



CLEVE HILL SOLAR PARK

REPORT TO INFORM APPROPRIATE ASSESSMENT APPENDICES (INCLUDING MATRICES)

November 2018
Revision A

Document Reference: 5.2.1
APFP Regulation: 5(2)(g)

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CLEVE HILL
SOLAR PARK

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APPENDIX 1 - NATURAL ENGLAND INITIAL ADVICE (DECEMBER 2016)

Date: 26 January 2017
Our ref: DAS/11342/198096
Your ref: 2238 Cleve Hill



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Dear Mike

Discretionary Advice Service (Charged Advice)

DAS/11342/198096

Development proposal and location: Cleve Hill Solar Photovoltaic Array, near Faversham, Kent

Thank you for your consultation on the above dated 06 October 2016, which was received on the same date.

This advice is being provided as part of Natural England's Discretionary Advice Service. Arcus Consultancy Services has asked Natural England to provide advice upon:

- The scope and results of the baseline ecological and ornithological surveys completed
- Implications of the above for the proposal, particularly in relation to The Swale Special Protection Area (SPA).
- At the meeting on 14 December 2016, a number of detailed questions were posed, which are considered in an annex to this letter.

This advice is provided in accordance with the Quotation and Agreement dated 17 November 2016.

The following advice is based upon the information within the following documents:

1. Cleve Hill Solar PV Array Ornithology Consultation Report (Arcus, Dec 16)
2. Cleve Hill Solar PV Array Non-avian Ecology Summary Report (Arcus, Dec 16)
3. Note of meeting held on 14 Dec 16 (Arcus, sent 23 Dec 16)

As the proposal is in the early stages of development a detailed layout is not yet available. Therefore the Potential Development Area (PDA) shown in figure 1 of the Ornithology Report, encompasses the entire area in which development could occur. It is recognised that the proposal may be refined to take account of constraints, including ecological and landscape considerations, during the course of the Environmental Impact Assessment.

Designated Nature Conservation Sites

The Swale Special Protection Area (SPA) and Ramsar site

The location of the proposal, outside, but adjacent to, The Swale SPA/Ramsar site, means that it has the potential to impact the features¹ for which the sites are designated, for example:

¹ See Annex 2 for advice on the species which make up the wintering and breeding bird assemblages, and Ramsar features.

- Disturbance to birds using adjacent habitats during construction, any maintenance activities during operation, and during decommissioning;
- Loss of functionally linked habitat (ie. land outside the designated site but which is necessary for the ecological or behavioural functioning, in the relevant season, of a qualifying feature for which the site has been designated);
- Potential for the solar panels to act as an ecological sink to any Ramsar invertebrates that lay their eggs on water.

Scope of surveys

Assessment of the scale and importance of the potential impacts identified above on the features of the designated sites depends on robust baseline survey data. The methodology for each of the surveys undertaken are set out in the Ornithology Report, and were discussed at the meeting on 14 December 2016.

I am satisfied that as the wintering bird surveys cover three winters (recognising that although the first winter only included Jan – Mar 14, this would have covered the time when, from our experience, the larger numbers of birds are found in the Swale), this is sufficient survey effort to gain a picture of bird use on the PDA and surrounds. At the meeting, Arcus clarified that, although there was a change in methodology for the surveys carried out between Sept 15 and Oct 16, the results allow comparison across the different wintering periods. The inclusion of flight activity surveys undertaken between Nov 15 and Oct 16, and nocturnal surveys in the winter 15-16 are welcomed. These additional surveys are helpful in understanding how key bird species use the area.

I am also satisfied that as the breeding bird surveys covered three seasons, this is sufficient. The inclusion of breeding raptor and owl surveys, are welcomed, which aid understanding of the significance of the site for these species groups.

My view is, therefore, that the coverage of surveys completed is sufficient to enable a thorough assessment of the potential impacts on SPA/Ramsar birds, and other important bird species.

Survey Results

It is recognised that the results presented in the Ornithology Report are in summary form and that further information and analysis will be presented in the Habitats Regulations Assessment and Environmental Statement. Therefore, the following are initial comments, and I will comment in detail at later stages in the process.

Taking each of the potential impacts identified above in turn:

Potential disturbance to birds

The Ornithology Report shows that the intertidal area of the Swale and Faversham Creek, adjacent to the PDA, is used by a wide range of wintering SPA/Ramsar birds at both high and low tide. Therefore, there are potentially significant numbers of birds that may be impacted by visual and noise disturbance during construction. Depending on the predicted maintenance needs for the array, there may also be potential for disturbance to occur during operation.

I recommend considering whether disturbance during construction can be avoided by timing works outside the wintering period. Alternatively, the use of less disturbing methods of construction, eg avoiding impact piling, should be explored.

Loss of functionally linked land for wintering birds

It is now well-established that where European site qualifying features might rely on nearby but undesignated functionally linked land, then this is within the scope of Habitats Regulations Assessments (HRAs) of new plans or projects.

The Ornithology Report shows that dark-bellied brent geese were recorded within the PDA in all three winters, and our site visit demonstrated that they were present in this winter. Therefore, it can be concluded from the summary data that brent geese regularly use the PDA, and hence my view is that it is functionally linked to the SPA.

The Ornithology Report also shows that the PDA is used by wintering waders including dunlin, golden plover, lapwing and curlew. These are species that qualify in their own right (dunlin) or as part of the wintering assemblage (see Annex 1), therefore, should be included in the assessment of the loss of functionally linked land.

At the meeting on 14 December Arcus outlined the intention to use 'bird days' to quantify the importance of the site to different species. My view is that this seems a sensible way to assess how important the PDA is to the functioning of the SPA.

Loss of functionally linked land for breeding birds

As outlined in Annex 1, The Swale SPA is designated for its assemblage of breeding birds of grazing marsh, which is made up of species named on the citation and species 'characteristic' of the habitat. The Ornithology Report indicates that a number of these species have been recorded breeding within the PDA, eg: marsh harrier, cuckoo, yellow wagtail, reed bunting and lapwing (from tables 5 and 9).

In assessing whether the PDA is functionally linked to the SPA for any of the assemblage breeding birds, you should consider whether the PDA is necessary for the ecological or behavioural functioning of the species, as opposed to supporting species that are typical of grazing marsh habitat but also widespread and common. Based on the summary information presented, my initial view is that the PDA may be functionally linked to the SPA for marsh harrier, as part of the breeding bird assemblage. This is because, although a breeding marsh harrier territory was confirmed only in 2014, the flight activity surveys show that the PDA is regularly used for foraging. Therefore, the PDA could be important for the ecological functioning of the marsh harrier component of the breeding bird assemblage, by providing important foraging habitat. However, the SPA populations of other typical grazing marsh species present within the PDA, for example reed bunting, are probably not dependant on the PDA for their ecological functioning, and therefore, are not functionally linked.

Potential for solar panels to act as an ecological sink to Ramsar invertebrates

There has been some research² that has demonstrated that insects that lay their eggs in water mistake solar panels for water bodies and try and lay their eggs on them. This can then impact their reproductive biology. The paper goes on to suggest that using white strips to break up the panel can reduce their attractiveness to insects.

The Swale Ramsar site was designated for its wetland plant and invertebrate communities. The citation mentions one species that lays its eggs in water and is attracted to horizontally polarised light: the dolichopodid fly *Campsicnemus majus*.

The Non-Avian Ecology Report states that a relatively low number of invertebrates were recorded for the size of site. Therefore, the risk to polarotactic insects may be low. However, my view is that the potential risk to the wetland invertebrate community should be considered in the HRA.

Protected landscape

The PDA is within 5km of the Kent Downs AONB. Therefore, if there are any sight lines from the AONB to the PDA, I would expect these viewpoints to be included in a Landscape and Visual Impact Assessment. However, unless any impacts on the AONB were assessed as significant, Natural England would not give bespoke landscape advice at the examination stage.

² Horvath et al. 2010. Reducing the maladaptive attractiveness of solar panels to polarotactic insects. Conservation Biology 24 (6) pp. 1644 - 1653

At the meeting on 14 December, Arcus asked for guidance to inform the landscape assessment. The following is Natural England's general advice on the scope of EIAs:

Landscape and visual impacts

Natural England would wish to see details of local landscape character areas mapped at a scale appropriate to the development site as well as any relevant management plans or strategies pertaining to the area. The EIA should include assessments of visual effects on the surrounding area and landscape together with any physical effects of the development, such as changes in topography.

The EIA should include a full assessment of the potential impacts of the development on local landscape character using landscape assessment methodologies³. We encourage the use of Landscape Character Assessment (LCA), based on the good practice guidelines produced jointly by the Landscape Institute and Institute of Environmental Assessment in 2013. LCA provides a sound basis for guiding, informing and understanding the ability of any location to accommodate change and to make positive proposals for conserving, enhancing or regenerating character, as detailed proposals are developed.

Natural England supports the publication *Guidelines for Landscape and Visual Impact Assessment*, produced by the Landscape Institute and the Institute of Environmental Assessment and Management in 2013 (3rd edition). The methodology set out is almost universally used for landscape and visual impact assessment.

In order to foster high quality development that respects, maintains, or enhances, local landscape character and distinctiveness, Natural England encourages all new development to consider the character and distinctiveness of the area, with the siting and design of the proposed development reflecting local characteristics. The EIA process should detail any layout alternatives together with justification of the selected option in terms of landscape impact and benefit.

The assessment should also include the cumulative effect of the development with other relevant existing or proposed developments in the area. In this context Natural England advises that the cumulative impact assessment should include other proposals currently at Scoping stage. Due to the overlapping timescale of their progress through the planning system, cumulative impact of the proposed development with those proposals currently at Scoping stage would be likely to be a material consideration at the time of determination of the planning application.

The assessment should refer to the relevant National Character Areas⁴ which can be found on our website. Links for Landscape Character Assessment at a local level are also available on the same page.

Protected Species

This proposal, as presented, has the potential to affect species protected under European or UK legislation. The Non-avian Ecology Report confirms the presence of a small population of great crested newts, foraging and commuting bats, reptiles and water voles. Natural England has produced [Standing Advice](#) which is available on its website. Whilst this advice is primarily designed to assist local planning authorities better understand the information required when assessing the impact of developments upon protected species, it also contains a wealth of information to help applicants ensure that their applications comply with good practice guidelines and contribute to sustainable development. Please refer to this Standing Advice for further information on what information the authority may require in terms of survey and mitigation proposals.

Further information can also be obtained from [The Institute of Ecology and Environmental](#)

³ <https://www.gov.uk/guidance/landscape-and-seascape-character-assessments>

⁴ <http://www.naturalengland.org.uk/publications/nca/default.aspx>

Biodiversity enhancements

Guidance on enhancements has been produced by the BRE Solar Centre⁵. In particular, solar arrays offer opportunities for enhancements through the management of the grassland between the panels. As discussed at our meeting on 14 December, the sowing of a seed mix to benefit invertebrates, including bumblebees, would be valuable in this location. In addition, the presence of ditches within the PDA offers the opportunity to enhance the water vole population of the site.

This letter concludes Natural England's Initial Advice within the Quotation and Agreement dated 17 November 2016.

As the Discretionary Advice Service is a new service, we would appreciate your feedback to help shape this service. We have attached a feedback form to this letter and would welcome any comments you might have about our service.

The advice provided in this letter has been through Natural England's Quality Assurance process

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named below. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Yours sincerely

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⁵ <https://www.bre.co.uk/filelibrary/pdf/Brochures/NSC-Biodiversity-Guidance.pdf>

Annex 1

European Protected Species

A licence is required in order to carry out any works that involve certain activities such as capturing the animals, disturbance, or damaging or destroying their resting or breeding places. Note that damage or destruction of a breeding site or resting place is an absolute offence and unless the offences can be avoided (e.g. by timing the works appropriately), it should be licensed. In the first instance it is for the developer to decide whether a species licence will be needed. The developer may need to engage specialist advice in making this decision. A licence may be needed to carry out mitigation work as well as for impacts directly connected with a development. Further information can be found in Natural England's ['How to get a licence'](#) publication.

If the application requires planning permission, it is for the local planning authority to consider whether the permission would offend against Article 12(1) of the Habitats Directive, and if so, whether the application would be likely to receive a licence. This should be based on the advice Natural England provides at formal consultation on the likely impacts on favourable conservation status and Natural England's [guidance](#) on how the three tests (no alternative solutions, imperative reasons of overriding public interest and maintenance of favourable conservation status) are applied when considering licence applications.

Natural England's pre-submission Screening Service can screen application drafts prior to formal submission, whether or not the relevant planning permission is already in place. Screening will help applicants by making an assessment of whether the draft application is likely to meet licensing requirements, and, if necessary, provide specific guidance on how to address any shortfalls. The advice should help developers and ecological consultants to better manage the risks or costs they may face in having to wait until the formal submission stage after planning permission is secured, or in responding to requests for further information following an initial formal application.

The service will be available for new applications, resubmissions or modifications – depending on customer requirements. More information can be found on [Natural England's website](#).

Annex 2

The Swale SPA

The HRA of the Cleve Hill Solar Farm should consider the potential impacts of the project against the published Conservation Objectives⁶ for The Swale. Supplementary advice on the Conservation Objectives is also available⁷, and should be used in conjunction with the advice in this letter.

Information on The Swale is also found on the standard data form⁸ on JNCC's website. Where there is a discrepancy between the features listed on the standard data form and the citation, the latter is the document to assess the project against. This approach has been tested through the NSIP examination of the Richborough Connection Project.

At the meeting on 14 December, Arcus requested advice on the HRA requirements with reference to the SPA citation, particularly in regard to the breeding and wintering assemblages.

Non-breeding assemblage

The Swale citation and Conservation Objectives list one of the qualifying features as the 'waterbird assemblage'. All 'waterbirds' (as defined by the Ramsar convention) form part of the assemblage. It is the assemblage as a whole that is the feature to be assessed within the HRA, with reference to the Conservation Objectives.

The integrity of the assemblage (for both breeding and non-breeding) is generally recognised as a product of both abundance and diversity. However, as it is impractical to list all the waterbird species and assess each one individually, it is generally recognised that some constituent species contribute more towards the integrity of the overall assemblage than others, and the assessment should therefore, focus on these.

Recognising this, and as a tool to assist with assessing the ecological impacts of any plan/project on the waterbird assemblage feature, it is useful to identify the 'main component species'. These are:

- (i) Those present in nationally important numbers and
- (ii) Migratory species present in internationally important numbers (which may also be qualifying features on their own right – although this is not always the case) and
- (iii) Those that occur in the assemblage in numbers >2000 individuals and
- (iv) Named component species otherwise listed on SPA citation

For (ii) where qualifying features are assessed individually, there is no requirement to repeat for the assemblage assessment. However, the possibility that any effects could have a cumulative effect with any effects for other component species, that might then accumulate to be significant for the assemblage as a whole, should be explored in the HRA.

The Swale citation states that it qualifies under Article 4.2 of the Birds Directive as it regularly supports over 20,000 waterfowl, with an average peak count of 57,600 birds recorded in the five winter period 1986/7 to 1990/1. It states that this total includes 17 species in internationally or nationally important numbers, but does not name them.

In this situation, and as a matter of best practice, the most recent data from BTO's Wetland Bird Survey (WeBS) should be considered to augment the information provided in the citation. Looking at the most recent (five year peak mean 2010/11 – 2014/15) WeBS counts for the Swale estuary⁹, the

⁶ <http://publications.naturalengland.org.uk/publication/5745862701481984?category=6528471664689152>

⁷ <https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK9012011&SiteName=swale&countyCode=&responsiblePerson=>

⁸ <http://jncc.defra.gov.uk/pdf/SPA/UK9012011.pdf>

⁹ Frost, T.M., et. al. 2016. *Waterbirds in the UK 2014/15: The Wetland Bird Survey*. BTO/RSPB/JNCC. Thetford. <http://www.bto.org/volunteer-surveys/webs/publications/webs-annual-report>

following 20 species currently occur in internationally (*) or nationally important numbers (criteria i and ii, above):

European white-fronted goose	Dark-bellied brent goose
Shelduck	Wigeon
Teal	Pintail
Shoveler	Little egret
Oystercatcher	Avocet
Golden plover	Grey plover
Lapwing	Sanderling
Dunlin	Ruff
Black-tailed godwit*	Bar-tailed godwit
Green sandpiper	Greenshank

In addition, knot is found in numbers greater than 2000 (criterion iii).

The current five year peak mean for curlew on the Swale estuary is 1137 (2010/11- 2014/15), which is below the threshold for national importance. However, the previous five year peak mean was 1413 (2009/10 – 2013/14) which was above the threshold for national importance. Taking into account the poor conservation status of this species and the likelihood that curlew will use functionally linked land for feeding purposes, I advise treating curlew as a 'main component species' within the assemblage.

This produces a total of 22 main component species.

Breeding bird assemblage

The identification of main component species for the breeding assemblage is slightly different to that for wintering. The main component species are:

- (i) those bird species 'characteristic' of the particular SPA bird habitat; and
- (ii) 'named components' listed on the SPA citation.

The Swale citation names certain species in the 'typical assemblage of breeding species' for grazing marsh, some of which are widespread and common (criterion ii). These are:

Shelduck	Mallard	Moorhen
Coot	Lapwing	Redshank
Reed warbler	Reed bunting	

In terms of the species characteristic of the particular habitat (criterion i), in this case, grazing marsh, the starting point should be the scoring species for the lowland damp grassland SSSI bird assemblage features¹⁰. This includes breeding ducks, waders, yellow wagtail, marsh harrier and others.

As noted above for the non-breeding assemblage, the integrity of an assemblage is taken to be a product of both abundance and diversity. In turn, the diversity of the assemblage depends on the species richness, abundance and the relative 'importance' (an assessment of the conservation status of each assemblage component). Each component makes a different contribution to the diversity of the assemblage, and changes to some components may be considered to affect diversity more than others. Negative changes to small numbers of relatively important assemblage

¹⁰ Drewitt, A.L., Whitehead, S. and Cohen, S. 2015. *Guidelines for the Selection of Biological SSSIs. Part 2: Detailed Guidelines for Habitats and Species Groups. Chapter 17 Birds*. Joint Nature Conservation Committee, Peterborough. http://jncc.defra.gov.uk/pdf/SSSI_Chptr17_Birds2015June.pdf

components may have a similar overall effect to negative changes in larger numbers of less important components.

The Swale Ramsar site

JNCC have published Information Sheets on Ramsar wetlands on their website¹¹. The Swale qualifies under Ramsar criterion 2 its vulnerable, endangered, or threatened plant and invertebrate communities; under criterion 5 for its assemblage of over 20,000 waterbirds, and under criterion 6 as it supports 1% of the population of a number of named waterbird species.

Natural England has not produced Conservation Advice packages, including Conservation Objectives, for Ramsar sites. This is because it is considered that the Conservation Advice packages for the overlapping European Marine Site will be, in most cases, sufficient to support the management of Ramsar interests.

The Ramsar Information Sheet for The Swale lists the qualifying species/populations under Ramsar criterion 6 (in section 14). Impacts on these species should form part of the HRA.

The Ramsar Information Sheet also lists noteworthy fauna (in section 20), which make up part of the assemblage of waterbirds. However, as Natural England considers that the Conservation Objectives for SPAs cover the management of Ramsar interests, and the SPA and Ramsar site were designated at the same time under the same criterion, I recommend only carrying out one assemblage assessment, on the species named under the SPA advice above.

In terms of the wetland plant and invertebrate communities, potential impacts on the habitats which support them are covered in the supplementary advice on conservation objectives¹² for The Swale SPA. Examples of the species which make up the plant and invertebrate communities are found in the noteworthy flora and fauna sections of the Ramsar Information Sheet.

¹¹ <http://jncc.defra.gov.uk/pdf/RIS/UK11071.pdf>

¹² <https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK9012011&SiteNameDisplay=The+Swale+SPA>

APPENDIX 2 - THE SWALE SPA CITATION

EC Directive 79/409 on the Conservation of Wild Birds:
Special Protection Area

The Swale extensions (Kent)

The Swale Special Protection Area is a wetland of international importance, comprising intertidal mudflats, shellbeaches, saltmarshes and extensive grazing marshes. It provides habitats for important assemblages of wintering waterfowl, and also supports notable breeding bird populations.

The proposed extensions to the Swale SPA include areas of intertidal mudflats and grazing marshes adjacent to the existing site and within The Swale Site of Special Scientific Interest. These areas are integral components of the complex of estuarine habitats composing the Swale.

The Swale qualifies under Article 4.2 of the EC Birds Directive as a wetland of international importance by virtue of regularly supporting over 20,000 waterfowl, with an average peak count of 57,600 birds recorded in the five winter period 1986/87 to 1990/91. This total includes internationally or nationally important wintering populations of seventeen species of migratory waterfowl. Of these, two occur in significant numbers within the proposed extensions: dark-bellied brent geese *Branta bernicla bernicla* and dunlin *Calidris alpina*. In the five winter period 1986/87 to 1990/91, the average peak counts for the Swale as a whole were 2,850 dark-bellied brent geese (1.6% of the world population, 3.1% of the British wintering population) and 13,000 dunlin (3% of the British wintering population). The mudflats of the proposed extensions have, in recent years, supported over 400 dark-bellied brent geese and 900 dunlin.

The mudflats of the proposed extensions support smaller numbers of several other species of wintering migratory waterfowl, including oystercatcher *Haematopus ostralegus*, ringed plover *Charadrius hiaticula*, grey plover *Pluvialis squatarola*, curlew *Numenius arquata* and redshank *Tringa totanus*. These species are present in internationally or nationally important numbers within the Swale as a whole.

The Swale also qualifies under Article 4.2 by virtue of regularly supporting diverse assemblages of the wintering and breeding migratory waterfowl of lowland wet grassland and other estuarine habitats.

The grazing marshes of the proposed extensions support an assemblage of wintering species typical of the grazing marshes elsewhere within the Swale, including shelduck *Tadorna tadorna*, wigeon *Anas penelope*, teal *Anas crecca* and curlew *Numenius arquata*. These species are present in internationally or nationally important numbers within the Swale as a whole.

The grazing marshes also support a typical assemblage of breeding species, including shelduck *Tadorna tadorna*, mallard *Anas platyrhynchos*, moorhen *Gallinula chloropus*, coot *Fulica atra*, lapwing *Vanellus vanellus*, redshank *Tringa totanus*, reed warbler

Acrocephalus scirpaceus and reed bunting *Emberiza schoeniclus*. Some of these species have restricted distributions in Britain because of habitat loss and degradation.

The grazing marshes of the proposed extensions also regularly support wintering, and occasionally breeding, short-eared owl *Asio flammeus* (a species listed under Annex 1 of the EC Birds Directive).

During severe winter weather elsewhere, the Swale, including those areas within the proposed extensions, can assume even greater national and international importance as a cold weather refuge. Wildfowl and waders from many other areas arrive, attracted by the relatively mild climate, compared with continental European areas, and the abundant food resources available.

The Swale SPA, including the proposed extensions, is part of the larger Thames estuary and contributes to its overall regional significance for birds in a European context.

SPA citation
LDS March 1993

APPENDIX 3 - THE SWALE STANDARD DATA FORM 2016

NATURA 2000 – STANDARD DATA FORM

Special Protection Areas under the EC Birds Directive.

Each Natura 2000 site in the United Kingdom has its own Standard Data Form containing site-specific information. The data form for this site has been generated from the Natura 2000 Database submitted to the European Commission on the following date:

22/12/2015

The information provided here, follows the officially agreed site information format for Natura 2000 sites, as set out in the [Official Journal of the European Union recording the Commission Implementing Decision of 11 July 2011](#) (2011/484/EU).

The Standard Data Forms are generated automatically for all of the UK's Natura 2000 sites using the European Environment Agency's Natura 2000 software. The structure and format of these forms is exactly as produced by the EEA's Natura 2000 software (except for the addition of this coversheet and the end notes). The content matches exactly the data submitted to the European Commission.

Please note that these forms contain a number of codes, all of which are explained either within the data forms themselves or in the end notes.

Further technical documentation may be found here
http://bd.eionet.europa.eu/activities/Natura_2000/reference_portal

As part of the December 2015 submission, several sections of the UK's previously published Standard Data Forms have been updated. For details of the approach taken by the UK in this submission please refer to the following document:

http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

More general information on Special Protection Areas (SPAs) in the United Kingdom is available from the [SPA home page on the JNCC website](#). This webpage also provides links to Standard Data Forms for all SPAs in the UK.

Date form generated by the Joint Nature Conservation Committee
25 January 2016.



NATURA 2000 - STANDARD DATA FORM

For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)

SITE UK9012011

SITENAME The Swale

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1. SITE IDENTIFICATION

1.1 Type A	1.2 Site code UK9012011	Back to top
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1.3 Site name

The Swale

1.4 First Compilation date 1982-08	1.5 Update date 2015-12
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1.6 Respondent:

Name/Organisation: Joint Nature Conservation Committee
Address: Joint Nature Conservation Committee Monkstone House City Road Peterborough PE1 1JY
Email:

1.7 Site indication and designation / classification dates

Date site classified as SPA:	1982-08
National legal reference of SPA designation	Regulations 12A and 13-15 of the Conservation Habitats and Species Regulations 2010, (http://www.legislation.gov.uk/uksi/2010/490/contents/made) as amended by The Conservation of Habitats and Species (Amendment) Regulations 2011 (http://www.legislation.gov.uk/uksi/2011/625/contents/made).

2. SITE LOCATION

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2.1 Site-centre location [decimal degrees]:

Longitude
0.839166667

Latitude
51.36083333

2.2 Area [ha]:

6509.88

2.3 Marine area [%]

44.5

2.4 Sitelength [km]:

0.0

2.5 Administrative region code and name

NUTS level 2 code **Region Name**

UKJ4	Kent
------	------

2.6 Biogeographical Region(s)

Atlantic (100.0
%)

3. ECOLOGICAL INFORMATION

3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

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Species			Population in the site							Site assessment				
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A B C D		A B C	
						Min	Max				Pop.	Con.	Iso.	Glo.
B	A052	Anas crecca			w	2969	2969	i		G	B		C	
B	A051	Anas strepera			w	86	86	i		G	C		C	
B	A675	Branta bernicla bernicla			w	1961	1961	i		G	C		C	
B	A672	Calidris alpina alpina			w	12394	12394	i		G	B		C	
B	A137	Charadrius hiaticula			w	269	269	i		G	C		C	
B	A130	Haematopus ostralegus			w	3731	3731	i	P	G	C		C	
B	A160	Numenius arquata			w	1622	1622	i		G	C		C	
B	A141	Pluvialis squatarola			w	2021	2021	i	P	G	B		C	

B	A162	Tringa totanus		w	1640	1640	i		G	C		C
---	------	--------------------------------	--	---	------	------	---	--	---	---	--	---

- **Group:** A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see [reference portal](#))
- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

3.3 Other important species of flora and fauna (optional)

Species				Population in the site				Motivation						
Group	CODE	Scientific Name	S	NP	Size		Unit	Cat.	Species Annex		Other categories			
					Min	Max		C R V P	IV	V	A	B	C	D
B	BBA	Breeding bird assemblage												X
B	WATR	Waterfowl assemblage			65588	65588	i						X	

- **Group:** A = Amphibians, B = Birds, F = Fish, Fu = Fungi, I = Invertebrates, L = Lichens, M = Mammals, P = Plants, R = Reptiles
- **CODE:** for Birds, Annex IV and V species the code as provided in the reference portal should be used in addition to the scientific name
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Unit:** i = individuals, p = pairs or other units according to the standard list of population units and codes in accordance with Article 12 and 17 reporting, (see [reference portal](#))
- **Cat.:** Abundance categories: C = common, R = rare, V = very rare, P = present
- **Motivation categories:** **IV, V:** Annex Species (Habitats Directive), **A:** National Red List data; **B:** Endemics; **C:** International Conventions; **D:** other reasons

4. SITE DESCRIPTION

4.1 General site character

[Back to top](#)

Habitat class	% Cover
N03	5.0
N15	47.0
N06	2.0
N23	6.0
N02	39.0
N05	1.0

Other Site Characteristics

2 Terrestrial: Geomorphology and landscape: coastal, floodplain 3 Marine: Geology: sand, clay, shingle, mud 4 Marine: Geomorphology: estuary, intertidal sediments (including sandflat/mudflat), shingle bar, subtidal sediments (including sandbank/mudbank)

4.2 Quality and importance

ARTICLE 4.2 QUALIFICATION (79/409/EEC) Over winter the area regularly supports: Branta bernicla bernicla (Western Siberia/Western Europe) 0.7% of the population 5 year peak mean 1991/92-1995/96 Calidris alpina alpina (Northern Siberia/Europe/Western Africa) 2.3% of the population in Great Britain 5 year peak mean 1991/92-1995/96 Tringa totanus (Eastern Atlantic - wintering) 0.9% of the population 5 year peak mean 1991/92-1995/96 ARTICLE 4.2 QUALIFICATION (79/409/EEC): AN INTERNATIONALLY IMPORTANT ASSEMBLAGE OF BIRDS Over winter the area regularly supports: 65588 waterfowl (5 year peak mean 1991/92-1995/96) Including: Branta bernicla bernicla, Anas strepera, Anas crecca, Haematopus ostralegus, Charadrius hiaticula, Pluvialis squatarola, Calidris alpina alpina, Numenius arquata, Tringa totanus

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i o b]
H	M02		B
H	M01		B
H	G01		I
H	F02		I
H	I01		B

Positive Impacts			
Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i o b]
H	A06		I
H	A02		I
H	D05		I
H	A04		I

Rank: H = high, M = medium, L = low

Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification,

T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions

i = inside, o = outside, b = both

4.5 Documentation

Conservation Objectives - the Natural England links below provide access to the Conservation Objectives (and other site-related information) for its terrestrial and inshore Natura 2000 sites, including conservation advice packages and supporting documents for European Marine Sites within English waters and for cross-border sites. See also the 'UK Approach' document for more information (link via the JNCC website).

Link(s): <http://publications.naturalengland.org.uk/category/6490068894089216>

<http://publications.naturalengland.org.uk/category/3212324>

http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

5. SITE PROTECTION STATUS (optional)

5.1 Designation types at national and regional level:

[Back to top](#)

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
UK01	16.1	UK04	100.0		

6. SITE MANAGEMENT

6.1 Body(ies) responsible for the site management:

Organisation:	Natural England
Address:	
Email:	

6.2 Management Plan(s):

An actual management plan does exist:

<input type="checkbox"/> Yes
<input type="checkbox"/> No, but in preparation
<input checked="" type="checkbox"/> No

6.3 Conservation measures (optional)

For available information, including on Conservation Objectives, see Section 4.5.

EXPLANATION OF CODES USED IN THE NATURA 2000 STANDARD DATA FORMS

The codes in the table below are also explained in the [official European Union guidelines for the Standard Data Form](#). The relevant page is shown in the table below.

1.1 Site type

CODE	DESCRIPTION	PAGE NO
A	Designated Special Protection Area	53
B	SAC (includes candidates Special Areas of Conservation, Sites of Community Importance and designated SAC)	53
C	SAC area the same as SPA. Note in the UK Natura 2000 submission this is only used for Gibraltar	53

3.1 Habitat representativity

CODE	DESCRIPTION	PAGE NO
A	Excellent	57
B	Good	57
C	Significant	57
D	Non-significant presence	57

3.1 Habitat code

CODE	DESCRIPTION	PAGE NO
1110	Sandbanks which are slightly covered by sea water all the time	57
1130	Estuaries	57
1140	Mudflats and sandflats not covered by seawater at low tide	57
1150	Coastal lagoons	57
1160	Large shallow inlets and bays	57
1170	Reefs	57
1180	Submarine structures made by leaking gases	57
1210	Annual vegetation of drift lines	57
1220	Perennial vegetation of stony banks	57
1230	Vegetated sea cliffs of the Atlantic and Baltic Coasts	57
1310	Salicornia and other annuals colonizing mud and sand	57
1320	Spartina swards (Spartinion maritimae)	57
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	57
1340	Inland salt meadows	57
1420	Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi)	57
2110	Embryonic shifting dunes	57
2120	Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ("white dunes")	57
2130	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	57
2140	Decalcified fixed dunes with <i>Empetrum nigrum</i>	57
2150	Atlantic decalcified fixed dunes (Calluno-Ulicetea)	57
2160	Dunes with <i>Hippophila rhamnoides</i>	57
2170	Dunes with <i>Salix repens</i> ssp. <i>argentea</i> (Salicion arenariae)	57
2190	Humid dune slacks	57
21A0	Machairs (* in Ireland)	57
2250	Coastal dunes with <i>Juniperus</i> spp.	57
2330	Inland dunes with open <i>Corynephorus</i> and <i>Agrostis</i> grasslands	57
3110	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)	57
3130	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea	57
3140	Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp.	57
3150	Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation	57

CODE	DESCRIPTION	PAGE NO
3160	Natural dystrophic lakes and ponds	57
3170	Mediterranean temporary ponds	57
3180	Turloughs	57
3260	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitriche-Batrachion vegetation	57
4010	Northern Atlantic wet heaths with Erica tetralix	57
4020	Temperate Atlantic wet heaths with Erica ciliaris and Erica tetralix	57
4030	European dry heaths	57
4040	Dry Atlantic coastal heaths with Erica vagans	57
4060	Alpine and Boreal heaths	57
4080	Sub-Arctic Salix spp. scrub	57
5110	Stable xerothermophilous formations with Buxus sempervirens on rock slopes (Berberidion p.p.)	57
5130	Juniperus communis formations on heaths or calcareous grasslands	57
6130	Calaminarian grasslands of the Violetalia calaminariae	57
6150	Siliceous alpine and boreal grasslands	57
6170	Alpine and subalpine calcareous grasslands	57
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)	57
6230	Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)	57
6410	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	57
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	57
6510	Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis)	57
6520	Mountain hay meadows	57
7110	Active raised bogs	57
7120	Degraded raised bogs still capable of natural regeneration	57
7130	Blanket bogs (* if active bog)	57
7140	Transition mires and quaking bogs	57
7150	Depressions on peat substrates of the Rhynchosporion	57
7210	Calcareous fens with Cladium mariscus and species of the Caricion davallianae	57
7220	Petrifying springs with tufa formation (Cratoneurion)	57
7230	Alkaline fens	57
7240	Alpine pioneer formations of the Caricion bicoloris-atrofuscae	57
8110	Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)	57
8120	Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii)	57
8210	Calcareous rocky slopes with chasmophytic vegetation	57
8220	Siliceous rocky slopes with chasmophytic vegetation	57
8240	Limestone pavements	57
8310	Caves not open to the public	57
8330	Submerged or partially submerged sea caves	57
9120	Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion roburi-petraeae or Ilici-Fagenion)	57
9130	Asperulo-Fagetum beech forests	57
9160	Sub-Atlantic and medio-European oak or oak-hornbeam forests of the Carpinion betuli	57
9180	Tilio-Acerion forests of slopes, screes and ravines	57
9190	Old acidophilous oak woods with Quercus robur on sandy plains	57
91A0	Old sessile oak woods with Ilex and Blechnum in the British Isles	57
91C0	Caledonian forest	57
91D0	Bog woodland	57
91E0	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	57
91J0	Taxus baccata woods of the British Isles	57

3.1 Relative surface

CODE	DESCRIPTION	PAGE NO
A	15%-100%	58
B	2%-15%	58
C	< 2%	58

3.1 Conservation status habitat

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	59
B	Good conservation	59
C	Average or reduced conservation	59

3.1 Global grade habitat

CODE	DESCRIPTION	PAGE NO
A	Excellent value	59
B	Good value	59
C	Significant value	59

3.2 Population (abbreviated to 'Pop.' in data form)

CODE	DESCRIPTION	PAGE NO
A	15%-100%	62
B	2%-15%	62
C	< 2%	62
D	Non-significant population	62

3.2 Conservation status species (abbreviated to 'Con.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	63
B	Good conservation	63
C	Average or reduced conservation	63

3.2 Isolation (abbreviated to 'Iso.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Population (almost) Isolated	63
B	Population not-isolated, but on margins of area of distribution	63
C	Population not-isolated within extended distribution range	63

3.2 Global Grade (abbreviated to 'Glo.' Or 'G.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent value	63
B	Good value	63
C	Significant value	63

3.3 Assemblages types

CODE	DESCRIPTION	PAGE NO
WATR	Non breeding waterfowl assemblage	UK specific code
SBA	Breeding seabird assemblage	UK specific code
BBA	Breeding bird assemblage (applies only to sites classified pre 2000)	UK specific code

4.1 Habitat class code

CODE	DESCRIPTION	PAGE NO
N01	Marine areas, Sea inlets	65
N02	Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins)	65
N03	Salt marshes, Salt pastures, Salt steppes	65
N04	Coastal sand dunes, Sand beaches, Machair	65
N05	Shingle, Sea cliffs, Islets	65
N06	Inland water bodies (Standing water, Running water)	65
N07	Bogs, Marshes, Water fringed vegetation, Fens	65
N08	Heath, Scrub, Maquis and Garrigue, Phygrana	65
N09	Dry grassland, Steppes	65
N10	Humid grassland, Mesophile grassland	65
N11	Alpine and sub-Alpine grassland	65
N14	Improved grassland	65
N15	Other arable land	65
N16	Broad-leaved deciduous woodland	65
N17	Coniferous woodland	65
N19	Mixed woodland	65
N21	Non-forest areas cultivated with woody plants (including Orchards, groves, Vineyards, Dehesas)	65
N22	Inland rocks, Screes, Sands, Permanent Snow and ice	65
N23	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites)	65
N25	Grassland and scrub habitats (general)	65
N26	Woodland habitats (general)	65

4.3 Threats code

CODE	DESCRIPTION	PAGE NO
A01	Cultivation	65
A02	Modification of cultivation practices	65
A03	Mowing / cutting of grassland	65
A04	Grazing	65
A05	Livestock farming and animal breeding (without grazing)	65
A06	Annual and perennial non-timber crops	65
A07	Use of biocides, hormones and chemicals	65
A08	Fertilisation	65
A10	Restructuring agricultural land holding	65
A11	Agriculture activities not referred to above	65
B01	Forest planting on open ground	65
B02	Forest and Plantation management & use	65
B03	Forest exploitation without replanting or natural regrowth	65
B04	Use of biocides, hormones and chemicals (forestry)	65
B06	Grazing in forests/ woodland	65
B07	Forestry activities not referred to above	65
C01	Mining and quarrying	65
C02	Exploration and extraction of oil or gas	65
C03	Renewable abiotic energy use	65
D01	Roads, paths and railroads	65
D02	Utility and service lines	65
D03	Shipping lanes, ports, marine constructions	65
D04	Airports, flightpaths	65
D05	Improved access to site	65
E01	Urbanised areas, human habitation	65
E02	Industrial or commercial areas	65

CODE	DESCRIPTION	PAGE NO
E03	Discharges	65
E04	Structures, buildings in the landscape	65
E06	Other urbanisation, industrial and similar activities	65
F01	Marine and Freshwater Aquaculture	65
F02	Fishing and harvesting aquatic resources	65
F03	Hunting and collection of wild animals (terrestrial), including damage caused by game (excessive density), and taking/removal of terrestrial animals (including collection of insects, reptiles, amphibians, birds of prey, etc.), trapping, poisoning, poaching, predator control, accidental capture (e.g. due to fishing gear), etc.)	65
F04	Taking / Removal of terrestrial plants, general	65
F05	Illegal taking/ removal of marine fauna	65
F06	Hunting, fishing or collecting activities not referred to above	65
G01	Outdoor sports and leisure activities, recreational activities	65
G02	Sport and leisure structures	65
G03	Interpretative centres	65
G04	Military use and civil unrest	65
G05	Other human intrusions and disturbances	65
H01	Pollution to surface waters (limnic & terrestrial, marine & brackish)	65
H02	Pollution to groundwater (point sources and diffuse sources)	65
H03	Marine water pollution	65
H04	Air pollution, air-borne pollutants	65
H05	Soil pollution and solid waste (excluding discharges)	65
H06	Excess energy	65
H07	Other forms of pollution	65
I01	Invasive non-native species	65
I02	Problematic native species	65
I03	Introduced genetic material, GMO	65
J01	Fire and fire suppression	65
J02	Human induced changes in hydraulic conditions	65
J03	Other ecosystem modifications	65
K01	Abiotic (slow) natural processes	65
K02	Biocenotic evolution, succession	65
K03	Interspecific faunal relations	65
K04	Interspecific floral relations	65
K05	Reduced fecundity/ genetic depression	65
L05	Collapse of terrain, landslide	65
L07	Storm, cyclone	65
L08	Inundation (natural processes)	65
L10	Other natural catastrophes	65
M01	Changes in abiotic conditions	65
M02	Changes in biotic conditions	65
U	Unknown threat or pressure	65
XO	Threats and pressures from outside the Member State	65

5.1 Designation type codes

CODE	DESCRIPTION	PAGE NO
UK00	No Protection Status	67
UK01	National Nature Reserve	67
UK02	Marine Nature Reserve	67
UK04	Site of Special Scientific Interest (UK)	67

APPENDIX 4 - THE SWALE SPA CONSERVATION OBJECTIVES



European Site Conservation Objectives for The Swale Special Protection Area Site Code: UK9012011

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.**

This document should be read in conjunction with the accompanying *Supplementary Advice* document, which provides more detailed advice and information to enable the application and achievement of the Objectives set out above.

Qualifying Features:

A046a *Branta bernicla bernicla*; Dark-bellied brent goose (Non-breeding)

A149 *Calidris alpina alpina*; Dunlin (Non-breeding)

Breeding bird assemblage

Waterbird assemblage

This is a European Marine Site

This SPA is a part of the Swale & Medway European Marine Site (EMS). These Conservation Objectives should be used in conjunction with the Regulation 35 Conservation Advice document for the EMS. For further details about this please visit the Natural England website at:

<http://www.naturalengland.org.uk/ourwork/marine/protectandmanage/mpa/europeansites.aspx> or contact Natural England's enquiry service at enquiries@naturalengland.org.uk or by phone on 0845 600 3078.

Explanatory Notes: European Site Conservation Objectives

These Conservation Objectives are those referred to in the Conservation of Habitats and Species Regulations 2010 (the "Habitats Regulations") and Article 6(3) of the Habitats Directive. They must be considered when a competent authority is required to make a 'Habitats Regulations Assessment' including an Appropriate Assessment, under the relevant parts of this legislation.

These Conservation Objectives and the accompanying Supplementary Advice (where this is available) will also provide a framework to inform the management of the European Site under the provisions of Articles 4(1) and 4(2) of the Wild Birds Directive, and the prevention of deterioration of habitats and significant disturbance of its qualifying features required under Article 6(2) of the Habitats Directive.

These Conservation Objectives are set for each bird feature for a [Special Protection Area \(SPA\)](#). Where the objectives are met, the site will be considered to exhibit a high degree of integrity and to be contributing to achieving the aims of the Wild Birds Directive.

Publication date: 30 June 2014 (Version 2). This document updates and replaces an earlier version dated 29 May 2012 to reflect Natural England's Strategic Standard on European Site Conservation Objectives 2014. Previous references to additional features identified in the 2001 UK SPA Review have also been removed.

APPENDIX 5 - THE SWALE RAMSAR INFORMATION SHEET (RIS)

Information Sheet on Ramsar Wetlands (RIS)

Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8th Conference of the Contracting Parties (2002) and Resolutions IX.1 Annex B, IX.6, IX.21 and IX. 22 of the 9th Conference of the Contracting Parties (2005).

Notes for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.
2. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 7, 2nd edition, as amended by COP9 Resolution IX.1 Annex B). A 3rd edition of the Handbook, incorporating these amendments, is in preparation and will be available in 2006.
3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

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

Joint Nature Conservation Committee

Monkstone House

City Road

Peterborough

Cambridgeshire PE1 1JY

UK

Telephone/Fax: +44 (0)1733 – 562 626 / +44 (0)1733 – 555 948

Email: RIS@JNCC.gov.uk

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DD MM YY

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Designation date

--	--	--	--	--	--

Site Reference Number

2. Date this sheet was completed/updated:

Designated: 31 August 1982

3. Country:

UK (England)

4. Name of the Ramsar site:

The Swale

5. Designation of new Ramsar site or update of existing site:

This RIS is for: Updated information on an existing Ramsar site

6. For RIS updates only, changes to the site since its designation or earlier update:

a) Site boundary and area:

** Important note: If the boundary and/or area of the designated site is being restricted/reduced, the Contracting Party should have followed the procedures established by the Conference of the Parties in the Annex to COP9 Resolution IX.6 and provided a report in line with paragraph 28 of that Annex, prior to the submission of an updated RIS.

b) Describe briefly any major changes to the ecological character of the Ramsar site, including in the application of the Criteria, since the previous RIS for the site:

7. Map of site included:

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

a) A map of the site, with clearly delineated boundaries, is included as:

- i) **hard copy** (required for inclusion of site in the Ramsar List): *yes* ✓ -or- *no* ☐;
- ii) **an electronic format** (e.g. a JPEG or ArcView image) *Yes*
- iii) **a GIS file providing geo-referenced site boundary vectors and attribute tables** *yes* ✓ -or- *no* ☐;

b) Describe briefly the type of boundary delineation applied:

e.g. the boundary is the same as an existing protected area (nature reserve, national park etc.), or follows a catchment boundary, or follows a geopolitical boundary such as a local government jurisdiction, follows physical boundaries such as roads, follows the shoreline of a waterbody, etc.

The site boundary is the same as, or falls within, an existing protected area.

For precise boundary details, please refer to paper map provided at designation

8. Geographical coordinates (latitude/longitude):

51 21 39 N 00 50 21 E

9. General location:

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

Nearest town/city: Faversham

On the north Kent of coast within the greater Thames estuary.

Administrative region: Kent

10. Elevation (average and/or max. & min.) (metres): 11. Area (hectares): 6514.71

Min.	-1
Max.	5
Mean	2

12. General overview of the site:

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

A complex of brackish and freshwater, floodplain grazing marsh with ditches, and intertidal saltmarsh and mudflat. These habitats together support internationally important numbers of wintering waterfowl. Rare wetland birds breed in important numbers. The saltmarsh and grazing marsh are of international importance for their diverse assemblages of wetland plants and invertebrates.

13. Ramsar Criteria:

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

2, 5, 6

14. Justification for the application of each Criterion listed in 13 above:

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

Ramsar criterion 2

The site supports nationally scarce plants and at least seven British Red data book invertebrates.

Ramsar criterion 5

Assemblages of international importance:

Species with peak counts in winter:

77501 waterfowl (5 year peak mean 1998/99-2002/2003)

Ramsar criterion 6 – species/populations occurring at levels of international importance.

Qualifying Species/populations (as identified at designation):

Species with peak counts in spring/autumn:

Common redshank , *Tringa totanus totanus*, 1712 individuals, representing an average of 1.4% of the GB population (5 year peak mean 1998/9-2002/3)

Species with peak counts in winter:

Dark-bellied brent goose, *Branta bernicla bernicla*, 1633 individuals, representing an average of 1.6% of the GB population (5 year peak mean 1998/9-2002/3)

Grey plover , *Pluvialis squatarola*, E Atlantic/W Africa -wintering 2098 individuals, representing an average of 3.9% of the GB population (5 year peak mean 1998/9-2002/3)

Species/populations identified subsequent to designation for possible future consideration under criterion 6.

Species with peak counts in spring/autumn:

Ringed plover , *Charadrius hiaticula*, Europe/Northwest Africa 917 individuals, representing an average of 1.2% of the population (5 year peak mean 1998/9-2002/3)

Species with peak counts in winter:

Eurasian wigeon , *Anas penelope*, NW Europe 15296 individuals, representing an average of 1% of the population (5 year peak mean 1998/9-2002/3)

Northern pintail , *Anas acuta*, NW Europe 763 individuals, representing an average of 1.2% of the population (5 year peak mean 1998/9-2002/3)

Northern shoveler , *Anas clypeata*, NW & C Europe 483 individuals, representing an average of 1.2% of the population (5 year peak mean 1998/9-2002/3)

Black-tailed godwit , *Limosa limosa islandica*, Iceland/W Europe 1504 individuals, representing an average of 4.2% of the population (5 year peak mean 1998/9-2002/3)

Contemporary data and information on waterbird trends at this site and their regional (sub-national) and national contexts can be found in the Wetland Bird Survey report, which is updated annually. See www.bto.org/survey/webs/webs-alerts-index.htm.

Details of bird species occurring at levels of National importance are given in Section 22

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

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

a) biogeographic region:

Atlantic

b) biogeographic regionalisation scheme (include reference citation):

Council Directive 92/43/EEC

16. Physical features of the site:

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

Soil & geology	alluvium, clay, mud, sand, shingle
Geomorphology and landscape	coastal, floodplain, shingle bar, subtidal sediments (including sandbank/mudbank), intertidal sediments (including sandflat/mudflat), estuary
Nutrient status	eutrophic
pH	no information
Salinity	brackish / mixosaline, fresh, saline / euhaline
Soil	no information
Water permanence	usually permanent, usually seasonal / intermittent
Summary of main climatic features	Annual averages (Greenwich, 1971–2000) (www.metoffice.com/climate/uk/averages/19712000/sites/greenwich.html) Max. daily temperature: 14.8° C Min. daily temperature: 7.2° C Days of air frost: 29.1 Rainfall: 583.6 mm Hrs. of sunshine: 1461.0

General description of the Physical Features:

The Swale is an estuarine area that separates the Isle of Sheppey from the Kent mainland. To the west it adjoins the Medway Estuary. It is a complex of brackish and freshwater, floodplain grazing marsh with ditches, and intertidal saltmarshes and mudflats. The intertidal flats are extensive, especially in the east of the site. Locally there are large mussel *Mytilus edulis* beds formed on harder areas of substrate. There is much diversity both in the salinity of the dykes (which range from fresh to strongly brackish) and in the topography of the fields.

17. Physical features of the catchment area:

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

The Swale is an estuarine area that separates the Isle of Sheppey from the Kent mainland. To the west it adjoins the Medway Estuary. It is a complex of brackish and freshwater, floodplain grazing marsh with ditches, and intertidal saltmarshes and mudflats. The intertidal flats are extensive, especially in the east of the site.

18. Hydrological values:

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

Shoreline stabilisation and dissipation of erosive forces, Flood water storage /
desynchronisation of flood peaks, Maintenance of water quality (removal of nutrients)

19. Wetland types:

Human-made wetland, Marine/coastal wetland

Code	Name	% Area
4	Seasonally flooded agricultural land	47.7
G	Tidal flats	38
H	Salt marshes	5.8
Other	Other	5.7
N	Rivers / streams / creeks: seasonal / intermittent	1.8
E	Sand / shingle shores (including dune systems)	1

20. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site, and the ecosystem services of the site and the benefits derived from them.

The intertidal flats are of fine, silty sediment. The saltmarsh is species rich, for example containing all southern species of *Puccinellia* and most *Salicornia* species. The grazing marsh grassland is mesotrophic and generally species-poor. It does, however, contain scattered rarities, mostly annuals characteristic of bare ground. Where the grassland is seasonally inundated and the marshes are brackish the plant communities are intermediate between those of mesotrophic grassland and those of saltmarsh. The grazing marsh ditches contain a range of flora of brackish and fresh water. The aquatic flora is a mosaic of successional stages resulting from periodic clearance of drainage channels. The dominant emergent plants are *Phragmites australis* and *Bolboschoenus maritimus*.

Ecosystem services

21. Noteworthy flora:

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

Nationally important species occurring on the site.**Higher Plants.**

The site holds several nationally scarce plants, including: *Chenopodium chenopodioides*, *Peucedanum officinale*, *Bupleurum tenuissimum*, *Spartina maritima*, *Inula crithmoides*, *Carex divisa*, *Trifolium squamosum*, *Hordeum marinum*.

22. Noteworthy fauna:

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

Birds**Species currently occurring at levels of national importance:****Species regularly supported during the breeding season:**

Mediterranean gull, *Larus melanocephalus*, 13 apparently occupied nests, representing an average of 12% of the GB population (Seabird Europe 2000 Census)

Black-headed gull , <i>Larus ridibundus</i> , N & C Europe	3835 apparently occupied nests, representing an average of 2.9% of the GB population (Seabird 2000 Census)
Little tern , <i>Sterna albifrons albifrons</i> , W Europe	20 apparently occupied nests, representing an average of 1% of the GB population (Seabird 2000 Census)
Species with peak counts in spring/autumn:	
Little egret , <i>Egretta garzetta</i> , West Mediterranean	29 individuals, representing an average of 1.7% of the GB population (5 year peak mean 1998/9-2002/3)
Whimbrel , <i>Numenius phaeopus</i> , Europe/Western Africa	98 individuals, representing an average of 3.2% of the GB population (5 year peak mean 1998/9-2002/3 - spring peak)
Eurasian curlew , <i>Numenius arquata arquata</i> , N. a. <i>arquata</i> Europe (breeding)	1779 individuals, representing an average of 1.2% of the GB population (5 year peak mean 1998/9-2002/3)
Spotted redshank , <i>Tringa erythropus</i> , Europe/W Africa	60 individuals, representing an average of 44.1% of the GB population (5 year peak mean 1998/9-2002/3)
Common greenshank , <i>Tringa nebularia</i> , Europe/W Africa	49 individuals, representing an average of 8.2% of the GB population (5 year peak mean 1998/9-2002/3)
Species with peak counts in winter:	
Little grebe , <i>Tachybaptus ruficollis ruficollis</i> , Europe to E Urals, NW Africa	147 individuals, representing an average of 1.8% of the GB population (5 year peak mean 1998/9-2002/3)
Greater white-fronted goose , <i>Anser albifrons albifrons</i> , NW Europe	973 individuals, representing an average of 16.8% of the GB population (5 year peak mean for 1996/7-2000/01)
Common shelduck , <i>Tadorna tadorna</i> , NW Europe	2437 individuals, representing an average of 3.1% of the GB population (5 year peak mean 1998/9-2002/3)
Eurasian teal , <i>Anas crecca</i> , NW Europe	3610 individuals, representing an average of 1.8% of the GB population (5 year peak mean 1998/9-2002/3)
Eurasian oystercatcher , <i>Haematopus ostralegus ostralegus</i> , Europe & NW Africa -wintering	4609 individuals, representing an average of 1.4% of the GB population (5 year peak mean 1998/9-2002/3)
Pied avocet , <i>Recurvirostra avosetta</i> , Europe/Northwest Africa	380 individuals, representing an average of 11.1% of the GB population (5 year peak mean 1998/9-2002/3)
European golden plover , <i>Pluvialis apricaria apricaria</i> , P. a. <i>altifrons</i> Iceland & Faroes/E Atlantic	7522 individuals, representing an average of 3% of the GB population (5 year peak mean 1998/9-2002/3)
Northern lapwing , <i>Vanellus vanellus</i> , Europe - breeding	15129 individuals, representing an average of 1% of the GB population (5 year peak mean 1998/9-2002/3)
Red knot , <i>Calidris canutus islandica</i> , W & Southern Africa (wintering)	3004 individuals, representing an average of 1% of the GB population (5 year peak mean 1998/9-2002/3)

Dunlin , <i>Calidris alpina alpina</i> , W Siberia/W Europe	9017 individuals, representing an average of 1.6% of the GB population (5 year peak mean 1998/9-2002/3)
Ruff , <i>Philomachus pugnax</i> , Europe/W Africa	53 individuals, representing an average of 7.5% of the GB population (5 year peak mean 1998/9-2002/3)

Species Information

Nationally important species occurring on the site.

Invertebrates.

Bagous cylindrus, *Erioptera bivittata*, *Lejops vittata*, *Peocilobothris ducalis*, *Philonthus punctus*, *Micronecta minutissima*, *Malchius vulneratus*, *Campsicnemus majus*, *Elachiptera rufifrons*, *Myopites eximia*.

23. Social and cultural values:

Describe if the site has any general social and/or cultural values e.g. fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values.

- Aesthetic
- Archaeological/historical site
- Environmental education/ interpretation
- Fisheries production
- Livestock grazing
- Non-consumptive recreation
- Scientific research
- Sport fishing
- Sport hunting
- Tourism
- Traditional cultural
- Transportation/navigation

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning? No

If Yes, describe this importance under one or more of the following categories:

- i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:
- ii) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:
- iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:
- iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

24. Land tenure/ownership:

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

25. Current land (including water) use:

Activity	On-site	Off-site
Nature conservation	+	
Tourism	+	
Recreation	+	
Current scientific research	+	
Fishing: commercial	+	
Fishing: recreational/sport	+	
Marine/saltwater aquaculture	+	
Gathering of shellfish	+	
Bait collection	+	
Arable agriculture (unspecified)		+
Livestock watering hole/pond	+	
Grazing (unspecified)	+	
Hay meadows	+	
Hunting: commercial	+	
Hunting: recreational/sport	+	
Industrial water supply		+
Industry		+
Sewage treatment/disposal		+
Harbour/port	+	+
Flood control	+	
Transport route	+	
Non-urbanised settlements	+	

26. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

Explanation of reporting category:

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

NA = Not Applicable because no factors have been reported.

Adverse Factor Category	Reporting Category	Description of the problem (Newly reported Factors only)	On-Site	Off-Site	Major Impact?
Erosion	1		+		+

For category 2 factors only.

What measures have been taken / are planned / regulatory processes invoked, to mitigate the effect of these factors?

Is the site subject to adverse ecological change? NO

27. Conservation measures taken:

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

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

b) Describe any other current management practices:

The management of Ramsar sites in the UK is determined by either a formal management plan or through other management planning processes, and is overseen by the relevant statutory conservation agency. Details of the precise management practises are given in these documents.

28. Conservation measures proposed but not yet implemented:

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

No information available

29. Current scientific research and facilities:

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

Fauna.

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

Habitat.

ENSIS monitoring.

Hydrological monitoring of the grazing marsh.

MNCR Littoral and Sublittoral survey.

30. Current communications, education and public awareness (CEPA) activities related to or benefiting the site:

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

Swale NNR and Elmley NNR (both RSPB and Elmley Conservation Trust) all provide viewing facilities.

31. Current recreation and tourism:

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

Activities, Facilities provided and Seasonality.

Yachting, jet-skiing and water-skiing mostly in the summer, bird watching throughout the year and angling and wildfowling during their legally permitted seasons. Disturbance from these activities is a current issue but it is addressed through negotiation relating to activities consented within the SSSI and information dissemination. There is no clear evidence of damage from any of these activities.

32. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept. of Agriculture/Dept. of Environment, etc.
 Head, Natura 2000 and Ramsar Team, Department for Environment, Food and Rural Affairs,
 European Wildlife Division, Zone 1/07, Temple Quay House, 2 The Square, Temple Quay, Bristol,
 BS1 6EB

33. Management authority:

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

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

34. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see 15 above), list full reference citation for the scheme.

Site-relevant references

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**APPENDIX 6 - BASELINE SURVEY COUNTS (DARK-BELLIED BRENT GOOSE,
LAPWING, GOLDEN PLOVER)**

Appendix 6

Baseline field counts of foraging dark-bellied brent goose in intertidal (blue), grazing marsh at east end (green) and grazing marsh/reedbed coastal sectors (grey)

N.B. totals may not add up to the sum of field counts, as double-counting of flocks that moved during the survey will have been accounted for.

Field Number				1	2	3	4	5	6	7	8	9	36	48	61	29	30	31	32	33	34	35	10	11	12	13	14	15	16	17	37					
Field Area (ha)				29.3	21.5	17.9	18.7	28.9	23.0	20.9	16.2	16.7	18.6	14.4	20.1	3.6	6.1	3.1	1.8	3.9	4.2	6.0	3.9	3.6	4.2	6.6	7.3	3.8	4.5	3.6	4.8					
SEASON	DATE	TIDE	SURVEY																																	
SEASON 1 - WINTER 13/14	09/01/2014	LT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	13/01/2014	HT	WBS (Farm)										0			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	15/01/2014	HT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	07/02/2014	LT	WBS	0	0	0	0	0	16	800	0	0	0	0	0	0	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	10/02/2014	LT	WBS (Farm)											0			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	12/02/2014	HT	WBS	6	0	0	0	0	0	0	0	0	0	0	0	0	120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	05/03/2014	HT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	07/03/2014	LT	WBS (Farm)														0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	10/03/2014	LT	WBS	0	0	2	2	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	08/10/2014	HT	PBS (West)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
SEASON 2 - WINTER 14/15	09/10/2014	HT	PBS (East)	0	0	0	0	0	400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	16/10/2014	LT	PBS (East)	0	0	0	0	3500	0	0	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0		
	17/10/2014	LT	PBS (West)	0	2	49	280	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	22/10/2014	HT	PBS (West)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	23/10/2014	HT	PBS (East)	0	0	0	0	1	0	0	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	12/11/2014	HT	WBS (Farm)											0			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	13/11/2014	LT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	21/11/2014	HT	WBS	0	0	0	0	130	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	09/12/2014	HT	WBS	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	10/12/2014	HT	WBS (Farm)											0			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	17/12/2014	LT	WBS	1	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	14/01/2015	LT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	20/01/2015	LT	WBS (Farm)														0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	21/01/2015	HT	WBS (East)	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	18/02/2015	HT	WBS (West)	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	24/02/2015	HT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25/02/2015	HT	WBS (Farm)														0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	26/02/2015	LT	WBS	0	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	SEASON 3 - WINTER 15/16	30/09/2015	HT	PASS WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		01/10/2015	LT	PASS WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28/10/2015		HT	PASS WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
29/10/2015		LT	PASS WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
23/11/2015		LT	LT INT	0	0	203	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
23/11/2015		LT	LT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
24/11/2015		HT	HT INT	0	5	135	1	0	1	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
24/11/2015		HT	HT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
14/12/2015	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

Field Number				1	2	3	4	5	6	7	8	9	36	48	61	29	30	31	32	33	34	35	10	11	12	13	14	15	16	17	37
Field Area (ha)				29.3	21.5	17.9	18.7	28.9	23.0	20.9	16.2	16.7	18.6	14.4	20.1	3.6	6.1	3.1	1.8	3.9	4.2	6.0	3.9	3.6	4.2	6.6	7.3	3.8	4.5	3.6	4.8
SEASON	DATE	TIDE	SURVEY																												
SEASON 4 - Winter 2017/18	14/12/2015	HT	HT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	15/12/2015	LT	LT INT	0	50	248	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	15/12/2015	LT	LT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	21/12/2015	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	21/12/2015	HT	NOC													0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	21/12/2015	LT	LT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	22/12/2015	HT	HT INT	0	0	0	74	0	0	0	0	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	22/12/2015	HT	HT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	05/01/2016	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	05/01/2016	LT	LT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	06/01/2016	HT	HT INT	0	0	0	0	0	6	0	520	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	06/01/2016	HT	HT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	19/01/2016	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	19/01/2016	LT	LT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	19/01/2016	LT	NOC													0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	20/01/2016	HT	HT INT	2	5	0	0	0	11	7	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	20/01/2016	HT	HT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	02/02/2016	LT	LT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	03/02/2016	HT	HT INT	0	0	0	0	105	0	0	0	270	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	03/02/2016	LT	LT INT	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	03/02/2016	HT	NOC													0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	04/02/2016	HT	HT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	16/02/2016	LT	LT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	17/02/2016	HT	HT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	01/03/2016	HT	HT INT	0	0	0	0	207	0	74	240	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	02/03/2016	LT	LT INT	0	0	0	0	0	121	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	02/03/2016	LT	LT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	02/03/2016	HT	NOC													0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	03/03/2016	HT	HT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	20/04/2016	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
21/04/2016	HT	HT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
21/04/2016	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
26/09/2017	HT	WWO	0	0	0	1	0	600	600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
27/09/2017	LT	WWO	0	0	0	0	0	220	706	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
12/10/2017	HT	WWO	0	0	0	0	0	0	785	2	46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
13/10/2017	LT	WWO	0	0	0	0	320	860	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
30/10/2017	LT	WWO	0	0	0	0	6	2	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
31/10/2017	HT	WWO	0	0	0	0	0	0	0	165	620	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
06/11/2017	HT	WWO	0	0	0	0	155	75	0	0	590	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
07/11/2017	LT	WWO	23	57	0	0	3	157	244	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
22/11/2017	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
23/11/2017	LT	WWO	0	22	0	6	205	397	167	98	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
06/12/2017	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
07/12/2017	LT	WWO	0	16	0	0	46	216	0	39	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

	Field Number		1	2	3	4	5	6	7	8	9	36	48	61	29	30	31	32	33	34	35	10	11	12	13	14	15	16	17	37	
	Field Area (ha)		29.3	21.5	17.9	18.7	28.9	23.0	20.9	16.2	16.7	18.6	14.4	20.1	3.6	6.1	3.1	1.8	3.9	4.2	6.0	3.9	3.6	4.2	6.6	7.3	3.8	4.5	3.6	4.8	
SEASON	DATE	TIDE	SURVEY																												
	20/12/2017	HT	WVO	0	0	0	0	0	0	0	0	0	0	0	750	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	28/12/2017	LT	WVO	1	2	0	0	0	0	55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12/01/2018	LT	WVO	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	16/01/2018	HT	WVO	0	0	0	19	0	0	600	0	0	0	0	0	560	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	27/01/2018	LT	WVO	0	0	0	1	5	17	0	0	0	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	30/01/2018	HT	WVO	0	0	0	0	1	5	0	0	24	0	0	0	414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	09/02/2018	LT	WVO	0	0	0	26	0	36	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	15/02/2018	HT	WVO	0	0	0	0	0	9	23	21	52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	21/02/2018	LT	WVO	0	0	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	26/02/2018	HT	WVO	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	01/03/2018	HT	WVO	14	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	06/03/2018	LT	WVO	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	16/03/2018	HT	WVO	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	27/03/2018	LT	WVO	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	06/04/2018	LT	WVO	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12/04/2018	HT	WVO	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Field Number			18	19	20	21	22	23	24	25	26	27	28	38	39	40	41	42	43	44	45	46	47	49	50	51	52	53	54	55	56	57	58	59	60	TOTAL	ARABLE		
Field Area (ha)			10.1	14.2	17.1	9.9	6.0	14.7	8.8	11.9	7.6	8.3	13.7	10.7	10.7	18.9	10.2	8.1	14.3	19.6	6.8	8.2	4.8	6.5	14.9	24.9	26.1	22.1	9.4	12.2	8.4	3.4	7.7	3.0	16.4				
SEASON	DATE	TIDE	SURVEY																																				
	21/12/2015	HT	NOC																																				
	21/12/2015	LT	LT WO																																				
	22/12/2015	HT	HT INT																																				
	22/12/2015	HT	HT WO																																				
	05/01/2016	LT	LT INT																																				
	05/01/2016	LT	LT WO																																				
	06/01/2016	HT	HT INT																																				
	06/01/2016	HT	HT WO																																				
	19/01/2016	LT	LT INT																																				
	19/01/2016	LT	LT WO																																				
	19/01/2016	LT	NOC																																				
	20/01/2016	HT	HT INT																																				
	20/01/2016	HT	HT WO																																				
	02/02/2016	LT	LT WO																																				
	03/02/2016	HT	HT INT																																				
	03/02/2016	LT	LT INT																																				
	03/02/2016	HT	NOC																																				
	04/02/2016	HT	HT WO																																				
	16/02/2016	LT	LT WO																																				
	17/02/2016	HT	HT WO																																				
	01/03/2016	HT	HT INT																																				
	02/03/2016	LT	LT INT																																				
	02/03/2016	LT	LT WO																																				
	02/03/2016	HT	NOC																																				
	03/03/2016	HT	HT WO																																				
	20/04/2016	HT	HT INT																																				
	21/04/2016	HT	HT WO																																				
	21/04/2016	LT	LT INT																																				
SEASON 4 - Winter 2017/18	26/09/2017	HT	WWO																																				
	27/09/2017	LT	WWO																																				
	12/10/2017	HT	WWO																																				
	13/10/2017	LT	WWO																																				
	30/10/2017	LT	WWO																																				
	31/10/2017	HT	WWO																																				
	06/11/2017	HT	WWO																																				
	07/11/2017	LT	WWO																																				
	22/11/2017	HT	WWO																																				
	23/11/2017	LT	WWO																																				
	06/12/2017	HT	WWO																																				
	07/12/2017	LT	WWO																																				
	20/12/2017	HT	WWO																																				
	28/12/2017	LT	WWO																																				
	12/01/2018	LT	WWO																																				
	16/01/2018	HT	WWO																																				

Field Number				18	19	20	21	22	23	24	25	26	27	28	38	39	40	41	42	43	44	45	46	47	49	50	51	52	53	54	55	56	57	58	59	60	TOTAL	ARABLE			
Field Area (ha)				10.1	14.2	17.1	9.9	6.0	14.7	8.8	11.9	7.6	8.3	13.7	10.7	10.7	18.9	10.2	8.1	14.3	19.6	6.8	8.2	4.8	6.5	14.9	24.9	26.1	22.1	9.4	12.2	8.4	3.4	7.7	3.0	16.4					
SEASON	DATE	TIDE	SURVEY																																						
	27/01/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46	0	
	30/01/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	400	0
	09/02/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65	0
	15/02/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	105	0
	21/02/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35	0
	26/02/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
	01/03/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	0
	06/03/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0
	16/03/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
	27/03/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
	06/04/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0
	12/04/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

Baseline field counts of foraging lapwing in intertidal (blue), grazing marsh at east end (green) and grazing marsh/reedbed coastal sectors (grey)

N.B. totals may not add up to the sum of field counts, as double-counting of flocks that moved during the survey will have been accounted for.

	Field Number		1	2	3	4	5	6	7	8	9	36	48	61	29	30	31	32	33	34	35	10	11	12	13	14	15	16	17	37		
	Field Area (ha)		29.3	21.5	17.9	18.7	28.9	23.0	20.9	16.2	16.7	18.6	14.4	20.1	3.6	6.1	3.1	1.8	3.9	4.2	6.0	3.9	3.6	4.2	6.6	7.3	3.8	4.5	3.6	4.8		
SEASON	DATE	TIDE	SURVEY																													
SEASON 1 - WINTER 13/14	09/01/2014	LT	WBS	70	1	0	0	180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	13/01/2014	HT	WBS (Farm)									0			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	15/01/2014	HT	WBS	400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	07/02/2014	LT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	10/02/2014	LT	WBS (Farm)									0			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	12/02/2014	HT	WBS	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	05/03/2014	HT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	07/03/2014	LT	WBS (Farm)										0			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	10/03/2014	LT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	SEASON 2 - WINTER 14/15	08/10/2014	HT	PBS (West)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
09/10/2014		HT	PBS (East)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
16/10/2014		LT	PBS (East)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
17/10/2014		LT	PBS (West)	25	0	6	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
22/10/2014		HT	PBS (West)	0	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
23/10/2014		HT	PBS (East)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12/11/2014		HT	WBS (Farm)									0			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
13/11/2014		LT	WBS	350	150	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
21/11/2014		HT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09/12/2014		HT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10/12/2014		HT	WBS (Farm)									0			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17/12/2014		LT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14/01/2015		LT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20/01/2015		LT	WBS (Farm)										0			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21/01/2015		HT	WBS (East)	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18/02/2015		HT	WBS (West)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24/02/2015		HT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25/02/2015	HT	WBS (Farm)										0			0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
26/02/2015	LT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
SEASON 3 - WINTER 15/16	30/09/2015	HT	PASS WO									0	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0		
	01/10/2015	LT	PASS WO									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	28/10/2015	HT	PASS WO									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	29/10/2015	LT	PASS WO									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	23/11/2015	LT	LT INT	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	23/11/2015	LT	LT WO									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	24/11/2015	HT	HT INT	19	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	24/11/2015	HT	HT WO									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	14/12/2015	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	14/12/2015	HT	HT WO									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15/12/2015	LT	LT INT	0	5	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
15/12/2015	LT	LT WO									0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Field Number				1	2	3	4	5	6	7	8	9	36	48	61	29	30	31	32	33	34	35	10	11	12	13	14	15	16	17	37					
Field Area (ha)				29.3	21.5	17.9	18.7	28.9	23.0	20.9	16.2	16.7	18.6	14.4	20.1	3.6	6.1	3.1	1.8	3.9	4.2	6.0	3.9	3.6	4.2	6.6	7.3	3.8	4.5	3.6	4.8					
SEASON	DATE	TIDE	SURVEY																																	
	21/12/2015	LT	LT INT	0	0	0	0	92	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	21/12/2015	HT	NOC													0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	21/12/2015	LT	LT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	22/12/2015	HT	HT INT	9	0	0	70	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	22/12/2015	HT	HT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	05/01/2016	LT	LT INT	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	05/01/2016	LT	LT WO											0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	06/01/2016	HT	HT INT	10	0	0	250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	06/01/2016	HT	HT WO											0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	19/01/2016	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	19/01/2016	LT	LT WO											0	0	0	0	85	0	0	0	0	0	50	0	0	0	0	0	0	0	0	0			
	19/01/2016	LT	NOC	0	0	0	0	0	0	0	0	0					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	20/01/2016	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	49	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	20/01/2016	HT	HT WO											0	0	0	0	10	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	02/02/2016	LT	LT WO											0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	03/02/2016	HT	HT INT	0	0	0	0	0	0	0	0	0	0	4	0	32	200	0	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	03/02/2016	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	03/02/2016	HT	NOC														0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	04/02/2016	HT	HT WO											0	0	0	0	150	0	150	0	0	0	0	0	0	0	0	0	0	0	0	0			
	16/02/2016	LT	LT WO											0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	17/02/2016	HT	HT WO											0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	01/03/2016	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	02/03/2016	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	02/03/2016	LT	LT WO											0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	02/03/2016	HT	NOC														0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	03/03/2016	HT	HT WO											0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	20/04/2016	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	21/04/2016	HT	HT WO											0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	21/04/2016	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	SEASON 4 - Winter 2017/18	26/09/2017	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
27/09/2017		LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
12/10/2017		HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
13/10/2017		LT	WWO	0	0	0	4	6	0	0	0	0	0	0	0	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
30/10/2017		LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
31/10/2017		HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
06/11/2017		HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0				
07/11/2017		LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0				
22/11/2017		HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
23/11/2017		LT	WWO	0	3	0	0	1	10	0	0	0	0	0	0	4	108	0	37	0	0	12	0	0	0	0	0	0	0	0	0	0				
06/12/2017		HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
07/12/2017		LT	WWO	0	0	0	0	0	3	0	0	0	0	0	0	3	2	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0				
20/12/2017		HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	20	6	3	6	0	67	0	0	0	0	0	0	0	0	0	0				
28/12/2017		LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	0	0	0	35	0	0	0	0	0	0	0	0	0	0				
12/01/2018		LT	WWO	0	0	0	0	200	0	0	0	0	0	0	0	0	0	0	170	0	0	0	0	0	0	0	0	0	0	0	0	0				

Field Number				1	2	3	4	5	6	7	8	9	36	48	61	29	30	31	32	33	34	35	10	11	12	13	14	15	16	17	37
Field Area (ha)				29.3	21.5	17.9	18.7	28.9	23.0	20.9	16.2	16.7	18.6	14.4	20.1	3.6	6.1	3.1	1.8	3.9	4.2	6.0	3.9	3.6	4.2	6.6	7.3	3.8	4.5	3.6	4.8
SEASON	DATE	TIDE	SURVEY																												
	16/01/2018	HT	WWO	0	0	0	60	0	0	0	0	0	0	0	0	0	290	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	27/01/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45	0	0	70	180	0	0	0	0	0	0	0	0	0
	30/01/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	09/02/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0	0	0	0	10	0	0	0	0	0	0	0	0	0
	15/02/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	21/02/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	26/02/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	01/03/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	06/03/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	16/03/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	27/03/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	06/04/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12/04/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Field Number				18	19	20	21	22	23	24	25	26	27	28	38	39	40	41	42	43	44	45	46	47	49	50	51	52	53	54	55	56	57	58	59	60	TOTAL	ARABLE		
Field Area (ha)				10.1	14.2	17.1	9.9	6.0	14.7	8.8	11.9	7.6	8.3	13.7	10.7	10.7	18.9	10.2	8.1	14.3	19.6	6.8	8.2	4.8	6.5	14.9	24.9	26.1	22.1	9.4	12.2	8.4	3.4	7.7	3.0	16.4				
SEASON	DATE	TIDE	SURVEY																																					
	27/01/2018	LT	WWO	165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	460	165	
	30/01/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	120	0
	09/02/2018	LT	WWO	0	0	5	0	0	0	0	0	0	0	35	0	0	0	0	0	0	0	270	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	361	311
	15/02/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	21/02/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1		
	26/02/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	01/03/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	06/03/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	
	16/03/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	27/03/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	
	06/04/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	12/04/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Baseline field counts of foraging golden plover in intertidal (blue), grazing marsh at east end (green) and grazing marsh/reedbed coastal sectors (grey)

N.B. totals may not add up to the sum of field counts, as double-counting of flocks that moved during the survey will have been accounted for.

Field Number				1	2	3	4	5	6	7	8	9	36	48	61	29	30	31	32	33	34	35	10	11	12	13	14	15	16	17	37	
Field Area (ha)				29.3	21.5	17.9	18.7	28.9	23.0	20.9	16.2	16.7	18.6	14.4	20.1	3.6	6.1	3.1	1.8	3.9	4.2	6.0	3.9	3.6	4.2	6.6	7.3	3.8	4.5	3.6	4.8	
SEASON	DATE	TIDE	SURVEY																													
SEASON 1 - WINTER 13/14	09/01/2014	LT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	13/01/2014	HT	WBS (Farm)											0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	15/01/2014	HT	WBS	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	07/02/2014	LT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	10/02/2014	LT	WBS (Farm)												0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	12/02/2014	HT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	05/03/2014	HT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	07/03/2014	LT	WBS (Farm)													0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	10/03/2014	LT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SEASON 2 - WINTER 14/15	08/10/2014	HT	PBS (West)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	09/10/2014	HT	PBS (East)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	16/10/2014	LT	PBS (East)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	17/10/2014	LT	PBS (West)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	22/10/2014	HT	PBS (West)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	23/10/2014	HT	PBS (East)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12/11/2014	HT	WBS (Farm)													0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	13/11/2014	LT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	21/11/2014	HT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	09/12/2014	HT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	10/12/2014	HT	WBS (Farm)														0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
	17/12/2014	LT	WBS	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	14/01/2015	LT	WBS	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	20/01/2015	LT	WBS (Farm)														0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
	21/01/2015	HT	WBS (East)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	18/02/2015	HT	WBS (West)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	24/02/2015	HT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25/02/2015	HT	WBS (Farm)														0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	
26/02/2015	LT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
SEASON 3 - WINTER 15/16	30/09/2015	HT	PASS WO											0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	01/10/2015	LT	PASS WO													0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	28/10/2015	HT	PASS WO														0		0	0	0	0	0	0	0	0	0	0	0	0	0	
	29/10/2015	LT	PASS WO															0		0	0	0	0	0	0	0	0	0	0	0	0	
	23/11/2015	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	23/11/2015	LT	LT WO															0		0	0	0	0	0	0	0	0	0	0	0	0	
	24/11/2015	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	24/11/2015	HT	HT WO																0		0	0	0	0	0	0	0	0	0	0	0	
	14/12/2015	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	14/12/2015	HT	HT WO																	0		0	0	0	0	0	0	0	0	0	0	0
15/12/2015	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
15/12/2015	LT	LT WO																		0		0	0	0	0	0	0	0	0	0	0	

Field Number			1	2	3	4	5	6	7	8	9	36	48	61	29	30	31	32	33	34	35	10	11	12	13	14	15	16	17	37						
Field Area (ha)			29.3	21.5	17.9	18.7	28.9	23.0	20.9	16.2	16.7	18.6	14.4	20.1	3.6	6.1	3.1	1.8	3.9	4.2	6.0	3.9	3.6	4.2	6.6	7.3	3.8	4.5	3.6	4.8						
SEASON	DATE	TIDE	SURVEY																																	
SEASON 4 - Winter 2017/18	21/12/2015	LT	HT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	21/12/2015	HT	NOC												0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	21/12/2015	LT	LT WO												0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	22/12/2015	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	22/12/2015	HT	HT WO												0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	05/01/2016	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	05/01/2016	LT	LT WO												0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	06/01/2016	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	06/01/2016	HT	HT WO												0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	19/01/2016	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	19/01/2016	LT	LT WO												0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	19/01/2016	LT	NOC												0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	20/01/2016	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	20/01/2016	HT	HT WO												0	0	0	0	0	0	95	0	0	0	0	0	0	0	0	0	0	0	0			
	02/02/2016	LT	LT WO												0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	03/02/2016	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	250	0	250	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	03/02/2016	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	350	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	03/02/2016	HT	NOC												0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	04/02/2016	HT	HT WO												0	0	0	0	210	0	600	0	0	0	0	0	0	0	0	0	0	0	0			
	16/02/2016	LT	LT WO												0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	17/02/2016	HT	HT WO												0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
01/03/2016	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
02/03/2016	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	490	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
02/03/2016	LT	LT WO												0	0	0	0	410	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
02/03/2016	HT	NOC												0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
03/03/2016	HT	HT WO												0	0	0	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0				
20/04/2016	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
21/04/2016	HT	HT WO												0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
21/04/2016	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
26/09/2017	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
27/09/2017	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
12/10/2017	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
13/10/2017	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
30/10/2017	LT	WWO	0	0	0	0	0	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
31/10/2017	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
06/11/2017	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
07/11/2017	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
22/11/2017	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
23/11/2017	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
06/12/2017	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
07/12/2017	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
20/12/2017	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	0	200	0	0	0	0	0	0	0	0	0	0				
28/12/2017	LT	WWO	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
12/01/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0				

	Field Number			1	2	3	4	5	6	7	8	9	36	48	61	29	30	31	32	33	34	35	10	11	12	13	14	15	16	17	37				
	Field Area (ha)			29.3	21.5	17.9	18.7	28.9	23.0	20.9	16.2	16.7	18.6	14.4	20.1	3.6	6.1	3.1	1.8	3.9	4.2	6.0	3.9	3.6	4.2	6.6	7.3	3.8	4.5	3.6	4.8				
SEASON	DATE	TIDE	SURVEY																																
	16/01/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	27/01/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	30/01/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	09/02/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	250	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	15/02/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	21/02/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	26/02/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	01/03/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	4	0	0	
	06/03/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	16/03/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	27/03/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	06/04/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12/04/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Baseline field counts of foraging golden plover in arable count sectors (yellow)

N.B. totals may not add up to the sum of field counts, as double-counting of flocks that moved during the survey will have been accounted for.

Field Number			18	19	20	21	22	23	24	25	26	27	28	38	39	40	41	42	43	44	45	46	47	49	50	51	52	53	54	55	56	57	58	59	60	TOTAL	ARABLE
Field Area (ha)			10.1	14.2	17.1	9.9	6.0	14.7	8.8	11.9	7.6	8.3	13.7	10.7	10.7	18.9	10.2	8.1	14.3	19.6	6.8	8.2	4.8	6.5	14.9	24.9	26.1	22.1	9.4	12.2	8.4	3.4	7.7	3.0	16.4		
SEASON	DATE	TIDE	SURVEY																										TOTAL	ARABLE							
SEASON 1 - WINTER 13/14	09/01/2014	LT	WBS																										0	0							
	13/01/2014	HT	WBS (Farm)																										0	0							
	15/01/2014	HT	WBS																										2	0							
	07/02/2014	LT	WBS																										0	0							
	10/02/2014	LT	WBS (Farm)																										0	0							
	12/02/2014	HT	WBS																										0	0							
	05/03/2014	HT	WBS																										0	0							
	07/03/2014	LT	WBS (Farm)																										0	0							
	10/03/2014	LT	WBS																										0	0							
	SEASON 2 - WINTER 14/15	08/10/2014	HT	PBS (West)																										0	0						
09/10/2014		HT	PBS (East)																										0	0							
16/10/2014		LT	PBS (East)																										0	0							
17/10/2014		LT	PBS (West)																										0	0							
22/10/2014		HT	PBS (West)																										0	0							
23/10/2014		HT	PBS (East)																										0	0							
12/11/2014		HT	WBS (Farm)																										0	0							
13/11/2014		LT	WBS																										0	0							
21/11/2014		HT	WBS																										0	0							
09/12/2014		HT	WBS																										0	0							
10/12/2014		HT	WBS (Farm)																										0	0							
17/12/2014		LT	WBS																										1	0							
14/01/2015		LT	WBS																										3	0							
20/01/2015		LT	WBS (Farm)																										0	0							
21/01/2015		HT	WBS (East)																										0	0							
18/02/2015		HT	WBS (West)																										0	0							
24/02/2015		HT	WBS																										0	0							
25/02/2015	HT	WBS (Farm)																										40	40								
26/02/2015	LT	WBS																										0	0								
SEASON 3 - WINTER 15/16	30/09/2015	HT	PASS WO																										0	0							
	01/10/2015	LT	PASS WO																										0	0							
	28/10/2015	HT	PASS WO																										5	5							
	29/10/2015	LT	PASS WO																										0	0							
	23/11/2015	LT	LT INT																										0	0							
	23/11/2015	LT	LT WO																										29	29							
	24/11/2015	HT	HT INT																										150	150							
	24/11/2015	HT	HT WO																										285	285							
	14/12/2015	HT	HT INT																										0	0							
	14/12/2015	HT	HT WO																										0	0							
	15/12/2015	LT	LT INT																										0	0							
	15/12/2015	LT	LT WO																										0	0							
21/12/2015	LT	LT INT																										0	0								

Field Number				18	19	20	21	22	23	24	25	26	27	28	38	39	40	41	42	43	44	45	46	47	49	50	51	52	53	54	55	56	57	58	59	60	TOTAL	ARABLE				
Field Area (ha)				10.1	14.2	17.1	9.9	6.0	14.7	8.8	11.9	7.6	8.3	13.7	10.7	10.7	18.9	10.2	8.1	14.3	19.6	6.8	8.2	4.8	6.5	14.9	24.9	26.1	22.1	9.4	12.2	8.4	3.4	7.7	3.0	16.4						
SEASON	DATE	TIDE	SURVEY																																							
	27/01/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	330	0		
	30/01/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	09/02/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	460	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	910	460
	15/02/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	21/02/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	26/02/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	01/03/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0
	06/03/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	16/03/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0
	27/03/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	06/04/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12/04/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

APPENDIX 7 – SCREENING MATRICES

Report to Inform and Appropriate Assessment

Appendix 7: Screening Matrices

This Appendix summarises the potential effects of the proposed Cleve Hill Solar Park upon European Sites which are considered within the Report to Inform and Appropriate Assessment (DCO Document Reference 5.2).

The European sites included within the screening assessment are:

- The Swale SPA;
- The Swale Ramsar;
- Thanet Coast & Sandwich Bay SPA;
- Outer Thames Estuary SPA; and
- Blean Complex SAC.

Effects considered within the screening matrices:

Designation	Effects described in submission information	Presented in screening matrices as
<p>The Swale SPA</p>	<ul style="list-style-type: none"> • Noise and visual disturbance during construction and decommissioning; • Noise and visual disturbance during operation; • Loss/change of habitats; • Fragmentation of habitats; • Hydrological changes; • Deposition of dust; • Collision (birds); and • Disturbance through changes in recreational access. 	<ul style="list-style-type: none"> • Noise, visual and lighting disturbance; • Loss/change of habitats; • Fragmentation of habitats; • Hydrological changes; • Deposition of dust; • Collision of birds; and • Recreational access disturbance.
	<p>In combination: (all of the above are considered in combination at the screening stage)</p> <ul style="list-style-type: none"> • Noise and visual disturbance during construction and decommissioning; • Noise and visual disturbance during operation; • Loss/change of habitats; • Fragmentation of habitats; • Hydrological changes; • Deposition of dust; • Collision (birds); and • Disturbance through changes in recreational access. 	<p>In combination:</p> <ul style="list-style-type: none"> • Noise, visual and lighting disturbance; • Loss/change of habitats; • Fragmentation of habitats; • Hydrological changes; • Deposition of dust; • Collision of birds; and • Recreational access disturbance.

Designation	Effects described in submission information	Presented in screening matrices as
<p>The Swale Ramsar</p>	<ul style="list-style-type: none"> • Noise and visual disturbance during construction and decommissioning; • Noise and visual disturbance during operation; • Loss/change of habitats; • Fragmentation of habitats; • Hydrological changes; • Deposition of dust; • Collision (birds); and • Disturbance through changes in recreational access; and • Attraction of egg-laying invertebrates. 	<ul style="list-style-type: none"> • Noise, visual and lighting disturbance; • Loss/change of habitats; • Fragmentation of habitats; • Hydrological changes; • Deposition of dust; • Collision of birds; and • Recreational access disturbance; and • Attraction of egg-laying invertebrates.
	<p>In combination: (all of the above are considered in combination at the screening stage)</p> <ul style="list-style-type: none"> • Noise and visual disturbance during construction and decommissioning; • Noise and visual disturbance during operation; • Loss/change of habitats; • Fragmentation of habitats; • Hydrological changes; • Deposition of dust; • Collision (birds); • Disturbance through changes in recreational access; and • Attraction of egg-laying invertebrates. 	<p>In combination:</p> <ul style="list-style-type: none"> • Noise, visual and lighting disturbance; • Loss/change of habitats; • Fragmentation of habitats; • Hydrological changes; • Deposition of dust; • Collision of birds; and • Recreational access disturbance; and • Attraction of egg-laying invertebrates.

Designation	Effects described in submission information	Presented in screening matrices as
Thanet Coast & Sandwich Bay SPA	<ul style="list-style-type: none"> Loss/change of habitats. [RIAA paragraph 38, page 9] 	Screened out – no LSE
	In combination: Not applicable	Screened out – no LSE
Outer Thames Estuary SPA	No pathway for impact [RIAA paragraph 39, page 9]	Screened out – no LSE
	In combination: Not applicable	Screened out – no LSE
Blean Complex SAC	No pathway for impact [RIAA paragraph 40, page 9]	Screened out – no LSE
	In combination: Not applicable	Screened out – no LSE

STAGE 1: SCREENING MATRICES

Matrix Key:

✓ = Likely significant effect **cannot** be excluded

✗ = Likely significant effect **can** be excluded

C = construction

O = operation

D = decommissioning

Where effects are not relevant to a particular feature the matrix cell should be formatted as follows:



HRA Screening Matrix 1: The Swale SPA

Name of European site and designation: The Swale Special Protection Area																										
EU Code: UK9012011																										
Distance to CHSP: 0 km																										
European site features			Likely effects of CHSP (alone and in-combination)																							
<i>Effect</i>			<i>Noise, visual and lighting disturbance</i>			<i>Loss/change of habitats</i>			<i>Fragmentation of habitats</i>			<i>Hydrological changes</i>			<i>Deposition of dust</i>			<i>Collision of birds</i>			<i>Recreational access disturbance</i>			<i>In-combination</i>		
<i>Stage of Development</i>			<i>C</i>	<i>O</i>	<i>D</i>	<i>C</i>	<i>O</i>	<i>D</i>	<i>C</i>	<i>O</i>	<i>D</i>	<i>C</i>	<i>O</i>	<i>D</i>	<i>C</i>	<i>O</i>	<i>D</i>	<i>C</i>	<i>O</i>	<i>D</i>	<i>C</i>	<i>O</i>	<i>D</i>	<i>C</i>	<i>O</i>	<i>D</i>
<i>Dark-bellied brent goose (non-breeding)</i>			√a	xc	√a	√d	√d		xf	xf		√g	xh	√g	√i		√i		xj			xk		√l	√l	√l
<i>Dunlin (non-breeding)</i>			√a	xc	√a	xd	xd		xf	xf		√g	xh	√g	√i		√i		xj			xk		√l	√l	√l
<i>Breeding bird assemblage</i>			√b	xc	√b	√e	√e		xf	xf		√g	xh	√g	√i		√i		xj			xk		√l	√l	√l
<i>Wintering assemblage</i>			√a	xc	√a	√d	√d		xf	xf		√g	xh	√g	√i		√i		xj			xk		√l	√l	√l

Evidence supporting conclusions:

- a. In the absence of mitigation, construction and decommissioning activities in the local landscape have the potential to cause noise and visual disturbance to wintering birds, affecting their foraging or roosting behaviour, resulting in reduced survival or productivity of individuals. [Section 5.2.5.1, paragraphs 63 to 68 of the RIAA].
- b. In the absence of mitigation, construction and decommissioning activities in the local landscape have the potential to cause noise and visual disturbance to breeding birds, affecting their nesting and foraging behaviour, resulting in reduced survival or productivity of individuals. [Section 5.2.5.1, paragraphs 63 to 68 of the RIAA].

- c.** Operational activities within the site will be of lower magnitude than the baseline farming activities. No areas of the site will be continuously lit, with security (PIR) and manually operated emergency lighting at transformers within the solar PV arrays. Operational disturbance to birds will be negligible. [Section 5.2.5.2, paragraphs 69 to 73 of the RIAA].
- d.** The loss/change of habitats occurs in the construction phase and applies throughout the operational phase. Decommissioning is assumed to return the land to its pre-development state and is therefore not relevant. LSEs can be excluded for dunlin and the majority of the wintering bird assemblage, with the exception of brent goose, lapwing and golden plover. These three species forage/roost on the arable land within which the solar PV arrays will be located and therefore LSEs cannot be excluded in the absence of mitigation. [Section 5.2.5.3, paragraphs 74 to 80 of the RIAA].
- e.** The loss/change of habitats occurs in the construction phase and applies throughout the operational phase. Decommissioning is assumed to return the land to its pre-development state and is therefore not relevant. LSEs can be excluded for the majority of the breeding bird assemblage (because the arable land within the site is not functionally linked to the SPA for those species), with the exception of marsh harrier. Marsh harriers forage around the arable fields within which the solar PV arrays will be located and therefore LSEs cannot be excluded in the absence of mitigation. [Section 5.2.5.3, paragraphs 81 to 83 of the RIAA].
- f.** The fragmentation of habitats potentially occurs in the construction phase and applies throughout the operational phase. Large areas of open habitat between arrays permits passage of birds through the landscape and the development does not prevent use of surrounding habitats. [Section 5.2.5.4, paragraphs 84 to 86 of the RIAA].
- g.** In the absence of embedded mitigation set out in the Outline Construction Environmental Management Plan (Outline CEMP, Technical Appendix A5.4 of the ES with similar measures applicable to a future Decommissioning Plan), there is an extremely low possibility of a catastrophic pollution event that adversely affects the water environment connected to the SPA. [Section 5.2.5.5, paragraphs 87 to 88 of the RIAA].
- h.** The hydrological assessment predicts a long-term positive effect of the development due to reduction of inputs of fertiliser and pesticides to the local agricultural landscape, therefore LSEs can be discounted for the operational phase. [Section 5.2.5.5, paragraphs 89 to 90 of the RIAA].
- i.** In the absence of embedded mitigation set out in the Outline Construction Environmental Management Plan (Outline CEMP, Technical Appendix A5.4 of the ES with similar measures applicable to a future Decommissioning Plan), there is a low risk

of dust soiling from earthworks and track-out that could adversely affect the habitats of the SPA. [Section 5.2.5.6, paragraphs 91 to 92 of the RIAA].

- j.** There is an absence of any evidence to indicate that there is a significant risk of collision of birds with solar panels or fences in the agricultural landscape. [Section 5.2.5.7, paragraphs 92 to 96 of the RIAA].
- k.** LSEs are excluded because there is not predicted to be any notable change in the recreational access on footpaths within and adjacent to the SPA. [Section 5.2.5.8, paragraphs 97 to 99 of the RIAA].
- l.** Potential for in-combination effects with other developments within 10 km of the Development site or within 2 km of The Swale SPA during construction, operation or decommissioning. [Section 6, paragraph 108 of the RIAA; Page 9-74 Section 9.2.8 of ES chapter 9: Ornithology].

HRA Screening Matrix 2: The Swale Ramsar Site

Name of European site and designation: The Swale Ramsar Site																													
EU Code: UK11071																													
Distance to CHSP: 0 km																													
European site features			Likely effects of CHSP (alone and in-combination)																										
			Noise, visual and lighting disturbance			Loss/change of habitats			Fragmentation of habitats			Hydrological changes			Deposition of dust			Collision of birds			Recreational access disturbance			Attraction of egg-laying invertebrates			In-combination		
Effect			C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D	C	O	D
<i>Stage of Development</i>																													
<i>Ramsar Criterion 2: Nationally scarce plants</i>																													
<i>Ramsar Criterion 2: At least seven British Red Data Book invertebrate species</i>																													
<i>Ramsar Criterion 5: Winter waterfowl assemblage of international importance</i>			√a	xc	√a	√d	√d		xf	xf		√g	xh	√g	√i		√i			xj			xk				xm	xm	xm
<i>Ramsar Criterion 6: Species/populations at level of international importance in spring/autumn: Redshank</i>			√a	xc	√a	xd	xd		xf		xk	√g	xh	√g	√i		√i			xj			xk				xm	xm	xm
<i>Ramsar Criterion 6: Species/populations at level of international importance in winter: Dark-bellied brent goose</i>			√b	xc	√b	√e	√e		xf		xk	√g	xh	√g	√i		√i			xj			xk				xm	xm	xm
<i>Ramsar Criterion 6: Species/populations at level of international importance in winter: Grey plover</i>			√a	xc	√a	√d	√d		xf		xk	√g	xh	√g	√i		√i			xj			xk				xm	xm	xm

Evidence supporting conclusions:

- a. In the absence of mitigation, construction and decommissioning activities in the local landscape have the potential to cause noise and visual disturbance to wintering birds, affecting their foraging or roosting behaviour, resulting in reduced survival or productivity of individuals. [Section 5.2.5.1, paragraphs 63 to 68 of the RIAA].
- b. In the absence of mitigation, construction and decommissioning activities in the local landscape have the potential to cause noise and visual disturbance to breeding birds, affecting their nesting and foraging behaviour, resulting in reduced survival or productivity of individuals. [Section 5.2.5.1, paragraphs 63 to 68 of the RIAA].
- c. Operational activities within the site will be of lower magnitude than the baseline farming activities. No areas of the site will be continuously lit, with security (PIR) and manually operated emergency lighting at transformers within the solar PV arrays. Operational disturbance to birds will be negligible. [Section 5.2.5.2, paragraphs 69 to 73 of the RIAA].
- d. The loss/change of habitats occurs in the construction phase and applies throughout the operational phase. Decommissioning is assumed to return the land to its pre-development state and is therefore not relevant. LSEs can be excluded for dunlin and the majority of the wintering bird assemblage, with the exception of brent goose, lapwing and golden plover. These three species forage/roost on the arable land within which the solar PV arrays will be located and therefore LSEs cannot be excluded in the absence of mitigation. [Section 5.2.5.3, paragraphs 74 to 80 of the RIAA].
- e. The loss/change of habitats occurs in the construction phase and applies throughout the operational phase. Decommissioning is assumed to return the land to its pre-development state and is therefore not relevant. LSEs can be excluded for the majority of the breeding bird assemblage (because the arable land within the site is not functionally linked to the SPA for those species), with the exception of marsh harrier. Marsh harriers forage around the arable fields within which the solar PV arrays will be located and therefore LSEs cannot be excluded in the absence of mitigation. [Section 5.2.5.3, paragraphs 81 to 83 of the RIAA].
- f. The fragmentation of habitats potentially occurs in the construction phase and applies throughout the operational phase. Large areas of open habitat between arrays permits passage of birds through the landscape and the development does not prevent use of surrounding habitats. [Section 5.2.5.4, paragraphs 84 to 86 of the RIAA].

- g.** In the absence of embedded mitigation set out in the Outline Construction Environmental Management Plan (Outline CEMP, Technical Appendix A5.4 of the ES with similar measures applicable to a future Decommissioning Plan), there is an extremely low possibility of a catastrophic pollution event that adversely affects the water environment connected to the SPA. [Section 5.2.5.5, paragraphs 87 to 88 of the RIAA].
- h.** The hydrological assessment predicts a long-term positive effect of the development due to reduction of inputs of fertiliser and pesticides to the local agricultural landscape, therefore LSEs can be discounted for the operational phase. [Section 5.2.5.5, paragraphs 89 to 90 of the RIAA].
- i.** In the absence of embedded mitigation set out in the Outline Construction Environmental Management Plan (Outline CEMP, Technical Appendix A5.4 of the ES with similar measures applicable to a future Decommissioning Plan), there is a low risk of dust soiling from earthworks and track-out that could adversely affect the habitats of the SPA. [Section 5.2.5.6, paragraphs 91 to 92 of the RIAA].
- j.** There is an absence of any evidence to indicate that there is a significant risk of collision of birds with solar panels or fences in the agricultural landscape. [Section 5.2.5.7, paragraphs 92 to 96 of the RIAA].
- k.** LSEs are excluded because there is not predicted to be any notable change in the recreational access on footpaths within and adjacent to the SPA. [Section 5.2.5.8, paragraphs 97 to 99 of the RIAA].
- l.** LSEs are excluded because most of the species cited are either saltmarsh specialists or associated with flowering plants (galls) or emergent vegetation (leaf minors). The majority of the ditch habitats that the Corixidae and Dolichopodidae species are likely to be found in are separated from the solar panel areas by a distance of least 15 m; the ditch habitats/marshland/saltmarsh/pools/mudflats within the Ramsar Wetland designation are the main focus for invertebrates, so those species mentioned are less likely to be impacted by solar panels and more likely to be distant from the solar PV area. Invertebrates are unlikely to fly at heights where the solar panels are. [Section 5.2.5.9, paragraphs 102 to 104 of the RIAA].
- m.** Potential for in-combination effects with other developments within 10 km of the Development site or within 2 km of The Swale SPA during construction, operation or decommissioning. [Section 6, paragraph 108 of the RIAA; Page 9-74 Section 9.2.8 of ES chapter 9: Ornithology].

HRA Screening Matrix 3: Thanet Coast & Sandwich Bay SPA

Name of European site and designation: Outer Thames Estuary Special Protection Area			
EU Code: UK9020309			
Distance to CHSP: 7.8 km			
European site features	Likely effects of CHSP (alone and in-combination*)		
<i>Effect</i>	<i>Habitat loss/change</i>		
<i>Stage of Development</i>	<i>C</i>	<i>O</i>	<i>D</i>
<i>Golden plover (non-breeding)</i>	xa	xa	
<i>Turnstone (non-breeding)</i>	xa	xa	
<i>Little tern (breeding)</i>	xb	xb	

*** no additional in-combination effects were identified at the screening stage of the HRA**

Evidence supporting conclusions:

- a. At a distance of nearly 8 km away, numbers of turnstones from the SPA are unlikely to range regularly as far as the Development site (where turnstones are already present within The Swale SPA) and would not make any use of the habitats within the Development site. Wintering golden plover originating from the Thanet Coast & Sandwich Bay SPA could occasionally range as far as the Development site and use the arable habitats. However, the most recent WeBS 5-year peak-mean count of golden plover for the Thanet Coast is only 34 birds. They are extremely unlikely to visit the Development site in numbers or frequency at which there would be any likely significant effects. [Section 5.1, paragraph 38 of the RIAA].
- b. There is no impact pathway for effects on breeding little terns associated with the Thanet Coast & Sandwich Bay SPA, because they make no use of the Development site. [Section 5.1, paragraph 38 of the RIAA].

HRA Screening Matrix 4: Outer Thames Estuary SPA

Name of European site and designation: Outer Thames Estuary Special Protection Area			
EU Code: UK9020309			
Distance to CHSP: 1.6 km			
European site features	Likely effects of CHSP (alone and in-combination*)		
<i>Effect</i>	<i>All potential effects</i>		
<i>Stage of Development</i>	<i>C</i>	<i>O</i>	<i>D</i>
<i>Red-throated diver (non-breeding)</i>	xa	xa	xa
<i>Common tern (foraging in breeding season)</i>	xa	xa	xa
<i>Little tern (foraging in breeding season)</i>	xa	xa	xa

*** no additional in-combination effects were identified at the screening stage of the HRA**

Evidence supporting conclusions:

- c. There is no impact pathway for effects on the habitats or qualifying interest features of the Outer Thames Estuary SPA. [Section 5.1, paragraph 40 of the RIAA].

HRA Screening Matrix 5: Blean Complex SAC

Name of European site and designation: Blean Complex Special Area of Conservation			
EU Code: UK0013697			
Distance to CHSP: 3.6 km			
European site features		Likely effects of CHSP (alone and in-combination*)	
<i>Effect</i>		<i>All potential effects</i>	
<i>Stage of Development</i>		<i>C</i>	<i>O</i>
<i>H9160. Sub-Atlantic and medio-European oak or oak-hornbeam forests of Carpinion betuli; Oak-hornbeam forests</i>		xa	xa

*** no additional in-combination effects were identified at the screening stage of the HRA**

Evidence supporting conclusions:

- a. There is no impact pathway for effects on the habitats or qualifying interest features of the Blean Complex SAC. [Section 5.1, paragraph 41 of the RIAA].

APPENDIX 8 – INTEGRITY MATRICES

Report to Inform an Appropriate Assessment

Appendix 8: Integrity Matrices for Cleve Hill Solar Park

STAGE 2: EFFECTS ON INTEGRITY

Likely significant effects have been identified for the following sites:

- [The Swale Special Protection Area](#)
- [The Swale Ramsar Wetland Site](#)

These sites have been subject to further assessment in order to establish if the NSIP could have an adverse effect on their integrity. Evidence for the conclusions reached on integrity is detailed within the footnotes to the matrices below.

Matrix Key

- ✓ = Adverse effect on integrity **cannot** be excluded
- ✗ = Adverse effect on integrity **can** be excluded

- C = construction
- O = operation
- D = decommissioning

Where effects are not relevant to a particular feature the matrix cell is formatted as follows:



HRA Integrity Matrix 1: The Swale SPA

Name of European site and designation: The Swale Special Protected Area															
EU Code: UK9012011															
Distance to NSIP: 0km															
European site features	Adverse effects on integrity														
<i>Effect</i>	<i>Noise, visual and lighting disturbance</i>			<i>Loss/change of habitats</i>			<i>Hydrological changes</i>			<i>Deposition of dust</i>			<i>In-combination effects</i>		
<i>Stage of Development</i>	<i>C</i>	<i>O</i>	<i>D</i>	<i>C</i>	<i>O</i>	<i>D</i>	<i>C</i>	<i>O</i>	<i>D</i>	<i>C</i>	<i>O</i>	<i>D</i>	<i>C</i>	<i>O</i>	<i>D</i>
<i>Dark-bellied brent goose (non-breeding)</i>	x _{ab}		x _d	x _e	x _e		x _h		x _h	x _i		x _i	x _j	x _j	x _j
<i>Dunlin (non-breeding)</i>	x _b		x _d				x _h		x _h	x _i		x _i	x _j	x _j	x _j
<i>Breeding bird assemblage</i>	x _c		x _d	x _f	x _f		x _h		x _h	x _i		x _i	x _j	x _j	x _j
<i>Wintering assemblage</i>	x _{ab}		x _d	x _g	x _g		x _h		x _h	x _i		x _i	x _j	x _j	x _j

Evidence supporting conclusions

- a. Dark bellied-brent geese, lapwing and golden plover frequently use the arable fields of the proposed development, so could be affected by noise and visual disturbance [Section 6.1.1.5 paragraph 160 of the RIAA]. The construction of the

development will take place over two to three seasons, and by a field-by-field basis. This means that large areas of the development site will free of development and disturbance at any one time. Additionally, development of the Arable Reversion Habitat Management Area (AR HMA) will occur prior to construction and will provide some resource to the geese and wintering waders. There is considered to be a sufficient extent of disturbance-free habitat during the first winter season to accommodate foraging birds. Approximately half of the AR HMA will be fully established and disturbance free during the second or third winter seasons providing suitable resources and disturbance-free land for the geese and to a lesser extent, lapwing and golden plover [Section 6.1.1.5 paragraph 161-164 of the RIAA]. The resulting temporary loss of foraging resources is not likely to cause reduction in survival/productivity. There will be no long-term adverse effects of noise or visual disturbance on the integrity of the SPA as a consequence of impacts to dark-bellied brent geese lapwing or golden plover [Section 6.1.1.5 paragraph 165-169 of the RIAA].

- b.** Guidance and available evidence suggest that noise disturbance causes adverse impacts to birds in estuarine habitats over a threshold of 70dB (L_{Amax}). A threshold value of 55dB (L_{Amax}) has been set as a level below which it is considered birds would not be disturbed to any material effect in intertidal habitats. Between levels of 55 dB L_{Amax} and 70dB L_{Amax} , birds in intertidal habitats would be expected to become alert and possibly reduce feeding efficiency but not move away (i.e. moderate disturbance effects), such that it is unlikely to result in detrimental effects that reduce their ability to survive or reproduce and would not affect their distribution [Section 6.1.1.1 paragraph 127 of the RIAA]. Applying worst case predictions suggests that the noise levels at the closest part of the SPA could exceed 65dB [Section 6.1.1.1 paragraph 134 of the RIAA], but won't exceed 70dB in intertidal habitats. This means that flight responses by birds (moderate-high disturbance effect) are unlikely to occur in intertidal habitats. Birds in a wider area could receive levels exceeding 55dB during piling activity; but, embedded mitigation measures (using a single piling rig with acoustic screening) will be used, in addition to the screening effect of the sea wall, to minimise the noise exceeding 55dB reaching the SPA [Section 6.1.1.1 paragraph 130-133 of the RIAA]. The worst-case scenario location (a distance of 80m from the SPA) for construction piling will only affect small areas, totalling 0.16% of the SPA, at any one time; but, the majority of piling activity will be at a greater distance from the SPA. Birds within the 0.16% of the SPA are expected to remain and habituate to the level of noise [Section 6.1.1.1 paragraph 134-137 of the RIAA]. The eastern grazing marsh will experience noise levels exceeding 65dB up to 55 m and exceeding 70 dB up to 35 m into the SPA, but this area was not found to be an important resource for wintering birds that form the SPA assemblage [Section 6.1.1.3 paragraph 151-153

of the RIAA]. There will be no long-term adverse effects of noise or visual disturbance on the integrity of the SPA as a consequence of impacts to wintering birds.

- c.** Guidance and available evidence suggest that noise disturbance causes adverse impacts to breeding birds over a threshold of 65dB (L_{Amax}) [Section 6.1.1.1 paragraph 126 of the RIAA]. Applying worst case predictions suggests that the noise levels at the closest part of the SPA could exceed 65dB causing moderate levels of disturbance. The grazing marsh to the north and west provides breeding habitat for a number of species. Activities that create noise which exceeds 65dB in the SPA coastal grazing marsh/reedbed will be avoided during the breeding season resulting in no adverse impacts to breeding birds in that location. The eastern grazing marsh will experience noise levels exceeding 65dB up to 55 m and exceeding 70 dB up to 35 m into the SPA, and visual disturbance of moving vehicles along the access road; but the breeding bird survey did not conclude that this area of the SPA is of importance to breeding birds that form the SPA assemblage [Section 6.1.1.3 paragraph 151-153 of the RIAA]. Localised disturbance to breeding marsh harrier may occur as a consequence of construction; however, there is substantial open habitat available to marsh harrier that will remain disturbance free and provide sufficient resources [Section 6.1.1.5 paragraph 156-158 of the RIAA]. There will be no long-term adverse effects of noise or visual disturbance on the integrity of the SPA as a consequence of impacts to the breeding bird assemblage species.
- d.** The noise levels during decommissioning will be lower and will occur over a shorter time period than the noise levels during construction, which was deemed as having no adverse impacts on the integrity of the SPA (**a-c**), so there will be no long-term adverse effects on the integrity of the SPA during decommissioning as a consequence of the implementation of embedded noise mitigation measures and methods to avoid disturbance [Section 6.1.1.1 paragraph 141 of the RIAA].
- e.** A managed mitigation area of 56 hectares (AR HMA) was identified and agreed in principle by Natural England to remain undeveloped in order to provide foraging and sheltering opportunities for the bird species associated with the SPA. The area was being utilised by 55% of the observed dark-bellied brent geese during the baseline surveys which suggests that it is in a suitable location capable of supporting birds associated with the SPA. Management will convert the arable land into permanent pasture which is known to support high densities of dark-bellied brent geese, and is a preferred feeding habitat of lapwings and golden plovers. The AR HMA will be established during the construction stage, and will provide high quality managed refuge habitat to mitigate for the loss of a larger, but lower quality, area. The number of bird-days (peak mean counts of the species per day multiplied the number of days in their active season) was calculated for dark-

bellied brent geese (101,940) to determine how much foraging resource is required from the site. The 56 ha HMA (providing 50.1 ha functionally available land) meets the necessary requirements of this species; consequently, the proposed development will not result in a net loss of resources for dark-bellied brent geese [Section 6.1.2.1 paragraphs 171-206 of the RIAA], so there will be no adverse impacts on the integrity of the SPA.

- f.** The change in land use may result in a reduction in the area of land available to foraging marsh harriers, but potential habitat enhancement areas for marsh harriers have been identified which will provide a net increase in suitable foraging habitat compared to baseline conditions. The proposed development will not result in a net loss of resources for the bird species associated with the SPA and it is predicted that marsh harriers will forage between and around the solar PV arrays in the meadow habitats created [Section 6.1.2.7 paragraphs 207-211 of the RIAA], so there will be no adverse impacts on the integrity of the SPA.
- g.** The solar PV development area on arable land provides functionally linked habitat to the SPA for golden plover and lapwing which are important component species of the SPA wintering bird assemblage. A managed mitigation area of 56 hectares (AR HMA) was identified and agreed in principle by Natural England to remain undeveloped in order to provide foraging and sheltering opportunities for the bird species associated with the SPA. Management will convert the arable land into permanent pasture which is known to be a preferred feeding habitat of lapwings and golden plovers. The AR HMA will be established during the construction stage, and will provide high quality managed refuge habitat to mitigate for the loss of a larger, but lower quality, area. The number of bird-days (peak mean counts of the species per day multiplied the number of days in their active season) was calculated for lapwing (56,023) and golden plover (28,802) to determine how much foraging resource is required from the site. A size of 56 hectares meets the necessary requirements of these species; consequently, the proposed development will not result in a net loss of resources for lapwing and golden plover [Section 6.1.2.1 paragraphs 171-206 of the RIAA], so there will be no adverse impacts on its integrity.
- h.** Potential impacts on the water environment are only considered to be possible through a catastrophic failure of fuel- or concrete-carrying vehicles leading to a pollution event occurring close to a drainage ditch directly connected to the European Site. Buffer zones of at least 5 metres and 8 metres have been included within the design of the development between the solar PV array infrastructure and non-IDB drainage ditches and IDB drainage ditches respectively. However, the buffer zones in the majority of the site have been increased to 15 metres to include grassland habitat enhancements around most of the site. This reduces the potential for chemicals off-spilled by fuel or concrete carrying vehicles to pollute the drainage ditches which may be hydrologically connected to the SPA. Additional measures are in place; including: the

presence of spill kits, speed limits for vehicles, and the maintenance of vehicles, which also contribute to minimising the likelihood of pollution entering the ditch. There will be no adverse effects on the integrity of the SPA as a consequence of hydrological changes [Section 6.1.3 paragraphs 212-216 of the RIAA].

- i.** A variety of mitigation measures, proven to reduce the potential for adverse dust effects, will be implemented throughout construction and decommissioning to control the impact of dust on the neighbouring SPA. There will be no adverse effects on the integrity of the SPA as a consequence of the deposition of dust [Section 6.1.4 paragraphs 217-220 of the RIAA].
- j.** The planning documents of in-combination projects were examined to extract information regarding the residual effects of the proposed development on The Swale SPA [Section 6.2: Table 7 of the RIAA, page 47]. The contribution of each project in-combination with the CHSP Development was found to be non-existent or negligible, negligible with appropriate mitigation, or positive. No in-combination effects have been identified that would elevate the magnitude of the effects of the development to a level that would be significant [Section 6.2.1 paragraph 226 of the RIAA].

HRA Integrity Matrix 2: The Swale Ramsar Site

Name of European site and designation: The Swale Ramsar Site															
EU Code: UK11071															
Distance to NSIP: 0km															
European site features	Adverse effects on integrity														
<i>Effect</i>	<i>Noise, visual and lighting disturbance</i>			<i>Loss/change of habitats</i>			<i>Hydrological changes</i>			<i>Deposition of dust</i>			<i>In-combination effects</i>		
<i>Stage of Development</i>	<i>C</i>	<i>O</i>	<i>D</i>	<i>C</i>	<i>O</i>	<i>D</i>	<i>C</i>	<i>O</i>	<i>D</i>	<i>C</i>	<i>O</i>	<i>D</i>	<i>C</i>	<i>O</i>	<i>D</i>
<i>Ramsar Criterion 5: Winter waterfowl assemblage of international importance</i>	x _{ab}		x _c	x _d	x _d		x _f		x _f	x _g		x _g	x _h	x _h	x _h
<i>Ramsar Criterion 6: Species/populations at level of international importance in spring/autumn: Redshank</i>	x _b		x _c				x _f		x _f	x _g		x _g	x _h	x _h	x _h
<i>Ramsar Criterion 6: Species/populations at level of international importance in</i>	x _{ab}		x _c	x _e	x _e		x _f		x _f	x _g		x _g	x _h	x _h	x _h

<i>winter: Dark-bellied brent goose</i>															
<i>Ramsar Criterion 6: Species/populations at level of international importance in winter: Grey plover</i>	x _b		x _c				x _f		x _f	x _g		x _g	x _h	x _h	x _h

Evidence supporting conclusions

- a. Dark bellied-brent geese, lapwing and golden plover frequently use the arable fields of the proposed development, so could be affected by noise and visual disturbance [Section 6.1.1.5 paragraph 160 of the RIAA]. The construction of the development will take place over two to three seasons, and by a field-by-field basis. This means that large areas of the development site will free of development and disturbance at any one time. Additionally, development of the Arable Reversion Habitat Management Area (AR HMA) will occur prior to construction and will provide some resource to the geese and wintering waders. There is considered to be a sufficient extent of disturbance-free habitat during the first winter season to accommodate foraging birds. Approximately half of the AR HMA will be fully established and disturbance free during the second or third winter seasons providing suitable resources and disturbance-free land for the geese and to a lesser extent, lapwing and golden plover [Section 6.1.1.5 paragraph 161-164 of the RIAA]. The resulting temporary loss of foraging resources is not likely to cause reduction in survival/productivity. There will be no long-term adverse effects of noise or visual disturbance on the integrity of the European Site as a consequence of impacts to dark-bellied brent geese lapwing or golden plover [Section 6.1.1.5 paragraph 165-169 of the RIAA].
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