosting; moving away from the source of the disturbance by walking or swimming before resuming the previous activity; or taking flight and either landing somewhere in the same area, or leaving the area completely.

5.3.13 As a general rule, each subsequent level of disturbance episode severity would result in a larger impact in terms of reduced feeding or roosting time and greater energy expenditure. Birds that move away from a noise source use energy and may be displaced to habitat of lesser quality. If birds do not move away but remain in an area, it could be inferred that no impact is occurring; however, such birds could experience a reduction in foraging efficiency due to increased vigilance behaviour or suffer a physiological stress response. Both scenarios can result in decreases in the overall fitness of a population, which in turn can lead to population-level effects through reduced breeding success or increased mortality.

5.3.14 Disturbance to breeding birds during the incubation or chick-rearing periods, which causes adults to leave a nest site, even for a short time, can result in egg or chick loss due to breakage or predation. Other effects can include disruption of courtship, nest-site defence and prospecting activities. All of these have the potential to cause population-level effects through overall reduction in breeding productivity.

5.3.15 In extreme cases, responses to airborne noise disturbance could include displacement from foraging areas or nesting areas, resulting in barrier effects that act to prevent access to areas of suitable habitat. However, the extent of activities that would occur as a result of the Proposed Development are not expected to cause any barrier effects.

Construction and demolition phase

5.3.16 The construction and demolition activities associated with the Proposed Development may result in an increase in airborne noise both within the Proposed Development site and its immediate surroundings. Airborne noise would be produced by the use of machinery for construction and demolition, increased vehicle movement and increased human presence on site during the construction and demolition phase.

5.3.17 Much of the work undertaken on bird responses to airborne noise disturbance in the UK has focussed on wintering estuarine waterbirds (Cutts *et al*. 2013, Wright *et al*. 2010). These studies tend to suggest that, while different species vary in their sensitivity to noise, overall bird response to noise disturbance is likely to be minor at levels (at the bird) of 70 dBA and lower (note that A refers to A-weighting which approximates the frequency response of the human ear). A distinction may be made between 'average' noise levels (L_{Aeq}) and maximum (impulsive) noise levels (L_{Amax}). Sudden impulsive noises (for example a gun shot or an explosion) are potentially most likely to cause disturbance reactions. These findings provide a general context for the current assessment, which deals with waterbird and non-waterbird species during the breeding and non-breeding seasons, when behavioural responses may differ.

5.3.18 Cutts *et al.* (2013) presented a table illustrating standard decay distances for airborne noise. According to this table, plant generating noise at approximately 100 dBA at source will have reduced to approximately 60 dBA at a distance of approximately 85 m, and <50 dBA at a distance of approximately 200 m. Decay distance may be affected by local factors such as ground type, prevailing wind and the presence of barriers and vegetation, which are not accounted for in the table.

5.3.19 Based on the above, it is considered that airborne noise disturbance as a result of the construction and demolition activities associated with the Proposed Development would not occur within the Minsmere-Walberswick SPA or Ramsar site. This is because the nearest boundary of the SPA lies approximately 600 m from the construction and demolition activities. For the same reasons, impacts due to airborne noise are not predicted within the Sandlings SPA or the Outer Thames Estuary SPA; the nearest boundaries of which are located 700 m and 500 m from the nearest proposed construction and demolition activities respectively.

5.3.20 Noise levels that could disturb qualifying features of the SPA utilising functionally linked habitat outwith the Minsmere-Walberswick SPA or Ramsar site, in close proximity (≤200 m) to the Proposed Development, are possible. This encompasses an area of habitat to the west that forms part of the Sizewell Marshes SSSI. Therefore, it is not possible to rule out LSE for airborne noise and this potential effect is screened in for AA for the following SPA qualifying features which make use of the Sizewell Marshes:

- marsh harriers (breeding);
- hen harriers (non-breeding);
- gadwall (both breeding and non-breeding);
- shoveler (both breeding and non-breeding);

- teal (breeding);
- bittern (breeding); and
- white-fronted goose (non-breeding).

5.3.21 LSE is screened out for qualifying species of the SPA (avocet, nightjar and little tern) and Ramsar Site (avocet and bearded tit) for which there is no (or little) suitable habitat within the Sizewell Marshes SSSI.

5.3.22 Due to a lack of suitable habitat for qualifying features of the Sandlings SPA and the Outer Thames Estuary SPA in the Proposed Development's ZoI for airborne noise, birds from these European sites would not be present in this area. Therefore, no LSE as a result of airborne noise is predicted with respect to these SPAs.

Operation

5.3.23 It is predicted that the airborne noise conditions associated with the Proposed Development during the operational phase would be largely similar to those currently experienced due to the existing Sizewell power station complex, with the exception of a small increase in airborne noise from the Coronation Wood area, i.e. due to the new Western Access Road, Laydown Area, Replacement Car Park, Training Centre and Visitor Centre.

5.3.24 It is, therefore, considered that airborne noise disturbance as a result of the operation of the Proposed Development would not occur within the Minsmere-Walberswick SPA or Ramsar site. This is because the nearest boundary of the European sites lies approximately 600 m from the Proposed Development. For the same reasons, effects due to airborne noise are not predicted within the Sandlings SPA or the Outer Thames Estuary SPA, the nearest boundaries of which are located 700 m and 500 m from the proposed operational activities.

5.3.25 Due to the fact that operational parts of the Proposed Development lie in close proximity to the Sizewell Marshes SSSI, there may be a slight increase in airborne noise levels in localised parts of the eastern area of the Sizewell Marshes SSSI. As stated above, on a precautionary basis it has been established that this area could be functionally linked to the Minsmere-Walberswick SPA and Ramsar site. However, despite this possible slight increase in noise levels, the ambient noise levels within the Sizewell Marshes SSSI would be expected to be essentially the same as those in the current (baseline) situation.

5.3.26 Due to the small scale of this effect, the low number of birds present, and the availability of higher quality habitat elsewhere within the local area for birds to use as an alternative (e.g. within the SPA itself, or other non-impacted local habitat within the Sizewell Marshes SSSI or the non-designated Minsmere South Levels area), it is concluded that there would be no LSE from operational airborne noise to the Minsmere-Walberswick SPA or Ramsar site.

5.3.27 Given the lack of suitable habitat for the qualifying features of the Sandlings SPA and the Outer Thames Estuary SPA in the Proposed Development's ZoI for airborne noise, birds from these sites would not be present in this area. Therefore, no LSE as a result

of operational airborne noise from the Proposed Development is predicted with regard to these SPAs.

d) Potential disturbance from artificial light

5.3.28 European sites that may be affected by the presence of artificial light sources are those with birds as an interest feature, i.e. SPA and Ramsar sites (**Table 4.2**).

5.3.29 Artificial lighting from the Proposed Development may have effects on SPA and Ramsar sites' qualifying features, albeit on a highly localised spatial scale.

5.3.30 Whilst artificial lighting can result in disorientation of birds and cause collisions with structures (particularly if placed on very tall structures) (Hockin *et al*., 1992; Montevecchi, 2006), other research has highlighted the potential benefits of such lighting by extending the time available to feed (Santos *et al*., 2010; Dwyer *et al*., 2013).

Construction and demolition phase

5.3.31 Due to the distances between the proposed construction and demolition activities and the nearest boundaries of each site (600 m for the Minsmere-Walberswick SPA and Ramsar site, 500 m for the Outer Thames Estuary SPA, and 700 m for the Sandlings SPA), LSE due to artificial light within these sites are not conceivable and are not considered further.

5.3.32 Due to a lack of suitable habitat for the qualifying features of the Sandlings SPA and the Outer Thames Estuary SPA in the immediate surroundings of the Proposed Development (considered to be the ZoI for artificial light), birds from these sites would not be present in this area. Therefore, no LSE as a result of artificial lighting from the Proposed Development is predicted on these SPAs and no further assessment is required.

5.3.33 Artificial lighting would be used within Coronation Wood during the construction and demolition phase, which is close to the Sizewell Marshes SSSI. As stated above, on a precautionary basis, it is presumed that the SSSI could be functionally linked to the Minsmere-Walberswick SPA and Ramsar site. Whilst Coronation Wood is directly adjacent to the SSSI, the artificial lighting used would be oriented towards the construction activities, with no lighting pointed towards the SSSI. Hence any light spill in to the SSSI is unlikely to be of sufficient intensity or duration to cause an adverse reaction from any SPA-qualifying species within the SSSI.

5.3.34 Due to the small scale of this effect, the low number of birds present, and the availability of higher quality habitat elsewhere within the local area for birds to use as an alternative should an impact occur (e.g. within the SPA itself, or other non-impacted local habitat within the Sizewell Marshes SSSI or the non-designated Minsmere South Levels area), it can be concluded that there would be no LSE from artificial lighting during the construction and demolition phase on the Minsmere-Walberswick SPA or Ramsar site.

Operation

5.3.35 The Lighting Strategy submitted with the planning application for the Proposed Development provides Isoline Calculation Results for the Proposed Development laydown area of 20 lux (25% output), 50 lux (50% output) and 100 lux (100% output). At 100 lux, the maximum distance of 0.5 lux from the site perimeter is 50 m, this reduces to 30 m at 50 lux and 20 m at 20 lux.

5.3.36 No light spill into the Sizewell Marshes SSSI, which contains habitat that may be functionally linked to the Minsmere-Walberswick SPA and Ramsar site, is therefore predicted.

e) Exposure to dust

5.3.37 Potential impacts during the construction/demolition phase of the Proposed Development may arise from exposure of qualifying habitats and species to dust. Dust-generating activities include site clearance, earthworks, use of materials such as concrete and demolition of structures. Secondary dust effects can result from 'trackout', i.e. mud and debris from construction vehicles as they access public roads.

5.3.38 Dust can have two types of effect on vegetation: physical and chemical. Direct physical effects include reduced photosynthesis and respiration through smothering. Indirect effects include an increased susceptibility to stress through exposure to pathogens and air pollution. The Institute for Air Quality Management guidance (Holman *et al.*, 2014) provides a guide to magnitude of impact from dust on sensitive receptors based on distance. This has been reproduced in **Table 5.2** below.

Table 5.2 Sensitivity of receptors to dust impacts (Holman *et al.*, 2014)

Receptor sensitivity	Distance from source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

5.3.39 The generation of dust could affect designated habitats of the Minsmere to Walberswick Heaths and Marshes SAC, and the habitats supporting the bird interest features of the Minsmere-Walberswick SPA and Ramsar site, and Sandlings SPA. There is no effect pathway from dust to the habitats supporting the bird interest features of The Outer Thames Estuary SPA. However, dust could affect the habitats of the Minsmere Marshes SSSI, which has possible functional links with several qualifying features of the Minsmere-Walberswick SPA/Ramsar site, as detailed above. All of the designated sites that could be affected by dust are classified as having 'high' sensitivity, due to their international importance.

5.3.40 As can be seen from **Table 5.2**, a high impact from dust is considered to occur for a high sensitivity receptor within 20 m from the source of the dust, and a medium impact between 20 – 50 m from the source of the dust. Due to the distance of the designated sites from the closest proposed construction/demolition activities (600 m for Minsmere-Walberswick SPA and Ramsar site, and 700 m for Sandlings SPA), habitats within these sites would not be affected by the generation of dust during construction/demolition activities.

5.3.41 Those construction/demolition activities closest to the SSSI are the clearing of Coronation Wood, and the construction of facilities in that location. Despite the possible occasional presence of birds from the Minsmere-Walberswick SPA and Ramsar site in the SSSI, a LSE on these features as a result of this impact pathway is not predicted. This is due to the small distance from source at which effects might occur (with a low impact predicted at distances of >50 m, **Table 5.2**). Thus, there would be a very low number of birds present within the Proposed Development's ZoI and higher quality habitat available elsewhere within the local area for birds to use as an alternative. Further, such impacts would be temporary and reversible and there is a natural vegetation barrier in place between Coronation Wood and the SSSI that would reduce the potential for the transport of dust from the source to the SSSI.

5.3.42 No LSE is, therefore, predicted on any European site or designated feature as a result of the generation of dust during the construction and demolition phase.

f) Potential visual disturbance

5.3.43 Construction and demolition activities can lead to visual disturbance to bird species. A review of the literature suggests that bird species are most likely to be disturbed in close proximity to the source of visual disturbance and that, at distances beyond 200 m, visual disturbance is less likely.

Construction and demolition phase

5.3.44 Due to the distances between the proposed construction and demolition activities and the nearest boundaries of each site (600 m for Minsmere-Walberswick SPA and Ramsar site, 500 m for Outer Thames Estuary SPA, and 700 m for Sandlings SPA), impacts due to visual disturbance within these sites are not considered to be feasible and are not considered further.

5.3.45 Based on the available evidence from disturbance studies (e.g. Rodgers and Smiyth 1995, Bregnballe *et al.* 2009a,b, Livesey *et al*. 2016) and the variability of response to sources of disturbance, a zone of sensitivity to disturbance of 300 m from potential sources of activity and visual intrusion is considered precautionary. As such, this is considered to be an appropriate buffer distance in situations where the activities in question are within direct line of sight of birds using the potentially affected areas. However, where visibility is obscured by screening or as a result of the topographical and habitat conditions on the site, reduced buffer distances are likely to be appropriate. In the case of the Proposed Development, birds potentially subject to disturbance are within the Sizewell Marshes area, an area of unimproved wet meadow (fen-meadow and rush pasture) with an extensive ditch system and areas of reedbed and alder carr. The tall vegetation associated with these habitats provides cover for birds and is considered to reduce their exposure to visual disturbance. Therefore, an appropriate

ZoI for visual disturbance in this instance is predicted to be ≤ 200 m, as proposed for airborne noise disturbance.

5.3.46 Thus, visual disturbance from construction and demolition activities could affect habitats in close proximity (<200 m) to the Proposed Development which are functionally linked to the Minsmere-Walberswick SPA and Ramsar site. This encompasses an area of habitat to the west that is designated as part of the Sizewell Marshes SSSI. Therefore, it is not possible to rule out LSE for visual disturbance and this potential effect is screened in for AA for the following species which make use of the Sizewell Marshes:

- marsh harriers (breeding);
- hen harriers (non-breeding);
- gadwall (both breeding and non-breeding);
- shoveler (both breeding and non-breeding);
- teal (breeding);
- bittern (breeding); and
- white-fronted goose (non-breeding).

5.3.47 LSE is screened out for qualifying species of the SPA (avocet, nightjar and little tern) and Ramsar site (avocet and bearded tit) for which there is no (or little) suitable habitat within the Sizewell Marshes SSSI.

Operation

5.3.48 It is predicted that the visual disturbance conditions would be largely similar to those currently experienced for the existing Sizewell power station complex. The Coronation Wood Development Area would see an increase in the potential for visual disturbance during operation as the area would fundamentally change from a wooded area to an area containing some of the relocated facilities. Despite the possible occasional presence of birds from the Minsmere-Walberswick SPA and Ramsar site in the ZoI of visual disturbance for the Proposed Development, LSE as a result of this impact pathway is not predicted. This is due to the low number of birds that use the ZoI and the availability of higher quality habitat elsewhere within the local area for birds to use as an alternative (e.g. within the SPA itself, the Minsmere South Levels, or other non-impacted local habitat within the Sizewell Marshes SSSI). Additional screening of the visual disturbance from trees and vegetation as a boundary between the Proposed Development and the SSSI would also reduce any potential visual disturbance.

5.3.49 Similarly, it is considered that visual disturbance as a result of the operation of the Proposed Development would not occur within the Minsmere-Walberswick SPA or Ramsar site. This is because the nearest boundary of the sites lies approximately 600 m from the Proposed Development. Significant effects due to visual disturbance are also not predicted within the Sandlings SPA or the Outer Thames Estuary SPA,

the nearest boundaries of which are located 700 m and 500 m from the Proposed Development.

g) Summary

Table 5.3 and **Table 5.4** below set out the outcome of the LSE screening assessment on the scoped in European sites due to the Proposed Development (alone) for construction/demolition and operational activities respectively.

Table 5.3 Outcome of screening assessment for the construction and demolition phase of the Proposed Development

Designated site	Potential effect	Qualifying feature	Outcome	LSE?
Minsmere to Walberswick Heaths and Marshes SAC	Direct habitat loss and fragmentation	All qualifying habitat features	No construction activity would occur in the SAC and no vehicular movements through the SAC; therefore, no direct habitat loss or fragmentation would occur.	No
	Exposure of sensitive habitats and species to dust	All qualifying habitat features	No effects are predicted from the generation of dust due to the distance between the designated site and the construction/demolition activities.	No
Minsmere-Walberswick SPA	Direct habitat loss and fragmentation	Habitats supporting the bird interest features	No construction activity would occur in the SAC and no vehicular movements through the SAC; therefore, no direct habitat loss or fragmentation would occur.	No
	Exposure of sensitive habitats and species to dust	Habitats supporting the bird interest features	No effects are predicted on supporting habitats from the generation of dust due to the distance between the designated site and the construction/demolition activities. No effects on birds are predicted that could be associated with the SPA population present with the Sizewell Marshes SSSI due to the low number of birds present, temporary nature of construction/demolition activities, and availability of higher quality habitat elsewhere.	No
	Disturbance from noise	All bird interest features	No effects are predicted from construction/demolition phase noise due to distance from the Proposed Development. LSE cannot be ruled out during construction/demolition for qualifying birds present with the Sizewell Marshes SSSI that could be associated with the SPA populations: marsh and hen harriers, gadwall, shoveler, teal, bittern and white-fronted goose.	Yes

Designated site	Potential effect	Qualifying feature	Outcome	LSE?
	Disturbance from artificial light	All bird interest features	No effects are predicted from construction/demolition phase artificial lighting due to distance from the Proposed Development. No effects on birds are predicted that could be associated with the SPA population present within the Sizewell Marshes SSSI due to the absence of a predicted impact of any magnitude within SSSI, low number of birds present, temporary nature of construction/demolition noise, and availability of higher quality habitat elsewhere.	No
	Visual disturbance	All bird interest features	No effects are predicted due to visual disturbance from the construction/demolition phase due to distance from the Proposed Development. LSE cannot be ruled out during the construction/demolition phase for qualifying birds present with the Sizewell Marshes SSSI that could be associated with the SPA populations: marsh and hen harriers, gadwall, shoveler, teal, bittern, and white-fronted goose.	Yes
Minsmere-Walberswick Ramsar site	Direct habitat loss and fragmentation.	Habitats supporting the bird interest features.	No construction activity would occur in the Ramsar site and no vehicular movements through the Ramsar site; therefore, no direct habitat loss or fragmentation would occur.	No
	Exposure of sensitive habitats and species to dust.	Habitats supporting the bird interest features.	No effects are predicted on supporting habitats from the generation of dust due to the distance between the designated site and the construction/demolition activities. No effects are predicted on birds that could be associated with the Ramsar site population present with the Sizewell Marshes SSSI due to the low number of birds present, temporary nature of construction/demolition activities, and availability of higher quality habitat elsewhere.	No

Designated site	Potential effect	Qualifying feature	Outcome	LSE?
	Disturbance from noise	All bird interest features.	No effects are predicted from construction/demolition phase noise on the Ramsar site due to distance from the Proposed Development. LSE cannot be ruled out during the construction/demolition phase for qualifying birds present with the Sizewell Marshes SSSI that could be associated with the following Ramsar populations: marsh harrier, gadwall, shoveler, teal, and bittern.	Yes
	Disturbance from artificial light	All bird interest features	No effects are predicted from construction/demolition phase artificial lighting on the Ramsar site due to distance from the Proposed Development. No effects are predicted on birds that could be associated with the Ramsar site population present with the Sizewell Marshes SSSI due to a small scale of impact on SSSI, low number of birds present, temporary nature of construction/demolition noise, and availability of higher quality habitat elsewhere.	No
	Potential visual disturbance on areas of sensitive species.	All bird interest features	No effects are predicted due to visual disturbance from the construction/demolition phase of the Proposed Development on the Ramsar site due to distance from the Proposed Development. LSE cannot be ruled out during the construction/demolition phase for qualifying birds present with the Sizewell Marshes SSSI that could be associated with the following Ramsar populations: marsh harrier, gadwall, shoveler, teal, and bittern.	Yes
Outer Thames Estuary SPA	Exposure of sensitive habitats and species to dust	Habitats supporting the bird interest features	No construction activity would occur in the SAC and no vehicular movements through the SAC; therefore, no direct habitat loss or fragmentation would occur.	No
	Disturbance from noise	All bird interest features	No effects are predicted on the bird interest features of the SPA from dust from the Proposed Development due to lack of suitable habitat for birds from this site within the ZoI.	No

Designated site	Potential effect	Qualifying feature	Outcome	LSE?
	Disturbance from artificial light	All bird interest features	No effects are predicted on the bird interest features of the SPA from artificial light disturbance from the Proposed Development due to a lack of suitable habitat for birds from this site within the ZoI.	No
	Visual disturbance	All bird interest features	No effects are predicted on the bird interest features of the SPA from visual disturbance from the Proposed Development due to a lack of suitable habitat for birds from this site within the ZoI.	No
Sandlings SPA	Direct habitat loss and fragmentation	Habitats supporting the bird interest features.	No construction activity would occur in the SAC and no vehicular movements through the SAC; therefore, no direct habitat loss or fragmentation would occur.	No
	Exposure of sensitive habitats and species to dust	Habitats supporting the bird interest features.	No effects are predicted on the supporting habitats from the generation of dust due to the distance between the designated site and the construction/demolition activities.	No
	Disturbance from noise	All bird interest features	No effects are predicted on the bird interest features of the SPA from noise disturbance from the Proposed Development due to a lack of suitable habitat for birds from this site within the ZoI.	No
	Disturbance from artificial light	All bird interest features	No effects are predicted on the bird interest features of the SPA from artificial light disturbance from the Proposed Development due to a lack of suitable habitat for birds from this site within the ZoI.	No
	Visual disturbance	All bird interest features	No effects are predicted on the bird interest features of the SPA from visual disturbance from the Proposed Development due to a lack of suitable habitat for birds from this site within the ZoI.	No

Table 5.4 Outcome of screening assessment for the operational phase of the Proposed Development

Designated site	Potential effect	Qualifying feature	Outcome	LSE?
Minsmere to Walberswick Heaths and Marshes SAC	Direct habitat loss and fragmentation	All habitat features	During operation, there would be no direct interaction between the Proposed Development and the SAC.	No
Minsmere to Walberswick SPA	Direct habitat loss and fragmentation	Habitats supporting the bird interest features	During operation, there would be no direct interaction between the Proposed Development and the SPA.	No
	Disturbance from noise	All bird interest features	No LSE predicted due to the low number of SPA birds present and availability of higher quality habitat elsewhere.	No
	Disturbance from artificial light	All bird interest features	No effects are predicted from operational phase artificial lighting on the SPA due to distance from the Proposed Development.	No
	Visual disturbance	All bird interest features	No effects are predicted on the bird interest features of the SPA from visual disturbance from the Proposed Development due to lack of suitable habitat for birds of this site within the ZoI.	No
Minsmere to Walberswick Ramsar site	Direct habitat loss and fragmentation	Habitats supporting the bird interest features	During operation, there would be no direct interaction between the Proposed Development and the Ramsar site.	No
	Disturbance from noise	All bird interest features	No effects are predicted from operational phase noise on the Ramsar site due to distance from the Proposed Development.	No
	Disturbance from artificial light	All bird interest features	No effects are predicted from operational phase artificial lighting on the Ramsar site due to distance from the Proposed Development.	No
	Visual disturbance	All bird interest features	No effects are predicted on the bird interest features of the Ramsar site from visual disturbance from the Proposed Development due to lack of suitable habitat for birds of this site within the ZoI.	No

Designated site	Potential effect	Qualifying feature	Outcome	LSE?
Outer Thames Estuary SPA	Direct habitat loss and fragmentation	Habitats supporting the bird interest features	During operation, there would be no direct interaction between the Proposed Development and the SPA.	No
	Disturbance from noise	All bird interest features	No effects are predicted on the bird interest features of the SPA from noise disturbance from the Proposed Development due to lack of suitable habitat for birds of this site within the ZoI.	No
	Disturbance from artificial light	All bird interest features	No effects are predicted on the bird interest features of the SPA from artificial light disturbance from the Proposed Development due to lack of suitable habitat for birds of this site within the ZoI.	No
	Visual disturbance	All bird interest features	No effects are predicted on the bird interest features of the SPA from visual disturbance from the Proposed Development due to lack of suitable habitat for birds of this site within the ZoI.	No
Sandlings SPA	Direct habitat loss and fragmentation	Habitats supporting the bird interest features	During operation, there would be no direct interaction between the Proposed Development and the SPA.	No
	Disturbance from noise	All bird interest features	No effects are predicted on the bird interest features of the SPA from noise disturbance from the Proposed Development due to lack of suitable habitat for birds of this site within the ZoI.	No
	Disturbance from artificial light	All bird interest features	No effects are predicted on the bird interest features of the SPA from artificial light disturbance from the Proposed Development due to lack of suitable habitat for birds of this site within the ZoI.	No
	Visual disturbance	All bird interest features	No effects are predicted on the bird interest features of the SPA from visual disturbance from the Proposed Development due to lack of suitable habitat for birds of this site within the ZoI for visual disturbance.	No

5.4 Screening in-combination effects

a) Scoping other plans and projects

5.4.1 EDF Energy (NGL) submitted an EIA Scoping Report to SCDC in October 2016 (EDF Energy, 2016) and a Scoping Opinion was received in December 2016. Subsequently, a pre-application meeting was held on 14 December 2018 to confirm cumulative schemes to be considered within the Environmental Statement. A review of publicly available information, such as on local planning authorities' planning portals, was carried out. Through this process, schemes to be considered within the cumulative effects assessment for the Proposed Development were confirmed.

5.4.2 Not all of the projects identified from the planning search have the potential to have in-combination effects with the Proposed Development. That is, there are certain types of development that are considered to be insignificant in nature and scale (e.g. change of use or conversions to existing buildings and erection of agricultural buildings) and, as such, are unlikely to have the potential to contribute to significant in-combination effects. These types of development were, therefore, scoped out.

5.4.3 It should also be noted that:

- more weight is given to those projects that are at a more advanced stage in planning/licensing, as there will be more confidence over the design and its likely impacts;
- future plans or projects for which sufficient information is not available to base a reliable assessment and which are not likely to be submitted or gain consent until after the Proposed Development has been completed, cannot reasonably be assessed; and
- caution must be adopted where there is the consideration of worst-case scenarios and details of other developments are not clear, as the assessment may become overly precautionary and unrealistic.

5.4.4 Through this exercise, the projects to be considered within the likely significant in-combination effect (LSIE) screening exercise, as confirmed with SCDC, were determined to comprise:

- Sizewell C nuclear power station.
- Scottish Power Renewables (SPR) East Anglia One North and East Anglia Two offshore windfarms, specifically the proposed onshore facilities.

5.4.5 No other plans or permitted developments were identified for inclusion to the in-combination assessment. **Table 5.1** below provides a description of the scoped-in projects along with the expected interactions between the relevant project and the Proposed Development.

Table 5.5 A description of the projects to be considered within the in-combination assessment and their interactions with the Proposed Development

Project description	Status	Location	Temporal overlap with Proposed Development?	Designated sites that could be affected	Spatial overlap with the Proposed Development?
Sizewell C nuclear power station – EDF Energy	Pre-submission Development Consent Order application. Assessment based on Stage 3 and Stage 4 public consultation materials.	Works at the Main Development Site of the Sizewell C nuclear power station overlap with the site of the Proposed Development and are within its ZoI.	Phase 1 of Proposed Development would be complete before the start of Sizewell C construction. The worst-case scenario is that Phase 2 of the Proposed Development would overlap with the start of Sizewell C construction, potentially with up to a two-year overlap overall.	All designated sites scoped in to the screening exercise	Some of the Sizewell B buildings to be demolished as part of the Proposed Development are within the site boundary of Sizewell C, as it is necessary to move these buildings for Sizewell C to progress.
East Anglia One North (EA1N) and East Anglia Two (EA2) SPR - comprising the following onshore facilities: • two substations (20 – 30 ha) • one National Grid compound • temporary construction compound • export cable.	Pre-submission Development Consent Order application. Assessment based on Stage 4 public consultation materials.	Onshore facilities: Between Thorpeness, Leiston and Friston. Construction traffic routes: Sizewell Gap/ Lover's Lane/ B1122/ A12 See **Figure 5.1**.	Construction of EA1N is expected to commence after the Proposed Development has been completed. Therefore, EA1N is only relevant to the operational phase assessment. Earliest construction start for EA2 is 2024 and is expected to last three years. Overlap with the operational phase of the Proposed Development and the construction and operation of EA2 and operation of EA1N.	Sandlings SPA	Both projects would utilise the B1122 for construction traffic access to the A12. Otherwise, no further spatial overlap with EA1N or EA2 onshore components.

b) Findings of the LSIE Stage 1 Screening exercise

i. Sizewell C nuclear power station

5.4.6 Phase 1 of the Sizewell C main development site would involve site establishment and preparation for earthworks, which are likely to comprise the following activities:

- preparation of the site for development and establishment of temporary infrastructure;
- archaeological excavations and translocation of protected species from the main development site to receptor sites nearby;
- diversion of the Sizewell Drain to enable development in the north-west corner of the SSSI;
- construction of the cut-off wall on the main development site and preparation of the main platform with initial utility connections;
- site clearance, establishment of temporary welfare facilities and security fencing;
- an access road would be established from the B1122, crossing the SSSI to arrive at the north of the main platform;
- site clearance (including removal of trees in wooded areas and removal of topsoil), initial excavation works;
- the initial excavation works would include: the main platform, contractors' compound areas, borrow pits, site entrance hub, accommodation campus, batching plant area, early access roads, and land east of Eastlands Industrial Estate (LEEIE);
- works would commence for the construction of the haul road, SSSI crossing, electricity substation, site entrance, accommodation campus, and LEEIE; and
- works on the foreshore would also commence during this phase. This would include: excavation of Bent Hills along the foreshore, creation of the construction phase sea defence, and ground preparation works such as soil strengthening and northern mound adaptation.

5.4.7 There is the possibility for a temporal overlap to occur between the Phase 2 construction activities of the Proposed Development and Phase 1 activities of the Sizewell C main development site. The Phase 2 activities of the Proposed Development are the construction of the Outline Development Zone, construction of a new Visitor Centre, and Northern Area Demolition Part 2. The two construction activities would be located in the southern-half of the Proposed Development site (i.e. Pillbox Field), with no interaction between these activities and the Phase 1 activities of Sizewell C main development site.

5.4.8 The Northern Area Demolition Part 2 would comprise the removal of the Technical Training Centre, the projects office, outage office, portacabin city 2 and base area facility. Demolition includes disconnection of services, removal of items within the building, including removal of glass from external windows, use of excavator/digger wit pecker attachment to demolish the buildings (starting from the roof), use of grinder to

cut down steel framework, crushing of concrete, and breaking of ground slabs. This is expected to take no longer than five months.

5.4.9 As there is both a spatial and a temporal overlap between the Phase 2 construction activities of the Proposed Development and the construction activities for the Sizewell C main development site, it is not possible to rule out the potential for LSIE. Due to the nature of the construction activities and the outcome of the alone LSE screening assessment, the following effects pathways are screened in to the in-combination appropriate assessment:

- potential disturbance of sensitive species from noise during construction and demolition;
- potential visual disturbance to sensitive species during construction and demolition.

5.4.10 Based on the outcome of the alone assessment, LSIE could arise with respect to the following sites and qualifying interest features:

- Minsmere-Walberswick SPA: marsh harriers (breeding), hen harriers (non-breeding), gadwall (both breeding and non-breeding), shoveler (both breeding and non-breeding), teal (breeding), bittern (breeding) and white-fronted goose (non-breeding).
- Minsmere-Walberswick Ramsar site: breeding populations of marsh harrier, gadwall, shoveler, teal and bittern (on the basis that the site qualifies under Criterion 2: an important assemblage of rare breeding birds associated with marshland and reedbeds).

ii. EA1N and EA2 Offshore Wind Farms

5.4.11 The proposed onshore substations, compounds and export cable facilities are to be utilised by both the EA1N and the EA2 offshore wind farms. Therefore, for the purposes of this LSIE assessment, the onshore facilities for EA1N and EA2 offshore wind farms have been considered as a single project.

5.4.12 Potential in-combination effects between the proposed EA1N and EA2 offshore wind farms and the Proposed Development may arise from the onshore export cable route only. The substations and a third substation being constructed for National Grid are located at Friston, approximately 8 km from the Proposed Development. **Figure 5.1** shows the locations of all onshore facilities to be installed for EA1N and EA2. The figure is taken from the Phase 4 consultation document 'Preliminary Environmental Information Report (PEIR)'[4].

5.4.13 The cable route is planned to commence at the transition bay approximately 500 m north of the edge of Thorpeness and run in a northerly direction until parallel to the

[4] www.scottishpowerrenewables.com/pages/ea_one_north_phase_4_consultation.aspx; accessed February 2019.

edge of Leiston. At Leiston it would turn in a westerly direction and cross the Sandlings SPA before running in a south westerly direction for approximately 2 km (**Figure 5.1**).

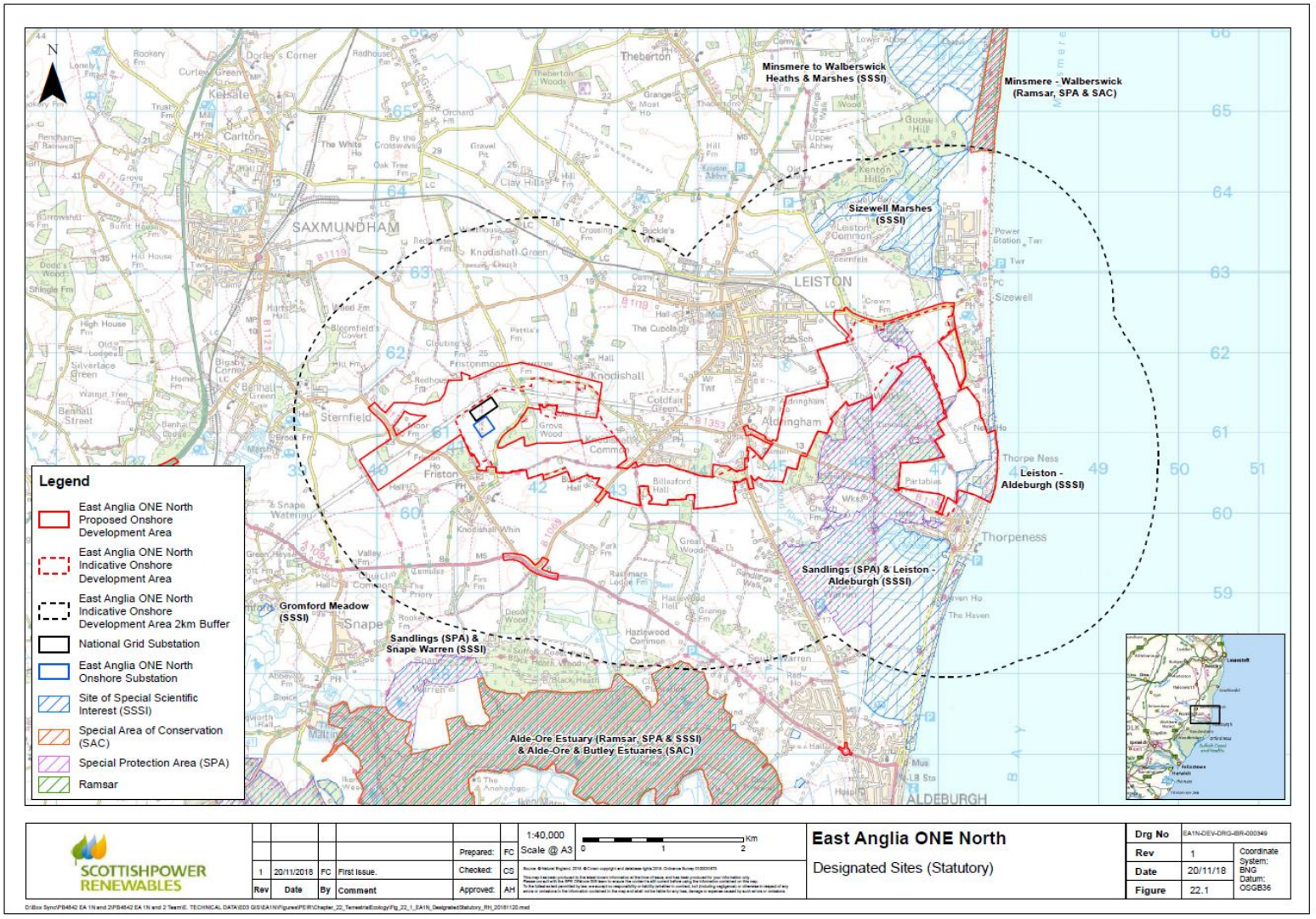
5.4.14 There is the potential for in-combination effects to arise due to the onshore cable route and the Proposed Development within the Sandlings SPA. The cable route is expected to cross through the Sandlings SPA and be installed through trenching methods. The route through the SPA for the cable route was chosen by SPR to minimise intrusion by crossing the site at its narrowest point in an area with poor habitat for nightjar and woodlark.

5.4.15 An LSE due to the Proposed Development alone is not predicted due to the distance between the closest proposed activities and the Sandlings SPA. Hence, due to the temporary nature of the construction and demolition activities of the Proposed Development, the distance of the Proposed Development to the SPA, and the lack of suitable habitat for nightjar and woodlark in the cable crossing, an LSIE is not predicted from the interaction of the Proposed Development and the proposed onshore export cable for EA1N and EA2 on the SPA.

5.4.16 During the operation of the cable there would be minimal activity required along the cable route, except for occasional maintenance activities.

5.4.17 Therefore, no LSIE has been identified between the EA1N and EA2 offshore wind farm export cable route and the Proposed Development.

Figure 5.1 EA1N and EA2 onshore project components, taken from EA1N PEIR; note that both EA1N and EA2 share the same onshore development area



6. BASELINE

6.1 Introduction

6.1.1 This section presents baseline information for the qualifying features of the SAC, SPAs and Ramsar site screened in to the AA (**Section 5**), as supporting information for the shadow AA provided in **Section 7**.

6.2 Minsmere-Walberswick SPA

6.2.1 The information presented here comprises an overview of population status of the SPA for the screened in qualifying features, as well as more in-depth consideration of the population trends and aspects of the habitat use of qualifying features where this is deemed to be required for the purposes of addressing particular impact pathways. Consideration is also given to the use of functionally linked habitat by qualifying features where there is considered to be the potential for impacts associated with the Proposed Development to affect these habitats or their use by qualifying features.

a) Population estimates of SPA qualifying features screened in

6.2.2 The population estimate from the SPA citation at classification, and the most recently available population estimate for the SPA qualifying features, show that for some species their abundance is currently considerably higher than at the time of citation, whilst for others the opposite is true (**Table 6.1**). Notable increases have occurred in the breeding populations of avocet, bittern, and in both the breeding and wintering populations of gadwall and shoveler. However, there have been marked declines in the breeding population of teal and in the wintering population of hen harrier. Although the most recent estimates for wintering white-fronted goose are considerably lower than those from the time of citation, this may simply reflect the fact that these birds tend to use the SPA for roosting at night, with the main daytime feeding area being at North Warren (RSPB, in litt.)[5]. Therefore, the SPA counts undertaken during the day may underestimate their abundance.

[5] https://app.bto.org/webs-reporting/

Table 6.1 Population estimates for the qualifying features of the Minsmere-Walberswick SPA for which LSE could not be excluded, as cited at classification and from the most recently available data

Qualifying feature		Citation population size[1] (year(s) from which derived)	Recent population estimate1 (year(s) from which derived)
Breeding	Bittern	5 males (pre-1991)	17.6 males (2011/12-15/16)
	Marsh harrier	15 females (pre-1991)	16 bp (2014-18)[2]
	Gadwall	24 bp (pre-1991)	84 bp (2011/12-15/16)
	Shoveler	23 bp (pre-1991)	65 bp (2011/12-15/16)
	Teal	73 bp (pre-1991)	1 bp (2011/12-15/16)
Non-breeding	Hen harrier	15 ind (1985/86-89/90)	<1 ind (5 years to 2018/19)
	Gadwall	90 ind (1985/86-89/90)	283 ind ((2013/14-2016/17)[3]
	Shoveler	100 ind (1985/86-89/90)	173 ind (2012/14-2016/17)[3]
	White-fronted goose	100 ind (1985/86-89/90)	16 ind (2012/13-2016/17)

[1] Count unit – bp = breeding pairs; ind = individuals.
[2] Based on data provided by RSPB, SWT and Natural England (mean value excludes 2015 as data incomplete in that year).
[3] Based on data from WeBS counts with counts for the Minsmere South Levels separated from those for the SPA section of the Minsmere WeBS count sector.
All other counts from Natural England's Designated Sites View (https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK9009101&SiteName=minsmere&SiteNameDisplay=Minsmere-Walberswick+SPA&countyCode=&responsiblePerson=&SeaArea=&IFCA Area=)

b) Population trends and habitat use of screened in qualifying features

- **Bittern – breeding**

SPA population

6.2.3 The SPA bittern population has more than tripled in size since the time of citation, at least as measured by the number of booming males (which is the count unit used to survey this species; **Table 6.1**). The SPA population currently represents approximately 11% of the UK breeding population of this species, which is estimated to be 164 booming males (Hayhow *et al*. 2017). The majority of the SPA population breeds on the RSPB Minsmere Reserve. RSPB monitoring data from the Minsmere Reserve show that the annual numbers of booming males fluctuated between eight and 11 between 2000 and 2010, with a slight increase in more recent years so that 11 were recorded in 2014 and 12 in both 2015 and 2016. Thus, the Minsmere Reserve holds approximately 60% of the SPA population.

6.2.4 The main breeding sites for the species on the Minsmere Reserve occur within the extensive area of reedbed habitat and open pool systems which is located immediately north of the Minsmere New Cut.

Use of the Minsmere South Levels and Sizewell Marshes

6.2.5 The Sizewell Marshes, adjacent to and west of the Proposed Development, and the Minsmere South Levels, north of the proposed development, lie outside the SPA and comprise habitat that may be used by bittern, so there is the potential for functional linkage with the SPA bittern population.

6.2.6 There is little evidence that these areas provide additional breeding habitat for the SPA population. Male bitterns have been heard booming in the Sizewell Marshes for short periods in spring in a number of recent years but there has been no evidence to suggest breeding has occurred in this area (SWT and ADAS 2013, SWT 2014, Cook and John 2014). Although standard breeding bird surveys are unsuitable for estimating the abundance of breeding bittern, it is notable that during annual breeding bird surveys of the Sizewell Marshes from 2011 to 2017 there was only a single breeding season record for bittern (SWT 2017). Also, an extensive programme of walkover surveys in this area, undertaken from April 2011 to March 2012 failed to record the species (AMEC 2012).

6.2.7 Both the Sizewell Marshes and Minsmere South Levels could be used as foraging habitat by breeding birds from the SPA during the breeding season, as well as by SPA birds outside the breeding season. Vantage point (VP) surveys were undertaken in 2008 and in 2011/12 to determine the extent to which bittern may commute between the SPA and these areas.

6.2.8 Over the course of 24 surveys, each of three hours duration, between 15th May and 4th August in 2008, a total of 10 bittern records were obtained (Entec, 2009). These comprised five flights between the SPA and Minsmere South Levels, three flights over the Minsmere South Levels and two birds on the ground within the Minsmere South Levels. No commuting flights to, or from, the Sizewell Marshes were recorded (Entec, 2009). The peak provisioning period of nestlings by female bittern is likely to be from late April to mid-June, although it may extend into August if there are replacement broods following failure of earlier breeding attempts (Snow and Perrins, 1998). Six of the 12 surveys in 2008 occurred between late April and mid-June.

6.2.9 The VP surveys in 2011 and 2012 extended over the full annual period (5th April 2011 – 16th March 2012), with surveys to detect birds commuting between the SPA and the Minsmere South Levels or Sizewell Marshes undertaken on a bi-monthly basis and comprising two surveys (each of three hours duration) on each survey day (AMEC, 2012). Additionally, further VP surveys were undertaken over this period across the Sizewell Marshes to record usage of this area by bittern. A total of five bittern records were obtained during these surveys, all of which were between October and early March (the non-breeding period). These comprised two commuting flights between the SPA and Minsmere South Levels, two flights over the Minsmere South Levels and one flight within the Sizewell Marshes (AMEC 2012).

6.2.10 Other evidence on the use of the Sizewell Marshes by bittern derives from radio-tracking studies undertaken by RSPB in 2000 and 2001, which showed that the Sizewell Marshes were used by first winter birds from the SPA (Gilbert, pers. comm., after Entec 2009). A first-year bird radio-tagged at Minsmere was also recorded commuting between Minsmere and Sizewell Marshes over winter (ADAS and SWT 2001, after Entec 2009), and a dead radio-tagged bird was recovered from a ditch in Sizewell Marshes (Gilbert, pers. comm., after Entec 2008). A review of the annual reports produced by SWT for the Sizewell Marshes reserve showed that bitterns are recorded, on average, once or twice annually, suggesting some usage of the marshes, mainly during the winter months.

6.2.11 Overall, the evidence outlined above suggests that breeding is limited to the SPA, and that breeding birds from the SPA may make limited use of the Minsmere South Levels (presumably for foraging) but rarely use the Sizewell Marshes. The available data suggest that most activity on the Minsmere South Levels occurs in the northern part of this area (i.e. closest to the reedbed breeding habitat within the SPA). Use of the Sizewell Marshes by bittern appears to be mainly in the non-breeding season and is often associated with first year birds. This is consistent with the fact that young birds in the UK are known to disperse widely from their natal sites (White *et al*., 2006). During winter, bitterns may also move across to the UK from breeding populations on the European Continent (Wotton *et al.* 2011).

- **Marsh harrier - breeding**

SPA population

6.2.12 Numbers of marsh harrier breeding within the SPA are currently at similar levels to those at the time of citation, although numbers were higher during the mid-2000s (**Table 6.1** and **Table 6.2**). Approximately 50% of the SPA population tend to occur on the RSPB's Minsmere Reserve in any given year (**Table 6.2**). Based upon the most recent five years of count data, the SPA population represents approximately 4 – 5% of the current British population of breeding marsh harrier, estimated to be 365 pairs (Hayhow *et al*., 2017).

Table 6.2 Number of breeding pairs of marsh harrier within the Minsmere to Walberswick SPA (2004-2018)

Year	Minsmere Reserve	Hen Reedbed	Walberswick NNR	Total
2004	10	2	9	21
2005	12	4	8	24
2006	13	4	7	24
2007	17	6	8	31
2008	15	3	No data	>18
2009	12	3	9	24
2010	10	3	No data	>13
2011	12	3	7	22
2012	10	3	8	21
2013	9	2	No data	>11

Year	Minsmere Reserve	Hen Reedbed	Walberswick NNR	Total
2014	6	2	5	13
2015	9	No data	No data	>9
2016	9	2	6	17
2017	9	2	6	17
2018	8	3	6	17

6.2.13 In addition to the birds breeding on the Minsmere-Walberswick SPA, there is also the potential for functional linkage between the Minsmere-Walberswick SPA breeding population and the marsh harriers that breed at the North Warren RSPB Reserve, which is outside the SPA and approximately 3.5 km south of Sizewell B. There have been two breeding pairs at North Warren in each year from 2014 to 2018, except in 2015 when there was only a single pair. There has been a maximum of three pairs recorded in any one year since 2004.

Marsh harrier flight activity within the vicinity of the Sizewell B site

(i) Introduction

6.2.14 With the exception of the birds which breed at North Warren to the south of the Proposed Development (for which there is the potential for functional linkage with the SPA population), breeding is essentially restricted to the SPA. However, marsh harriers range widely and hunt over land which is within the vicinity of the Proposed Development, most notably on the Sizewell Marshes and Minsmere South Levels which provide suitable wetland foraging habitat for this species. Therefore, impacts may arise via effects on foraging birds (or on the habitats on which they depend).

6.2.15 A considerable amount of field survey was undertaken to establish usage by marsh harrier of the Minsmere South Levels and parts of the Sizewell Marshes, via a series of VP surveys (**Figures 6.1** to **6.4**). During each VP survey, all observed marsh harrier flight activity was recorded but with the subsequent analyses of flight activity restricted to those areas referred to as “High Visibility Areas” (HVAs – see below). During VP surveys, the marsh harrier flight lines were plotted on a base map, together with additional information including, height of flight, duration of flight, gender of bird, and prey items carried (if any). Survey data were collected from a single VP (i.e. VP3) covering the entirety of the Minsmere South Levels, four VPs (1, 2, 4 and 6) covering parts of the Sizewell Marshes and a single VP (5) from arable habitats to the west of the Minsmere South Levels and Sizewell Marshes (**Figures 6.1** to **6.4**). Survey work was undertaken as follows:

- (2014 - 2015) – Hyder bimonthly surveys from April 2014 to September 2015; and
- (2016) – Arcadis surveys from April 2016 to September 2016.

6.2.16 The available survey data were analysed and two metrics developed which provide a comparative measure of the intensity of marsh harrier flight activity within the overall study area. These metrics can be used to determine whether any areas within the study area are of particular importance for foraging for marsh harrier.

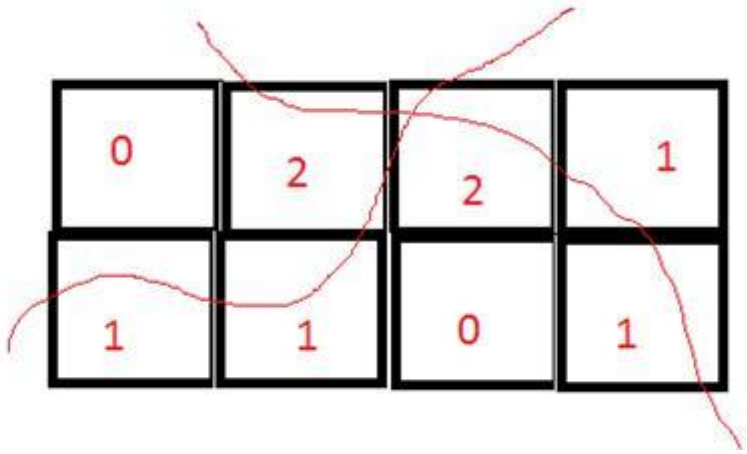
6.2.17 There are significant parts of Sizewell Marshes that are only partially visible or not visible from the selected VPs. Therefore, given that the habitats used by marsh harrier within the Sizewell Marshes (reed bed and floodplain grassland) are relatively uniform across the marshes with no major differences in habitat structure (i.e. areas of reed bed are structurally similar to other areas of reedbed, and the coastal grazing marsh is relatively uniform in structure), it is assumed that the level of usage of areas outwith the High Visibility Areas (HVAs) by marsh harrier is likely to be similar to that observed within the HVAs in Sizewell Marshes. This assumption is considered to be valid, as greater usage of areas by marsh harrier not within HVAs is unlikely, given that birds would, more than likely, have to cross areas of full visibility in order to reach areas that were not visible during the VP surveys. This issue has been addressed in more detail through some of the additional work undertaken to address possible biases in the flight activity surveys, as identified from consultation with stakeholders (see below).

(ii) Flight path count metric (metric one)

6.2.18 This intensity of use analysis is based on counts of marsh harrier flight paths from the individual VPs used. It was recognised that visibility was not uniform from each VP, particularly within Sizewell Marshes, and it was therefore not possible to base the calculation of the intensity of use on the entire area of visibility from the VP (because of the variability in the extent to which the air space above this area was visible). To address this a Zone of Theoretical Visibility (ZTV) modelling exercise using digital surface and terrain mapping data was undertaken to establish the areas of high visibility (i.e. those areas in which there is 100% visibility) for each VP. The boundaries of these areas were then calibrated in the field, and in consultation with stakeholders, before being used in this analysis. These comprise the HVAs and encompass the area of unrestricted visibility from ground level upwards. Once the HVAs were finalised it was then possible to calculate the intensity of marsh harrier usage (i.e. flight lines per ha per hour) based on the following method:

6.2.19 The HVAs were split into 100 m x 100 m (1 ha cells). Cells on the edge of each HVA were clipped to the HVA extents and so had a smaller area.

6.2.20 The number of mapped marsh harrier flights across each grid cell from corresponding VPs were counted, as shown in the diagram below.



6.2.21 The per cell intensity of use was calculated as ic = L/T where: ic is the per cell intensity; T is the number of hours recorded at the VP for a specific season and L is the sum of the number of birds per flight line that cross the grid cell.

6.2.22 Using the above method, the variation in the intensity of use across each HVA has been calculated and the results mapped. To enable comparison between HVAs within the entire study area to be undertaken, the total number of survey hours for all of the VPs has been summed and used to derive a flight per hour metric.

6.2.23 **Figure 6.1** (2014 data alone) provides a graphic view of the intensity outputs and shows flights per hectare / hr for the breeding season based on the Hyder survey data for each of the VPs analysed.

(iii) Flight path length metric (metric two) and use of the Sizewell Marshes and Minsmere South Levels

6.2.24 This metric comprises the measurement of the length of observed and plotted flight lines within each of the HVAs and calculation of a simple metric that provides a measure of flight path (metre length) per hectare per hour (i.e. a measure of flight intensity). The results of this analysis are provided in **Table 6.3** for breeding season flight data from 2014, 2015 and 2016.

Table 6.3 Calculated marsh harrier intensity of flight activity for individual HVAs, based upon the flightline length (m) per hr per ha metric

VP/ HVA	Year	Area (ha)	Total Flightline Length (m)	Total Survey Time (h)	Flightline length / hr / ha	Mean flightline length / hr / ha
1	2014	8.74	5181	66	8.98	8.4
	2015		1484	38	4.46	
	2016		3599	36	11.43	
2	2014	13.26	2906	66	3.32	6.1
	2015		4819	36	10.10	
	2016		3353	36	7.03	
3	2014	136	169280	90	13.85	10.3
	2015		84248	72	8.6	
	2016		66566	66	7.42	
4	2014	9.78	2276	47	4.95	3.9
	2015		178	30	0.61	
	2016		1855	36	5.27	
5	2014	17.25	1275	48	1.54	2.1
	2015		992	30	1.92	

VP/ HVA	Year	Area (ha)	Total Flightline Length (m)	Total Survey Time (h)	Flightline length / hr / ha	Mean flightline length / hr / ha
	2016		1812	36	2.92	
6	2014	1.62	413	30	8.49	7.8
	2015		530	30	10.92	
	2016		277	36	4.77	

6.2.25 The average value for this metric across the Sizewell Marshes (i.e. as measured within HVAs 1, 2, 4 and 6, which combined cover approximately 43% of suitable foraging habitat within the Marshes) is 6.1 m/ha/hr (based on 2014-2016 data), which compares with a value of 10.3 m/ha/hr as recorded within HVA 3, which encompasses the Minsmere South Levels. Therefore, this flight activity data indicates that the average intensity of use of Minsmere South Levels is almost twice that of the Sizewell Marshes.

6.2.26 Analysis of intensity of use at the 1 ha level across each of the HVAs (the intensity of use metric calculated for each cell being flight path length divided first by survey effort (the same for each grid cell within a particular HVA) and then by the area of each grid cell) has also been undertaken. This approach takes account of the fact that grid cells around the margins of the HVAs were often less than a full 1 ha in extent. The results of this analysis for the Sizewell Marshes and Minsmere South Levels HVAs are shown in **Figure 6.1** and **Figures 6.3** to **6.4** (for each of the 2014, 2015 and 2016 survey data, respectively). The outputs from this metric compare favourably with those derived from the intensity of use metric based on the number of flights (presented in **Figure 6.2** for 2014 only), with both metrics showing a similar pattern in the variation of usage.

6.2.27 Overall, it is considered that the flight path metric provides a better measure of activity and intensity of use within a given area. Unlike the count metric, the length metric enables a better calculation of the intensity of use of partial (ha) cells at the edges of the HVAs. It is also worth noting that the flight path length within a given area is likely to be highly correlated with flight time in that area. As such, the flight path length metric is broadly analogous to the metric recommended for quantifying levels of flight activity and its distribution within a survey area for the purposes of impact assessments for onshore wind farms, where flight activity is measured as the flight time within the survey area (SNH, 2017).

6.2.28 It should be noted that both metrics show that there is significant variation of use by foraging marsh harrier across Minsmere South Levels, with the southern end of this area being little used low relative to the central and more northerly parts.

Figure 6.1 Marsh harrier flight activity during April to September 2014, as measured by the number of flights per ha per hour

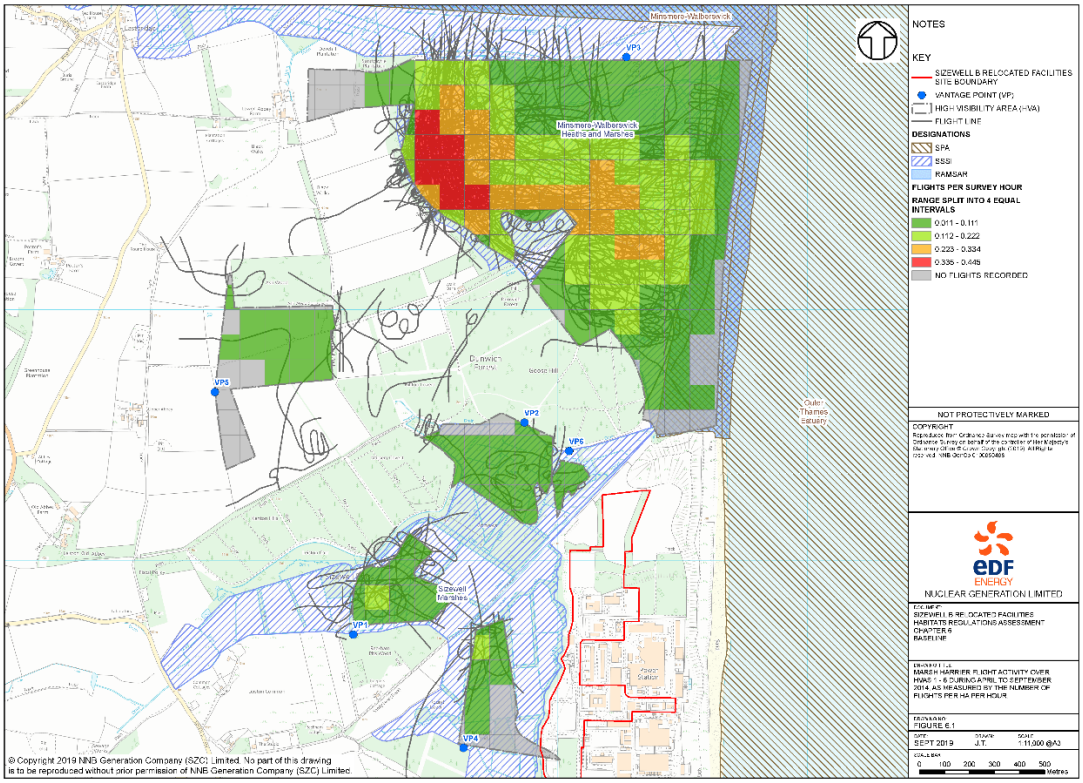


Figure 6.2 Marsh harrier flight activity during April to September 2014, as measured by flightpath length per ha per hour

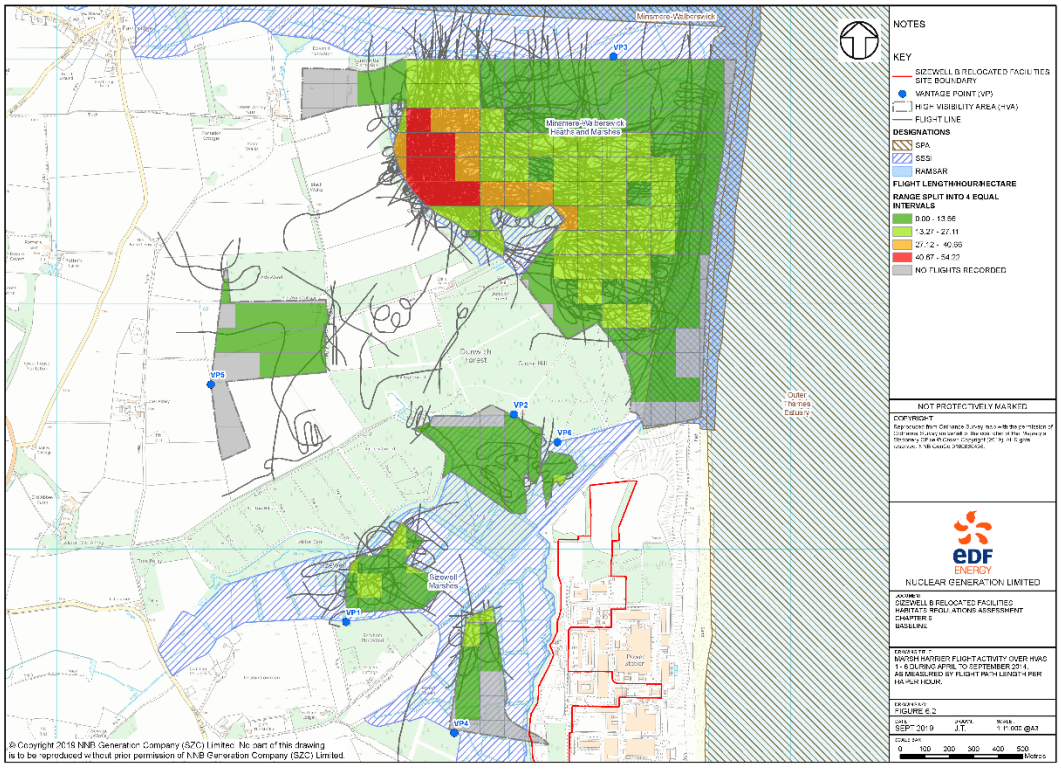


Figure 6.3 Marsh harrier flight activity during April to September 2015, as measured by flightpath length per ha per hour

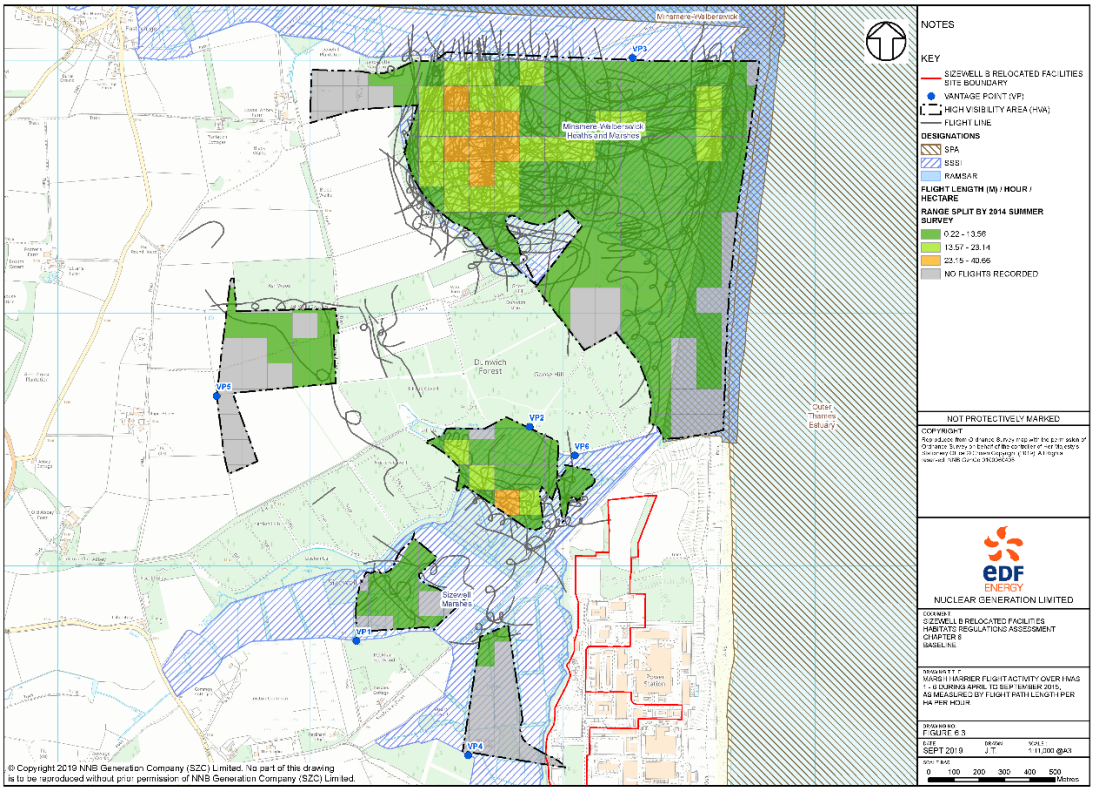
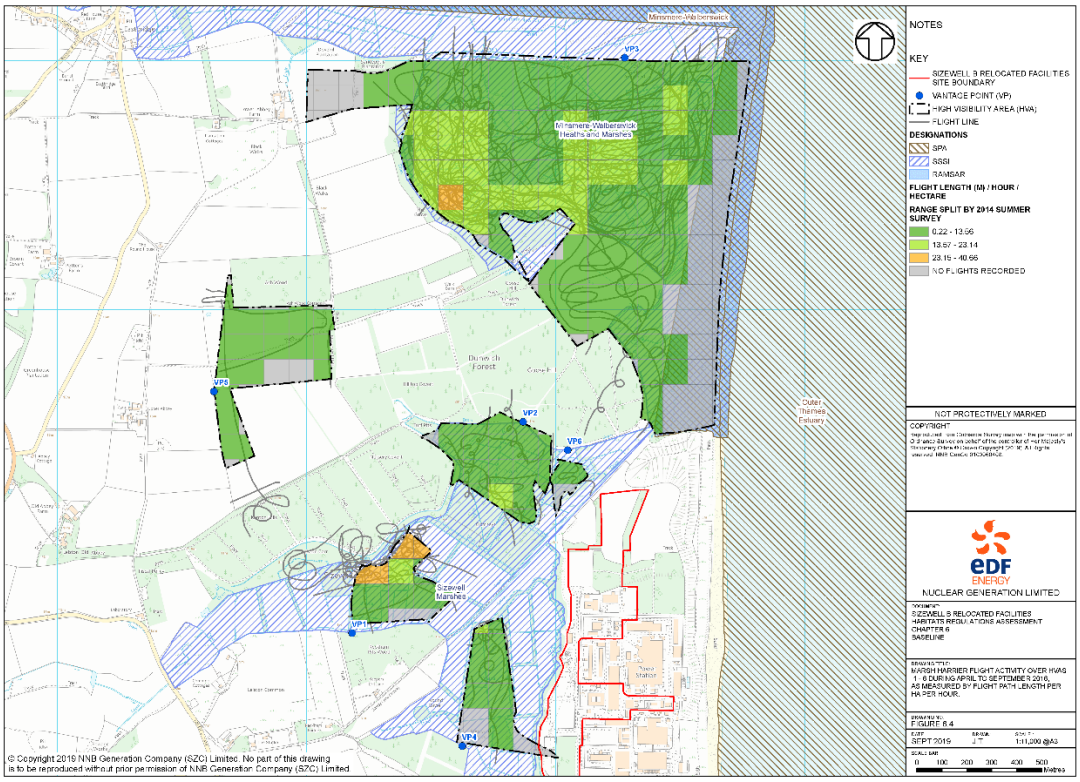


Figure 6.4 Marsh harrier flight activity during April to September 2016, as measured by flightpath length per ha per hour



(iii) Possible biases in estimating flight activity

6.2.29 Following discussions with, and comments from, stakeholders on the flight activity surveys (including at the Sizewell C Project stakeholder workshop held on 24 November 2015), a number of potential biases in the recording and estimation of flight activity were identified. Details of the work undertaken to investigate each of these potential biases have been reported elsewhere (Arcadis, 2016; Marchant, 2016), but a summary of this work and of the resultant conclusions is provided below:

- Potential sex bias in birds foraging on the Minsmere South Levels and Sizewell Marshes: Male and female marsh harriers may exploit different prey resources (due in part, at least, to the larger size of the females). Any sex bias amongst the birds recorded foraging within the HVAs may be useful in informing the habitat management on the mitigation land. However, comparisons of the sex of marsh harriers during surveys may be complicated by plumage variation amongst male birds, with some retaining juvenile-type plumage throughout their lifecycle (Blanc *et al*., 2013). Therefore, a proportion of adult males may be misclassified as juveniles or adult females during surveys, which should be borne in mind when interpreting the survey findings.

  Comparisons of the (apparent) sex of marsh harriers observed during the 2014 and 2015 surveys revealed a greater proportion of flights by females than males during the 2014 breeding season (67% compared to 22%, with the remainder being juveniles or birds of undetermined sex) and 2014/15 winter period (84% compared to 11%, with the remainder being birds of undetermined sex) (Arcadis 2016). However, during the 2015 breeding season, 49% of flights were of identifiable males and 39% in female-type plumages (with the remainder of juveniles or birds of undetermined sex).

  Therefore, no clear conclusions can be made as to the likelihood of any sex bias in the birds using the areas surveyed for the assessment during the breeding season, which is the period of main interest to the current assessment (Arcadis, 2016). Furthermore, the habitat management on the mitigation land will aim to provide a range of prey types selected by marsh harriers throughout the breeding cycle, including larger prey such as rabbits.

- Under-recording of flight activity within the HVA 1: The HVA 1 was selected on the basis of covering a range of habitats that contributed to providing a representative sample of the habitats (from across the different HVAs) likely to be used by foraging marsh harriers within the Sizewell Marshes. This HVA encompassed approximately 20% of the reed bed within the two compartments to the south of Grimsey's wood, and concerns were expressed that the exclusion of the larger part of this reed bed may have led to an underestimation of flight activity.

  To estimate the extent of any underestimation in flight activity, a second VP was established using a deer-shooting High Seat. Coverage of the reed bed area in question was increased to 70% when surveys were conducted simultaneously from VP1 and the High Seat (Arcadis, 2016).

  During 20 hours of surveys conducted simultaneously from VP1 and the High Seat in 2015, a total of six marsh harrier flights were recorded, of which four were from VP1 (including flights of two birds over the HVA at the same time) and two from the High Seat (with the flights from VP1 not visible from the High Seat, and vice-versa).

The total flight time recorded from the High Seat (120 seconds) was slightly greater than that recorded from VP1 (90 seconds).

These surveys provided no indication that the reed bed in question was a particular focus of marsh harrier activity within Sizewell Marshes, and that inclusion of a larger part of the reed bed within the HVA would have resulted in higher estimates of the intensity of flight activity (Arcadis, 2016).

- Under-recording of low flying birds at distance within HVA 3: The HVA 3 encompasses the Minsmere South Levels and at 136 ha it is the largest of all the HVAs used (extending across an area which is eight to 84 times greater than that of the other HVAs – **Table 6.3**). The most distant part of the HVA is 1.5 km from VP3 (**Figures 6.1** to **6.4**), which raised concerns that marsh harrier flights may have been under-recorded at this distance, particularly for low flying birds that were against a dark background created by the pine plantations bordering parts of the HVA (Marchant, 2016).

  To assess whether there was a reduced detection rate of distant and low flying marsh harriers, surveys of the southern section of the HVA were conducted from VP3 simultaneously with surveys of this area from a second, closer, VP. These comparisons suggested that the detection of distant flights from VP3 was reduced (with a total of 13 flights recorded from the two VPs combined, of which seven were recorded from the closer VP but not VP3, whilst only one flight was recorded from VP3 but not from the closer VP) (Marchant, 2016). There was no indication that this reduced detection of flights was associated with flight height (Marchant, 2016).

  However, these surveys also indicated that the overall occurrence of flights in the southern part of this HVA was low, whilst half of the missed flights were of birds passing very rapidly through the extremities of the survey area (Marchant, 2016). Therefore, the reduced detection of flights in this section of the Minsmere South Levels will not have affected the findings of the assessment in any meaningful way.

- Under-recording of flight activity when multiple birds are in flight over the HVA: Surveys were undertaken by single observers and concerns were expressed that this may have caused underestimation of flight activity when more than one bird was present within the HVA at any one time. However, few of the surveys recorded more than one bird in flight at any one time, and a validation exercise (undertaken using two observers operating independently at VP3) demonstrated that flights missed by observers invariably involved situations where only one bird was known to be in flight over the HVA (Marchant, 2016). Although the validation exercise at VP3 demonstrated that a proportion of flights were missed by observers, this should not affect any of the comparisons of flight activity (e.g. between Minsmere South Levels and Sizewell Marshes) because they do not rely upon absolute measures of activity.

- Potential bias in flight path length metric: It was suggested that the estimated number of flights per day within an HVA may provide a more meaningful and clearer approach to estimating the intensity of flight activity than the flight path length metric currently used (**Table 6.3**).

  Comparisons of flight activity between the Minsmere South Levels and the Sizewell Marshes based upon the number of flights per day revealed a broadly similar trend to that obtained using the flight path length metric, with substantially greater activity levels within the Minsmere South Levels (Arcadis, 2016). Although the extent of this

difference appeared to be greater when based upon the number of flights per day this is an artefact of the HVA for the Minsmere South Levels extending across an area four times greater than the total HVA area for the Sizewell Marshes (and would reduce accordingly if the metric incorporated survey area).

Also, as noted above, the flight path length metric is broadly analogous to the metric recommended for quantifying levels of flight activity and its distribution within a survey area for the purposes of onshore wind farm impact assessments (SNH, 2017). This further supports the view that flight path length is a suitable metric for the use in the current assessment.

6.2.30 Therefore, the work undertaken to address the concerns which emerged from the Sizewell C Project stakeholder workshop (over the flight activity surveys and the associated estimation of the intensity of flight activity) indicate no strong justification for amending the approaches used to date. Rather, these investigations suggest that the currently derived estimates of the intensity of flight activity are appropriate for the purposes of informing the assessment of disturbance to foraging marsh harriers as a result of the Proposed Development.

- **Gadwall - breeding**

SPA population

6.2.31 The SPA breeding gadwall population has more than tripled in size since the time of citation (**Table 6.1**). A high proportion of the SPA gadwall population breed on the RSPB Minsmere Reserve, but the Reserve encompasses part of the Minsmere-Walberswick SPA only (and also extends onto non-SPA land in some places, such as the Minsmere South Levels), so that the gadwall population estimates for the Reserve cannot be assumed to be fully representative of the SPA. The numbers of pairs estimated to breed on the RSPB Minsmere Reserve varied from 44 to 96 between 2010 and 2016 (**Table 6.4**).

Table 6.4 Annual numbers of breeding pairs of gadwall, shoveler and teal recorded on the RSPB Minsmere Reserve (MR), the Minsmere South Levels (MSL) and Sizewell Marshes (SM); data for MR and MSL are derived from RSPB monitoring data, whilst those for SM are from SWT (2017)

Year	Gadwall			Shoveler			Teal		
	Entire MR[1]	MSL	SM	Entire MR[1]	MSL	SM	Entire MR[1]	MSL	SM
2010	96	14	-	63	17	-	0	0	-
2011	44	14	4	59	2	0	0	0	0
2012	80	12	4	105	7	0	0	0	0
2013	90	40	7	54	35	0	0	0	1
2014	86	16	6	43	4	1	0	0	0
2015[2]	67	-	4	33	-	1	0	-	0
2016	48	1	3	68	2	0	0	0	0
2017	-	5	4	-	9	0	-	0	0

[1] Counts for the entire MR are inclusive of the counts for the MSL.
[2] No counts available for the waterfowl species in the Minsmere South Levels in 2015.

Use of the Minsmere South Levels and Sizewell Marshes

6.2.32 The Sizewell Marshes and Minsmere South Levels (which occur outside the SPA – **Figure 6.5**) comprise habitat that may be used by breeding gadwall, so there is the potential for functional linkage with the SPA gadwall population.

6.2.33 Numbers of gadwall breeding on the Minsmere South Levels are monitored by RSPB as part of the monitoring programme for the Minsmere Reserve, whilst numbers breeding on the Sizewell Marshes have been estimated from surveys undertaken using the BTO's CBC method (Bibby et al. 2000, SWT 2017). The numbers of pairs estimated to breed on the Minsmere South Levels varied from one to 40 between 2010 and 2017, whilst those on the Sizewell Marshes varied from three to seven between 2011 and 2017 (**Table 6.4**). Data are not available on the distribution of breeding gadwall within either the Minsmere South Levels or Sizewell Marshes.

- **Shoveler - breeding**

SPA population

6.2.34 The SPA breeding shoveler population has almost tripled in size since the time of citation (**Table 6.4**). A high proportion of the SPA shoveler population breed on the RSPB Minsmere Reserve, but the Reserve encompasses part of the Minsmere-Walberswick SPA only (and also extends onto non-SPA land in some places, such as the Minsmere South Levels), so that the shoveler population estimates for the Reserve cannot be assumed to be fully representative of the SPA. The numbers of pairs estimated to breed on the RSPB Minsmere Reserve varied from 33 to 105 between 2010 and 2016 (**Table 6.4**).

Use of the Minsmere South Levels and Sizewell Marshes

6.2.35 The Minsmere South Levels and Sizewell Marshes (which occur outside the SPA – **Figure 6.5**) comprise habitat that may be used by breeding shoveler, so there is the potential for functional linkage with the SPA shoveler population.

6.2.36 Numbers of shoveler breeding on the Minsmere South Levels are monitored by RSPB as part of the monitoring programme for the Minsmere Reserve, whilst numbers breeding on the Sizewell Marshes have been estimated from surveys undertaken using the BTO's CBC method (Bibby et al. 2000, SWT 2017). The numbers of pairs estimated to breed on the Minsmere South Levels varied from two to 35 between 2010 and 2017, whilst records from the Sizewell Marshes are limited to single pairs in 2014 and 2015 (**Table 6.4**). Data are not available on the distribution of breeding shoveler within either the Minsmere South Levels or Sizewell Marshes.

- **Teal - breeding**

SPA population

6.2.37 Teal are now virtually absent from the SPA as a breeding species, with the most recently available 5 year mean peak count being one breeding pair, representing a major decline from the estimated citation population of 73 pairs (**Table 6.1**).

Use of the Minsmere South Levels and Sizewell Marshes

6.2.38 The Sizewell Marshes and Minsmere South Levels (which occur outside the SPA – **Figure 6.5**) comprise habitat that may be used by breeding teal, so there is the potential for functional linkage with the SPA teal population. However, no teal have been recorded on the Minsmere South Levels since before 2010 (as is the case for the rest of the RSPB Minsmere Reserve), whilst only a single pair were recorded in the breeding bird surveys undertaken on the Sizewell Marshes between 2011 and 2017 (**Table 6.4**).

- **Hen harrier – non-breeding**

SPA population

6.2.39 At the time of citation, a non-breeding aggregation of 15 hen harriers was estimated to occur on the SPA, representing at least 2% of the UK wintering population of the species which was estimated to be 750 birds at that time (Natural England, 2019). However, only a single individual hen harrier has been recorded on the SPA in the past five years (Natural England 2019).

Use of the Minsmere South Levels and Sizewell Marshes

6.2.40 Given the current scarcity of wintering hen harrier on the SPA, there is unlikely to be any extensive use of the Minsmere South Levels or Sizewell Marshes by this qualifying feature. However, when present, hen harriers may range widely and could hunt over the Minsmere South Levels and Sizewell Marshes, which are likely to provide suitable wetland foraging habitat.

6.2.41 Surveys to determine use of the Minsmere South Levels and Sizewell Marshes by hen harrier were undertaken over the winters of 2011/12 and 2014/15, with the following findings:

- Walkover surveys of the Sizewell Marshes: These were undertaken between April 2011 and March 2012, with 12 during the winter period (defined as October to March for the current purposes). Each survey was seven to nine hours in duration, with no hen harrier sightings recorded in any of the surveys (AMEC 2012).
- VP surveys, 2011/12: Hen harrier occurrence was also recorded during the bi-monthly VP surveys undertaken in 2011 and 2012 to record commuting flights of bittern between the SPA and Minsmere South Levels and Sizewell Marshes (see above). Two surveys (each of three hours duration) were undertaken on each survey day, with two hen harrier sightings obtained over the wintering period (in October and November survey) and both involving birds hunting over the Minsmere South Levels (AMEC, 2012).
- VP surveys, 2014/15: Hen harrier occurrence was recorded during VP surveys undertaken from October 2014 to March 2015 at the VP locations used to record marsh harrier flight activity over the Minsmere South Levels and Sizewell Marshes (i.e. VPs 1 – 6, **Figure 6.1**). A total of 10 records were obtained (with one, eight and two from the October, November and December surveys, respectively). All sightings were of single birds (comprising one adult male, two adult females, six which were either adult females or juveniles and one with no assigned age or sex), and nine of the sightings were of birds in flight (either commuting or hunting) with

one of a perched bird (which subsequently flew off). Four of the records were from the Minsmere South Levels and six from the Sizewell Marshes.

- **Gadwall, shoveler and white-fronted goose – non-breeding**

SPA populations

6.2.42 The qualifying features considered in this section are all over-wintering populations of waterbird species. They are considered together in a single section because the data which are used to characterise the baseline conditions for these qualifying features derive from the same series of surveys and share a number of common attributes.

6.2.43 Of these qualifying features, the SPA population size of over-wintering gadwall is estimated to be more than three times higher than at the time of citation, whilst that of shoveler is almost twice as high as at the time of citation (**Table 6.1**). By contrast, the most recent estimate of the SPA white-fronted goose population is considerably lower than at the time of citation. However, as detailed above, recent SPA counts for this qualifying feature may be underestimates because the SPA is used mainly as a nocturnal roost whereas counts were made during daylight hours.

Use and importance of the Minsmere South Levels and Sizewell Marshes

(i) Introduction

6.2.44 In addition to the habitats used by these qualifying features within the SPA, suitable habitat also occurs on the Sizewell Marshes and Minsmere South Levels and wintering waterbirds occur on these areas. Given this, it is possible that the SPA populations of wintering waterbirds also depend upon these areas (e.g. for the provision of additional foraging resources) and that there is functional linkage with the SPA.

6.2.45 Consequently, baseline survey data were used to quantify the relative use of the SPA, the Minsmere South Levels and Sizewell Marshes by wintering gadwall, shoveler and white-fronted goose. The baseline data were derived both from project-specific surveys of the latter two areas and by accessing British Trust for Ornithology (BTO) Wetland Bird Survey (WeBS) data from count sectors which give coverage (albeit partial in some instances) of the Minsmere South Levels, Sizewell Marshes and the Minsmere-Walberswick SPA (**Figure 6.6**).

(ii) Project-specific surveys – coverage and methods

6.2.46 Winter waterbird surveys specifically commissioned to support the consent of the proposed development were carried out by Arcadis over two seasons in 2014-15 and 2018-19. Four survey areas were covered once a month in both winter periods, but with the 2014-15 surveys extending from November to March and the 2018-19 surveys from December to February (**Table 6.5**). The surveys covered the Minsmere South Levels and the suitable waterbird habitat within the Sizewell Marshes, with the latter comprising the discrete areas identified as Sizewell Belts, Goodrum's Fen and SSSI Reedbed, and Rookyard Woods (**Figure 6.6**).

Table 6.5 Details of the location and timing of the project-specific surveys for wintering waterbirds

Survey area	Location of area (see also Figure 6.6)	Survey dates and times 2014-15	Survey dates and times 2018-19	Overlap with designated sites	
				SSSIs	SPA/ Ramsar sites
Sizewell Belts	Western part of Sizewell Marshes	11/11 1310-1415 04/12 1000-1110 08/01 1200-1330 05/02 1200-1415 05/03 1015-1145	11/12 1035-1135 10/01 1115-1230 07/02 1105-1205	Sizewell Marshes	None
Rookyard Woods	Eastern, northeastern and southeastern sections of Sizewell Marshes (adjacent to SZB site)	27/11 1230-1345 18/12 0750-0910 08/01 1200-1400 19/02 1000-1120 03/03 0845-1015	11/12 1245-1440 10/01 0920-1100 07/02 1315-1425		
Goodrum's Fen and SSSI Reedbed		11/11 1130-1240 04/12 0810-0930 08/01 1015-1140 05/02 0930-1145 05/03 0900-0950	11/12 0950-1030 10/01 1330-1445 07/02 0940-1040		
Minsmere South Levels	North of the Sizewell B site	11/11 1200-1410 04/12 0800-1200 08/01 1100-1340 05/02 1000-1240 05/03 0830-1100	11/12 1030-1430 10/01 0930-1330 07/02 0930-1250	Minsmere-Walberswick Heaths and Marshes	

6.2.47 Surveys were undertaken within two to three hours of high tide, following the BTO WeBS methods to obtain a count of waterbirds recorded either visually or audibly within the specified survey area (Bibby *et al*., 2000).

6.2.48 For the Minsmere South Levels, the surveyors walked a transect around the boundary of the survey area (the periphery bund and sea wall), stopping at specific VPs to carry out point counts (**Figure 6.6**). The VPs were located on the raised areas around the Minsmere South Levels (i.e. the sea wall) and therefore provided good visibility over

the entire Minsmere South Levels, as well as avoiding disturbance to the waterbirds within the survey area. During each survey the number of each species was recorded, with the locations of each bird or aggregation plotted onto field maps.

6.2.49 Within Sizewell Marshes, waterbirds were mainly present within ditches. Therefore, an alternative method was adopted, with the side of each ditch walked and any birds observed or flushed counted. Aggregations of each waterfowl species were plotted onto maps.

6.2.50 In 2018-19, the surveys of the Minsmere South Levels and the Sizewell Marshes were undertaken simultaneously to reduce the chances of double counting of birds moving between the two areas.

Figure 6.5 The BTO Wetland Bird Survey (WeBS) count sectors from which data are used to inform the winter waterbird baseline

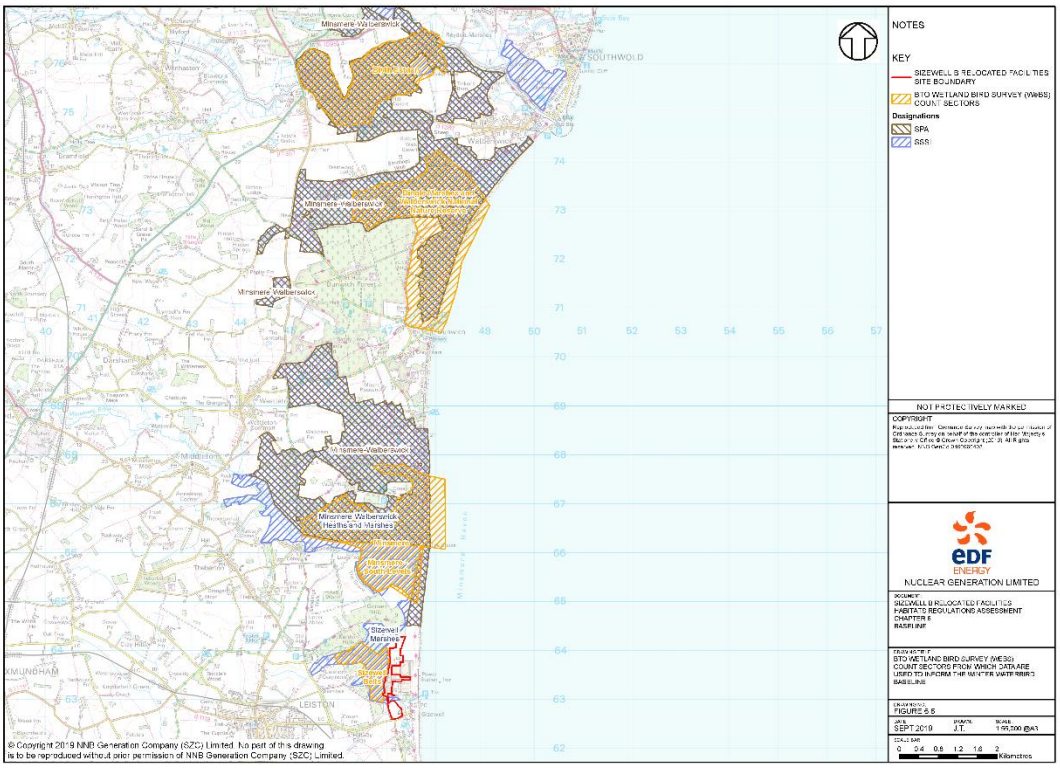
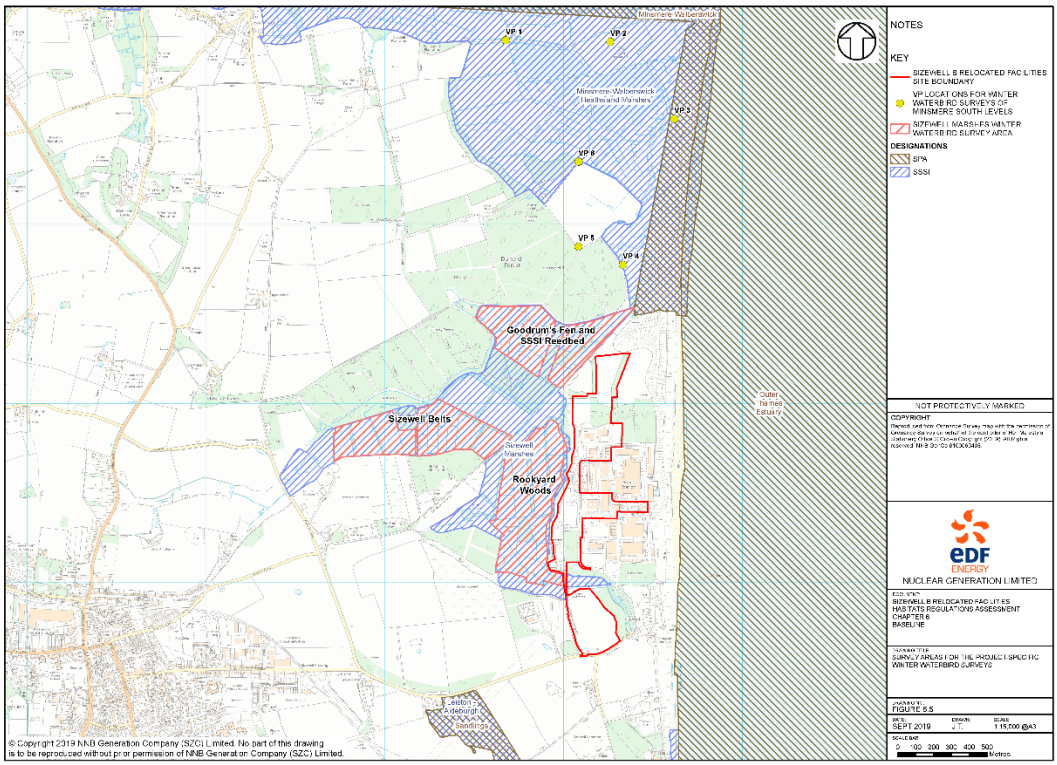


Figure 6.6 Survey areas for the project-specific winter waterbird surveys



(iii) Wetland Bird Survey (WeBS) data – coverage and methods

6.2.51 WeBS core count data were obtained from the BTO and RSPB for five count sectors located in the same region as the proposed development, with the objectives of augmenting the project-specific baseline data and providing an up-to-date overview of the population status of the relevant species in the wider area (including the Minsmere-Walberswick SPA). Details of the location of these count sectors and the winter periods for which data were available, are provided in **Table 6.6** and **Figure 6.5**.

6.2.52 In relation to these WeBS data, it is important to note that the Minsmere South Levels is subsumed within the Minsmere sector, but the RSPB-provided data allowed the counts within the Minsmere South Levels to be distinguished.

Table 6.6 Details of the location of WeBS count sectors used in this assessment together with the winter periods for which data were obtained

Count sector	Location of sector (see also Figure 6.6)	Data availability	Overlap with designated sites	
			SSSIs	SPA/ Ramsar sites
Sizewell Belts[1]	Encompasses most of the Sizewell Marshes	Seven winter seasons (2010-11 to 2016-17)	Sizewell Marshes	None
Minsmere South Levels	North of the Sizewell B site	Seven winter seasons (2012-13 to 2018-19)	Minsmere-Walberswick Heaths and Marshes	
Minsmere	North of the Sizewell B site (and includes the Minsmere South Levels)	Seven winter seasons (2012-13 to 2018-19)		Minsmere-Walberswick
Dingle Marshes and Walberswick NNR	Approximately 5.5 km north of the Sizewell B site			
Blyth Estuary	Approximately 10 km north of the Sizewell B site			

[1] The WeBS Sizewell Belts count sector is not equivalent to the project-specific survey area termed the Sizewell Belts (see text and **Figures 6.5** and **6.6**).

6.2.53 The WeBS core count surveys were carried out according to the standard WeBS methods (Bibby et al. 2000). For any given survey month, surveys of all the count sectors in **Table 6.6** for which counts were undertaken were carried out on the same day to minimise the risk of birds being double counted. In all cases, the species coverage in these surveys was classified as "good".

(iv) Comparison of the methods and coverage of the project-specific surveys and WeBS

6.2.54 As described above, project-specific surveys used WeBS survey methods and, as such, it is likely that the outputs from the two survey programmes are broadly comparable.

6.2.55 There is a non-exact spatial overlap between the project-specific survey areas and the WeBS count sectors from which data have been obtained (**Figure 6.5** and **Figure 6.6**).

6.2.56 The WeBS Sizewell Belts count sector consists of a single polygon which encompasses almost all of the Rookyard Woods and most of the Sizewell Belts project-specific survey areas within the Sizewell Marshes. However, the western extent of the project-specific Sizewell Belts survey area is not covered by the WeBS count sector of the same name. The Sizewell Belts WeBS count sector has no overlap with the Goodrum's Fen and SSSI Reedbed project-specific survey area but does include some of the land between the three discrete project-specific survey areas within Sizewell Marshes (**Figure 6.5** and **Figure 6.6**). The project-specific surveys for the Minsmere South Levels cover some small areas of land (near to VPs 4 and 5) which appear to lie outwith the WeBS Minsmere South Levels count sector (**Figure 6.5** and **Figure 6.6**). Given these differences in coverage, the Sizewell Belts and Minsmere South Levels WeBS count sectors are subsequently termed 'WeBS Sizewell Belts' and 'WeBS Minsmere South Levels' in this report.

6.2.57 The Minsmere, Dingle Marshes and Walberswick NNR and Blyth Estuary WeBS count sectors cover large parts of the Minsmere-Walberswick SPA and Ramsar site. These areas are not covered by the project-specific surveys.

6.2.58 In terms of temporal overlap, there are seven seasons of WeBS data available for WeBS Sizewell Belts (winters 2010-11 to 2016-17), four for the Dingle Marshes and Walberswick NNR and the Blyth Estuary count sectors (winters 2010-11 to 2013-14), and seven for the Minsmere count sector (winters 2012-13 to 2018-19). The RSPB-provided WeBS data enabled separation of the counts within the WeBS Minsmere South Levels from the rest of the Minsmere count sector for each of these winter periods. For the purposes of establishing the baseline for assessing impacts on the SPA wintering waterbirds, the winter season is defined as October to March (which encompasses the period over which project-specific survey data were collected and is the annual period for which the WeBS data are extracted).

6.2.59 The project-specific surveys were undertaken in the winters of 2014-15 and 2018-19.

(v) Baseline survey results - gadwall

9. Project-specific surveys

6.2.60 Numbers of gadwall recorded during the baseline surveys varied both between survey areas during individual surveys and between individual surveys within survey areas. During 2014-15, numbers were consistently higher in the Minsmere South Levels than in the Sizewell Marshes, with the respective peak count in the Minsmere South Levels being four times that in the Sizewell Marshes (**Table 6.7**). However, the reverse pattern occurred in 2018-19, with numbers consistently higher in the Sizewell Marshes, where the peak count was almost three times that in the Minsmere South Levels (**Table 6.7**).

6.2.61 Within Sizewell Marshes, gadwall numbers were highest in the Goodrum's Fen and SSSI Reedbed survey area in both winters and consistently low in the Sizewell Belts area (**Table 6.7**, **Figure 6.7** and **Figure 6.8**). The Rookyard Woods survey area held lowest numbers in 2014-15 (with a seasonal peak count of two) but substantially higher numbers in 2018-19 (when the seasonal peak count was 31).

Table 6.7 Number of gadwall recorded during project-specific winter waterbird surveys in the Sizewell Marshes and Minsmere South Levels

Winter season	Date	Sizewell Marshes				Minsmere South Levels
		Sizewell Belts	Rookyard Woods	Goodrum's Fen and SSSI Reedbed	Total	
2014-15	11/11	0	-	0	0	0
	27/11	-	0	-		-
	04/12	0	-	0	2	50
	18/12	-	2	-		-
	08/01	0	0	3	3	110
	05/02	2	-	29	31	55
	19/02	-	0	-		-
	03/03	-	0	-	4	-
	05/03	4	-	0		126
	Seasonal Peak	4	2	29	31	126
2018-19	11/12	4	2	0	6	2
	10/01	8	31	41	80	3
	07/02	0	23	24	47	28
	Seasonal Peak	8	31	41	80	28

Figure 6.7 Gadwall abundance and distribution in the Minsmere South Levels and Sizewell Marshes in winter 2014/15

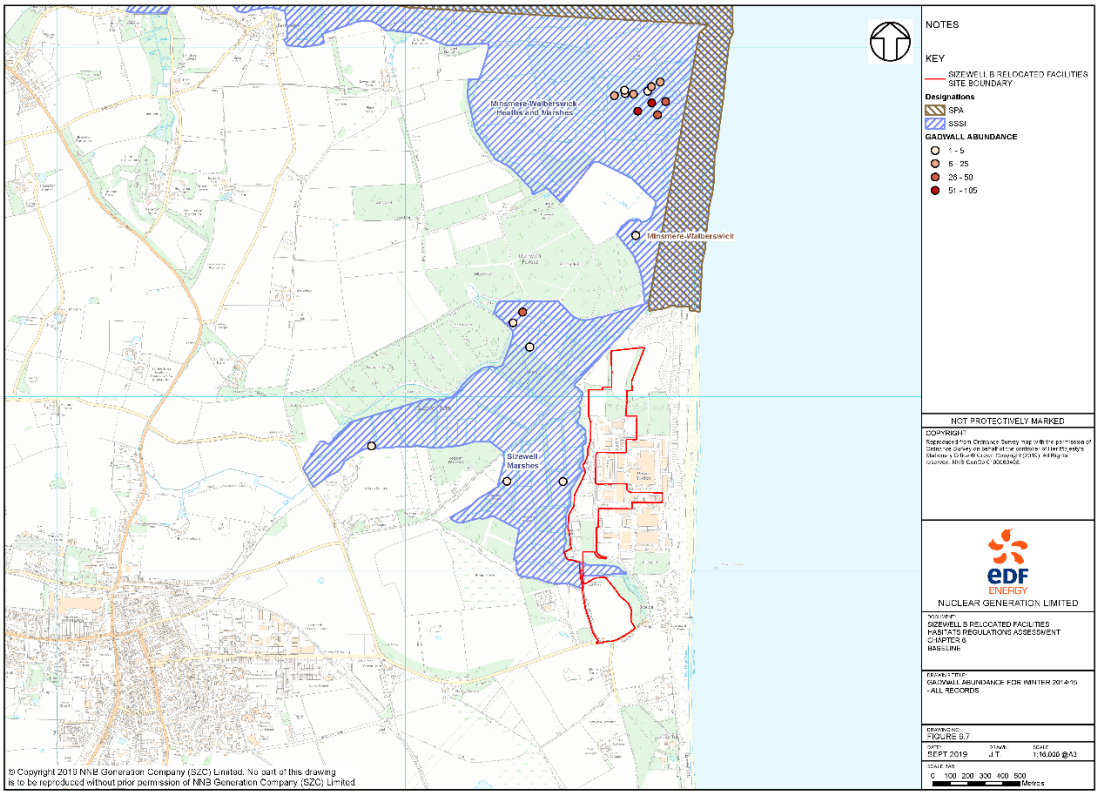


Figure 6.8 Gadwall abundance and distribution in the Minsmere South Levels and Sizewell Marshes in winter 2018/19

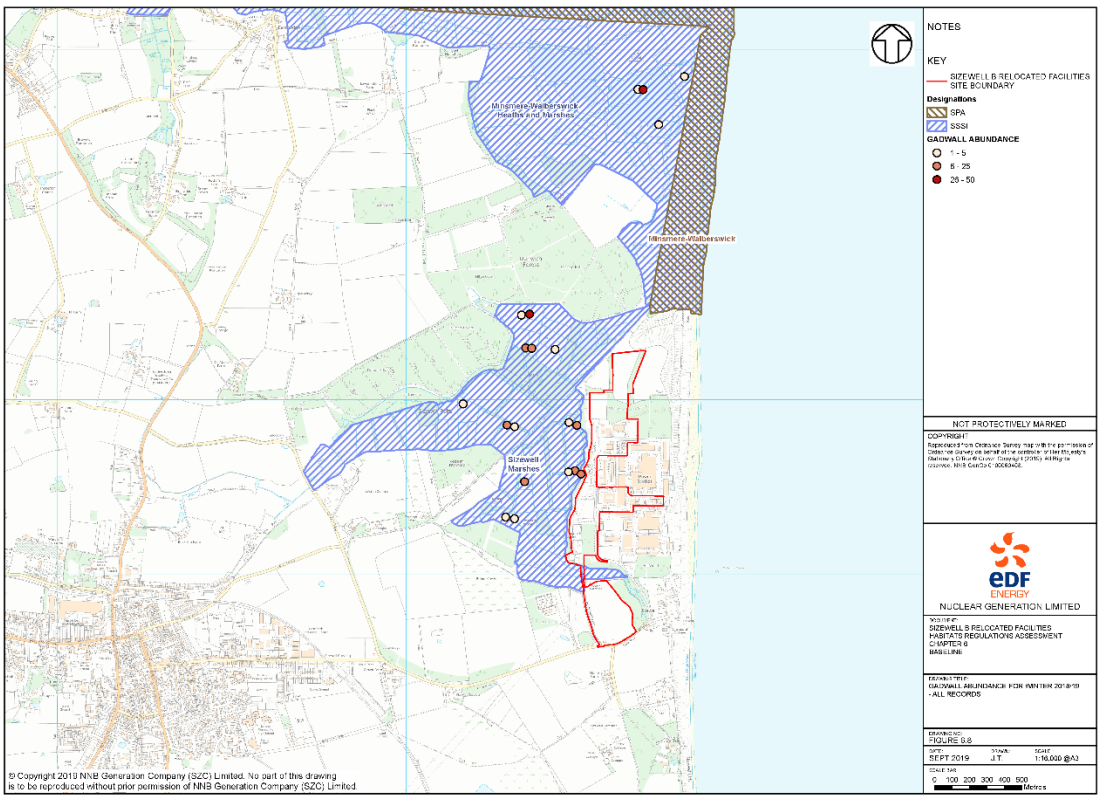


Figure 6.9 Shoveler abundance and distribution in the Minsmere South Levels and Sizewell Marshes in winter 2014/15

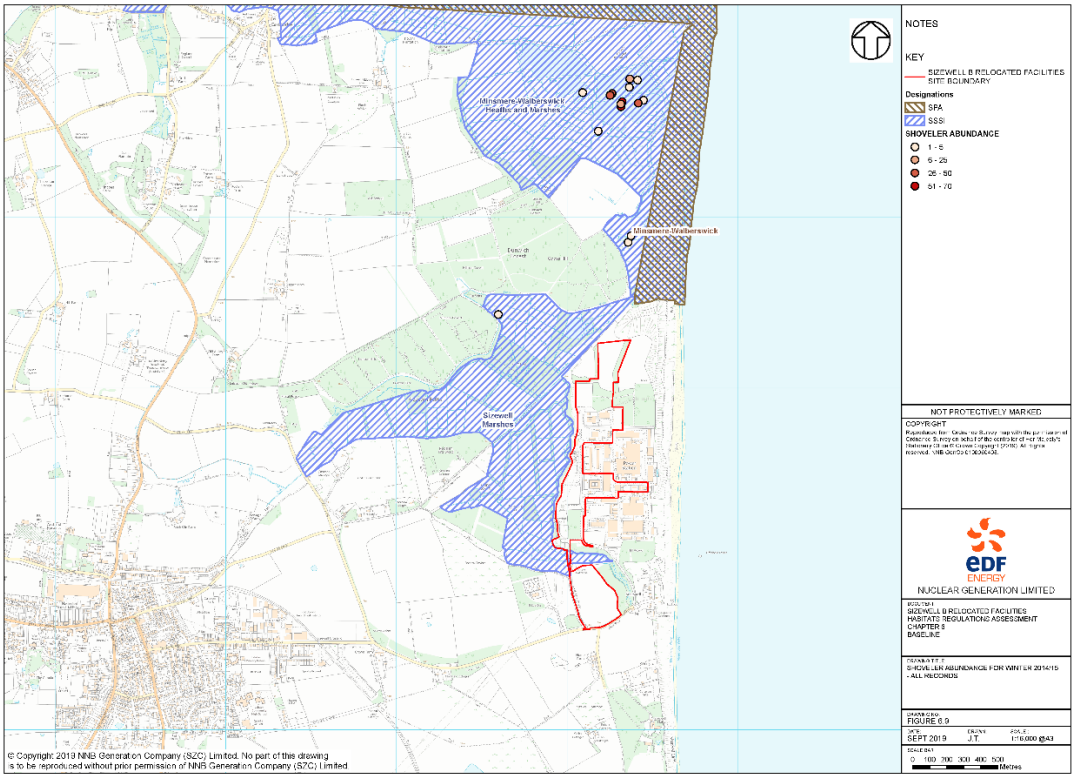
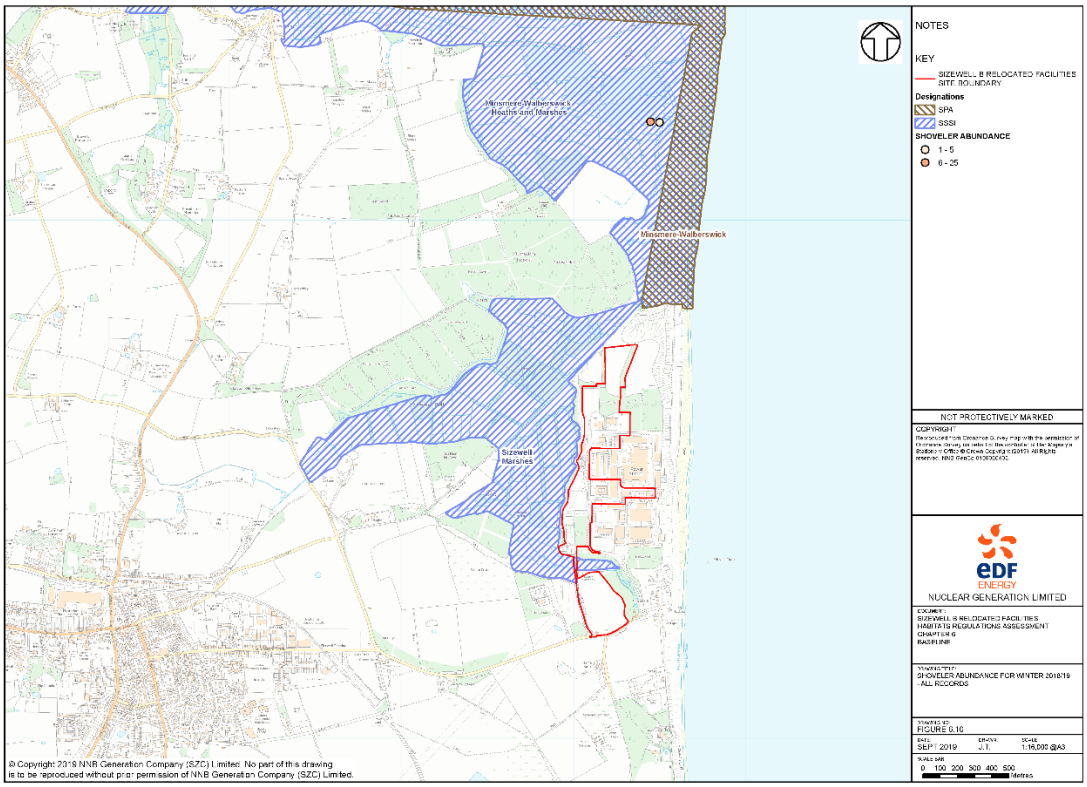


Figure 6.10 Shoveler abundance and distribution in the Minsmere South Levels and Sizewell Marshes in winter 2018/19



10. WeBS counts

6.2.62 Peak numbers of gadwall as recorded in different winter periods by the WeBS counts are presented in **Table 6.8** along with a mean peak value from the most recent four year period for which data are available for all count sectors (i.e. 2013-14 to 2016-17).

Table 6.8 Peak numbers of gadwall recorded in each winter period for which data are available between 2010-11 and 2018-19 during WeBS surveys in count sectors covering the Sizewell Marshes, Minsmere South Levels and the Minsmere-Walberswick SPA

Winter season	Sizewell Belts	Minsmere			Dingle Marshes and Walberswick NNR	Blyth Estuary
		Whole count area[1]	Minsmere excl South Levels	Minsmere South Levels		
2010-11	151	-	-		-	-
2011-12	9	-	-		-	-
2012-13	40	632	252	474	-	-
2013-14	25	548	132	442	52	0
2014-15	30	437	318	338	46	2
2015-16	27	270	262	154	38	0
2016-17	21	161	161	14	122	0
2017-18	-	292	188	238	-	-
2018-19	-	237	237	12	-	-
Mean peak count 2013-14 to 2016-17 (all years)	25.7 (43.3)	354.0 (368.1)	205.3 (214.0)	237.0 (238.9)	64.5	0.5

[1] Peak numbers for the whole count area are less than the summed peak numbers for Minsmere excluding the South Levels plus Minsmere South Levels because the peak numbers on the different parts of the Minsmere count sector occur on different survey visits.

6.2.63 These data show that largest numbers occur within the Minsmere WeBS count sector. Considering the numbers from this count sector with those for the other sectors within the Minsmere-Walberswick SPA (i.e. Dingle Marshes and Walberswick NNR and Blyth Estuary) gives a mean peak count of 419 birds for the period from 2013-14 to 2016-17on the SPA and Minsmere South Levels combined, with the peak counts for the individual winter periods ranging from approximately 280 to 600 birds (and exceeding 600 if the 2012-13 data are included) (**Table 6.8**).

6.2.64 Numbers on the Minsmere South Levels were often relatively high, particularly in the earlier years for which data were obtained. They accounted for an average of 30% of the birds (range 0% – 91%) across all available counts in the Minsmere sector (i.e. from 2012-13 to 2018-19) and of 44% (range 0% - 82%) across the peak counts for the individual winter periods (2012-13 to 2018-19). Excluding the data from the

Minsmere South Levels gives a mean peak count of 283 birds on the count sectors within the SPA between 2013-14 and 2016-17, with the peak counts for the individual winter periods ranging from approximately 180 to 370 birds (**Table 6.8**). This mean peak count is substantially larger than the citation population of 90 birds (**Table 6.1**).

6.2.65 Within the WeBS Sizewell Belts count sector, the peak winter counts recorded for gadwall have been relatively consistent, except in 2010-11 for which the peak count of 151 birds is almost six times greater than the mean peak count of approximately 26 for 2013-14 to 2016-17 (**Table 6.8**).

11. Comparison of datasets

6.2.66 There are some common patterns present in the data collected from both survey programmes with respect to relative bird distribution, as well as differences between the survey programmes with respect to the overall numbers of birds recorded. Overall, the data show that numbers of gadwall on the Sizewell Marshes tend to be low compared to those on the Minsmere-Walberswick SPA, but that the Minsmere South Levels may hold relatively high numbers, albeit with some marked variation in the peak counts from different winter periods.

6.2.67 Both survey programmes recorded birds at the Minsmere South Levels, with the same between-year pattern of higher numbers in the 2014-15 winter than in the 2018-19 winter (with the numbers recorded by both surveys in 2018-19 being notably low – **Table 6.7** and **Table 6.8**). However, the peak WeBS count for the Minsmere South Levels in 2014-15 was markedly higher than that for the project-specific surveys. The vast majority of records from the project-specific surveys in 2014-15 occurred on the largest pool system in the survey area to the east of the centre of the survey area, which is also within the WeBS count sector (**Figure 6.7**).

6.2.68 The peak numbers recorded in the Sizewell Marshes by both WeBS and the project-specific surveys were similar in 2014-15 but none of the more recent WeBS counts recorded numbers as high as those in the 2018-19 project-specific surveys (**Table 6.7** and **Table 6.8**). A possible explanation for this difference is that the WeBS Sizewell Belts count sector excludes the Goodum's Fen and SSSI Reedbed area, which is where highest numbers have been recorded in the Sizewell Marshes during the project-specific surveys.

(vi) Baseline survey results – shoveler

12. Project-specific surveys

6.2.69 Shoveler were scarce or absent from the Sizewell Marshes during the baseline surveys in both winters 2014-15 and 2018-19 but were relatively abundant on the Minsmere South Levels where seasonal peak counts of 85 and 18 were recorded in 2014-15 and 2018-19, respectively (**Table 6.9**). In both winters, shoveler records on the Minsmere South Levels were concentrated on the largest pool system in the survey area to the east of the centre of the survey area (**Figure 6.9** and **Figure 6.10**).

Table 6.9 Number of shoveler recorded during project-specific winter waterbird surveys in the Sizewell Marshes and Minsmere South Levels

Winter season	Date	Sizewell Marshes				Minsmere South Levels
		Sizewell Belts	Rookyard Woods	Goodrum's Fen and SSSI Reedbed	Total	
2014-15	11/11	0	-	0	0	10
	27/11	-	0	-		-
	04/12	0	-	0	0	45
	18/12	-	0	-		-
	08/01	0	0	0	0	79
	05/02	0	-	2	2	85
	19/02	-	0	-		-
	03/03	-	0	-	0	-
	05/03	0	-	0		61
	Seasonal Peak	0	0	2	2	85
2018-19	11/12	0	0	0	0	0
	10/01	0	0	0	0	1
	07/02	0	0	0	0	18
	Seasonal Peak	0	0	0	0	18

13. WeBS counts

6.2.70 Peak numbers of shoveler as recorded in different winter periods by the WeBS counts are presented in **Table 6.10**, along with a mean peak value from the most recent four-year period for which data are available for all count sectors (i.e. 2013-14 to 2016-17).

Table 6.10 Peak numbers of shoveler recorded in each winter period for which data are available between 2010-11 and 2018-19 during WeBS surveys in count sectors covering the Sizewell Marshes, Minsmere South Levels and the Minsmere-Walberswick SPA

Winter season	Sizewell Belts	Minsmere			Dingle Marshes and Walberswick NNR	Blyth Estuary
		Whole count area[1]	Minsmere excl South Levels	Minsmere South Levels		
2010-11	10	-	-		-	-
2011-12	0	-	-		-	-
2012-13	26	226	226	171	-	-
2013-14	15	371	212	282	34	5
2014-15	18	259	124	152	16	4
2015-16	17	136	126	60	8	5
2016-17	17	109	109	28	47	0
2017-18	-	145	131	64	-	-
2018-19	-	260	260	24	-	-
Mean peak count 2013-14 to 2016-17 (all years)	16.8 (14.7)	218.8 (215.1)	142.8 (169.7)	130.5 (111.6)	26.2	3.5

[1] Peak numbers for the whole count area are less than the summed peak numbers for Minsmere excluding the South Levels plus Minsmere South Levels because the peak numbers on the different parts of the Minsmere count sector occur on different survey visits.

6.2.71 These data show that largest numbers occur within the Minsmere WeBS count sector. Considering the numbers from this count sector with those for the other sectors within the Minsmere-Walberswick SPA (i.e. Dingle Marshes and Walberswick NNR and Blyth Estuary) gives a mean peak count of 249 birds for the period from 2013-14 to 2016-17 on the SPA and Minsmere South Levels combined, with the peak counts for the individual winter periods ranging from approximately 150 to 400 birds (**Table 6.10**).

6.2.72 Numbers on the Minsmere South Levels were often relatively high, particularly in the earlier years for which data were obtained. They accounted for an average of 23% of the birds (range 0% – 83%) across all available counts in the Minsmere sector (i.e. from 2012-13 to 2018-19) and of 27% (range 0% - 76%) across the peak counts for the individual winter periods (2012-13 to 2018-19). Excluding the data from the Minsmere South Levels gives a mean peak count of 173 birds on the count sectors within the SPA between 2013-14 and 2016-17, with the peak counts for the individual winter periods ranging from approximately 140 to 250 birds (**Table 6.10**). This mean peak count is substantially larger than the SPA citation population of 100 birds (**Table 6.1**).

6.2.73 Within the WeBS Sizewell Belts count sector, the peak winter counts recorded for shoveler have been relatively consistent, with a mean peak count of approximately 17 for the period from 2013-14 to 2016-17, although no birds were recorded in 2011-12 (**Table 6.10**). Despite the relative consistency in the mean peak counts the occurrence of shoveler within this count sector has been variable, with no birds recorded in 12 of the 30 WeBS surveys undertaken between October and March over the last five years.

14. Comparison of datasets

6.2.74 As for the gadwall data, there are some common patterns present in the shoveler data collected from both survey programmes with respect to bird distribution, though there are also some differences between the survey programmes with respect to the numbers of birds recorded. Overall, the data show that the numbers of shoveler on the Sizewell Marshes tend to be low compared to those on the Minsmere-Walberswick SPA, but that the Minsmere South Levels may hold relatively high numbers, albeit with some marked variation in the peak numbers from different winter periods and a trend for lower numbers in more recent winters.

6.2.75 As for gadwall, both survey programmes recorded birds at the Minsmere South Levels, with the same between-year pattern of higher numbers in the 2014-15 winter than in the 2018-19 winter (with numbers recorded by both surveys in 2018-19 being notably low – **Table 6.9** and **Table 6.1**). However, the peak WeBS count for the Minsmere South Levels in 2014-15 was higher than that for the project-specific surveys. Again, as for gadwall, the vast majority of shoveler records on the Minsmere South Levels during the 2014-15 project-specific surveys occurred on the largest pool system in the survey area to the east of the centre of the survey area, which is also within the WeBS count sector (**Figure 6.9**).

6.2.76 Greater numbers of shoveler were recorded during WeBS counts within the WeBS Sizewell Belts count sector (with peak counts of 10 or more birds in six of the seven years for which data were obtained) than during project-specific surveys of the Sizewell Marshes, which recorded only two birds in this area during the two winters of survey (**Table 6.9** and **Table 6.10**). Such a marked discrepancy between the respective counts is difficult to explain, although it is notable that shoveler were recorded in a relatively low proportion (i.e. 60%) of the WeBS Sizewell Belts counts. This, together with the scarcity of records from the project-specific surveys, suggests their occurrence within the Sizewell Marshes in winter may be sporadic.

(vii) Baseline survey results – white-fronted goose

6.2.77 White-fronted goose was not recorded in any of the project-specific surveys of the Minsmere South Levels or Sizewell Marshes.

6.2.78 For the WeBS counts that were accessed there was only a single record (of 13 birds in January 2016) from the Minsmere South Levels and no records from the Sizewell Marshes.

6.2.79 However, North Warren provides the main daytime feeding area for this species in Suffolk[5] and those birds are reported to often roost on the Minsmere-Walberswick SPA, and sometimes Minsmere South Levels (RSPB, in litt.). Arrival at these roosting areas is reported to occur after dark with departure before dawn.

6.3 Minsmere to Walberswick Ramsar site

6.3.1 All the Ramsar qualifying species screened in in relation to the Proposed Development (marsh harrier, gadwall, shoveler, teal and bittern) are also qualifying species of the SPA. Thus, the baseline data for these Ramsar qualifying species are as presented above for the SPA.

7. INFORMATION FOR APPROPRIATE ASSESSMENT

7.1 Introduction

7.1.1 The information required for Appropriate Assessment of the effects of the Proposed Development, alone and in-combination, on the qualifying species of the SPA and Ramsar site screened in to the assessment (**Table 5.3** and **Table 5.4**), is presented below.

7.2 Minsmere-Walberswick SPA – Proposed Development alone – Construction and Demolition Phase Noise and Visual Disturbance

a) Introduction

7.2.1 Although noise and visual disturbance have been separated out for the purposes of screening for LSE, in reality birds are likely to perceive anthropogenic disturbance as a combination of noise and visual stimuli. Observed reactions to disturbance recorded in empirical studies, on which the ZoIs for noise and visual disturbance identified above (in each case within 200 m from the Proposed Development) have been predicted, are often likely to be due to combined auditory and visual cues. Given this, and the fact that for the current assessment the distance at which both of these stimuli are predicted to cause potential responses in birds is the same, noise and visual disturbance during the construction and demolition phase (hereafter referred to simply as the construction phase) are considered together in the shadow AA below.

7.2.2 Due to possible functional linkage between the Sizewell Marshes and the Minsmere-Walberswick SPA, it is possible that SPA birds may use areas within the ZoI of airborne noise and visual disturbance for the Proposed Development. This potential effect was screened in for the SPA qualifying species marsh harrier, bittern, gadwall, shoveler and teal during the breeding season, and, hen harrier, gadwall, shoveler and white-fronted goose during the non-breeding season.

b) Breeding season qualifying species

Marsh harrier

7.2.3 Marsh harriers that nest within the Minsmere-Walberswick SPA may forage within the Sizewell Marshes, so there is the potential for noise and visual disturbance effects from the Proposed Development to displace birds from foraging habitat. However, the predicted area that would be affected is relatively small, extending up to 200 m out from the Proposed Development onto the Sizewell Marshes (**Section 5.3(b)**). Surveys of marsh harrier flight activity (described in **Section 6.2(b)**) demonstrate that other areas of suitable foraging habitat (notably the Minsmere South Levels) are more heavily used by foraging birds than are the Sizewell Marshes. Furthermore, of the four plots on which marsh harrier flight activity has been monitored within the Sizewell Marshes, the lowest levels of flight activity were recorded on the plot which is partly

within, and adjacent to, the area of the Sizewell Marshes which may be affected by noise effects from the Proposed Development (**Figures 6.1** – **6.4**).

7.2.4 This indicates that marsh harriers make little use of the areas within the ZoI for airborne noise and visual disturbance. Therefore, no adverse effect is predicted on the SPA breeding marsh harrier population as a result of airborne noise and visual disturbance during construction of the Proposed Development.

Bittern

7.2.5 As described in **Section 6.2** above, there is no evidence that bitterns breed in the Sizewell Marshes, which represent the closest area of suitable habitat to the Proposed Development, and the only such area within the potential ZoI of disturbance during construction. There is also no evidence that the Sizewell Marshes are an important foraging area for bitterns breeding within the Minsmere-Walberswick SPA. A single record of a bittern flying within the Sizewell Marshes was obtained during VP surveys in the non-breeding season in 2012. RSPB radiotracking studies and SWT records indicate that first winter birds from the SPA may make some use of the Sizewell Marshes during the non-breeding season, dispersing from their natal sites.

7.2.6 The available evidence suggests low usage of the Sizewell Marshes by bitterns, whilst the ZoI for construction disturbance (predicted to be within 200 m) overlaps with a relatively small area of the Sizewell Marshes. It appears that the Sizewell Marshes is predominantly used by bitterns outside the breeding season, including by first year birds from the SPA breeding population. No information is available on the relative use of bitterns of different areas of the Sizewell Marshes. However, given the extent of the wetland area, any birds which might be disturbed from areas in close proximity to construction works would be able to move to areas of undisturbed habitat nearby and still within the Sizewell Marshes SSSI. Thus, no adverse effect on the SPA breeding population of bittern is predicted as a consequence of noise and visual disturbance during construction.

Gadwall

7.2.7 On a precautionary basis it is assumed that breeding gadwall in the Sizewell Marshes are functionally linked to the breeding population of the Minsmere-Walberswick SPA, and this wider population also includes the Minsmere South Levels (see **Figure 6.5**). The most recent population estimate for the SPA is 84 breeding pairs over the period 2011/12 to 2015/16 (**Table 6.1**). Over a similar period, the Sizewell Marshes supported an average of 5 pairs and the Minsmere South Levels an average of 14 pairs (**Table 6.4**), giving a wider SPA population estimate of approximately 103 pairs, of which the Sizewell Marshes supports about 5%.

7.2.8 The distribution of breeding gadwall within the Sizewell Marshes is not known, so the number of breeding pairs, if any, within the ZoI of noise and visual disturbance (i.e. ≤200 m from the Proposed Development) is unknown (but it is highly unlikely that more than a small proportion of the small number of pairs estimated to breed within the Sizewell Marshes do so within the ZoI). It is also unknown whether any pairs that might be displaced would be able to move to an alternative nest sites within the Sizewell Marshes, or would be displaced elsewhere. However, the potentially affected birds derive from areas of habitat that may be functionally linked to the SPA, as opposed to

being from the designated population. Thus, the potential displacement of breeding pairs from Sizewell Marshes would not reduce the numbers nesting within the SPA boundary (currently more than three times larger than the breeding population cited at the time the site was designated, **Table 6.1**). This relatively low level of potential displacement affecting (albeit functionally linked) birds outside the SPA would not adversely affect the SPA breeding gadwall population as a consequence of noise and visual disturbance from construction.

Shoveler

7.2.9 Shoveler are a scarce and sporadic breeding species in the Sizewell Marshes (**Table 6.4**). Nevertheless, on a precautionary basis it is assumed that breeding shoveler in the Sizewell Marshes are functionally linked to the breeding population of the Minsmere-Walberswick SPA, and this wider population also includes the Minsmere South Levels (see **Figure 6.5**). The most recent population estimate for the SPA is 65 breeding pairs over the period 2011/12 to 2015/16 (**Table 6.1**). Over a similar period, the Sizewell Marshes supported a maximum of 1 pair (a mean of 0.4 pairs) and the Minsmere South Levels an average of 12 pairs (**Table 6.4**), giving a wider SPA population estimate of approximately 77 pairs, of which the Sizewell Marshes supports about 0.5%.

7.2.10 The distribution of breeding shoveler within the Sizewell Marshes is not known, so the number of breeding pairs, if any, within the ZoI of noise and visual disturbance (i.e. ≤200m from the Proposed Development) is unknown (although it seems most likely that no shoveler breed within the ZoI). It is also unknown whether any pairs that might be displaced would be able to move to an alternative nest site within the Sizewell Marshes, or would be displaced elsewhere. However, the potentially affected birds derive from areas of habitat that may be functionally linked to the SPA, as opposed to being from the designated population. Thus, the potential displacement of breeding pairs from Sizewell Marshes would not reduce the numbers nesting within the SPA boundary (currently almost three times larger than the breeding population cited at the time the site was designated, **Table 6.1**). This very low level of potential displacement affecting (albeit functionally linked) birds outside the SPA would not adversely affect the SPA breeding shoveler population as a consequence of noise and visual disturbance from construction.

Teal

7.2.11 Breeding teal are essentially absent from the Sizewell Marshes and Minsmere South Levels, with one record of a single breeding pair (in 2013) between 2011 and 2017 and no breeding records between 2010 and 2017 respectively (**Table 6.4**). Teal are also virtually absent now from the SPA as a breeding species (**Table 6.1**). Noise and visual disturbance to a small area of the Sizewell Marshes during the construction of the Proposed Development would not affect the likelihood of teal nesting within the SPA boundary. As such, no adverse effects on the SPA breeding teal population are predicted as a consequence of noise and visual disturbance from construction activities.

c) Non-breeding qualifying features

Hen harrier

7.2.12 Hen harriers were recorded flying over the Sizewell Marshes on six occasions during VP surveys between October 2014 and March 2015. Each time a single bird was recorded, but over the survey period the observations included birds identified as adult males, adult females and 'ringtails' (either adult females or immature females or males), indicating the presence of a number of different individuals over the winter. No hen harriers were recorded over the Sizewell Marshes in VP surveys in 2011/12, or in walkover surveys between April 2011 and March 2012. Natural England (2019) report that only a single hen harrier has been recorded on the Minsmere-Walberswick SPA over the past five years.

7.2.13 Wintering hen harriers forage over wide areas in lowland habitats, favouring flat landscapes with wide expanses of unbroken wetland, farmland or heath (English Nature, 2002). Given the availability of this kind of habitat in the vicinity of Sizewell Marshes, including the Minsmere South Levels and Minsmere-Walberswick SPA, potential displacement from the identified ZoI of the proposed development would not be predicted to adversely affect the availability of foraging habitat for birds associated with the Minsmere-Walberswick SPA. Furthermore, there is no evidence of the Sizewell Marshes being used as winter roost site by this species (at least in recent years (e.g. SWT 2017).

7.2.14 The lack of regular or frequent records of this species for the Sizewell Marshes indicates that the area is not important for wintering hen harriers. Thus, potential construction disturbance from the identified ZoI of the Proposed Development would not adversely affect the availability of roosting habitat for birds associated with the Minsmere-Walberswick SPA.

Gadwall

7.2.15 The available WeBS data suggest that over-wintering numbers of gadwall on the Sizewell Marshes are low relative to the numbers occurring on the SPA, whereas the numbers occurring on the Minsmere South Levels can be as high, or higher, than those on the SPA (**Table 6.8**). If the birds using the SPA, Minsmere South Levels and Sizewell Marshes are regarded as being part of a wider SPA population (which follows from the assumption that the Sizewell Marshes and Minsmere South Levels are functionally linked to the SPA), the WeBS data suggest that the peak numbers of gadwall occurring within the Sizewell Marshes range from 4% to 8% of this population between years (whilst, by comparison, for the Minsmere South Levels the peak numbers range from 5% to 70% of this population between years, averaging 53%).

7.2.16 There are limitations to the WeBS Sizewell Belts data because the count sector does not encompass all areas of suitable waterbird habitat within Sizewell Marshes, and the project-specific survey data suggest that in some, but not all, years the peak gadwall numbers occurring on the Sizewell Marshes may be higher than indicated by the WeBS counts. However, importantly, the WeBS count sector does encompass the ZoI for noise and visual disturbance, whilst the project-specific survey data do not suggest that the area of the Sizewell Marshes within the ZoI is of disproportionate importance to gadwall using the Sizewell Marshes (**Figures 6.7** and **6.8**).

7.2.17 Relating the highest seasonal peak count from the project-specific surveys (i.e. 80 – **Table 6.7**) to the total mean peak WeBS count for the 'assumed wider SPA population' (i.e. 445 –**Table 6.8**), indicates that peak numbers on the Sizewell Marshes could represent approximately 18% of this population in certain years.

7.2.18 The distribution of gadwall records from the two winter periods of project-specific surveys provide no indication that the ZoI for noise and visual disturbance is of disproportionate importance to gadwall using the Sizewell Marshes but, rather, show that the majority of observations within the Sizewell Marshes occur beyond 200m from the Proposed Development and outside this ZoI (**Figures 6.7** and **6.8**).

7.2.19 Therefore, only a small proportion of the wintering gadwall using the Sizewell Marshes could be affected by construction disturbance from the Proposed Development and, in turn, the Sizewell Marshes supports a relatively small proportion of the wider SPA population. Any birds that are disturbed would be able to relocate to suitable alternative habitat within the Sizewell Marshes, Minsmere South Levels or the Minsmere-Walberswick SPA. Studies of the movements of wintering gadwall also indicate there is likely to be a regular inter-change of birds between these areas and other areas of suitable habitat within the wider region (Briggs, 2007; Briggs *et al.* 2012), so that alternative habitats would be available over a wider area. Consequently, no adverse effects due to construction-related disturbance on the SPA population of wintering gadwall are predicted.

Shoveler

7.2.20 The available WeBS data suggest that over-wintering numbers of shoveler on the Sizewell Marshes are low relative to the numbers occurring on the SPA (**Table 6.10**). By contrast, the numbers occurring on the Minsmere South Levels can be as high, or higher, than those on the SPA, although they have been markedly lower during the more recent winter periods for which data are available. If the birds using the SPA, Minsmere South Levels and Sizewell Marshes are regarded as being part of a wider SPA population (which follows from the assumption that the Sizewell Marshes and Minsmere South Levels are functionally linked to the SPA), the WeBS data suggest that the peak numbers of shoveler occurring within the Sizewell Marshes range from 4% to 10% of this population between years (whilst, by comparison, for the Minsmere South Levels the peak numbers range from 16% to 66% of this population between years, averaging 49%).

7.2.21 As detailed above for gadwall, there are limitations to the WeBS Sizewell Belts data because the count sector does not encompass all areas of suitable waterbird habitat within Sizewell Marshes. Despite this, shoveler were absent or near-absent in the records from the Sizewell Marshes during both years of project-specific surveys and numbers were considerably lower than as recorded by the WeBS counts (**Table 6.9**).

7.2.22 All records of shoveler from the project-specific surveys of the Sizewell Marshes are outside the ZoI of construction disturbance from the Proposed Development (**Figures 6.9** and **6.10**). The WeBS counts suggest higher numbers of shoveler may occur on the Sizewell Marshes and it is possible that the data from the project-specific surveys underestimate the use of the areas within the ZoI for construction disturbance. However, it seems highly unlikely that the ZoI would be of disproportionate importance

for shoveler within the Sizewell Marshes and, therefore, the numbers of birds using the area are likely to be small.

7.2.23 The lower numbers of wintering shoveler on the Sizewell Marshes compared with the Minsmere South Levels and Minsmere Walberswick SPA is likely to reflect the available habitat, in particular the absence of extensive open water bodies which are preferred by this species (Briggs *et al.,* 2012). In addition, during winter this species may commute between multiple sites over the diel period and change patterns of use regularly over the course of the non-breeding season (Briggs, 2007).

7.2.24 Therefore, compared with other areas likely to be used by the wider Minsmere-Walberswick SPA population of shoveler, the Sizewell Marshes represents less favoured habitat (a system of ditches rather than open and connected waterbodies) and, in addition, wintering birds are likely to move regularly between different areas within a given day. It is likely that, at most, only small numbers of birds use the ZoI for construction disturbance from the Proposed Development, and any birds which might be disturbed within this ZoI would be able to relocate to suitable alternative habitat within the Sizewell Marshes, or else more preferred habitat within the Minsmere South Levels or the Minsmere-Walberswick SPA. Consequently, no adverse effects due to construction-related disturbance on the SPA population of wintering gadwall are predicted.

White-fronted goose

7.2.25 The available survey data (both project-specific and WeBS) demonstrate that the main feeding areas of the SPA white-fronted goose population occur in areas that will not be affected by construction-related noise and visual disturbance. Birds are reported to often roost at night on the Minsmere-Walberswick SPA, and sometimes Minsmere South Levels, areas that are also beyond the ZoI for construction works for the Proposed Development. White-fronted goose was not recorded in any project specific surveys, or the accessed WeBS count data, for the Sizewell Marshes.

7.2.26 Consequently, no adverse effects due to construction-related disturbance on the SPA population of wintering white-fronted goose are predicted.

7.3 Minsmere-Walberswick SPA – In-Combination Assessment

7.3.1 The Sizewell C main development site was the only project, and project component, for which LSIE could not be excluded (**Section 5.4**). This is due to the possibility of a temporal overlap of up to approximately two years between Phase 2 of the Proposed Development (involving activities such as excavating and concreting and cladding) and the initial phases of Sizewell C main development site construction. Construction activities for the Sizewell C main development site have the potential to cause noise and visual disturbance that could affect qualifying features from the Minsmere-Walberswick SPA, hence leading to the potential for in-combination effects on this SPA during the period of overlap between the two projects.

7.3.2 However, as detailed above, the effects predicted to arise from the construction and demolition of the Proposed Development are small and only arise via the encroachment of noise and visual stimuli onto a relatively small part of the Sizewell Marshes SSSI, which is outside the SPA but has functional linkage with some SPA

qualifying features. As such, it is considered that these very minor effects have little potential to contribute in any substantial way to in-combination effects.

7.3.3 It is assumed that for the Sizewell C main development site to proceed, mitigation would have to be applied to offset any adverse effects predicted on the Minsmere-Walberswick SPA, whether as a result of the project-alone or the project in-combination with other plans and projects. Therefore, it is concluded that there would be no adverse effects on the integrity of the Minsmere-Walberswick SPA as a result of the construction and demolition of the Sizewell B Relocated Facilities in-combination with the construction of the Sizewell C Project.

7.4 Minsmere-Walberswick Ramsar site – Alone and In-combination

7.4.1 All of the Ramsar site qualifying species screened in to the AA in relation to the Proposed Development (marsh harrier, gadwall, shoveler, teal and bittern) are also qualifying species of the Minsmere-Walberswick SPA. Thus, the appropriate assessments for these species presented above for the SPA also apply to the Ramsar site. Adverse effects due to construction-related disturbance on the Ramsar populations are not, therefore, predicted.

8. CONCLUSION

8.1 Introduction and approach

8.1.1 This report considers the implications of the Proposed Development on the conservation objectives of the 'screened in' European sites and qualifying features. It sits alongside the Environmental Statement considered with the application for planning permission for relocation and demolition of a number of existing facilities at Sizewell B nuclear power station.

8.1.2 The Shadow HRA report was prepared based on a two-stage process, which included screening for LSE, followed by AA. The potentially significant effects of the Proposed Development have been assessed alone as well as in-combination with other relevant plans or projects. The approach for dealing with in-combination effects was to determine the environmental parameters that could be affected by the interaction of effects between projects.

8.2 Stage 1 Screening

8.2.1 The European site scoping exercise identified five European sites for inclusion in the LSE screening assessment, as follows:

- Minsmere to Walberswick Heaths and Marshes SAC;
- Minsmere-Walberswick SPA;
- Minsmere-Walberswick Ramsar site;
- Outer Thames Estuary SPA; and
- Sandlings SPA.

8.2.2 For each qualifying feature of the European sites listed above, the screening exercise assessed whether or not a LSE associated with the Proposed Development alone had the potential to arise from the following potential effect pathways:

During construction and demolition:

- direct habitat loss and alteration;
- potential exposure of sensitive habitats and species to the generation of dust;
- potential disturbance to sensitive species from noise;
- potential disturbance to sensitive species due to artificial light; and
- potential visual disturbance to sensitive species.

During operation:

- potential for noise, visual and artificial lighting impacts associated with buildings and car parking.

8.2.3 LSE was identified for the Proposed Development alone for the Minsmere-Walberswick SPA and Ramsar site due to potential visual disturbance and disturbance from noise for marsh and hen harriers, gadwall, shoveler, teal, bittern and white-fronted goose.

8.2.4 An assessment for LSIE was undertaken for the Proposed Development and the Sizewell C nuclear power station (the main development site) and EA1N and EA2 offshore wind farms (specifically the proposed export cable route). This assessment concluded that there was potential for LSIE on the Minsmere-Walberswick SPA and Ramsar site from the Proposed Development and Sizewell C main development site.

8.3 Stage 2 Appropriate Assessment

8.3.1 AA of the Minsmere-Walberswick SPA and Ramsar site for potential noise and visual disturbance during the construction and demolition phases of the Proposed Development (alone and in-combination with the early construction of the Sizewell C main development site) was undertaken.

8.3.2 The AA, both alone and in-combination, concluded that the potential noise and visual disturbance would not adversely affect the populations of the qualifying features or the integrity of the Minsmere-Walberswick SPA and Ramsar site in view of the sites' conservation objectives.

8.4 Overall conclusion of the Shadow HRA

8.4.1 The overall conclusion drawn from the above for the purposes of the Shadow HRA is that adverse effects on the integrity of European sites and their qualifying features would not arise due to the Proposed Development in its construction/demolition or operation phases, either alone or in-combination with other plans and projects.

8.4.2 In the context of the HRA process, given the findings of the shadow AA, this assessment can be concluded at the end of Stage 2 and, hence, Stages 3 and 4 of the HRA process do not need to be considered.

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