

ecology solutions ltd

HANBURY PROPERTIES LTD

LAND OFF SUMMER LANE
PAGHAM

**Information to enable a
Habitats Regulations Assessment
of the impacts on the
Pagham Harbour Ramsar / Special
Protection Area
pursuant to Regulation 61
of The Conservation of
Habitats and Species
Regulations 2010**

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1. INTRODUCTION

1.1. Background

- 1.1.1. Ecology Solutions was commissioned by Hanbury Properties Ltd to undertake ecological assessment work pursuant to the production of documentation in support of a planning application to be submitted in respect of land off Summer Lane, Pagham, West Sussex.
- 1.1.2. Specifically, Ecology Solutions were instructed to assess implications of the Development Proposals on nearby designated sites of European/international importance, namely the Pagham Harbour Special Protection Area (SPA) / Ramsar site.
- 1.1.3. The findings of this assessment work are set out within this 'Information to enable a Habitats Regulations Assessment' document, such that the competent authority (in this instance Arun District Council) has all the necessary information before it in order to carry out it's duties in considering the application in line with relevant planning policy and legislation, including specifically The Conservation of Habitats and Species Regulations 2010 (hereinafter referred to as the Habitats Regulations).
- 1.1.4. Development Proposals for the Application Site are for the provision of residential development (90 units) along with public open space, associated landscape and biodiversity measures and access.

1.2. Purpose of this Report

- 1.2.1. This report specifically assesses the potential significant effects of the Development Proposals on the nearby designated sites of European/international importance, including Pagham Harbour SPA / Ramsar site.
- 1.2.2. Specific regard is had to the test under Regulation 61(1) of the Habitats Regulations. Regulation 61(1) is described and considered further in Section 2 of this document.
- 1.2.3. Assessment under Regulation 61 of the Habitats Regulations is required in this instance given the Application Site's proximity to the Pagham Harbours SPA/Ramsar site. The proximity of the Application Site to these and other European designated sites is described in detail at Section 3 of this report and is also shown on Plan ECO1.
- 1.2.4. As part of this assessment, professional judgement has been applied in some instances in order to interpret information. Ecology Solutions is a member of the Institute of Ecology and Environmental Management and the Institute of Environmental Management and Assessment and its' professional ecologists are qualified to make such judgements where appropriate.

- 1.2.5. This document assesses the likely significant effects of the Development Proposals associated with the Application Site as a whole, both alone and in combination with other plans / projects.
- 1.2.6. It is the opinion of Ecology Solutions, following appropriate and detailed assessment that the Development Proposals would not result in a significant adverse effect on the nearby SPA/Ramsar site either alone or in combination with other plans or projects, and that as such the tests contained at Regulation 61(1) of the Habitats Regulations would not be failed and that there is no need therefore to undertake an Appropriate Assessment.

1.3. Application Site Characteristics

- 1.3.1. The Application Site is located at the western settlement boundary of Pagham, to the immediate north of Summer Lane. The surrounding landscape is dominated by existing residential development to the north, south and east. To the west lies land currently under arable cultivation.
- 1.3.2. The Application Site itself is dominated by arable land, and semi-improved (grazed) grassland with scrub and (predominantly dry) drainage ditches.

2. LEGISLATIVE AND PLANNING POLICY BACKGROUND

Legislation and relevant case law

- 2.1. The proximity of the Application Site to the nearby designated site of European/international importance, namely the Pagham Harbour SPA / Ramsar site means that the EC Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna (Habitats Directive) and the EC Directive on Wild Birds (the Birds Directive) are relevant in this instance. These two Directives are transposed in UK legislation through the Habitats Regulations (2010).
- 2.2. Pagham Harbour is also classified as a Ramsar site. The UK is a signatory to the Convention on Wetlands of International Importance Especially as Wildfowl Habitat 1971, commonly known as the Ramsar Convention after the town in which it was signed. Parties to the Ramsar Convention are obliged to designate particular sites as Wetlands of International Importance. The obligations imposed by the Convention are in themselves not particularly strong, in that they require the promotion and encouragement of the stated aims, rather than any specific action. However, as a matter of policy, Ramsar sites receive the same protection as designated SPAs and SACs. The procedures applicable to European sites are therefore to be applied to Ramsar sites, even though these are not European sites as a matter of law.
- 2.3. The relevant Directives and UK legislation are discussed below.

Habitats and Birds Directives

- 2.4. Under the EC Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna, commonly referred to as the Habitats Directive (Council Directive 92/43/EEC), Member States are required to take special measures to maintain the distribution and abundance of certain priority habitats and species (listed in Annexes I and II of the Directive). In particular each Member State is required to designate the most suitable sites as SACs. All such SACs will form part of the Natura 2000 network under article 3(1) of the Habitats Directive.
- 2.5. Article 2(3) sets out that member states have a duty, in exercising their obligations under the Habitats Directive to:

“.. take account of economic, social and cultural requirements and local characteristics.”
- 2.6. Under the EC Directive on Wild Birds (the Birds Directive) (Council Directive 2009/147/EEC, previously 79/409/EEC), Member States are required to take special measures to conserve the habitats of certain rare species of birds (listed in Annex I of the Directive) and regularly occurring migratory birds. In particular each Member State is required to classify the most suitable areas of such habitats as SPAs. This is designed to protect wild birds, and to provide sufficient diversity of habitats for all species so as to maintain populations at an ecologically sound level. All Bird Directive

SPAs will also be part of the Natura 2000 network under article 3(1) of the Habitats Directive.

- 2.7. Thus there is an obligation under the Habitats Directive and the Birds Directive for member states to designate sites before turning to measures for their protection.
- 2.8. The protection afforded to SPAs is delivered through Article 6 of the Habitats Directive. Article 6(2) requires member states to take appropriate steps to avoid the deterioration of natural habitats and disturbance of species for which the sites have been designated, in so far as the disturbance could be significant in relation to the objectives of the Directive. Article 6(3) and Article 6(4) require that a plan or project not directly connected with the management of the site, but likely to have a significant effect upon it, either individually or in combination with other plans or projects, must be subject to an appropriate assessment of its implications on the site, in view of the sites conservation objectives.
- 2.9. Having undertaken an appropriate assessment, the competent authority may agree to a plan or project where it can be concluded that it will not adversely affect the integrity of the site. In light of a negative assessment on the implications for the integrity of the site, Article 6(4) provides that the plan or project may still proceed where it can be demonstrated that there are no alternatives and there are imperative reasons of over-riding public interest as to why it must proceed. In the event that a plan or project is to proceed on the basis of imperative reasons of over-riding public interest, by direction of Article 6(4), compensatory measures must be put in place to ensure that the overall coherence of the Natura 2000 network is protected.

The Conservation of Habitats and Species Regulations 2010

- 2.10. The Conservation of Habitats and Species Regulations 2010, commonly referred to as the Habitats Regulations, transpose the requirements of the Habitats Directive and Birds Directive into UK legislation. The Habitats Regulations aim to protect a network of sites in the UK that have rare or important habitats and species in order to safeguard biodiversity. Note that the Conservation of Habitats and Species Regulations 2010 replace the Conservation (Natural Habitats &c.) Regulations 1994.
- 2.11. Under the Habitats Regulations, Competent Authorities have a duty to ensure that all the activities they regulate have no adverse effect on the integrity of any of the Natura 2000 sites. Regulation 61 of the Habitats Regulations requires that:

“61(1) A competent authority, before deciding to undertake, or give any consent, permission or other authorisation for a plan or project, which:-

 - (a) is likely to have a significant effect on a European site or a European offshore marine site in Great Britain (either alone or in combination with other plans or projects) and

- (b) is not directly connected with or necessary for the management of the site,

shall make an appropriate assessment of the implications for the site in view of that site's conservation objectives.

61(3) The competent authority must for the purposes of the assessment consult the appropriate nature conservation body and have regard to any representations made by that body within such reasonable time as the authority may specify.

61(5) In the light of the conclusions of the assessment, and subject to regulation 62, the authority shall agree to a plan or project only after having ascertained that it will not adversely affect the integrity of the European site.

61(6) In considering whether a plan or project will adversely affect the integrity of the site, the authority shall have regard to the manner in which it is proposed to be carried out or to any conditions or restrictions subject to which they propose that the consent, permission or other authorisation should be given."

- 2.12. Regulation 61 of the Habitats Regulations therefore sets out a two stage process. The first test is to determine whether the plan / project is likely to have a significant effect on the European site, the second test (if applicable) is to determine whether the plan / project will affect the integrity of the European site.
- 2.13. Some key concepts of the Habitats Directive and Habitats Regulations have been clarified through case law. The most pertinent cases in relation to Development Proposals are the "Waddenzee Judgement" and the "Dilley Lane Decision" and these are discussed below.

Waddenzee Judgement

- 2.14. In the 'Waddenzee' case the European Court of Justice considered the trigger for 'Appropriate Assessment'. It decided that an appropriate assessment is required for a plan or project where there is a probability or a risk that it will have a significant effect on the SPA. The Judgement states [at paragraph 3(a)] that:
- "...any plan or project not directly connected with or necessary to the management of the site is to be subject to an appropriate assessment of its implications for the site in view of the site's conservation objectives if it cannot be excluded, on the basis of objective information, that it will have a significant effect on that site, either individually or in combination with other plans or projects."
- 2.15. Hence the need for an appropriate assessment should be determined on a precautionary basis.

- 2.16. The Judgement gives clarity that the test of 'likely significant effect' should also be undertaken in view of the European sites conservation objectives. It is stated at paragraph 3(b)] that:

"where a plan or project not directly connected with or necessary to the management of a site is likely to undermine the site's conservation objectives, it must be considered likely to have a significant effect on that site."

- 2.17. Paragraph 4 of the Judgement emphasises the requirement for the appropriate assessment to rely on objective scientific information:

"...an appropriate assessment...implies that, prior to its approval, all the aspects of the plan or project which can, by themselves or in combination with other plans or projects, affect the site's conservation objectives must be identified in the light of the best scientific knowledge in the field. The competent national authorities, taking account of the appropriate assessment of the implications...for the site concerned in the light of the site's conservation objectives, are to authorise such an activity only if they have made certain that it will not adversely affect the integrity of that site. That is the case where no reasonable scientific doubt remains as to the absence of such effects."

Dilly Lane Decision

- 2.18. The Secretary of State's decision to allow an appeal in relation to applications for a total of 170 new homes on a greenfield site off Dilly Lane, Hartley Witney was challenged in High Court by Hart District Council. The legal challenge was made on the grounds that the Secretary of State had erred in departing from her Inspector's conclusions as to the effects on the Thames Basin Heaths SPA. A key issue for the case was whether mitigation measures should be disregarded when assessing whether the project would have a significant effect on the SPA. Mr Justice Sullivan ruled in favour of the Secretary of State after concluding that there was no absolute legal rule that mitigation measures should be disregarded in assessing whether the new homes would have significant effect on the SPA. Mr Justice Sullivan states at paragraph 55 of his judgement:

"The competent authority is not considering the likely effect of some hypothetical project in the abstract. The exercise is a practical one which requires the competent authority to consider the likely effect of the particular project for which permission is being sought. If certain features (to use a neutral term) have been incorporated into that project, there is no sensible reason why those features should be ignored at the initial, screening, stage merely because they have been incorporated into the project in order to avoid, or mitigate, any likely effect on the SPA."

- 2.19. As such, it is right and proper that mitigation or avoidance measures, which form a feature of a plan / project should be viewed as integral to the plan / project and not excluded when considering the likely significance test at Regulation 61(1).

Sweetman Case

- 2.20. Further guidance in relation to the consideration of impacts in the light of the Habitats Regulations is provided in the Sweetman case. The case as set out by the Advocate General considered in detail the test for likely significant effect in paragraphs 50 and 51:

“50. The test which that expert assessment must determine is whether the plan or project in question has ‘an adverse effect on the integrity of the site’, since that is the basis on which the competent national authorities must reach their decision. The threshold at this (the second) stage is noticeably higher than that laid down at the first stage. That is because the question (to use more simple terminology) is not ‘should we bother to check’ (the question at the first stage) but rather ‘what will happen to the site if this plan or project goes ahead; and is that consistent with “maintaining or restoring the favourable conservation status” of the habitat or species concerned’...

51. It is plan, however, that the threshold laid down at this stage of Article 6(3) may not be set too high, since the assessment must be undertaken having rigorous regard to the precautionary principle. That principle applies where there is uncertainty as to the existence or extent of risks. The competent national authorities may grant authorisation to a plan or project only if they are convinced that it will not adversely affect the integrity of the site concerned. If doubt remains as to the absence of adverse effects, they must refuse authorisation.”

- 2.21. The Court of Justice of the European Union (CJEU) agreed with the Advocate General’s conclusions, and held:

“40. Authorisation for a plan or project, as referred to in Article 6(3) of the Habitats Directive, may therefore be given only on condition that the competent authorities – once all aspects of the plan or project have been identified which can, by themselves or in combination with other plans or projects, affect the conservation objectives of the site concerned, and in the light of the best scientific knowledge in the field – are certain that the plan or project will not have lasting adverse effects on the integrity of that site. That is so where no reasonable scientific doubt remains as to the absence of such effects.”

- 2.22. Hence a plan or project may be authorised only if no reasonable scientific doubt remains as to the absence of effects. Reasonable scientific doubt will exist if the evidence is not sufficiently conclusive, or if there are gaps in the information.

Guidance and other Relevant Documents

- 2.23. Guidance on the interpretation of key terms and concepts contained within the European and UK legislation of relevance to European designated sites is provided through several documents issued by the European

Commission and national organisations such as the JNCC and Natural England. This guidance is discussed below.

Natura Standard Data Forms

- 2.24. A standard reporting format has been developed for Natura 2000 sites (SPAs and SACs) to ensure that the relevant site selection information is reported and stored in a consistent manner which can be easily made available.
- 2.25. A standard reporting form for SPAs and SACs was developed by the European Commission and published in 1996. The form is used for all sites designated, or proposed to be designated as SPAs and SACs under the relevant Directives, with the information to be stored on a central database.
- 2.26. Article 4 of the Habitats Directive provides the legal basis for providing the data. Article 4 states that information shall include a map of the site, its name, location, extent and the data resulting from application of the criteria specified in Annex III and that this shall be provided in a format established by the Commission. Under Article 4 (paragraph 3) of the Birds Directive Member States are required to provide the Commission with all relevant information to enable it to take any appropriate steps in order to protect relevant species in areas where the Directive applies.
- 2.27. Whilst it is the relevant country agency (i.e. Natural England) that is responsible for designating a site, it is the JNCC who are responsible for collating the lists of European and international designated sites, together with relevant supporting information. The Nature 2000 Data Forms for SPAs and SACs are therefore made available by the JNCC.
- 2.28. Within the explanatory notes for Natura Standard Data Forms (European Commission 1996) the following “main objectives” of the Natura data form / database are given:
1. “to provide the necessary information to enable the Commission, in partnership with the Member States, to co-ordinate measures to create a coherent NATURA 2000 network and to evaluate its effectiveness for the conservation of Annex I habitats and for the habitats of species listed in Annex II of Council Directive 92/43/EEC as well as the habitats of Annex I bird species and other migratory bird species covered by Council Directive 79/409/EEC.”
 2. “to provide information which will assist the Commission in other decision making capacities to ensure that the NATURA 2000 network is fully considered in other policy areas and sectors of the Commission's activities in particular regional, agricultural, energy, transport and tourism policies.”
 3. “to assist the Commission and the relevant committees in choosing actions for funding under LIFE and other financial instruments where data relevant to the conservation of sites,

such as ownership and management practice, are likely to facilitate the decision making process.”

4. “to provide a useful forum for the exchange and sharing of information on habitats and species of Community interest to the benefit of all Member States.”

Managing Natura 2000 Sites (European Communities 2000)

- 2.29. The document entitled “Managing Natura 2000 Sites the provisions of article 6 of the Habitats Directive 92/43/CEE”, published by the European Commission in 2000, provides guidelines to the Member States on the interpretation of certain key concepts used in Article 6 of the Habitats Directive. It should be noted that the section relating to Article 6(4) has subsequently been replaced through the publication of a further guidance document by the European Commission in 2007 entitled “Guidance document on Article 6(4) of the ‘Habitats Directive’, which is considered below under the relevant heading.
- 2.30. This document states at Section 2.3.3 that conservation measures must correspond to the ecological requirements of the habitats and species present for which the site is designated and that these requirements “involve all the ecological needs necessary to ensure their favourable conservation status”.
- 2.31. At section 3.5 the guidance states, in relation to deterioration and disturbance of habitats or species:

“Deterioration or disturbance is assessed against the conservation status of species and habitats concerned. At a site level, the maintenance of the favourable conservation status has to be evaluated against the initial conditions provided in the Natura 2000 standard data forms when the site was proposed for selection or designation, according to the contribution of the site to the ecological coherence of the network. This notion should be interpreted in a dynamic way according to the evolution of the conservation status of the habitat or the species.”
- 2.32. Section 4.4.1 sets out that in determining what may constitute a likely ‘significant’ effect one should take into account the conservation objectives for the site and other relevant baseline information. In the second paragraph of this section of the document it is stated:

“In this regard, the conservation objectives of a site as well as prior or baseline information about it can be very important in more precisely identifying conservation sensitivities.”
- 2.33. Section 4.5.3 of the document sets out the duty of member states to provide certain specific information in support of the inclusion of a site within the Natura 2000 network. This information is to be provided in a format specified by the European Commission (the Natura 2000 Standard Data Form).

- 2.34. A link is drawn between the Standard Data Form and the formation of the sites conservation objectives within the text box at the end of section 4.5.3 of the guidance where it is stated:

“The information provided according to the standard data form established by the Commission forms the basis for a Member State’s establishment of the site’s conservation objectives.”

- 2.35. With regard to an assessment of the effects of a plan / project on the integrity of a site, the ‘integrity of the site’ is defined at Section 4.6.3 as:

“... the coherence of the site’s ecological structure and function, across the whole area, or the habitats, complex of habitats and / or populations of species for which the site is or will be classified.”

- 2.36. The guidance is clear, within the text box at the foot of page 39, that an assessment as to the implications of the plan / project on the integrity of the site should be limited to an assessment against the sites conservation objectives:

“The integrity of the site involves its ecological functions. The decision as to whether it is adversely affected should focus on and be limited to the site’s conservation objectives.”

- 2.37. Section 5 of the document deals with Article 6(4) of the Habitats Directive. Note that this section has been expanded upon, and replaced by further guidance issued by the European Commission entitled “Guidance document on Article 6(4) of the Habitats Directive 92/43/EEC” (2007). This document is dealt with below at paragraphs 2.57 – 2.61.

Assessment of Plans and Projects Significantly Affecting Natura 2000 sites- Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (European Commission 2001)

- 2.38. This document, published by the European Commission in 2001, gives guidance on carrying out and reviewing those assessments required under Article 6(3) and (4) of the Habitats Directive. It is provided as supplementary guidance and does not over-ride or replace any of that set out within Managing Natura 2000 (European Commission 2000) which as stated at page 6 of the document, “is the starting point for the interpretation of the key terms and phrases contained in the Habitats Directive”. The guidance provided is not mandatory and it is clearly set out that its use is “optional and flexible” and that it is for “Member States to determine the procedural requirements deriving from the directive”.

- 2.39. The guidance sets out the key stages in following the tests contained within the Habitats Directive. Pertinent to this application, stages one and two are relevant. Stage one is the screening stage assessing the likelihood of a plan / project resulting in a significant effect upon the European site. The second comprises the appropriate assessment.

- 2.40. Section 3.2.4 is concerned with Appropriate Assessment and specifically, the assessment against the conservation objectives of the European Site. Box 9 provides a list of five example conservation objectives for differing broad habitat types. One such example, that for a coastal site, taken from Box 9 is provided below:

“to maintain the status of the European features of this coastal site in favourable condition, allowing for natural change. Features include coastal shingle vegetation and lagoons (within a candidate special area of conservation (SAC), which is also an SPA).”

Internal Guidance to decisions on ‘Site Integrity’: A framework for provision of advice to competent authorities (English Nature 2004)

- 2.41. Natural England (formerly English Nature) has produced an internal guidance document on the provision of advice to competent authorities regarding the concept of “site integrity” in undertaking an appropriate assessment.

- 2.42. This guidance sets out a definition for integrity. It states that integrity is considered at the site level and gives the following definition, as taken from PPG9:

“The coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and / or levels of populations of the species for which it was classified”.

- 2.43. Integrity is further defined within section 3.0 where it is stated that:

“In a dynamic context ‘integrity’ can be considered as a site having a sense of resilience and ability to evolve in ways that are favourable to conservation.”

- 2.44. The need to maintain, or restore the site to, favourable conservation status is dealt with in the final paragraph of section 3.0. Natural England quotes guidance issued jointly by the Environment Agency, English Nature and Countryside Council for Wales.

- 2.45. The guidance provides a checklist within section 4.1, for assessing the likelihood of an adverse effect on integrity occurring as a result of the proposed plan / project. It is stated that if the answer to all of the questions posed within the checklist is “yes” then it is reasonable to conclude that there will be no adverse effect upon integrity. In the event that one or more of the answers is no, then the guidance suggests that a series of further site specific factors, listed at 4.2 – 4.7 of the guidance must be.

Common Standards Monitoring (JNCC February 2004)

- 2.46. Common Standards Monitoring is a means by which condition objectives for habitats, species, or other features of designated sites (e.g. SSSIs and SPAs) are set based on key attributes of the features.
- 2.47. The Joint Nature Conservation Committee (JNCC) and the country Conservation Agencies (e.g. Natural England) developed guidance on the setting and assessing of condition objectives, as required under the Birds and Habitats Directives and set out a framework for this in 1999. This framework is provided in the form of Common Standards Monitoring (CSM) guidance which comprises a suite of documents including an "Introduction to the Guidance Manual on Common Standards Monitoring" and several species / habitat specific documents, including those for lowland heathland, birds, reptiles and invertebrates. The Introduction to the Guidance Manual covers various relevant concepts and terms. It also provides a background to the setting of conservation objectives and sets out the desired approach to setting targets, monitoring, management and reporting on conservation measures in designated sites.
- 2.48. The Introduction to CSM Guidance and CSM guidance for individual site attributes (e.g. its bird or reptile interest) set out specific criteria regarding the identification of interest features, targets and methods of assessment. There is in-built flexibility and allowances for 'judgements to be made' when assessing, for example, favourable condition.
- 2.49. It is understood that Natural England applies the Common Standards Monitoring approach to European designated sites through an assessment of the SSSI unit condition. This is undertaken on a cycle of approximately 6 years. The assessment does not relate to the Conservation Objectives of the European site, but provides a tool for tailoring future management of the SSSI such that favourable condition of the interest features can be maintained or restored as appropriate.

National Planning Policy Framework (2012) and ODPM / Defra Circular (ODPM & Defra, 2005)

- 2.50. Paragraphs 113 and 118 of the National Planning Policy Framework (2012) are of direct relevance. Paragraph 113 is concerned with the hierarchy of international, national and locally designated sites such that "protection is commensurate with their status and gives appropriate weight to their importance and the contribution that they make to wider ecological networks". Bullet point six at paragraph 118 asserts that Ramsar sites, proposed SPAs, SACs and sites providing compensatory measures for adverse effects on European sites should be afforded the same level of protection as classified SPAs and designated SACs.
- 2.51. Guidance on the determination of whether an effect on a European designated site is likely to be significant, together with the scope of appropriate assessments and ascertaining the effect on the integrity are provided within the DEFRA Circular (ODPM & DEFRA, 2005). This DEFRA Circular was published in relation to Planning Policy Statement 9 (PPS(9),

which has recently been superseded by the National Planning Policy Framework (2012). However, the National Planning Policy Framework retains reference to the DEFRA Circular (2005), which to date has not been replaced or subject to any amendment.

- 2.52. With respect to the significance test, the DEFRA Circular states at paragraph 13 that:

“The decision as to whether an appropriate assessment is necessary should be made on a precautionary basis”.

- 2.53. The Waddenzee Judgement is specifically referred to at paragraph 13 of the Circular. With regards to the need to undertake an appropriate assessment; this is only required where it is not possible to conclude, on the basis of objective information, that the plan / project will not have a significant effect on the European site, either individually or in combination with other plans / projects.

- 2.54. Paragraph 14 clarifies that in considering the likely significance of an effect, the decision taker should assess whether the effect would be significant in terms of the sites conservation objectives.

- 2.55. Paragraph 15 clarifies the importance of assessing the likely significant effect on each of the interest features for which the site is designated.

- 2.56. Guidance on the scope of an Appropriate Assessment is provided at paragraph 17:

“If the decision-taker concludes that a proposed development (not directly connected with or necessary to the management of a site) is likely to significantly affect a European site, they must make an appropriate assessment of the implications of the proposal for the site in view of the site’s conservation objectives. These relate to each of the interest features for which the site was classified... The scope and content of an appropriate assessment will depend on the nature, location, duration and scale of the proposed project and the interest features of the relevant site. It is important that an appropriate assessment is made in respect of each interest feature for which the site is classified; and for each designation where a site is classified under more than one international obligation...”

- 2.57. At paragraph 20 the definition of “integrity” for the purpose of interpreting the tests contained within the Habitats Regulations is given as:

“The integrity of a site is the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified.”

- 2.58. The DEFRA Circular includes a flow diagram (see Appendix 1) setting out the series of steps competent authorities are required to take in considering proposals affecting Internationally designated Nature Conservation Sites.

This is based on the information and flow charts given in guidance issued by the European Commission (European Commission Environment DG, 2001).

- 2.59. The information contained within this report follows the steps outlined in the flow diagram and takes account of the EC guidance on the basis of information currently available on the nature of the development in relation to those Internationally Designated Nature Conservation Sites identified within this assessment. Professional judgement has been applied to interpret this information within the context of the sites' conservation objectives and the criteria under which they are designated.

Guidance document on Article 6(4) of the 'Habitats Directive' (European Commission 2007)

- 2.60. This document, published by the European Commission in 2007, is intended to provide clarification on key terms / concepts as referred to within "Managing Natura 2000 Sites" and replaces the section on Article 6(4) within that earlier document.

- 2.61. The Guidance document covers, in particular, the concepts of Alternative Solutions, Imperative Reasons of Overriding Public Interest, Compensation Measures, Overall coherence and the Opinion of the Commission.

- 2.62. With regard to ensuring the quality of an appropriate assessment, and to define exactly what needs to be compensated, it is stated at Section 1.3 that:

"Assessment procedures of plans or projects likely to affect Natura 2000 sites should guarantee full consideration of all elements contributing to the site integrity and to the overall coherence of the network, both in the definition of the baseline conditions and in the stages leading to identification of potential impacts, mitigation measures and residual impacts. These determine what has to be compensated, both in quality and quantity."

- 2.63. The need to use information contained within the Natura Standard Data Form, in tandem with the sites conservation objectives when undertaking an appropriate assessment is specifically referred to (under the second hyphenated point at Section 1.3 on page 5).

- 2.64. Section 1.3.2 gives guidance on the application of Article 6(4) in respect of reasons of overriding public importance and Section 1.4.1 gives guidance on the application of Article 6(4) in respect of compensatory measures.

Conservation Objectives

- 2.65. The Conservation Objectives for SPAs and SACs are published by Natural England. Those for Pagham Harbour SPA are included at Appendix 2.

3. SITE LOCATIONS

3.1. The Pagham Harbour SPA/Ramsar site is located to the south-west of the Application Site, approximately 1km away at its closest point. Other European / international designated sites are located at considerably greater distances. For completeness, the Chichester and Langstone Harbours SPA / Ramsar site and the Solent Maritime Special Area of Conservation (SAC) are located approximately 6.6km to the west of the Application Site at their closest point. There are no other such sites within 10km of the Application Site.

3.2. Consideration has been given to potential significant effects occurring on the Chichester and Langstone Harbours SPA / Ramsar site and the Solent Maritime SAC. It is considered that given the distances involved, the Development Proposals would not be likely to give rise to a significant effect on these sites, when the project is considered either alone or in combination with other plans or projects. This conclusion is also reflected within the "Interim Policy Statement on Development and Disturbance of Birds in Special Protection Areas and identified Compensatory Habitats" document (April 2014) published by Chichester District Council. It is stated that:

"Through the Solent Disturbance and Mitigation Project (SDMP), Councils across the Solent have identified a "zone of influence" surrounding the Chichester & Langstone Harbours SPA/SAC site that extends to 5.6km from the Special Area of Conservation(SAC) boundary. Accordingly, the Council will approach consideration of planning applications within the zone as set out below."

3.3. In this instance, the Application Site falls well outside of the identified zone of influence. No further consideration is therefore required in relation to potential effects on the Chichester and Langstone Harbours SPA / Ramsar site and the Solent Maritime SAC.

3.4. Pagham Harbour SPA / Ramsar site

3.4.1. Pagham Harbour SPA / Ramsar Site covers an area of 636.68ha, the SPA boundary being consistent with that of the Ramsar Site. The relevant Natura Standard Data Form and Ramsar Information Sheet are included at Appendix 3.

3.4.2. Pagham Harbour SPA / Ramsar Site comprises one underpinning SSSI, namely Pagham Harbour SSSI. The citation for this SSSI is included at Appendix 3.

3.5. Relationship between the SPA / Ramsar sites and the Application Site

3.5.1. The relationship between the relevant SPA / Ramsar Site is shown on Plan ECO1.

4. CONSERVATION STATUS OF THE PAGHAM HARBOUR SPA / RAMSAR SITE

4.1. SPA Qualifying Features

- 4.1.1. Pagham Harbour SPA (and Ramsar site) comprises an estuarine basin with an extensive central area of saltmarsh and intertidal mud-flats, surrounded by lagoons, shingle, open water, reed swamp and wet grassland. The mud-flats are rich in invertebrates and algae, which provide feeding areas for birds. Areas of lower saltmarsh are dominated by Common Cord-grass *Spartina anglica*, with patches of Glasswort *Salicornia* spp.
- 4.1.2. Pagham Harbour SPA qualifies under Article 4.1 of the Birds Directive on account of it supporting breeding populations of Little Tern *Sterna albifrons*, Common Tern *Sterna hirundo*, together with over-wintering Ruff *Philomachus pugnax*.
- 4.1.3. The site further qualifies under Article 4.2 of the Birds Directive on account of it supporting important populations of over-wintering Dark-bellied Brent Goose *Branta bernicla*.
- 4.1.4. The Natura 2000 Standard Data Form for the SPA is included in Appendix 3.

4.2. Ramsar site Qualifying Features

- 4.2.1. Pagham Harbour Ramsar site qualifies under Ramsar criterion 6 on account of it supporting important populations of wintering Dark-bellied Brent Goose. Black-tailed godwit *Limosa limosa islandica*, are cited on the Ramsar Information Sheet as being identified subsequent to designation for possible future consideration under Criterion 6.
- 4.2.2. The Ramsar Information Sheet for the Ramsar site is included in Appendix 3.

4.3. Condition of SPA Ramsar Habitats

- 4.3.1. Habitat information for each of the management units of the Pagham Harbour SSSI is given within the 'condition assessment comment' included within the documents at Appendix 4. There are currently 23 management units, of which the majority are documented as being in "favourable condition", with the condition of six units being documented as either "unfavourable recovering" or 'unfavourable no change'.
- 4.3.2. Favourable condition for the SSSI is defined as being adequately conserved and meeting its 'conservation objectives'. Nonetheless, it is stated that there is scope for the enhancement of these SSSIs (SPA / SAC / Ramsar site).
- 4.3.3. The citations for the SSSI is included at Appendix 3.

4.4. Conservation Objectives

- 4.4.1. The Habitats Regulations require an appropriate assessment to be undertaken “in view of the site’s nature conservation objectives”. Conservation objectives are a statement of the measures required to maintain at, or restore to, favourable conservation status the natural habitats and / or the populations of species of wild fauna and flora for which the site has been selected. The conservation status of a species is defined as favourable when the population, range and natural habitats of the species are stable or increasing. Similarly the conservation status of a habitat is favourable when the range, structure and function, and typical species thereof, are stable or increasing.
- 4.4.2. The Conservation Objectives for the Pagham Harbour SPA / Ramsar site are included at Appendix 2.

4.5. Pagham Harbour SSSI qualifying features

- 4.5.1. Pagham Harbour SSSI is designated on account of ecological and geological interest features. In relation to ecological matters, the site contains an extensive area of salt-marsh with tidal mudflats, shingle, open water, reed swamp and wet grassland. The site is of national importance for wintering wildfowl and waders and also for breeding birds within the harbour and the surrounding pasture. In addition, the site supports nationally important communities of plants and invertebrates.
- 4.5.2. Whilst the main purpose of this document is to address potential significant effects on the Pagham Harbour SPA / Ramsar site, given the underpinning nature of the SSSI designation and the consistency of site boundaries consideration is also give to effects on the SSSI where relevant.

5. ASSESSMENT OF THE IMPLICATIONS OF THE DEVELOPMENT PROPOSALS FOR THE SPA / RAMSAR SITE CONSERVATION OBJECTIVES

- 5.1. Section 2 of this document sets out the legislation, guidance and case law of relevance to an assessment of the implications of a plan / project on a European site. Having regard to this legislation and supporting guidance it is clear that the assessment is a two stage process, the first being the 'likely significant effect' stage, the second being the 'integrity test'.
- 5.2. It is clear that the Conservation Objectives of the European site are the most important consideration in determining whether the plan / project will have an adverse effect on the site, including any effects on its integrity. Indeed, some guidance indicates that it is only the Conservation Objectives against which the plan / project should be tested in line with the Habitats Directive / Regulations. However, other European guidance implies that additional information is relevant.
- 5.3. It is evident that there is a clear hierarchical approach to assessing effects on European sites in line with the Habitats Directive / Regulations. The primary test is that against the Conservation Objectives (now updated to include specific reference to qualifying interest features) with other considerations following these. Such other considerations would include:
- Other features of interest associated with the site; and
 - Other relevant baseline information for the site.
- 5.4. In line with the above, whilst the qualifying interest features of the site and other baseline information have informed this assessment, the greatest weight has been placed upon the formal conservation objectives for the European site, as set out by Natural England.
- 5.5. This section includes a description of the potentially significant effects arising from the Development Proposals at the Application Site on the integrity of the Pagham Harbour SPA / Ramsar site. The potential effects are assessed within this section in order to address the test under Regulation 61(1) in the first instance. The assessment of potential significant effects is undertaken at this stage of the Development Proposals "alone" (i.e. not "in combination").
- 5.6. In undertaking this assessment, consideration has been given to the best available scientific knowledge. An appropriate assessment (if required) could therefore be undertaken consistent with the *Waddenzee* Judgement, which requires the use of the best scientific knowledge to inform a decision where no reasonable scientific doubt remains as to the presence and / or absence of effects that would adversely affect the integrity of the designated site (see Section 2 above). Furthermore, consideration is given to the *Dilly Lane* High Court Judgement; whereby it is deemed right and proper to consider the mitigation designed into the plan / project as being an integral part of the plan / project and that as such, they should not be viewed separately (see section 2 above).

5.7. Potential Impacts on the Pagham Harbour SPA / Ramsar site in the absence of Mitigation

- 5.7.1. Given that the reasons for classification as an SPA and designation as a Ramsar Site are essentially similar, it is reasonable to consider the potential for impacts upon the two designations as one rather than undertake a separate assessment for each.
- 5.7.2. Given the separation of the Application Site from the SPA/Ramsar site it is considered that there would be no significant effects from lighting, air quality or noise impacts during the construction or operational phases of the Development Proposals.
- 5.7.3. Potential pathways for significant effects are considered to be limited to the following:
- Disturbance effects (dog walking, walking);
 - Hydrological impacts;
 - Loss of supporting habitat for qualifying bird interest features of the SPA / Ramsar site, or disturbance to such species using supporting habitat.
- 5.7.4. It is considered that the proposed development could have an indirect effect on the qualifying features of the Pagham Harbour SPA / Ramsar in respect of increased visitor pressure, prior to mitigation. Furthermore, any increases in water discharge rates into the SPA /Ramsar site could result in a potential significant adverse effect. These identified pathways for effects are discussed in detail below.

Disturbance effects (on qualifying bird species)

- 5.7.5. Given the distances involved, it is considered that there is potential for new residents associated with the proposed development to access areas of the SPA / Ramsar site (e.g. for recreational purposes), thereby increasing visitor pressure on the site and potentially disturbing birds, including those listed as designating features of the site.
- 5.7.6. The SPA / Ramsar site is designated on account of its breeding and over-wintering bird populations (see Section 4) and as such, it is considered that effects are associated with both the spring / summer and winter periods. During winter, birds are susceptible to adverse effects through disturbance due to food sources being scarcer and efficient use of energy being of heightened importance to survival. During the breeding season, disturbance can result in adult birds being flushed from nests, leaving eggs or young exposed to the elements and predation. Prolonged or repeated disturbance can cause the adults to abandon a nest site.

Assessing visitor impacts

- 5.7.7. The proposals are for the construction of 90 residential units.

5.7.8. The average number of residents per household within the Arun District¹ is 2.2. On this basis, the new development could give rise to a population of 198 additional people.

5.7.9. In order to inform the assessment into potential occupancy rates, adopted guidance produced by Natural England in relation to the Strategic Access Management and Monitoring Project for the Thames Basin Heaths (TBH) SPA has been used as a guide. In defining occupancy figures for homes a range of data sets were analysed by Natural England, including information from Surrey County Council, the North East Hampshire Transport Strategy and Wokingham Borough Council. Using this data Natural England define an average occupancy rate for dwellings, "selected on a precautionary basis", as follows:

1 bedroom	1.4 people
2 bedrooms	1.85 people
3 bedrooms	2.5 people
4 bedrooms	2.85 people
5+ bedrooms	3.7 people

5.7.10. It is considered that the above figures are suitable to use in a precautionary assessment into occupancy rates at the Application Site. This calculation is shown below in Table 1:

No Beds	Unit No's	Occupancy Rate	People
1	12	1.4	16.8
2	34	1.85	62.9
3	34	2.5	85
4	10	2.85	28.5
Total	90		193.2

Table 1: Number of new residents generated based on the indicative housing mix submitted as part of the outline planning application.

5.7.11. It is therefore considered that the Development Proposals would generate between 117 and 198 new residents. Given the housing mix, it can be expected that the number of new residents would be towards the lower end of this threshold.

5.7.12. Some of these new residents would be expected to own pets, including dogs and access to nearby recreational areas for dog walking will be required. Whilst noting the presence of public rights of way close to the Application Site, in the absence of suitable, additional open space provision in the immediate vicinity of the new dwellings, it is possible that new residents would access the SPA / Ramsar site on a more regular basis than would otherwise be the case.

¹ 2011 Census, Office for National Statistics

- 5.7.13. The Development Proposals provide for a significant area of open space for informal recreation, including dog walking and this is discussed further below in respect of mitigation measures.
- 5.7.14. On the basis of emerging planning policy and guidance in respect of the effects of new residential developments in the district, a package of mitigation and avoidance measures aimed at mitigating / avoiding recreational impacts on the SPA / Ramsar site has been put forward. This is discussed further below in Section 6.

Hydrological impacts

Vulnerability

- 5.7.15. Estuarine habitats are susceptible to toxic contamination, sedimentation and erosion, with the later two affecting the structure of the habitats present. Toxic contamination has the potential to kill off benthic, and other invertebrates as well as plant species. Via the uptake of toxins by these groups, knock on effects on organisms further up the food chain (e.g. birds) are also possible.

Predicted Impacts

- 5.7.16. There is no watercourse (e.g. river, stream) within or adjacent to the Application Site, which would offer a direct hydrological link with the SPA/Ramsar site. The Pagham Rife is located approximately 0.8km to the west of the Application Site at its closest point. Field drains / ditches in the local area may offer potential hydrological connectivity to the SPA / Ramsar site, although from studying the relevant Ordnance Survey map, there appears to be no direct link with several gaps in the network. In the event that a link does exist, via sub-surface field drains and culverts, discharge to the SPA / Ramsar site would be over a distance in excess of 1.5km.
- 5.7.17. Specific consideration has been given to the proposed surface water and foul water drainage strategies associated with the proposals.
- 5.7.18. Noting the lack of direct hydrological connectivity between the Application Site and wider ditch / drainage network (discharging to the SPA / Ramsar site), it is considered that activities during the construction phase would be highly unlikely to result in adverse effects on the SPA / Ramsar site (e.g. through contaminated surface water run-off). In any event, mitigation measures will be in place to deal with any contamination issues during the construction phase. Such measures would include the provision of spill kits to machine operators, use of interceptors/bunds where appropriate and agreed safe storage protocols for any chemicals on site.
- 5.7.19. During the operational phase of development it is considered that potential effects would be limited to the following:

- Contamination of the local hydrological system (surface water run-off);
 - A change in water discharge rates into Pagham Harbour as a result of the drainage (storm water) strategy;
 - A change in water discharge rates into Pagham Harbour as a result of the foul water treatment strategy.
- 5.7.20. Consideration has been given to potential toxic contamination of the hydrological system during the operational phase. Given the distances involved (as set out above in relation to the construction phase), and the mitigation incorporated into the scheme in relation to the surface water drainage strategy (see below), it is considered that there would be no likely significant effects on the SPA / Ramsar site.
- 5.7.21. With regard to potential changes in water discharge rates into Pagham Harbour, both the surface water drainage (storm water) and foul water strategies are key.
- 5.7.22. An inappropriately designed surface water drainage strategy could, either directly or indirectly alter ground water run-off or infiltration rates, with the result that a greater 'load' is placed on the local drainage network.
- 5.7.23. The surface water drainage strategy will utilise a SUDS based system, with appropriately designed attenuation features. There will be no direct discharge of surface water into the local drainage network and natural infiltration levels would not be above the current 'green field' run off rate. The fine detail of the drainage strategy will be agreed with the Environment Agency, providing a further level of comfort to the decision taker on this matter.
- 5.7.24. It is considered that there would be no potential significant effect on the SPA / Ramsar site or the SSSI as a result of the surface water drainage strategy.
- 5.7.25. Regarding the treatment of foul and storm water, it is proposed that this will be discharged directly to Pagham Waste Water Treatment Works (WWTW). Waste water will either be pumped, or a gravity system may be employed depending on the results of further work to be undertaken at the detailed design stage. It is understood that the Pagham WWTW has sufficient capacity and that ('clean' water) discharge rates from the WWTW would not be adversely affected.
- 5.7.26. On the basis of the above, it is considered that the Development Proposals would not have a significant effect on the SPA / Ramsar site or SSSI as a result of hydrological impacts and no additional specific mitigation measures are considered necessary.

Supporting Habitat

- 5.7.27. It is necessary to give specific consideration to the extent to which land associated with the Development Proposals could be classed as 'supporting habitat' to the SPA / Ramsar site. Supporting habitat is that which, whilst not designated, plays an important role in the maintenance of populations of qualifying bird interest features at the SPA / Ramsar site. This would include, for example, land which provides an important foraging resource for such species. In some instances, adverse impacts on supporting habitat can lead to a conclusion that the plan / project is likely to have a significant effect on the European designated site.
- 5.7.28. The Application Site, and additional land which will come forward as open space provision has been assessed to determine whether qualifying bird interest features of the SPA / Ramsar site would be in any way dependent upon the habitat features present.
- 5.7.29. Of the listed qualifying bird interest features for the SPA / Ramsar site, the only species which requires more detailed consideration is Dark-bellied Brent Goose. This species is known to utilise arable land in the local area for foraging. Other qualifying bird interest features (Tern sps and Ruff) would not be reliant upon the land in question given the habitats present and the specific requirements of these species.
- 5.7.30. With specific regard to the wintering habitats of Brent Geese, investigations have found that they are most likely to forage on short dense swards of dry, improved grasslands with a high abundance of perennial Rye-grass *Lolium perenne* and an area of between 5 and 6 ha, located up to 1.5 km inland and 4-5 km along the coast from coastal roosting sites (Vickery and Gill 1999). In addition, this species has increasingly taken to grazing on cultivated grasslands and winter cereal fields near the coast (Scott and Rose 1996).
- 5.7.31. Winter waterfowl surveys, undertaken by Aluco Ecology Ltd during the period November 2014 – March 2015 recorded no use of the Application Site or land proposed for open space provision by Dark-bellied Brent Goose, or indeed any waterfowl. Relevant survey information is presented at Appendix 5.
- 5.7.32. Noting the fact that Dark-bellied Brent Geese will forage on different fields, year to year, depending on the crops present, further analysis has been undertaken into the potential importance of the Application Site and surrounding land for this species.
- 5.7.33. In broad terms the development footprint includes compartmentalised and enclosed, (horse grazed) grassland with a ruderal component and land under arable cultivation. Noting the preference of this species for large areas of open habitat, it would be expected that they would avoid the grassland component of the Application Site. With regard to the arable field, this is approximately 3ha in size and thus is well below the optimal field size.

- 5.7.34. Consideration has been given to the fact that a significant amount of agricultural land (including that under arable cultivation) is present in the wider landscape.
- 5.7.35. The boundaries of the arable field within the development footprint are defined by clear boundary features including existing built form, a road and vegetated field margins. Thus, whilst the field is broadly contiguous with other arable habitat to the south and east it does have an enclosed feel. The development footprint is bounded to the north and east by existing residential development and the proximity to the existing settlement boundary will also play a part in dissuading Dark-bellied Brent Geese from using it. The same applies for the land proposed to deliver open space provision, south of Summer Lane, which also has existing development to the north and east. It is considered that these factors would deter use by this species even if crops were present which provided an optimal foraging resource.
- 5.7.36. In addition to the site specific survey work undertaken, pre-existing information has been sought on the recorded abundance of this species in the locality of the Application Site.
- 5.7.37. It is understood from conversations with the relevant Natural England Officer, that the specific area in question (Application Site and surrounding arable land, north east of the SPA) was considered of 'low' importance for the species, based on survey work undertaken several years ago. Further information on Dark-bellied Brent Goose numbers for the Application Site and surrounding area was sought from Natural England, the Royal Society for the Protection of Birds (RSPB), the British Trust for Ornithology, Wetland Bird Survey (WeBS) and Sussex Biological Records Centre. Natural England, RSPB and the BTO referred Ecology Solutions to WeBS for detailed information. Natural England also advised that the Sussex Biological Records Centre should be contacted.
- 5.7.38. Pre-existing survey information is presented at Appendix 6. This information shows that the Application Site and land in the immediate vicinity is of limited importance to Dark-bellied Brent Geese in the context of the habitats in closest proximity to the SPA / Ramsar site.
- 5.7.39. As can be seen from the SxBRC information presented at Appendix 6, only historic records (from 1986) exist for this species within quadrat G, within which the proposed development footprint is located. The data also shows historic use of habitat within Quadrat E (into which the development footprint extends), with such use almost certainly focussed on the large area of arable habitat in the northeast. In relation to Quadrat D, within which open space is proposed as part of the Development proposals, records show use by circa 2,000 individuals for several years (1990, 1994, 2000, 2007 and 2011), with low level use (100 individuals) in 2012. For two of these years, 1990 and 1994 specific locations are provided and these are shown on the plan at Appendix 6 as "D1" and "D2", in the far north west of this quadrat, at a

considerable distance from the Pagham settlement boundary and close to the SPA / Ramsar site. It is considered likely that the non-specific location records provided for the D 1km² quadrat (2000, 2007, 2011 and 2012) are for birds recorded in the north west (i.e. similar areas to the location specific records from 1990 and 1994).

- 5.7.40. WeBS data provided by the BTO shows a maximum count of 3,001 Dark-bellied Brent Geese for the relevant recording sector, from 2010. During subsequent years this number has fallen, with a maximum counts of 1,620 in 2011, 2,500 in 2012, 2,280 in 2013 and just 730 in 2014. The data provided by the BTO has been used to inform the WeBS information / analysis presented within Appendix 6.
- 5.7.41. Looking at the broad data set obtained, it is clear that the farmland in the local area is of some value to this species. However, the information strongly suggests that activity is more heavily focussed on land in and around the SPA / Ramsar site itself, and located at a considerable distance from the settlement boundary of Pagham.
- 5.7.42. The Development Proposals do not include any land which could be classed as important supporting habitat for the SPA / Ramsar site.
- 5.7.43. The Development Proposals would not significantly extend the Pagham settlement boundary, since essentially the proposal are centred within a 'corner' created through the historic development of the settlement. It is considered that the Development Proposals would not be likely to adversely affect the continued use of habitat both within and outside of the SSSI / SPA / Ramsar site by Dark-bellied Brent Geese.
- 5.7.44. By way of summary conclusion, it is considered that the Development Proposals would not be likely to result in a significant adverse effect on Dark-bellied Brent Geese (or any other qualifying feature) through impacts on supporting habitat.

6. MITIGATION / AVOIDANCE MEASURES AND THE IN COMBINATION TEST

- 6.1. Taking a precautionary stance, and on the basis of emerging planning policy in relation to avoiding significant adverse effects on the Pagham Harbour (SPA / Ramsar site), a package of mitigation/avoidance measures is proposed in relation to alleviating visitor pressure on the SPA / Ramsar site. These measures have been discussed with Natural England, including at a meeting held on 1st April 2015.
- 6.2. The mitigation / avoidance strategy comprises two key elements; firstly, on site provision for recreation activities including dog walking and secondly, a package of measures aimed at alleviating existing and future pressures from visitor numbers at the SPA / Ramsar site itself. These measures are discussed below.
- 6.3. As discussed above, the Development Proposals will deliver additional informal recreation opportunities 'on the doorstep' of new residents. Recreational (including dog walking) opportunities will be created in the form of public open space.
- 6.4. Informal open space is to be provided in the north and west of the Application Site, immediately adjacent to the new properties. This open space totals 0.95ha and will comprise SuDS attenuation features, grassland and shrub planting and will provide areas suitable for recreation including dog walking. In addition, a large block of open space is proposed immediately south of the Application Site, beyond Summer Lane. Since this large block of open space is a key element of the SPA mitigation strategy, it is referred to in this document as 'Core Open Space'. The Core Open Space and that within the development footprint will be linked through a green corridor which runs north/south through the centre of the new residential development.
- 6.5. The open space to the south of Summer Lane will have a total area of 1.62ha. Of this 1ha will be designed and managed to provide informal recreation opportunities. This part of the site sits closest to the new residential properties and will comprise new grassland, hedgerow and shrub planting. It will have an open and natural feel, undulating topography and will be managed specifically to ensure areas of long and short grassland, with views broken by areas of shrub planting. A series of informal mown footpaths will offer easy access and dogs will be allowed to run off the lead. To the south east of this informal area, a further area, 0.62ha in size will provide more formal recreational opportunities (possibly a sports field). An illustrative masterplan showing the open space provision within the Application Site is presented at Appendix 7.
- 6.6. From detailed discussions with Natural England it is understood that a key requirement in relation to on-site mitigation / avoidance measures (e.g. as opposed to initiatives provided at the SPA / Ramsar site) is that any open space provision is above that required by the local planning authority. As can be clearly seen, the total open space provision is well in excess of local authority requirements, which is set at 0.85ha for this development. Indeed, the 0.62ha of formal open space, when combined with open space

provision adjacent to the development footprint (i.e. the 0.95ha north of Summer Lane) would more than meet LPA requirements. Under this scenario the whole of the 1ha of proposed informal open space south of Summer Lane and a large proportion of that to the north can be considered as 'additional' open space provision.

- 6.7. Circular walks will be available within the open space provision. A walk of approximately 0.8km can easily be achieved within the land south of Summer Lane. The length of walk possible for new residents associated with the Development Proposals will increase by at least 0.1km through the use of any green corridor link into the development and further walking opportunities will be available in public open space present in the north and west of the Application Site. Overall a circular walk of over 1km would be possible.
- 6.8. It is proposed that the open space to the south of Summer Lane will be 'gifted' to the local Parish Council.
- 6.9. The open space will be subject to a suitable management regime to maintain an informal and safe environment for users. It will be managed in perpetuity and secured by way of a section 106 planning agreement. A copy of an iterative management plan is included at Appendix 8. It is considered that the detail of any required management plan could be agreed by way of a suitably worded planning condition attached to any planning permission.
- 6.10. The location of the open space (south of Summer Lane) and the opportunities for informal recreation will be clearly sign-posted from the new development. Furthermore, at the entrance to the open space, an interpretation board will highlight footpaths, including a circular walk. It will also highlight the sensitivities of the SPA / Ramsar site and direct people to the RSPB Visitor Centre at Pagham harbour for further information. The use of the open space for recreation and the sensitivities of the SPA / Ramsar site will also be highlighted within an information pack, provided to all new residents.
- 6.11. The open space (south of Summer Lane) will be available to new residents ahead of first occupation, thus before a potential adverse effect on the SPA / Ramsar site could occur.
- 6.12. As stated above, the intention is to create a significant area of open space which offers opportunities for recreation (including dog walking) which will be easily accessible to the new residents associated with the Development Proposals. It is accepted that the proposals will not deliver an experience akin to that found at the coast, and some new residents would be likely to visit the SPA / Ramsar site on occasion. It is expected however, that the open space provision will reduce the overall number of potential visits to the SPA / Ramsar site (and SSSI) by offering an easily accessible area for regular (e.g. daily / routine) dog walks by new residents.

- 6.13. It is also noted that the open space provision would provide a new facility for existing local residents, thereby reducing the number of visits to the SPA / Ramsar site by existing residents in the local area.
- 6.14. The above measures are commended to the local planning authority as representing a suitable package of measures which will alleviate both existing and potential increased recreation at the SPA / Ramsar site. It is however noted that Natural England considers that even in instances where open space is provided for new residents, increased visitor pressure is still likely to result, especially so when considering residential development proposals in combination with other plans / projects. On this basis, consideration has been given to the requirement for further mitigation / avoidance measures such that when the Development Proposals are considered both alone and in combination, the conclusion of 'no likely significant effect' can be safely reached. A widely accepted approach to such mitigation / avoidance measures, is for visitor access and management initiatives (e.g. wardening and footpath management) to be implemented at the designated site, funded through developer contributions.
- 6.15. Currently, unlike for the Chichester and Langstone Harbours SPA / Ramsar site and the Solent Maritime SAC, there is no formally adopted, strategic level approach to mitigation for the Pagham Harbour SPA / Ramsar site. It is understood that discussions between relevant stakeholders (e.g. Arun District Council, RSPB, Natural England, Chichester District Council and other members of the Solent Disturbance and Mitigation Project) are currently on-going in relation to extending the provisions of the Solent Disturbance and Mitigation Project to include Pagham Harbour SPA / Ramsar site. Such an approach may be relevant in the future; however in the interim period negotiations are taking place in relation to the adoption of an interim strategy which will involve the funding of visitor access and management initiatives at Pagham Harbour SPA / Ramsar site. It is understood that the relevant projects to be funded and the associated direct costs have been identified. The identified projects are as follows:
- Provision of a year round warden (part-time);
 - Signage / interpretation and education (possibly delivered by the warden); and
 - Monitoring the effectiveness of the measures.
- 6.16. During a meeting held with Natural England on 1st April, it was confirmed that the financial contribution would likely be between £800 and £900 per unit. Whilst costings for the projects themselves were available, admin and associated costs were not as yet finalised.
- 6.17. It is understood that the calculated funding secures the package in perpetuity and that the funds must be made available prior to first occupation.
- 6.18. It is also understood (from discussions with Natural England) that the interim strategy is likely to be finalised shortly and that subsequent to this each relevant local authority will be responsible for taking the strategy

forward. From the information currently available, the interim strategy is likely to be in place and adopted by Arun District council prior to the determination of the planning application associated with the Application Site. Certainly it would be expected that the interim strategy will be in place well ahead of any occupation associated with the Development Proposals.

- 6.19. The Applicant is fully committed to the payment of a developer contribution towards a strategic level mitigation / avoidance strategy (such as that outlined above).
- 6.20. The final sum payable could be secured by way of a section 106 agreement and will be agreed with Arun District Council (in consultation with Natural England where appropriate). In the event that the final interim strategy is not in place at the point of determination, it is considered that an appropriately worded condition could be attached to any permission granted such that the fine detail of the mitigation package (i.e. the sum to be paid) is finalised (in agreement with Natural England and Arun District Council), and that any payment is made prior to first occupation. In this way the Competent Authority can be assured (i.e. no doubt remains) that appropriate mitigation / avoidance measures will be delivered ahead of any potential significant effect arising in relation to the Development Proposals.
- 6.21. It is considered that (having adopted a precautionary stance) the provision of new recreational opportunities within the Development Proposals and a financial contribution towards agreed and properly targeted visitor access / management initiatives at the SPA / Ramsar site / SSSI, would avoid any potential significant adverse effects on the SPA / Ramsar site / SSSI through increased recreational pressure when the project is considered alone. Having undertaken an assessment of all possible effects on the SPA / Ramsar site as a result of the Development Proposals, in view of the European sites Conservation Objectives, it is considered that the plan / project would not be likely to give rise to any significant effects, when the plan / project is considered alone. At worst, the plan / project would give rise to effects which would be classed as *de minimis*.

Specific consideration of the In-Combination Test

- 6.22. It is considered by Ecology Solutions that the potential effects identified in relation to the Development Proposals will be avoided or mitigated through the implementation of the measures described above, such that there would be no significant residual adverse effects on the SPA / Ramsar site (or SSSI) when the plan / project is considered alone. In this light, in combination effects would not be possible.
- 6.23. Since Development Proposals are scrutinised so carefully by Competent Authorities and the relevant Statutory Authorities in light of the Habitats Regulations, recent case law and guidance, it is not likely that another plan / project would come forward without sufficient mitigation or avoidance measures to off set any perceived deleterious effects on a European designated site.

- 6.24. To date, plans/projects which have come forward in the local area have thus far done so through the agreement, with Natural England, of a package of measures designed to avoid adverse effects on European designated sites, such that a lawful consent can be granted. However, it is now commonplace for planning authorities to adopt a strategic level mitigation / avoidance tool in relation to new residential development, which necessarily takes full account of potential in combination effects on European designated sites. To date no formal strategic level mitigation tool has been adopted, though such as strategy is currently close to finalisation.
- 6.25. On the basis that all relevant development proposals will provide appropriate mitigation / avoidance measures, where necessary in line with a strategic package of measures (in relation to potential in combination effects), as agreed with Natural England, it is therefore concluded that there would not be any potential significant in-combination effects on the SPA / Ramsar site.

Summary Conclusion

- 6.26. Having considered all of the potential significant effects that could arise from the Development Proposals, in light of the avoidance and mitigation measures which form an integral part of the application, Ecology Solutions conclude that the proposals would not be likely to give rise to a significant effect on the SPA / Ramsar site when the Development Proposals are considered either alone or in combination with other plans or projects. No additional adverse impacts have been identified in relation to Pagham Harbour SSSI and no additional mitigation would be required.

7. SUMMARY AND CONCLUSIONS

- 7.1. Ecology Solutions has undertaken a detailed assessment of the implications of the Development Proposals on the Pagham Harbour SPA / Ramsar site in view of the European sites conservation objectives.
- 7.2. The findings of this work are set out within this Information to enable a Habitats Regulations Assessment document, such that the competent authority, in exercising its duties under the Habitats Regulations, has all the necessary information before it to considering the application.
- 7.3. Assessment under Regulation 61 of the Habitats Regulations is required in this instance, since the Application Site lies in relatively close proximity to the Pagham Harbour SPA / Ramsar site. Consideration has also been given to any additional impacts which could arise in relation to the Pagham Harbour SSSI, wherever relevant.
- 7.4. The principal potential adverse impacts which could arise in respect of the SPA / Ramsar site / SSSI are through increased visitor pressure, although impacts in relation to hydrological impacts have also been considered.
- 7.5. No potential significant effects on the SPA / Ramsar site / SSSI were identified in relation to hydrological impacts and no additional, specific mitigation is considered necessary in this instance.
- 7.6. With regard to potential increased recreational pressure at the SPA / Ramsar site / SSSI, mitigation / avoidance measures have been put forward following detailed discussions with Natural England.
- 7.7. As part of the Development Proposals, a significant area of informal open space will be provided for recreational purposes, including dog walking. This provision will be well in excess of that required by the local planning authority for amenity purposes. The open space will deliver an attractive and natural environment for informal recreation where dogs can be exercised off the lead, with grassland, scrub / trees and boundary hedgerows. A network of footpaths will enable a circular walk. The open space would be maintained in perpetuity and will be the subject of a Section 106 planning agreement.
- 7.8. New residents would be provided with a pack highlighting the recreation opportunities available in the new open space area and the sensitivities of the SPA / Ramsar site. The likelihood of residents utilising the open space resource would be increased further through appropriate signage.
- 7.9. In addition, the Applicant is committed to the securing of an appropriate financial contribution, as set through an emerging interim mitigation / avoidance strategy for the SPA / Ramsar site. It is understood that such a strategy is likely to be in place shortly and is likely to be adopted ahead of determination of this planning application. In the absence of an adopted interim strategy, it is considered that an appropriately worded planning condition could be attached to any permission such that the deliverability of the required measures ahead of first occupation is not in doubt.

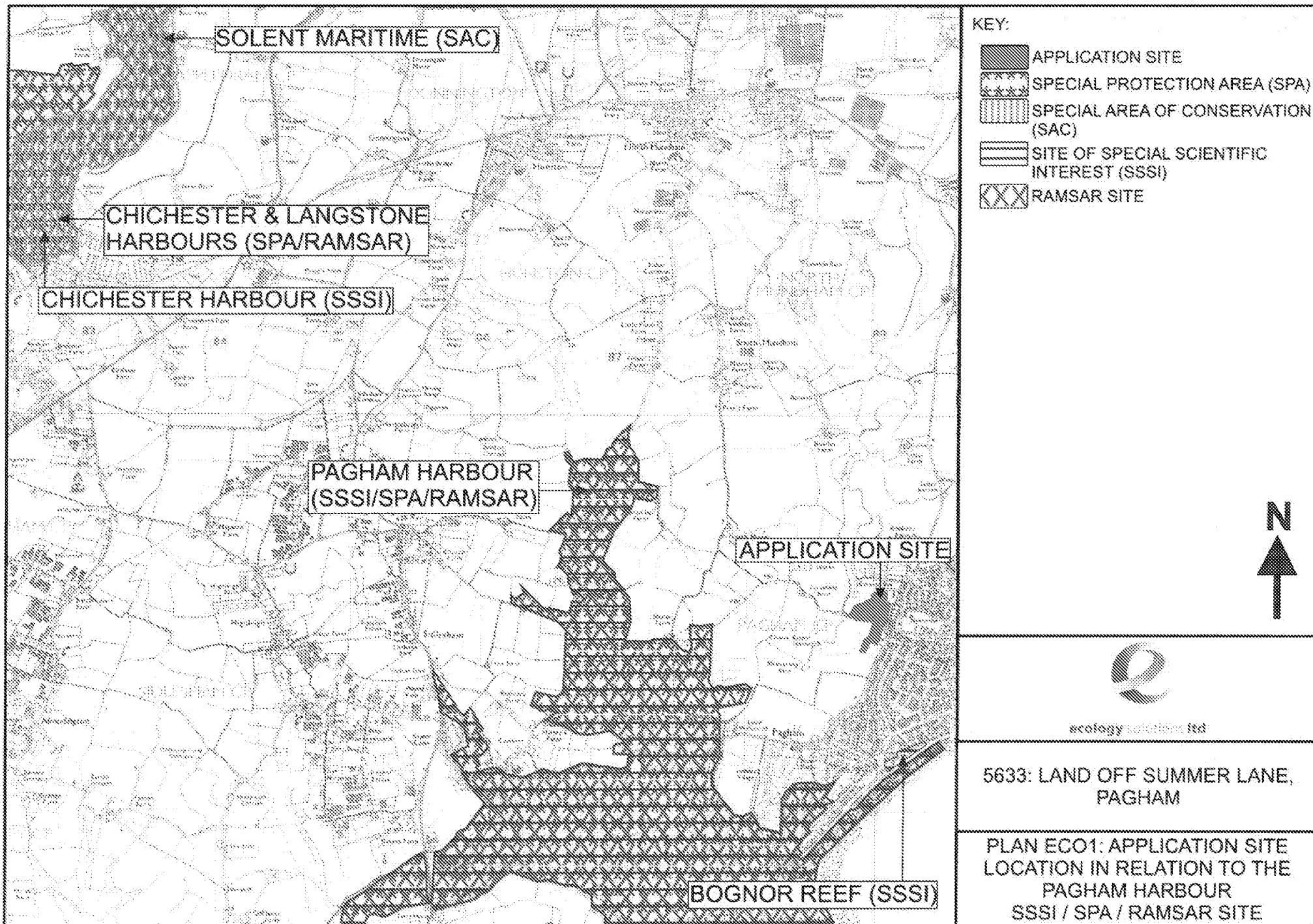
- 7.10. It is considered that (having adopted a precautionary stance) the provision of the financial contribution, open space and education/interpretation initiatives would avoid any potential significant adverse effects that the Development Proposals could have on the SPA / Ramsar site.
- 7.11. It is considered that there would be no likely potential significant (adverse) effects on the Pagham Harbour SPA/Ramsar site when the Development Proposals are considered either alone or in combination with other plans/projects, in light of the tests at Regulation 61(1) of the Habitats Regulations. There is therefore no requirement to undertake an Appropriate Assessment of the Development Proposals. No additional impacts have been identified in relation to Pagham Harbour SSSI and no additional mitigation measures are considered necessary.
- 7.12. As the project alone or in combination would not contribute to an overall significant effect that may have an adverse impact on the integrity of the SPA / Ramsar site (in view of the SPA conservation objectives), or adverse impacts on the SSSI, the Development Proposals would by definition be acceptable, subject to securing the mitigation and avoidance measures proposed. In those terms the competent authority could legally and safely grant consent for the proposed plan/project.

PLANS & APPENDICES

PLANS

PLAN ECO1

Application Site location in relation to the Pagham
Harbour SPA / Ramsar site



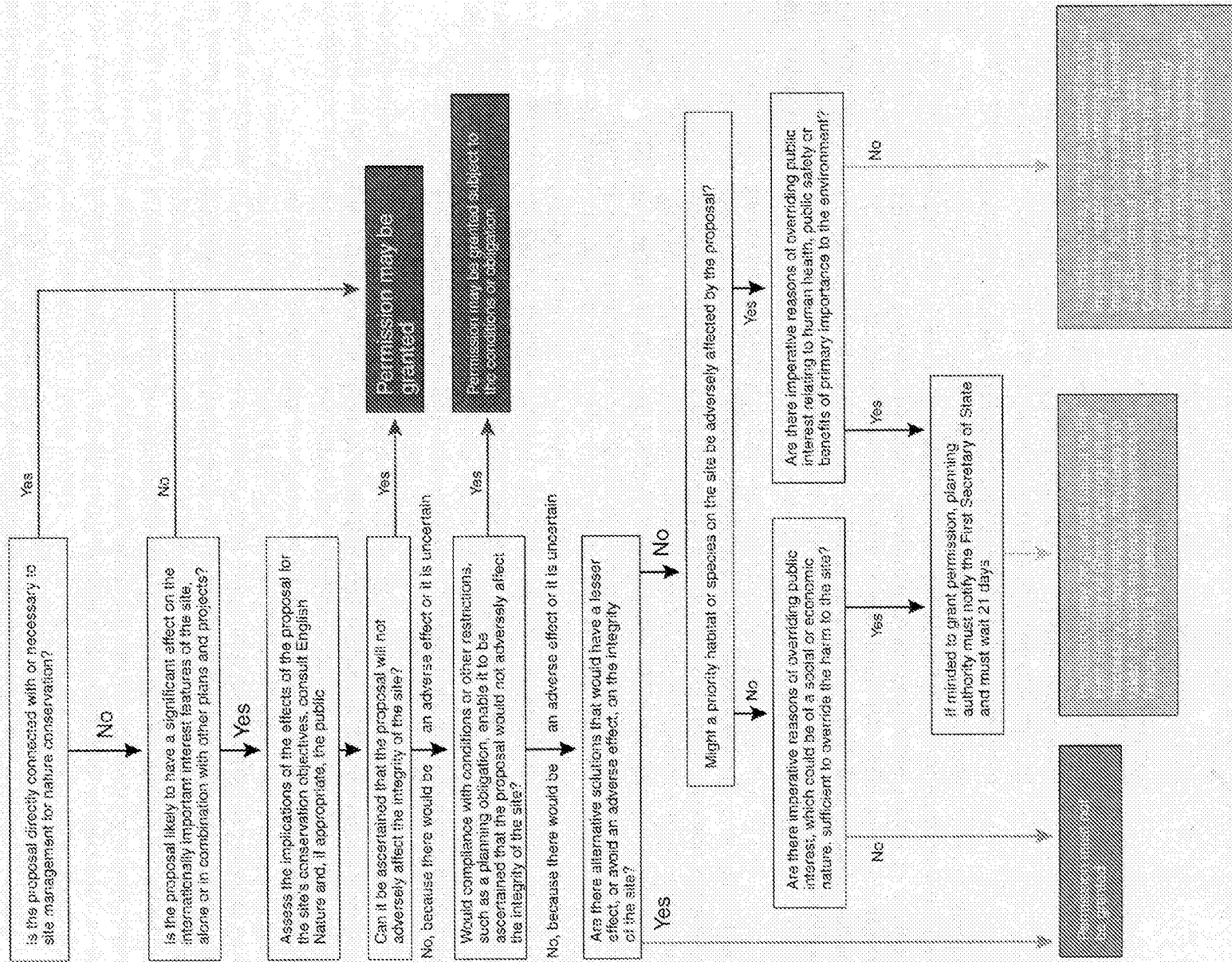
Based upon the Ordnance Survey map with permission of the Controller of Her Majesty's Stationery Office. © Crown Copyright. Ecology Solutions Ltd. Plan No: ECO1. AL 110144628

APPENDICES

APPENDIX 1

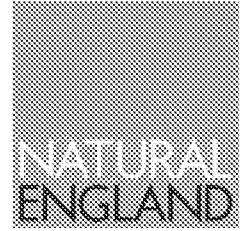
Flow Diagram from ODPM / Defra Circular

Figure 1: Consideration of development proposals affecting Internationally Designated Nature Conservation Sites



APPENDIX 2

Copy of the Conservation Objectives for Pagham
Harbour SPA



European Site Conservation Objectives for Pagham Harbour Special Protection Area Site Code: UK9012041

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)

A151 *Philomachus pugnax*; Ruff (Non-breeding)

A193 *Sterna hirundo*; Common tern (Breeding)

A195 *Sterna albifrons*; Little tern (Breeding)

This is a European Marine Site

This SPA is a part of the Pagham Harbour 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 3

SPA Natura Form, Ramsar Information Sheet and
SSSI citation

NATURA 2000

STANDARD DATA FORM

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

1. Site identification:

1.1 Type 1.2 Site code

1.3 Compilation date 1.4 Update

1.5 Relationship with other Natura 2000 sites

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1.6 Respondent(s)

1.7 Site name

1.8 Site indication and designation classification dates

date site proposed as eligible as SCI	
date confirmed as SCI	
date site classified as SPA	198803
date site designated as SAC	

2. Site location:

2.1 Site centre location

longitude	latitude
00 45 38 W	50 45 48 N

2.2 Site area (ha) 2.3 Site length (km)

2.5 Administrative region

NUTS code	Region name	% cover
UK533	West Sussex	100.00%

2.6 Biogeographic region

☐ Alpine

☒ Atlantic

☐ Boreal

☐ Continental

☐ Macaronesia

☐ Mediterranean

3. Ecological information:

3.1 Annex I habitats

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

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

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

Population						Site assessment			
		Resident	Migratory			Population	Conservation	Isolation	Global
			Breed	Winter	Stage				
Code	Species name								
A046a	<i>Branta bernicla bernicla</i>			1794 I		C		C	
A151	<i>Philomachus pugnax</i>			10 I		C		C	
A195	<i>Sterna albifrons</i>		7 P			C		C	
A193	<i>Sterna hirundo</i>		0 P			C		C	

4. Site description:

4.1 General site character

Habitat classes	% cover
Marine areas. Sea inlets	0.6
Tidal rivers. Estuaries. Mud flats. Sand flats. Lagoons (including saltwork basins)	39.2
Salt marshes. Salt pastures. Salt steppes	5.2
Coastal sand dunes. Sand beaches. Machair	
Shingle. Sea cliffs. Islets	20.2
Inland water bodies (standing water, running water)	1.0
Bogs. Marshes. Water fringed vegetation. Fens	2.8
Heath. Scrub. Maquis and garrigue. Phygrana	
Dry grassland. Steppes	
Humid grassland. Mesophile grassland	
Alpine and sub-alpine grassland	
Improved grassland	30.3
Other arable land	
Broad-leaved deciduous woodland	0.7
Coniferous woodland	
Evergreen woodland	
Mixed woodland	
Non-forest areas cultivated with woody plants (including orchards, groves, vineyards, dehesas)	
Inland rocks. Scree. Sands. Permanent snow and ice	
Other land (including towns, villages, roads, waste places, mines, industrial sites)	
Total habitat cover	100%

4.1 Other site characteristics

Soil & geology:

Alluvium, Clay, Gravel, Mud, Neutral, Nutrient-rich, Sand, Sedimentary, Shingle

Geomorphology & landscape:

Coastal, Estuary, Floodplain, Intertidal sediments (including sandflat/mudflat), Islands, Lagoon, Lowland, Open coast (including bay), Pools, Shingle bar, Subtidal sediments (including sandbank/mudbank)

4.2 Quality and importance

ARTICLE 4.1 QUALIFICATION (79/409/EEC)

During the breeding season the area regularly supports:

Sterna albifrons 0.3% of the GB breeding population
(Eastern Atlantic - breeding) 5 year mean, 1992-1996

Sterna hirundo % of the GB breeding population
(Northern/Eastern Europe - breeding) Count, as at 1996

Over winter the area regularly supports:

Philomachus pugnax
(Western Africa - wintering)

1.4% of the GB population
5 year mean, 1995-1999

ARTICLE 4.2 QUALIFICATION (79/409/EEC)

Over winter the area regularly supports:

Branta bernicla bernicla
(Western Siberia/Western Europe)

0.6% of the population
5 year peak mean 1991/92-1995/96

4.3 Vulnerability

Pagham Harbour comprises an extensive central area of salt marsh and tidal mudflats, with surrounding habitats including lagoons, shingle, open water, reed swamp and wet permanent grassland.

The majority of the site is a Local Nature Reserve managed by West Sussex County Council. Historical land drainage for agricultural purposes is being addressed through the Local Nature Reserve Management Plan and Management Agreements, while pollution from inadequate treatment of sewage discharges will be reviewed by the Environmental Agency.

5. Site protection status and relation with CORINE biotopes:

5.1 Designation types at national and regional level

Code	% cover
UK04 (SSSI/ASSI)	100.0

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

FOR OFFICE USE ONLY.

DD MM YY

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Designation date

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Site Reference Number

2. Date this sheet was completed/updated:

Designated: 30 March 1988

3. Country:

UK (England)

4. Name of the Ramsar site:

Pagham Harbour

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):

50 45 48 N 00 45 38 W

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: Chichester

10 km south-east of Chichester.

Administrative region: West Sussex

10. Elevation (average and/or max. & min.) (metres): 11. Area (hectares): 636.68

Min. -1

Max. 5

Mean 1

12. General overview of the site:

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

Pagham Harbour comprises an extensive central area of saltmarsh and tidal mudflats with surrounding habitats including lagoons, shingle, open water, reed swamp and wet permanent grassland.

The intertidal mudflats are rich in invertebrate and algae, and provide important feeding areas for birds. The lower saltmarsh is dominated by common cord-grass but also includes patches of glasswort. At higher levels sea-purslane is abundant. The area supports internationally important numbers of wintering pintail and nationally important numbers of dark-bellied brent goose, grey plover and black-tailed godwit.

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).

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

Qualifying Species/populations (as identified at designation):

Species with peak counts in winter:

Dark-bellied brent goose, *Branta bernicla* 2512 individuals, representing an average of 1.1% of the 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 winter:

Black-tailed godwit, *Limosa limosa islandica*, 377 individuals, representing an average of 1% 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.

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	neutral, shingle, sand, mud, clay, alluvium, nutrient-rich, sedimentary, gravel
Geomorphology and landscape	lowland, coastal, floodplain, shingle bar, subtidal sediments (including sandbank/mudbank), intertidal sediments (including sandflat/mudflat), open coast (including bay), enclosed coast (including embayment), estuary, islands, lagoon, pools
Nutrient status	mesotrophic
pH	circumneutral
Salinity	brackish / mixosaline, fresh, saline / euhaline
Soil	mainly mineral
Water permanence	usually permanent

Summary of main climatic features	Annual averages (Bognor Regis, 1971–2000) (www.metoffice.com/climate/uk/averages/19712000/sites/bognor_regis.html) Max. daily temperature: 13.7° C Min. daily temperature: 7.7° C Days of air frost: 24.0 Rainfall: 717.4 mm Hrs. of sunshine: 1902.9
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General description of the Physical Features:

Pagham Harbour is an estuarine basin that comprises an extensive central area of saltmarsh and intertidal mudflats, surrounded by lagoons, shingle, open water, reed swamp and wet permanent grassland.

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).

Pagham Harbour is an estuarine basin that comprises an extensive central area of saltmarsh and intertidal mudflats, surrounded by lagoons, shingle, open water, reed swamp and wet permanent grassland.

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, Sediment trapping

19. Wetland types:

Marine/coastal wetland

Code	Name	% Area
G	Tidal flats	33.3
Other	Other	31
E	Sand / shingle shores (including dune systems)	20.1
H	Salt marshes	5.2
F	Estuarine waters	3.3
J	Coastal brackish / saline lagoons	2.4
Sp	Saline / brackish marshes: permanent	2.2
Tp	Freshwater marshes / pools: permanent	0.8
W	Shrub-dominated wetlands	0.6
A	Shallow marine waters	0.6
M	Rivers / streams / creeks: permanent	0.3
9	Canals and drainage channels	0.2

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.

This site comprises an extensive central area of saltmarsh and tidal mudflats with surrounding habitats including shingles, open water, reed swamp and wet permanent grassland. Pagham Harbour is of national importance for wintering, wildfowl and waders and also for breeding birds both within the Harbour and the surrounding grazing pasture. The site supports nationally important communities of plants and invertebrates.

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.**

Petrorhagia nanteuillii

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 with peak counts in spring/autumn:**

Little egret , <i>Egretta garzetta</i> , West Mediterranean	60 individuals, representing an average of 3.6% of the GB population (5 year peak mean 1998/9-2002/3)
Whimbrel , <i>Numenius phaeopus</i> , Europe/Western Africa	104 individuals, representing an average of 3.4% of the GB population (5 year peak mean 1998/9-2002/3 - spring peak)
Common greenshank , <i>Tringa nebularia</i> , Europe/W Africa	20 individuals, representing an average of 3.3% of the GB population (5 year peak mean 1998/9-2002/3)

Species with peak counts in winter:

Slavonian grebe , <i>Podiceps auritus</i> , Northwest Europe	14 individuals, representing an average of 1.9% of the GB population (5 year peak mean 1998/9-2002/3)
Northern pintail , <i>Anas acuta</i> , NW Europe	462 individuals, representing an average of 1.6% of the GB population (5 year peak mean 1998/9-2002/3)
Grey plover , <i>Pluvialis squatarola</i> , E Atlantic/W Africa -wintering	704 individuals, representing an average of 1.3% of the GB population (5 year peak mean 1998/9-2002/3)
Spotted redshank , <i>Tringa erythropus</i> , Europe/W Africa	5 individuals, representing an average of 3.6% of the GB population (5 year peak mean 1998/9-2002/3)

Species Information**Nationally important species occurring on the site.****Invertebrates.**

Nematostella vectensis

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
- Aquatic vegetation (e.g. reeds, willows, seaweed)
- Archaeological/historical site
- Environmental education/ interpretation

Fisheries production
 Livestock grazing
 Non-consumptive recreation
 Scientific research
 Sport fishing
 Sport hunting
 Tourism

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
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	+	
Bait collection	+	+
Arable agriculture (unspecified)		+
Permanent arable agriculture		+
Livestock watering hole/pond	+	+
Permanent pastoral agriculture	+	+
Hunting: recreational/sport	+	+
Sewage treatment/disposal	+	+
Flood control	+	+
Irrigation (incl. agricultural water supply)		+
Transport route		+

Urban development		+
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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?
No factors reported	NA				

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)	+	+
Special Protection Area (SPA)	+	
Land owned by a non-governmental organisation for nature conservation	+	
Management agreement	+	
Site management statement/plan implemented	+	

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.

Contemporary.

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.

Completed.

Environment, Flora and Fauna.

Extensive research and surveys into tidal regimes, sediment movement and the distribution of all major animal and plant groups has been carried out in Pagham Harbour.

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.

There is an interpretative centre for the Local Nature Reserve.

A full time Education Officer is employed, the programme being particularly directed at schoolchildren.

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.

Land based recreation:

Walking including dog walking - all year.

Bird watching - all year.

Sea bathing - mostly summer.

Wildfowling: Only in agreed areas - 1 September to 20 February

Adjacent seasonal caravan parks - mainly summer.

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

COUNTY: WEST SUSSEX

SITE NAME: PAGHAM HARBOUR

DISTRICT: CHICHESTER: ARUN

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981. Part of this site is a Local Nature Reserve (under S21 of The National Parks and Access to the Countryside Act 1949)

Local Planning Authority: CHICHESTER DISTRICT COUNCIL; ARUN DISTRICT COUNCIL

National Grid Reference: SZ 875 970

Area: 615.9 ha 1521.9 acres

Ordnance Survey Sheet 1:50,000: 197

1:10,000: SZ 89 NW, NE, SE

Date Notified (under 1949 Act): 1954

Date of Last Revision: 1980

Date Notified (under 1981 Act): 1986

Date of Last Revision:

Other Information: This site lies within the South Coast Plain. Pagham Harbour is a proposed NCR site. This site contains Pagham Harbour GCR site and part of Bognor Regis (Palaeobotany) GCR site. This is also a proposed Ramsar/SPA site.

Reasons for Notification:

This site comprises an extensive central area of salt-marsh and tidal mudflats with surrounding habitats including shingle, open water, reed swamp and wet permanent grassland. Pagham Harbour is of national importance for wintering wildfowl and waders and also for breeding birds both within the Harbour and the surrounding grazing pasture. The site supports nationally important communities of plants and invertebrates.

Pagham Harbour was reclaimed for agriculture in the late nineteenth century but was flooded again by a storm in the early twentieth century. The extensive intertidal mudflats are rich in algae and invertebrates and provide important feeding areas for birds.

Salt-marsh is a habitat threatened nationally through reclamation for agriculture. The lower part of the salt-marsh is dominated by the hybrid common cord-grass *Spartina anglica* with patches of the glassworts *Salicornia* spp. Above this zone sea-purslane *Halimione portulacoides* covers large areas with other species such as sea aster *Aster tripolium* in the periphery. At one part of the site within a mixed salt-marsh community greater sea-spurrey *Spergularia media* and sea lavender *Limonium vulgare* are found. The upper margin of the salt-marsh has developed a narrow strip of grassland dominated by sea couch *Elymus pycnanthus*.

Vegetated shingle is a nationally rare community. At Pagham, the type and extent of plant cover is dictated by the shifting nature of the substrates, the sea defence works, and by its relative exposure to the elements. In sheltered areas a diverse grass sward has developed with herbs such as early forget-me-not *Myosotis ramosissima*, biting stonecrop *Sedum acre* and the nationally endangered chiding pink *Petrorhagia nanteuilli*. This contrasts with the sparse vegetation of the shingle ridge where the uncommon sea-kale *Crambe maritima* and yellow-vetch *Vicia lutea* are found.

Pagham Harbour has a wide variety of wetland habitats. Brackish drainage ditches dissect the land where common reed *Phragmites australis* dominates. This forms fairly extensive swamps in some areas including the Severals to the west of the Harbour which are important for breeding and migrating reed and sedge warblers. Sidlesham ferry to the north-west provides high water feeding and roosting areas for waders while Pagham Lagoon in the east is a stormy weather sheltering site for sea duck. Here may also be found the nationally endangered starlet sea anemone *Nematostella vectensis*.

The small amount of woodland at Pagham Harbour is dominated by willow and oak. One of these areas supports a small heronry. In contrast, the ancient woodland at Norton Priory is drier with oak standards and a rich ground flora. Scrub is found both in the form of hedges and as more extensive patches with hawthorn *Crataegus monogyna* and gorse *Ulex europaeus* being the main constituents. The damp unimproved grassland surrounding the Harbour is used as a major wader roost and is grazed by large numbers of Brent Geese. Some fields of improved grassland are included in the site as they too, support nationally important populations of birds.

Pagham Harbour is an overwintering area for over 120 species of bird. The numbers of wintering pintail, ringed and grey plover and black-tailed godwit regularly reach 1% of British populations and the site is of international importance for wintering ruff and Brent Geese. The mudflats also provide food for a diverse breeding community of birds including oystercatcher, shelduck and redshank.

Notable invertebrates include the sand dart *Agrotis ripae*, Matthew's wainscot moth *Mythimna favicolor* and the long-winged conehead grasshopper *Conocephalus discolor*.

Geology:

Pagham Harbour is a key site for coastal geomorphology. It is significant both as a classic shingle spit landform and for the links that have been demonstrated between the coastal near shore and offshore forms and sediments. The shingle spit system comprises a series of sub-parallel ridges and recurves, marking different phases of extension and frontal accretion. Shingle reaches the beach *via* the intertidal zone, and the so-called "Pagham delta" and the behaviour of the spits and delta are intimately linked with water and sediment circulation around the Selsey peninsula. The area also provides an excellent example of the role of weed rafting of shingle in coastal sediment budgets.

This site also includes, at the north-eastern end, part of a key site for plant fossils from the London Clay (divisions B₁ and B₂). It is the only locality in the Hampshire Basin to yield abundant London Clay plants and the only site known to have yielded plants from the B₂ division of this formation. The site has yielded examples of some one hundred and thirty species (representing seventy families), including numerous type specimens. Dominant families include the Vitaceae, Menispermaceae and Burseraceae. The genera *Bognoria* and *Aldwichia* are only found here, as are some thirty species. An outstanding palaeobotanical site of great importance to studies of Tertiary floras.

APPENDIX 4

Relevant SSSI Unit Condition Tables

Main Habitat	Responsible Officer	Unit Number	Unit Id	Area (ha)	NNR Overlap Area (ha)	Latest Assessment Date	Assessment Description	Comment	Adverse Condition Reasons
PAGHAM HARBOUR - WEST SUSSEX, (ARUN,CHICHESTER,)									
STANDING OPEN WATER AND CANALS	KRISTOFFER HEWITT	001	1008822	11.5833	0.00	26/10/2010	Unfavourable - Recovering	This unit was apparently affected by a pollution incident. Investigation did not reveal a source of pollution and there are no indications that there is a risk of a recurrence. Survey carried out by University of Brighton indicates that although there is still a rather impoverished flora and fauna, there are clear signs of recovery of the lagoon system. This includes relatively good overall populations of lagoon taxa, including 3 specialist lagoon species, and an absence of several taxa previously recorded that indicated organic enrichment. A previously recorded diverse gastropod community is not evident however. Further monitoring will be carried out to better understand the processes driving the biological composition of the site.	
NEUTRAL GRASSLAND - Lowland	KRISTOFFER HEWITT	002	1008829	1.8925	0.00	12/03/2009	Unfavourable - Recovering	Improvements have been made under AMP and through direct management and water qulaity is now improving.	
NEUTRAL GRASSLAND - Lowland	KRISTOFFER HEWITT	003	1017439	15.8196	0.00	01/10/2008	Favourable	The grassland is notified for the breeding birds it supports. The most recent Pagham Harbour LNR breeding bird survey has identified the breeding bird interest as being in favourable condition.	

FEN, MARSH AND SWAMP - Lowland	KRISTOFFER HEWITT	004	1008840	9.4987	0.00	12/04/2005	Unfavourable - Recovering	A Management Agreement has now been signed, and a tender accepted for the works, so reed clearance should now take place in autumn 2005. This assessment has been made on the basis that management of the unit to achieve favourable condition has been secured through the WES agreement just signed, which addresses all reasons for unfavourable condition. It is not based on a full site assessment.	
FEN, MARSH AND SWAMP - Lowland	KRISTOFFER HEWITT	005	1017443	10.339	0.00	28/01/2010	Favourable	The unit, part of the Pagham Harbour Local Nature Reserve, is predominantly occupied by reed swamp dominated by common reed. The habitat is in good condition and well managed, and is considered to support suitable habitat for breeding and non-breeding bird assemblages. Woodland within the northern part of the unit is has not undergone any decline since the previous assessment and remains in good condition.	
NEUTRAL GRASSLAND - Lowland	KRISTOFFER HEWITT	006	1017441	12.9443	0.00	01/10/2008	Favourable	The grassland is notified for the breeding birds it supports and the wintering birds (brent geese). The Pagham harbour LNR breeding bird survey has identified the breeding bird interest as being in favourable condition and the WeBS counts indicates the brent geese numbers are in favourable condition.	
NEUTRAL GRASSLAND - Lowland	KRISTOFFER HEWITT	007	1008830	62.5501	0.00	01/10/2008	Favourable	The grassland is notified for the breeding birds it supports and the wintering birds (brent geese). The Pagham harbour LNR breeding bird survey has identified the breeding bird interest as being in favourable condition and the WeBS counts indicates the brent geese numbers are in favourable condition.	

NEUTRAL GRASSLAND - Lowland	KRISTOFFER HEWITT	008	1008831	26.2269	0.00	01/10/2008	Favourable	The grassland is notified for the breeding birds it supports and the wintering birds (brent geese). The Pagham harbour LNR breeding bird survey has identified the breeding bird interest as being in favourable condition and the WeBS counts indicates the brent geese numbers are in favourable condition.	
NEUTRAL GRASSLAND - Lowland	KRISTOFFER HEWITT	009	1008832	32.7494	0.00	28/01/2010	Favourable	The unit, part of the Pagham Harbour Local Nature Reserve, is predominantly occupied by lowland neutral grassland. The area is well managed, involving grazing and coppicing some of the ditches in sections to encourage the aquatic plant diversity. The unit is considered to support suitable habitat for breeding bird assemblage.	
BROADLEAVED, MIXED AND YEW WOODLAND - Lowland	KRISTOFFER HEWITT	010	1008825	2.616	0.00	29/04/2009	Unfavourable - Recovering	WGS has been agreed for the wood and is underway, with works concentrating on removal of bracken, rhododendron and sycamore. Early results are very encouraging.	

NEUTRAL GRASSLAND - Lowland	KRISTOFFER HEWITT	011	1008834	10.7349	0.00	28/01/2010	Favourable	The unit is occupied by a mosaic of woodland, lowland neutral grassland and reed swamp dominated by common reed. The area appears to be well managed, and is considered to support suitable habitat for breeding bird assemblage. The woodland exhibits good structural diversity including oak, yew, alder and hawthorn, with bramble and gorse occupying the groundlayer, along with satisfactory levels of standing/lying deadwood. In addition, a small area of habitat with affinities to dune heath was observed on the eastern margin of the unit adjacent to the public footpath, supporting a good cover of lichens and bryophytes such as Cladonia spp, Rhytidiadelphus squarrosus, Pseudoscleropodium purum and Dicranum scoparium. This area soon grades into neutral grassland towards the centre of the unit. The site is also subject to rabbit grazing, which is not considered to be having a significant adverse impact on the site.	
LITTORAL SEDIMENT	KRISTOFFER HEWITT	012	1008823	35.434	0.00	28/01/2010	Favourable	The northern half of the unit is dominated by littoral sediment and upper saltmarsh, dominated by sea-purslane and common cord-grass (Spartina). The southern half of the site is mainly littoral sediment with some amounts of sea-purslane dominated salt marsh and small areas of shingle on the southern margin. The saltmarsh has not appeared to undergo any significant decline since the previous assessment, and is considered to provide suitable supporting habitat for aggregations of non-breeding birds.	

SUPRALITTORAL SEDIMENT	KRISTOFFER HEWITT	014	1017447	19.0505	0.00	12/09/2008	Favourable	First CVSM assessment and the vegetated shingle came out well. The coastal geomorphology is also in favourable condition.	
EARTH HERITAGE	KRISTOFFER HEWITT	015	1016777	12.9243	0.00	10/06/2010	Favourable	Site visited with SSSI officer Elaine Webster. SSSI interest feature assessed: SD1 - Rumex crispus - Glaucium flavum shingle community. The unit, part of the Pagham Harbour Local Nature Reserve, supports some strandline vegetation including Atriplex prostrata Spear-leaved Orache, Beta maritima Sea Beet, Sedum acre Biting Stonecrop and Suaeda maritima Annual Sea-blite. Since the previous assessment the shingle bar has shifted in position, as part of the natural dynamic processes of the shingle system. This change does not affect the assessment of this unit.	

EARTH HERITAGE	KRISTOFFER HEWITT	016	1017438	57.6464	0.00	10/06/2010	Favourable	Site visited with SSSI Officer Elaine Webster. SSSI inetrest feature assessed: SD1 - Rumex crispus - Glaucium flavum shingle community. The unit, part of the Pagham Harbour Local Nature Reserve, supports shingle vegetation in its northern half including several positive indicator species, dominated by Crambe maritima with frequent Elytrigia atherica and occasional Glaucium flavum, Sedum acre, Cerastium diffusum and Solanum dulcamara. However, invasive red valerian Centranthus ruber is at risk of encroaching into the northern half of the unit and requires immediate attention. The council who are responsible for managing the Local Nature Reserve are aware of this problem. Much of this vegetation appears to have encroached from adjacent unit 14.	
BROADLEAVED, MIXED AND YEW WOODLAND - Lowland	KRISTOFFER HEWITT	017	1017442	1.0521	0.00	01/10/2008	Favourable	The woodland is notified for the breeding birds it supports, in particular the small heronry. The Pagham Harbour LNR breeding bird survey has identified the breeding bird interest as being in favourable condition and the heronry in this unit is doing well.	
NEUTRAL GRASSLAND - Lowland	KRISTOFFER HEWITT	018	1008833	13.0362	0.00	01/10/2008	Favourable	The rough grassland is notified for the breeding birds it supports. The Pagham Harbour LNR breeding bird survey has identified the breeding bird interest as being in favourable condition.	

FEN, MARSH AND SWAMP - Lowland	KRISTOFFER HEWITT	019	1017444	2.412	0.00	01/10/2008	Favourable	The grassland and fen is notified for the breeding birds it supports. The Pagham Harbour LNR breeding bird survey has identified the breeding bird interest as being in favourable condition.	
LITTORAL SEDIMENT	KRISTOFFER HEWITT	020	1017445	250.291	0.00	01/10/2008	Favourable	The intertidal sediment is notified for the wintering birds it supports. WeBS and other counts indicates the wintering wader and wildfowl numbers are in favourable condition. The saltmarsh was assessed on 22 July and was favourable, though it was noted that the Spartina is still dominant over large areas.	
LITTORAL SEDIMENT	KRISTOFFER HEWITT	021	1017446	3.2476	0.00	01/10/2008	Favourable	The intertidal sedimentis notified for the wintering birds it supports. WeBS and other counts indicates the wintering wader and wildfowl numbers are in favourable condition.	
NEUTRAL GRASSLAND - Lowland	KRISTOFFER HEWITT	022	1017440	8.0815	0.00	27/10/2008	Unfavourable - Recovering	The grassland and fen is notified for the breeding birds it supports and the wintering birds (mainly brent geese). The Pagham Harbour LNR breeding bird survey has identified the breeding bird interest as being in favourable condition and the WeBS and other counts indicates the brent geese and other wader/ wildfowl numbers are in favourable condition. Works are continuing on improvements to trhe new scrape to get better control of water levels and these will greatly improve its potential for breeding waders when completed.	

SUPRALITTORAL SEDIMENT	KRISTOFFER HEWITT	023	1029561	9.4054	0.00	10/06/2010	Unfavourable - No change	SSSI interest feature assessed: SD1 - Rumex crispus - Glaucium flavum shingle community. The unit, under private ownership, supports shingle vegetation including several positive indicator species, dominated by Crambe maritima with frequent Elytrigia atherica and occasional Glaucium flavum Yellow-horned Poppy, Echium vulgare Viper?s-bugloss, Sedum acre Biting Stonecrop, Tripleurospermum maritimum Sea Mayweed, Cerastium diffusum Sea Mouse-ear and Solanum dulcamara Bittersweet. However the unit has been heavily invaded by red valerian Centranthus ruber which has established a dense and expanding cover, most likely as a result of garden invasives from the adjacent houses. It appears little action has been taken to remove this species over recent years, and requires immediate action to prevent further encroachment. This should be addressed preferably as part of a wider plan to address this invasive species for the SSSI as a whole. In addition, some of the neighbouring residents keep boats on the unit which has resulted in some degradation of existing shingle vegetation.	LACK OF CORRECTIVE WORKS - INAPPROPRIATE WEED CONTROL,
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SUPRALITTORAL SEDIMENT	KRISTOFFER HEWITT	024	1029562	19.4761	0.00	10/06/2010	Favourable	Site visited with SSSI Officer Elaine Webster. SSSI interest feature assessed: SD1 - Rumex crispus - Glaucium flavum shingle community. The unit, part of the Pagham Harbour Local Nature Reserve, supports shingle vegetation including several positive indicator species, dominated by Crambe maritima with frequent Elytrigia atherica and occasional Glaucium flavum Yellow-horned Poppy, Echium vulgare Viper?s-bugloss, Sedum acre Biting Stonecrop, Tripleurospermum maritimum Sea Mayweed, Cerastium diffusum Sea Mouse-ear and Solanum dulcamara Bittersweet. In addition there are patches of lichen cover (Cladonia spp and a black lichen which indicates minimal disturbance) scattered across the south-western end of the unit. Much of this vegetation is in good condition with these species occurring at appropriate levels of cover across the unit, especially within the south-western end of the unit. In addition, scattered Silene uniflora Sea Campion occurs within the central part of the unit near to the car park. However this appears to be adversely affected by rabbit grazing in this area which should be
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APPENDIX 5

Winter Waterfowl Report

ALUCO ECOLOGY LTD

**WINTER
WATERFOWL SURVEY**

**LAND AT SUMMER LANE,
PAGHAM**

MARCH 2015

Aluco Ecology Ltd Registered in England No. 5598341
info@alucoecology.co.uk www.alucoecology.co.uk
Hampshire 01962 886633 / Berkshire 01488 648321 / South-West 01326 291064
Registered Office: Pencairn, Penmenner Road, The Lizard, Cornwall TR12 7NR

WINTER WATERFOWL SURVEY LAND AT SUMMER LANE, PAGHAM

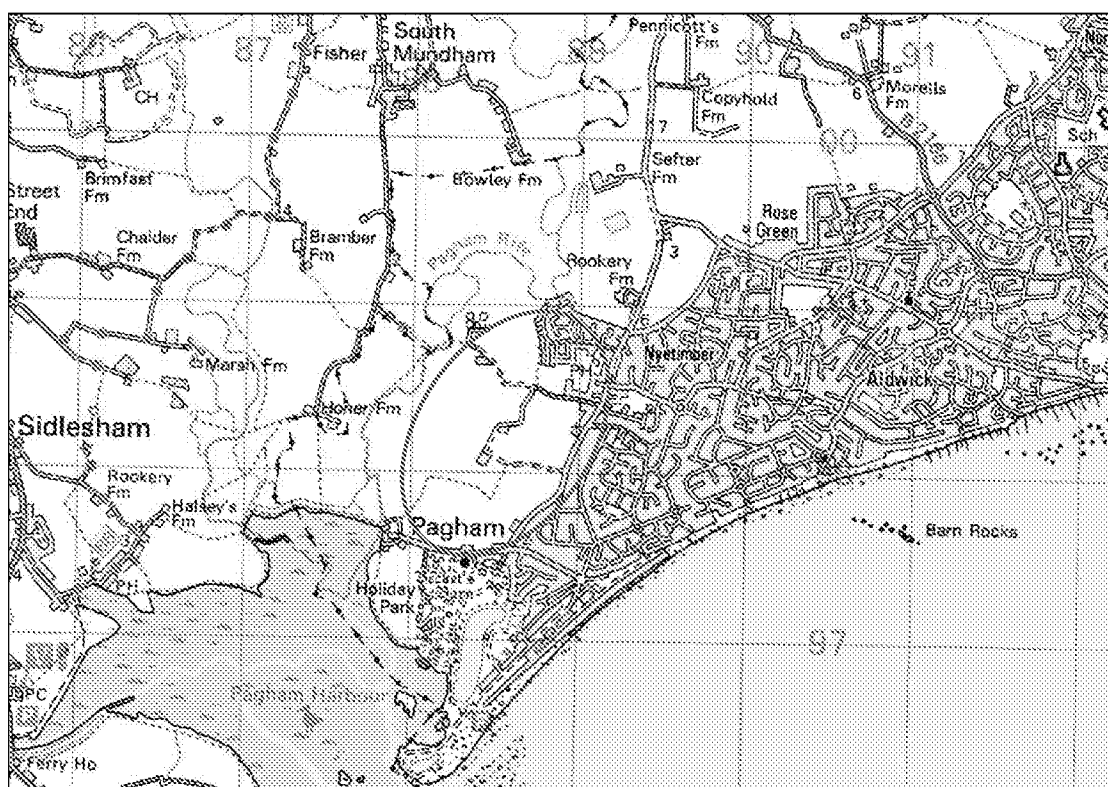
1.0 INTRODUCTION

Background

- 1.1 This document presents survey data for winter bird survey counts during the period November 2014 -February 2015 for an area of farmland at Summer Lane, Pagham, and adjacent areas.

Site Location

- 1.2 The survey area consists of arable farmland, permanent pasture, and scrub. Its location is shown at **Figure 1** below.
- 1.3 The survey area is just over 400m from the coastal designated sites at Pagham Harbour at its closest point. These are designated for waterfowl and coastal habitats and include within 1km: Pagham Harbour Special Protection Area (SPA) and Ramsar Site, Solent Maritime and Solent & Isle of Wight Lagoons Special Areas of Conservation (SAC), Pagham Harbour Site of Special Scientific Interest (SSSI) and Farlington Marshes Local Nature Reserve (LNR). Citations for these designated sites outlining the special interest features are provided at **Technical Appendix 1**.



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Figure 1: Location of the Main Survey Area

2.0 METHODOLOGY

- 2.1 The survey area was selected on the basis of the field network around the proposed development site (fields 1 & 2, see **Figure 2** below). All of the fields on the plateau east of the Pagham Rife valley were surveyed. Consideration was also given to fields further west of fields 5/6 and North of 5 / Rookery Farm with additional casual monitoring of these areas on the edge of the main survey block.
- 2.2 The survey area was scanned using binoculars and telescopes to check for any feeding or roosting waders and wildfowl. Survey work was undertaken by experienced bird surveyors. Observations of other species were sometimes recorded on an incidental basis. For each visit a note was usually made of the state of the tide and weather conditions (which might affect use by waterfowl). Visits were made during high tide and other tidal states. Public use of each area was also recorded.
- 2.3 The main survey area was then walked on foot, scanning all open areas to locate feeding birds. The survey area was divided into defined count areas. Area 1 and 2 are part of the proposed development location at Summer Lane. **Figure 2** shows the survey areas for winter waterfowl work during 2014/15.

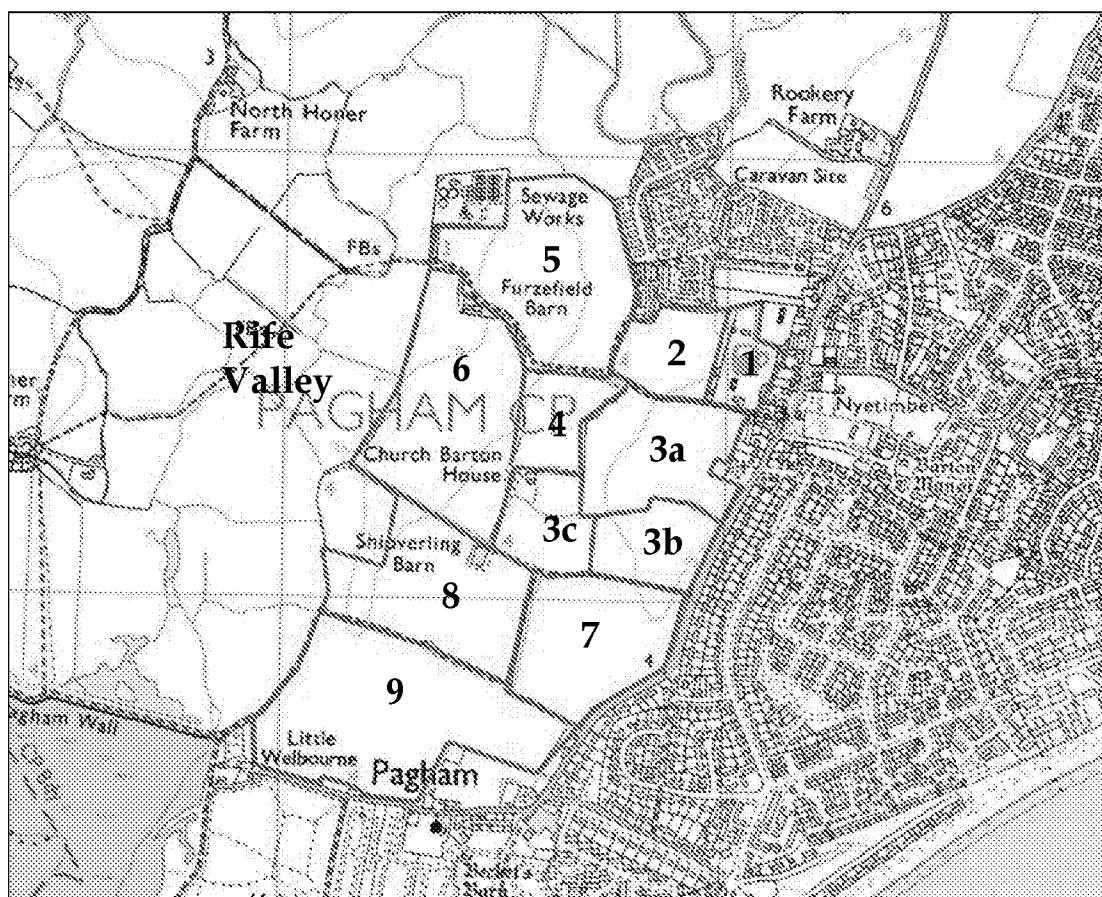


Figure 2: Count Areas for Winter Waterfowl Survey

3.0 RESULTS

Description of Count Areas

- 3.1 The count areas consist of farmland along Summer Lane (Areas 1-6), and areas to the south along the public rights of way (Areas 7-9) which are mostly under arable production at present with the exception of Fields 1, 3c and a very small section of the top of 6, which are horse paddocks. The arable fields were ploughed in late autumn or early winter and during the survey were mostly bare, apart from field 5 which was early growth winter wheat. Mature hedges are present around some of the fields particularly towards the centre of the count area, and others contain open ditches.

Waterfowl Records

- 3.2 Brent Goose *Branta bernicula* and Wader records are provided for the 1km square of the count area, but detailed locations of these records have not been provided.
- 3.3 The survey comprised fifteen visits carried out between the end of November 2014 and very early March 2015. Details of timing are presented at **Table 1** below.
- 3.4 **Table 2** below shows details of waterfowl species recorded, with **Table 3** providing a summary of other birds noted during the winter period.
- 3.5 The survey recorded waterfowl in Fields 5, where on two dates in early winter part of the Dark-bellied Brent Goose *Branta bernicula bernicula* flock from Pagham Harbour used the field, along with a single European White-fronted Goose *Anser albifrons albifrons* during the second date. No other waterfowl were recorded on site, or on any other dates. Waders including Eurasian Curlew *Numenius arquata* and Northern Lapwing *Vanellus vanellus* used the ploughed fields at 3b, 5, 7 and 9. This was generally in low numbers for feeding and roosting, but with a peak count of 71 in Field 7. Occasional flocks of Lapwing and Brent Geese were noted flying around the wider Rife Valley. Numbers of other waterfowl were noted in the wider Rife valley, but this is outside and to the west of the count area. No Brent Geese were recorded from the fields immediately west/north of Field 5/6 of the count area during survey work, which could be monitored from the edge of the count area.
- 3.6 The main survey areas at Summer Lane (Areas 1-3a) recorded no waterfowl use during the survey with the majority of records coming from field 5 as well as 3b and 7 further south. The majority of the ploughed fields were used by a number of Gulls mostly for loafing and roosting. These records are provided in **Technical Appendix 1**.
- 3.7 Dog walkers and walkers were recorded on every visit, usually in low numbers (see **Table 1**). The use of the footpaths heading east and west through the site was regular. Use of the wider footpath network into the Rife Valley north of Pagham harbour was much less frequent during survey visits. The use of the sea wall is also frequent.

Table 1: Survey Dates

Date	Ob(s)	Start	End	Weather	Tides	Notes
30 Nov 2014	PM-R & JN	10:00	11:10	Sunny, cold, light wind.	LT 11:02 (1.5m)	See map and e-mail of 1st Dec for details of habitats, etc. Dog walkers - c.4 along Summer Lane, including one using path between 5 and 2; about 2 more using path between 7, 8 & 9 and the Furzefield Barn road.
7 Dec 2014	PM-R	11:10	12:10	Cloudy, threatening rain. Brisk NW wind	HT 11:37 (5.6m)	Dog walkers - 3 along Summer Lane and one using path between 5 and 2. Informed by a local that crop spraying took place on field 5 on 3 Dec 2014 and no Brent seen since.
12 Dec 2014	PM-R	09:30	10:30	Heavy rain overnight. Cloudy. Brisk W wind	LT 08:44 (1.4m)	Dog walkers - 4 along Summer Lane and 3 along road to Shipverling Barn and 1 between 8 and 9. Field 7 has been recently flattened and ploughed with very fine, shallow furrows as if ready for seeding.
19 Dec 2014	GK	09:00	10:30	Sunny, cold, light wind 7c	HT 08:49 (5m)	Dog walkers 3people and 2 dogs north footpath; 4people 3 dogs south footpath
28 Dec 2014	PM-R	12:30	13:30	Sunny, cold, light north wind.	LT 09:21 (1.0m)	Dog walkers - 2 along Summer Lane and 2 along road to Shipverling Barn and 3 between 8 and 7. A flock of 300+ Lapwing seen rising from the field immediately north of field 5 and dropping back down.
1 Jan 2015	GK	11:00	12:00	Rain clearing 6c	LT 13:56 (1.3m)	2 people 3 dogs south footpath
8 Jan 2015	PM-R	13:00	14:00	Bright sunshine after a morning of torrential rain	HT 13:07 (5.3m)	No dog walkers. 400+ Lapwing seen rising from the field immediately west of field 6 and dropping back down.
17 Jan 2015	GK	07:00	09:00	Part cloud at start with some frost, light drizzle by end. Med. Strength SW wind	HT 08:17 (4.8m)	2people and 2 dogs south path. 1 person 1 dog north path
22 Jan	GK	07:00	09:30	clear to begin, no wind 1c	LT05:46 (0.4m)	2 dog walkers along Summer Lane with 3 dogs.

2015						
1 Feb 2015	PM-R	09:45	10:45	Cloudy with sunny spells. Bitter north wind	HT 09:38 (4.8m)	Dog walkers - 2 along Summer Lane and 2 along road to Shipverling Barn and then between 7 and 8.
5 Feb 2015	GK	11:30	15:00	clear, sunny 7c	HT12:16 (5.4m)	1 dog walker with 2 dogs summer lane, 2 dog walkers southern footpath with 2 dogs
12 Feb 2015	GK	14:00	16:00	Part cloud 6c	Ht 16:21 (4.5m)	1 Dog Walker with 1 dog Summer Lane
15 Feb 2015	PM-R	09:40	10:30	Bright sunshine. Mild 7C.	HT 07:50 (4.6m)	2 dog walkers along Summer Lane, plus a horse and rider and 3 dog walkers along road to Shipverling Barn and then between 7 & 8.
19 Feb 2015	GK	06:30	09:30	Part Cloud to light rain by end. 5c-6c SW wind	HT 11:21 (5.9m)	2 dog walkers 3 dogs on summer lane
1 Mar 2015	PM-R	11:35	12:10	Bright sunshine. Windy. Mild 10C	HT 08:20 (4.5m)	Just the one dog walker along road to Shipverling Barn

Surveyors: JN – John Norton, PM-R – Peter Milnets-Raby, GK - Gareth Knass

Table 2: Waterfowl Recorded During Survey

Date	Time	Field	Species	Count	Notes
30 Nov 2014	10:10	5	Brent Goose	1086	Feeding (present 10.00=10.30 at least and settled; a few flew in during count).
30 Nov 2014	10:50	7	Curlew	26	Feeding; flew off when disturbed by Peregrine.
30 Nov 2014	10:55	3b	Lapwing	4	Roosting.
12 Dec 2014	09:36	5	Brent Goose	747	Compact feeding flock very close to boundary with field 2
12 Dec 2014	09:36	5	White-fronted Goose	1	Feeding in with Brent - a juvenile
12 Dec 2014	09:52	3b	Lapwing	8	Roosting
19 Dec 2014	09:45	7	Curlew	71	feeding
28 Dec 2014	13:40	5	Lapwing	4	Roosting
1 Jan 2015	11:35	7	Curlew	2	roosting
1 Jan 2015	11:50	9	Curlew	3	Feeding
8 Jan 2015	13:08	5	Curlew	39	Feeding
8 Jan 2015	13:35	7	Curlew	3	Feeding
1 Feb 2015	09:50	5	Curlew	8	Feeding
1 Feb 2015	10:20	3b	Lapwing	5	Roosting
12 Feb 2015	15:30	9	Curlew	2	Feeding
15 Feb 2015	10:15	3b	Lapwing	4	Roosting

Table 3: Other Species recorded from the Count Area

Species	Status	Comments
Grey Partridge <i>Perdix perdix</i>	Red BAP	Recorded in fields 5 & 6 on two occasions. Max count 8 birds. Also noted west of site in Rife Valley.
Lapwing <i>Vanellus vanellus</i>	Red	Recorded loafing in arable fields on a few dates
Herring Gull <i>Larus argentatus</i>	Red	loafing on arable fields regularly in small numbers
Skylark <i>Alauda arvensis</i>	Red BAP	Recorded regularly in Rife Valley adjacent to the site. Occasionally noted overflying count area.
Fieldfare <i>Turdus pilaris</i>	Red	Noted flying over site on two dates
Song Thrush <i>Turdus philomelos</i>	Red, BAP	Present in count area around boundary habitats
Common Starling <i>Sturnus vulgaris</i>	Red	Present in low numbers around the residential edge of count area, occasionally using fields on site.
House Sparrow <i>Passer domesticus</i>	Red	Numerous pairs located in housing along east boundary, and along Summer Lane
Linnet <i>Carduelis cannabina</i>	Red, BAP	Recorded flying over count area, and present in Rife Valley to the west.
Yellowhammer <i>Emberiza citrinella</i>	Red	Recorded on hedgerow adjacent to sewerage works west edge of count area (field 5). Present in Rife Valley.
Brent Goose <i>Branta bernicula bernicula</i>	Amber	Recorded on two dates in Field 5.
Common Kestrel <i>Falco tinnunculus</i>	Amber	Recorded flying over.
Eurasian Curlew <i>Numenius arquata</i>	Amber	Recorded feeding on ploughed fields in count area.
Mediterranean Gull <i>Ichthyaetus melanocephalus</i>	Amber, Sch1	Recorded on two dates in Field 7
Black-headed Gull <i>Chroicocephalus ridibundus</i>	Amber	Recorded in count area.
Common Gull <i>Larus canus</i>	Amber	Recorded in count area.
Lesser Black-backed Gull <i>Larus fuscus graellsii</i>	Amber	Recorded in count area.
Great Black-backed Gull <i>Larus marinus</i>	Amber	Recorded in count area.
Green Woodpecker <i>Picus viridis</i>	Amber	Regularly seen and heard around Summer Lane area
Meadow Pipit <i>Anthus pratensis</i>	Amber	Small flocks on arable land, with max ccount of 13 in Field 7. Sometimes associating with Pied Wagtail flock.
Dunnock <i>Prunella modularis</i>	Amber	Common species around field boundaries where woody.
Goldcrest <i>Regulus regulus</i>	Amber	Recorded from boundary of Field 1
Reed Bunting <i>Emberiza schoeniclus</i>	Amber	Recorded on hedgerow adjacent to sewerage works west edge of count area (field 5). Present in Rife Valley.

Peregrine Falcon <i>Falco peregrinus</i>	Sch1	Recorded in Field 9 on one visit.
Cetti's Warbler <i>Cettia cetti</i>	Sch1	Heard from count area at western edge – present along Pagham Rife.
Chiff Chaff <i>Phylloscopus collybita</i>	not listed	recorded on a couple of dates around sewerage works, and also present along Rife outside count area
Sparrowhawk <i>Accipiter nisus</i>	not listed	Recorded on two dates around Summer Lane area and north of count area.
Pied Wagtail <i>Motacilla alba yarrelli</i>	not listed	max count of 44 individuals in 3b on one date

Key

Sch1 = Listed under Schedule 1 of the Wildlife & Countryside Act 1981 (as amended)

BAP = Listed as a local or national Biodiversity Action Plan species

Red = Red Listed bird of Conservation Concern

Amber = Amber listed bird of Conservation Concern

(nb details of these category listings is provided in Eaton et al (2009))

4.0 CONCLUSIONS

- 4.1 A winter waterfowl survey was undertaken on farmland at Summer Lane and surrounds to the west of Pagham, during November 2014 to March 2015. The survey recorded some use of the open fields by waterfowl (wildfowl/Geese or waders).
- 4.2 There was no use of Fields 1, 2, 3a, 3c, 4, 6 or 8 by waterfowl. Fields 3b, 5, 7 and 9 were used by both Curlew and Lapwing, with field 5 also used on two occasions by part of the wintering flock of Brent Geese from Pagham Harbour.
- 4.3 The count area provides wintering habitats and opportunities for a number of birds of conservation concern. This use is part associated with Pagham Harbour and Pagham Rife valley to the west of the count area, where habitats of local to international value for bird species are present. The habitats within the count area are generally more intensively managed arable farmland.

5.0 REFERENCES

Eaton MA, Brown AF, Noble DG, Musgrove AJ, Hearn R, Aebischer NJ, Gibbons DW, Evans A and Gregory RD (2009) Birds of Conservation Concern 3: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man. British Birds 102, pp296–341

Sussex Biodiversity Records Centre Data Search June 2013.

Technical Appendix 1

Coastal Designated Sites Within 1km of the Survey Area

SPA description

(information as published 2001)

Pagham Harbour

Country	England
Unitary Authority	West Sussex
SPA status	Classified 30/03/1988
Latitude	50 45 48 N
Longitude	00 45 38 W
SPA EU code	UK9012041
Area (ha)	636.68
Component SSSI/ASSIs	Pagham Harbour

Pagham Harbour is located on the south coast of England in West Sussex. It is an estuarine basin that comprises an extensive central area of saltmarsh and intertidal mud-flats, surrounded by lagoons, shingle, open water, reed swamp and wet permanent grassland. The mud-flats are rich in invertebrates and algae, and provide important feeding areas for birds. The lower saltmarsh is dominated by Common Cord-grass *Spartina anglica*, with patches of Glasswort *Salicornia* spp. The area supports breeding Little Tern *Sterna albibrons* in summer, as well as wintering concentrations of Ruff *Philomachus pugnax* and Pintail *Anas acuta*.



Qualifying species

For individual species accounts visit the [Species Accounts section](#)

This site qualifies under **Article 4.1** of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:

During the breeding season;

Little Tern *Sterna albibrons*, 12 pairs representing 0.5% of the breeding population in Great Britain (Count as at 1995)

Over winter;

Ruff *Philomachus pugnax*, 160 individuals representing at least 22.9% of the wintering population in Great Britain

This site also qualifies under **Article 4.2** of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:

Over winter;

Pintail *Anas acuta*, 628 individuals representing at least 1.0% of the wintering Northwestern Europe population (5 year peak mean 1991/2 - 1995/6)

Note:

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

Note that sites selected for waterbird species on the basis of their occurrence in the breeding, passage or winter periods also provide legal protection for these species when they occur at other times of the year.

Designated Site Map (ESD/13/350)

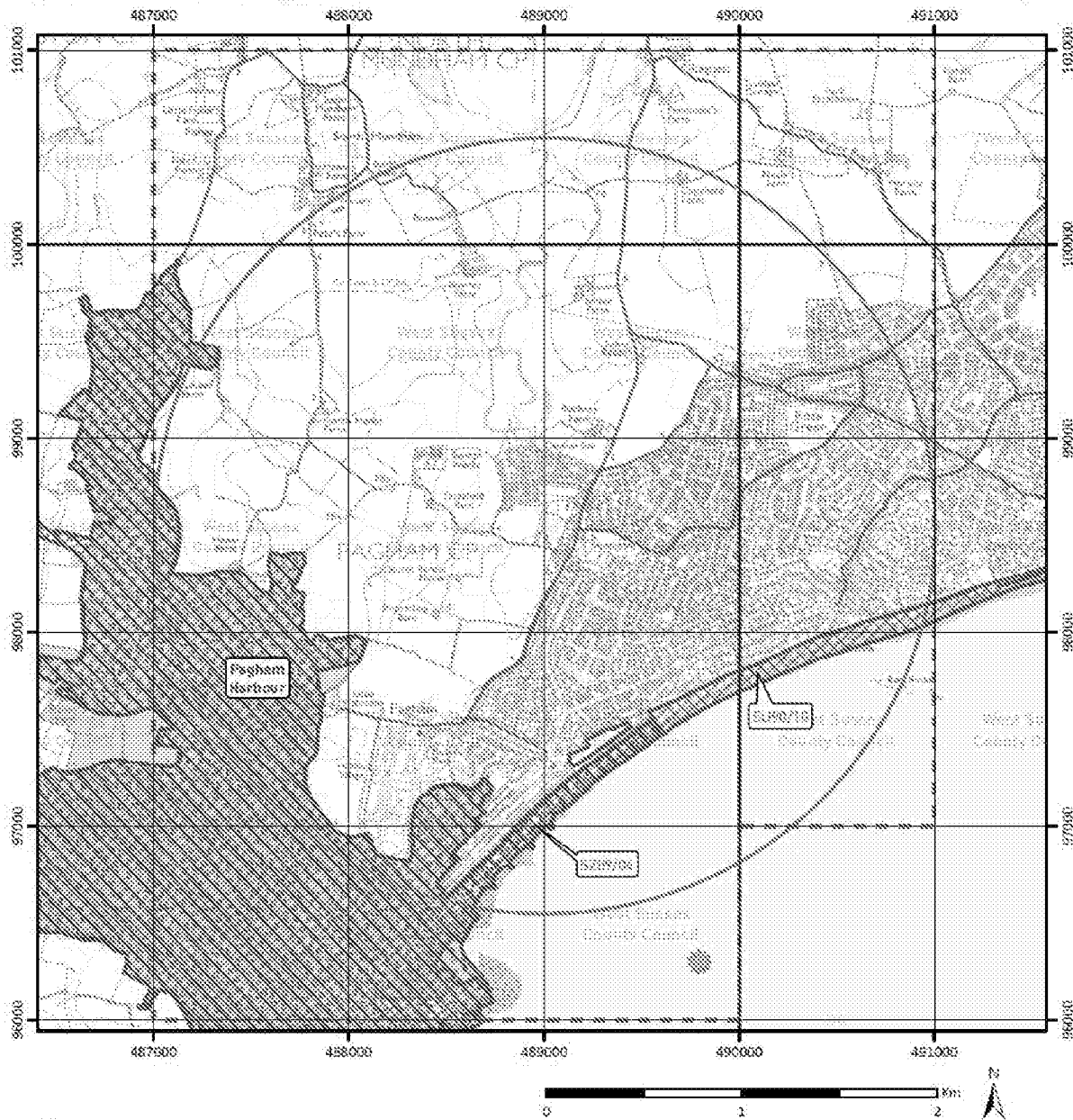
Land at Summer Lane, Pagham + 2km radius

Prepared for Gareth Knapp (Aluco Ecology Ltd) - 27/06/2013



**Sussex
Biodiversity
Record Centre**

Woods Mill, Haverhill,
West Sussex BN20 9SD
info@sussexbrc.org.uk
01273 402250/0512
www.sussexbrc.org.uk



Key to Map:

- Enquiry area
- Species search area
- LGS
- LNR
- Marine SSSI
- Ramsar
- SPA
- SSSI

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SITE OF SPECIAL SCIENTIFIC INTEREST (SSSI)

Site Name:	Pagham Harbour		
County:	West Sussex		
District:	Chichester, Arun		
Local Planning Authority:	Chichester District Council, Arun District Council		
Size:	615.9 hectares (1521.9 acres)		
National Grid Ref:	SZ875970		
Date Notified (Under 1949 Act):	1954	Date of last revision:	1980
Date Notified (Under 1981 Act):	1986	Date of last revision:	-
Other Information:	This site lies within the South Coast Plain. Pagham Harbour is a proposed NCR site. This site contains Pagham Harbour GCR site and part of Begnor Regis (Palaeobotany) GCR site. This is also a proposed Ramsar/SPA site.		

Reason for Notification

This site comprises an extensive central area of salt-marsh and tidal mudflats with surrounding habitats including shingle, open water, reed swamp and wet permanent grassland. Pagham Harbour is of national importance for wintering wildfowl and waders and also for breeding birds both within the Harbour and the surrounding grazing pasture. The site supports nationally important communities of plants and invertebrates.

Pagham Harbour was reclaimed for agriculture in the late nineteenth century but was flooded again by a storm in the early twentieth century. The extensive intertidal mudflats are rich in algae and invertebrates and provide important feeding areas for birds.

Salt-marsh is a habitat threatened nationally through reclamation for agriculture. The lower part of the salt-marsh is dominated by the hybrid common cord-grass *Spartina anglica* with patches of the glassworts *Salicornia* spp. Above this zone sea-purslane *Halimione portulacoides* covers large areas with other species such as sea aster *Aster tripolium* in the periphery. At one part of the site within a mixed salt-marsh community greater sea-spurrey *Spergularia media* and sea lavender *Limonium vulgare* are found. The upper margin of the salt-marsh has developed a narrow strip of grassland dominated by sea couch *Elymus pycnanthus*.

Vegetated shingle is a nationally rare community. At Pagham, the type and extent of plant cover is dictated by the shifting nature of the substrates, the sea defence works, and by its relative exposure to the elements. In sheltered areas a diverse grass sward has developed with herbs such as early forget-me-not *Myosotis ramosissima*, biting stonecrop *Sedum acre* and the nationally endangered childing pink *Petrorhagia nanteuilli*. This contrasts with the sparse vegetation of the shingle ridge where the uncommon sea-kale *Crambe maritima* and yellow-vetch *Vicia lutea* are found.

Pagham Harbour has a wide variety of wetland habitats. Brackish drainage ditches dissect the land where common reed *Phragmites australis* dominates. This forms fairly extensive swamps in some areas including the Severals to the west of the Harbour which are important for breeding and migrating reed and sedge warblers. Sidlesham ferry to the north-west provides high water feeding and roosting areas for waders while Pagham Lagoon in the east is a stormy weather sheltering site for sea duck. Here may also be found the nationally endangered starlet sea anemone *Nematostella vectensis*.

The small amount of woodland at Pagham Harbour is dominated by willow and oak. One of these areas supports a small heronry. In contrast, the ancient woodland at Norton Priory is drier with oak standards and a rich ground flora. Scrub is found both in the form of hedges and as more extensive patches with hawthorn *Crataegus monogyna* and gorse *Ulex europaeus* being the main constituents. The damp unimproved grassland surrounding the Harbour is used as a major wader roost and is grazed by large numbers of Brent Geese. Some fields of improved grassland are included in the site as they too, support nationally important populations of birds.

Pagham Harbour is an overwintering area for over 120 species of bird. The numbers of wintering pintail,

ringed and grey plover and black-tailed godwit regularly reach 1% of British populations and the site is of international importance for wintering ruff and Brent Geese. The mudflats also provide food for a diverse breeding community of birds including oystercatcher, shelduck and redshank.

Notable invertebrates include the sand dart *Agrotis ripae*, Matthew's wainscot moth *Mythimna favicolor* and the long-winged conehead grasshopper *Conocephalus discolor*.

Geology

Pagham Harbour is a key site for coastal geomorphology. It is significant both as a classic shingle spit landform and for the links that have been demonstrated between the coastal near shore and offshore forms and sediments. The shingle spit system comprises a series of sub-parallel ridges and recurves, marking different phases of extension and frontal accretion. Shingle reaches the beach via the intertidal zone, and the so-called "Pagham delta" and the behaviour of the spits and delta are intimately linked with water and sediment circulation around the Selsey peninsula. The area also provides an excellent example of the role of weed rafting of shingle in coastal sediment budgets.

This site also includes, at the north-eastern end, part of a key site for plant fossils from the London Clay (divisions B₁ and B₂). It is the only locality in the Hampshire Basin to yield abundant London Clay plants and the only site known to have yielded plants from the B₂ division of this formation. The site has yielded examples of some one hundred and thirty species (representing seventy families), including numerous type specimens. Dominant families include the Vitaceae, Menispermaceae and Burseraceae. The genera *Bognoria* and *Aldwychia* are only found here, as are some thirty species. An outstanding palaeobotanical site of great importance to studies of Tertiary floras.

COUNTY: WEST SUSSEX

SITE NAME: BOGNOR REEF

DISTRICT: ARUN

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

Local Planning Authority: ARUN DISTRICT COUNCIL

National Grid Reference: SZ 912982

Area: 64.4 (ha.) 159.1 (ac.)

Ordnance Survey Sheet 1:50,000: 197

1:10,000: SZ 99 NW, SZ 89 NE

Date Notified (Under 1949 Act): 1980

Date of Last Revision: –

Date Notified (Under 1981 Act): 1988

Date of Last Revision: –

Other Information:

This site will be listed in 'A Geological Conservation Review'.

Reasons for Notification:

This site comprises a long stretch of foreshore of great geological interest and an extensive area of vegetated shingle, a habitat type which is rare in Britain. At the western end is a small area of old sand dune with an interesting flora including a specially protected species listed on Schedule 8 of the Wildlife and Countryside Act 1981.

Biological Interest

The shingle strip which runs along the beach at Bognor develops into an extensive shingle beach west of SZ 915982. In the shelter of the main bank shingle plant communities have developed, typically with yellow horned poppy *Glaucium flavum*, sea beet *Beta vulgaris*, and the uncommon sea kale *Crambe maritima*. Small grassy patches occur infrequently, with false oat-grass *Arrhenatherum elatius* and red fescue *Festuca rubra*.

The small outlying area of sand dune at The Green is all that remains of a once much more extensive dune system. The grassland, scrub and small marsh support a number of interesting plants and invertebrates including the long-winged conehead grasshopper *Conocephalus discolor* and the nationally endangered chiding pink *Petrorhagia nanteuilii*.

Geological Interest

The foreshore here is one of the few places where the whole thickness of the London Clay can be studied in sequence, although favourable tides occur infrequently and some exposures remain constantly under water. Most of the rocks are clays or sands but there are two sequences of more resistant rocks: calcareous sandstones which form the main Bognor Reef and glauconitic sandstones which comprise the less substantial Barn Rocks to the west. The fossil flora and fauna of these beds is outstanding.

The site is a key site for plant fossils from the London Clay (divisions B₁ and B₂) and is of great importance to the study of Tertiary floras. It is the only locality in the Hampshire Basin to yield abundant London Clay plants and the only site known to have yielded plants from the B₂ division of this formation. The site has yielded examples of some one hundred and thirty species (representing seventy families), including numerous type specimens. Dominant families include the Vitaceae, Menispermaceae and Burseraceae. The genera *Bognoria* and *Aldwichia* are found only here, as are some thirty species. An outstanding palaeobotanical site of great importance to studies of Tertiary floras.

The eastern foreshore is a valuable site which has yielded a diverse Lower Eocene avifauna, including a significant number of small species which are only rarely preserved. Seven

species (representing seven orders) have been recorded from the site. For five species this is the type locality. Three orders, the Charadriiformes, Columbiformes and Apodiformes, are unique to Great Britain at this time.

Finally the most important site in the world for pyritised fossil insects (especially beetles) is on the foreshore at Aldwick. This mode of fossilisation preserves insects uncrushed and they can be extracted simply by sieving. The insects are allochthonous, being derived from the land and associated with a marine fauna (of Lower Eocene age) after death. One species of beetle belongs to a genus, *Pactopus*, now confined to western North America, and otherwise unknown in a fossil state. Other beetles include representatives of modern tropical genera, as well as the earliest known members of the families Eucnemidae and Anobiidae.

Technical Appendix 2

Records of Gulls

Date	Time	Area	Species	No.
30 Nov 2014	10:55	9	Great Black-backed Gull	21
7 Dec 2014	11:45	9	Great Black-backed Gull	59
7 Dec 2014	11:45	9	Herring Gull	14
12 Dec 2014	09:55	7	Black-headed Gull	72
12 Dec 2014	10:10	9	Great Black-backed Gull	21
12 Dec 2014	10:10	9	Herring Gull	17
19 Dec 2014	09:10	5	Black-headed Gull	23
19 Dec 2014	09:45	7	Black-headed Gull	65
19 Dec 2014	09:45	7	Herring Gull	12
19 Dec 2014	09:45	7	Great Black-backed Gull	1
19 Dec 2014	09:45	7	Mediterranean Gull	1
28 Dec 2014	13:55	7	Great Black-backed Gull	22
28 Dec 2014	13:55	7	Herring Gull	31
1 Jan 2015	11:10	5	Black-headed Gull	13
1 Jan 2015	11:35	7	Black-headed Gull	75
1 Jan 2015	11:35	7	Common Gull	2
1 Jan 2015	11:35	7	Great-black Backed Gull	19
1 Jan 2015	11:35	7	Herring Gul	22
1 Jan 2015	11:50	9	Herring Gull	5
8 Jan 2015	13:08	5	Great Black-backed Gull	9
8 Jan 2015	13:08	5	Mediterranean Gull	1
8 Jan 2015	13:08	5	Black-headed Gull	32
8 Jan 2015	13:08	5	Common Gull	1
8 Jan 2015	13:35	7	Great Black-backed Gull	59
8 Jan 2015	13:35	7	Herring Gull	22
17 Jan 2015	08:00	7	Herring Gull	2
17 Jan 2015	08:00	7	Black-headed Gull	7
17 Jan 2015	08:15	3b	Black-headed Gull	8
17 Jan 2015	08:15	3a	Black-headed Gull	5
17 Jan 2015	08:30	5	Black-headed Gull	2
17 Jan 2015	08:50	2	Black-headed Gull	3
17 Jan 2015	08:50	2	Common Gull	1
22 Jan 2015	09:00	2	Herring Gull	2
22 Jan 2015	07:30	4	Herring Gull	1
22 Jan 2015	09:00	5	Black-headed Gull	2
22 Sep 2015	08:00	9	Black-headed Gull	3
1 Feb 2015	10:35	7	Great Black-backed Gull	6
1 Feb 2015	10:35	7	Herring Gull	3

1 Feb 2015	10:35	7	Common Gull	1
5 Feb 2015	11:45	2	Black-headed Gull	13
5 Feb 2015	11:50	3a	Herring Gull	4
5 Feb 2015	11:50	3a	Black-headed Gull	3
5 Feb 2015	12:00	5	Herring Gull	2
5 Feb 2015	14:35	7	Herring Gull	3
5 Feb 2015	14:35	7	Black-headed Gull	4
5 Feb 2015	14:20	9	Black-headed Gull	7
12 Feb 2015	14:50	7	Great Black-backed Gull	4
15 Feb 2015	10:10	7	Great Black-backed Gull	2
19 Feb 2015	06:50	5	Herring Gull	3
19 Feb 2015	09:00	9	Herring Gull	2
19 Feb 2015	09:00	3b	Black-headed Gull	7

APPENDIX 6

Pre-existing Dark-bellied Brent Geese baseline information



KEY:
SEARCH AREA FOR BRENT GOOSE
WETLAND BIRD SURVEY (WeBS)
DATA OF CLOSEST AND MOST
RELEVANT AREA.
LOCATIONS OF BRENT GOOSE
RECORDS PROVIDED BY SUSSEX
BIOLOGICAL RECORDS CENTRE
(SxBRC)

See accompanying table for
detail of records



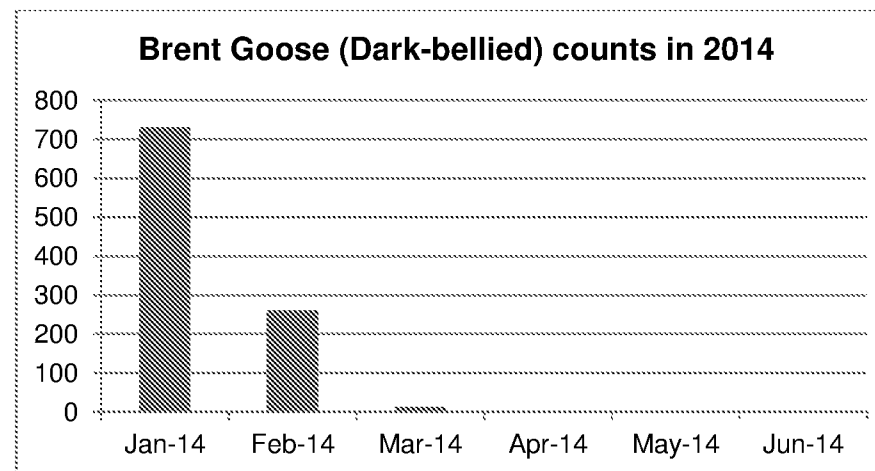
ecology solutions ltd

5633: SUMMER LANE, PAGHAM

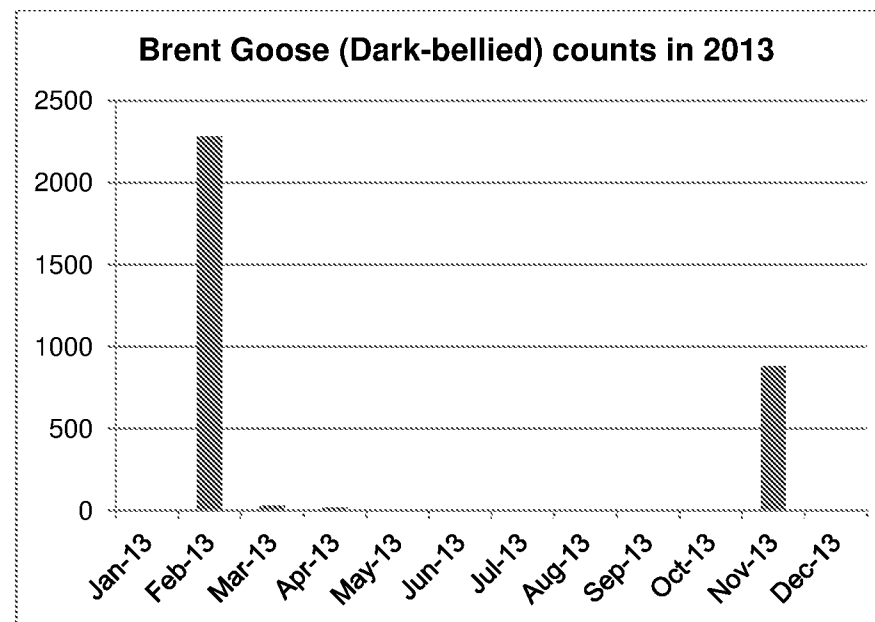
APPENDIX 6: DARK BELLIED
BRENT GEESE BASELINE
INFORMATION

Appendix 6: Brent Geese data based on WeBS count information

Species Code	Species Name	Date	Count
DB	Brent Goose (Dark-bellied)	Jun-14	0
DB	Brent Goose (Dark-bellied)	May-14	0
DB	Brent Goose (Dark-bellied)	Apr-14	0
DB	Brent Goose (Dark-bellied)	Mar-14	12
DB	Brent Goose (Dark-bellied)	Feb-14	260
DB	Brent Goose (Dark-bellied)	Jan-14	730

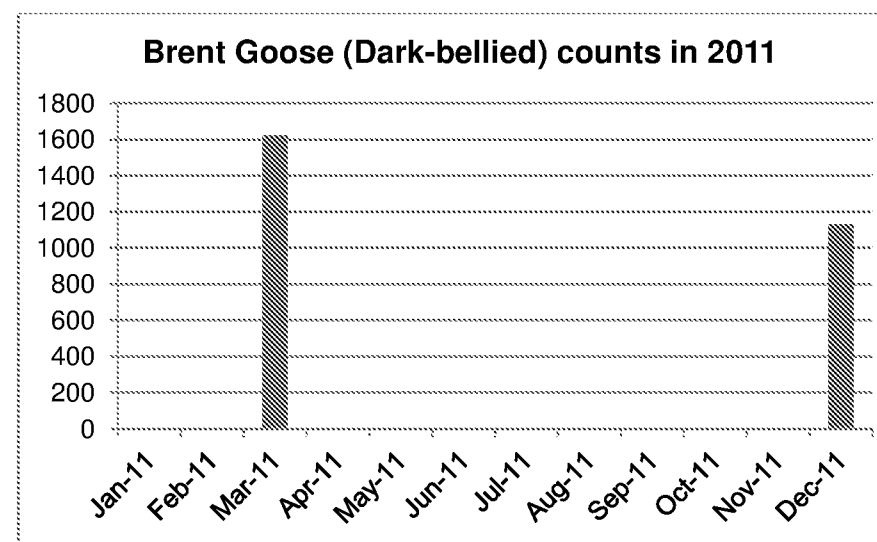
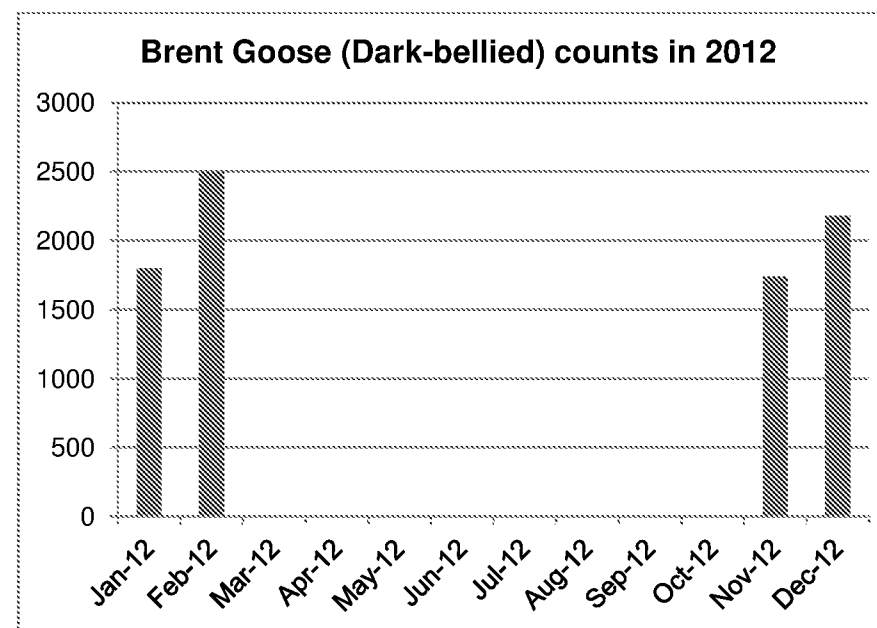


Species Code	Species Name	Date	Count
DB	Brent Goose (Dark-bellied)	Dec-13	0
DB	Brent Goose (Dark-bellied)	Nov-13	880
DB	Brent Goose (Dark-bellied)	Oct-13	0
DB	Brent Goose (Dark-bellied)	Sep-13	0
DB	Brent Goose (Dark-bellied)	Aug-13	0
DB	Brent Goose (Dark-bellied)	Jul-13	0
DB	Brent Goose (Dark-bellied)	Jun-13	0
DB	Brent Goose (Dark-bellied)	May-13	0
DB	Brent Goose (Dark-bellied)	Apr-13	16
DB	Brent Goose (Dark-bellied)	Mar-13	30
DB	Brent Goose (Dark-bellied)	Feb-13	2280
DB	Brent Goose (Dark-bellied)	Jan-13	7



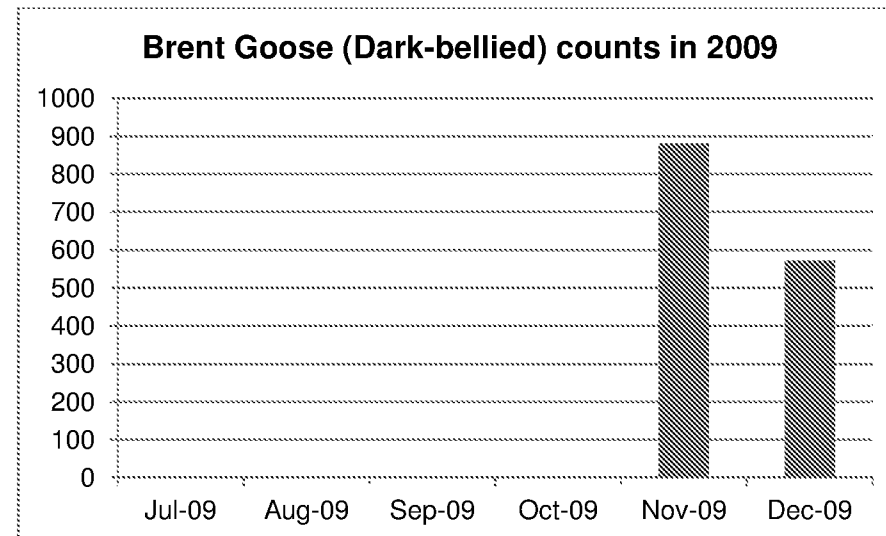
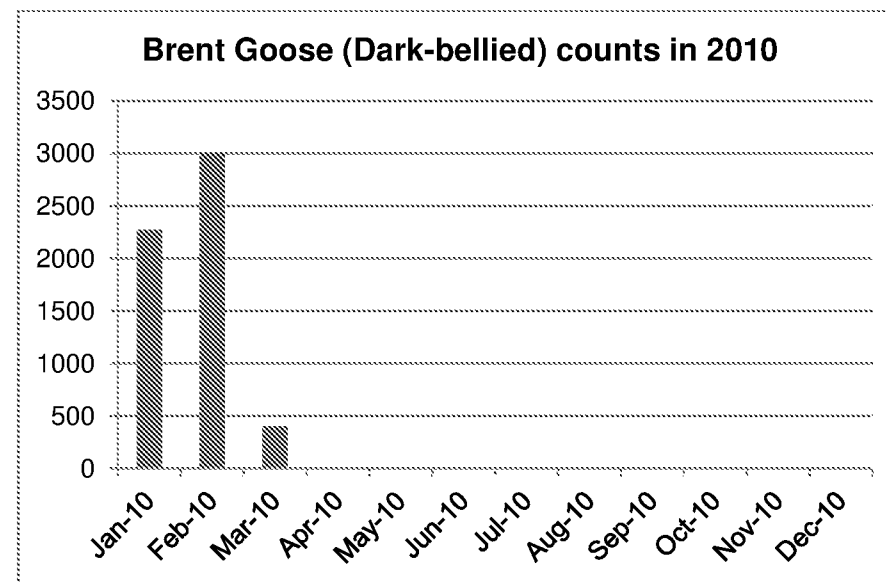
Species Code	Species Name	Date	Count
DB	Brent Goose (Dark-bellied)	Dec-12	2180
DB	Brent Goose (Dark-bellied)	Nov-12	1740
DB	Brent Goose (Dark-bellied)	Oct-12	0
DB	Brent Goose (Dark-bellied)	Sep-12	0
DB	Brent Goose (Dark-bellied)	Aug-12	0
DB	Brent Goose (Dark-bellied)	Jun-12	0
DB	Brent Goose (Dark-bellied)	May-12	0
DB	Brent Goose (Dark-bellied)	Apr-12	0
DB	Brent Goose (Dark-bellied)	Mar-12	0
DB	Brent Goose (Dark-bellied)	Feb-12	2500
DB	Brent Goose (Dark-bellied)	Jan-12	1800

Species Code	Species Name	Date	Count
DB	Brent Goose (Dark-bellied)	Dec-11	1130
DB	Brent Goose (Dark-bellied)	Nov-11	0
DB	Brent Goose (Dark-bellied)	Sep-11	0
DB	Brent Goose (Dark-bellied)	Aug-11	0
DB	Brent Goose (Dark-bellied)	Jul-11	0
DB	Brent Goose (Dark-bellied)	Jun-11	0
DB	Brent Goose (Dark-bellied)	May-11	0
DB	Brent Goose (Dark-bellied)	Apr-11	1
DB	Brent Goose (Dark-bellied)	Mar-11	1620
DB	Brent Goose (Dark-bellied)	Feb-11	5
DB	Brent Goose (Dark-bellied)	Jan-11	0



Species Code	Species Name	Date	Count
DB	Brent Goose (Dark-bellied)	Dec-10	0
DB	Brent Goose (Dark-bellied)	Nov-10	0
DB	Brent Goose (Dark-bellied)	Oct-10	0
DB	Brent Goose (Dark-bellied)	Sep-10	0
DB	Brent Goose (Dark-bellied)	Aug-10	0
DB	Brent Goose (Dark-bellied)	Jul-10	0
DB	Brent Goose (Dark-bellied)	Jun-10	0
DB	Brent Goose (Dark-bellied)	May-10	0
DB	Brent Goose (Dark-bellied)	Apr-10	0
DB	Brent Goose (Dark-bellied)	Mar-10	401
DB	Brent Goose (Dark-bellied)	Feb-10	3001
DB	Brent Goose (Dark-bellied)	Jan-10	2270

Species Code	Species Name	Date	Count
DB	Brent Goose (Dark-bellied)	Dec-09	572
DB	Brent Goose (Dark-bellied)	Nov-09	880
DB	Brent Goose (Dark-bellied)	Oct-09	0
DB	Brent Goose (Dark-bellied)	Sep-09	0
DB	Brent Goose (Dark-bellied)	Aug-09	0
DB	Brent Goose (Dark-bellied)	Jul-09	0



Appendix 6. Sussex Biological Records Centre (SxBRC) Brent Goose Annual Peak Count per Survey Area (Refer to accompanying plan)

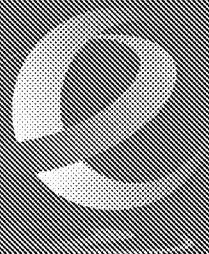
Year / Survey Area		1986	1987	1988	1990	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
A	1km ²															1000	2000								1000		
B	1	3000	2500						10			150	500	500		25	3			1046	2	1000	2000			200	
	2										50																500
	3																										37
	1km ²	1800																					1500				1900
C	1				284	1002		1830	2400	2500	2051								20		636	300			5	1500	6
	2		5	110				400		15	1			6		70		1000	1500	1500	700			800		350	1000
	3													1													
	4	17																		1200	1200	1100					
	5														700			1000						300	2500	27	
	6																										
	7				3500	4360		3000	4500	2797		200		100			75	35						2000	1000	1800	2100
	8	400						1500										800			150			200		200	
	9	500		12					1000							3						1200				200	12
	10																								93		
	11		900											4													
	12					1000		1			77		500			1		1		2000				1	1		800
	13																										
	14													1500						1000							
	15																				1100						
	16		500							1200		2										5		750			220
	17							800															2000	7		70	
	18										800																
	1km ²	3500	3000				1000	2200	2750	1	1400	1520	2	1000	20	1800	3000	1000	1000	2000	2000	1500	2000	3000	2100	2000	2200
D	1				2200																						
	2							2100																			
	1km ²													2200							2100		1		2000	100	
E	1km ²									2000																	
F	1km ²															150	17										
G	1	1154																									
	1km ²																										

APPENDIX 7

Illustrative masterplan

APPENDIX 8

Iterative Core Open Space Management Plan



ecology solutions ltd

HANBURY PROPERTIES LTD

LAND OFF SUMMER LANE
PAGHAM

**Iterative
Informal Open Space
Management Plan**

May 2015
5633.IOSMP.vf

ecology solutions for
planners and developers

ARUP DISTRICT COUNCIL P15615017

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3	CORE OPEN SPACE MANAGEMENT	3

1. INTRODUCTION

- 1.1. Detailed consideration of the potential for the Development Proposals to give rise to significant effects on European / internationally designated sites is given within the accompanying 'Information to enable a Habitats Regulations Assessment' document. As part of the proposed mitigation / avoidance package of measures being put forward in respect of potential effects on the Pagham Harbour Special Protection Area (SPA), an area of informal open space is to be provided in close proximity to the new development.
- 1.2. This document outlines the proposed design and ongoing management works for an area of informal open space that is to be provided as part of the mitigation scheme to address potential significant effects on the Pagham Harbour SPA / Ramsar site.
- 1.3. In the absence of any specific guidance relating to the design of informal open space for Pagham Harbour SPA / Ramsar site (or other such coastal designated sites) the informal open space provision has been designed with consideration given to guidance produced by Natural England for Suitable Assessable Natural Green Space (SANGS) for Thames Basin Heaths SPA. Whilst the guidance cannot be applied in strict terms, given that for coastal SPAs replication of SPA habitats / experiences is not appropriate / possible, the guidance does provide a tool for ensuring that the open space is designed to be as user-friendly as possible, thus ensuring that it serves to attract as many visitors as possible.
- 1.4. Subject to the delivery of the proposed informal open space, in tandem with other proposed mitigation / avoidance measures, it is considered that there would be no significant adverse effects on the SPA / Ramsar site either alone or in-combination, when the plan or project is considered in the light of the tests at Regulation 61(1) of the Habitats Regulations.

2. DESIGN OF THE PROPOSED CORE OPEN SPACE

- 2.1. The proposed open space south of Summer Lane is approximately 1.62ha in size, with 1ha in the north provided as informal Core Open Space which forms a main element of the SPA / Ramsar site mitigation avoidance package of measures. 0.62ha to the south of this will be utilised for more formal recreation activities.
- 2.2. At present, the land in question comprises an area of arable land located to the south of Summer Lane. Dense vegetation, including amenity hedgerow sections associated with adjacent properties are present at the eastern boundary.
- 2.3. The open space will be located immediately to the south of the proposed new residential development at the Application Site. The Core Open Space will be linked to the development by a new dedicated entrance located along Summer Lane, opposite the new development. This will provide new residents with immediate and easy access to it.
- 2.4. The illustrative design of the open space associated with the scheme, including the Core Open Space is shown at Appendix 7 of the 'Information to enable a Habitats Regulations Assessment' document. The Core Open Space will include a significant area of wildflower rich grassland, with areas of scrub / tree planting, bounded by native hedgerows, creating a natural and attractive environment.
- 2.5. A series of mown footpaths will be provided within the Core Open Space and a circular walk will be possible which could extend around the boundaries of the more formal provision in the south.
- 2.6. A dog bin will be provided at the entrance to the Core Open Space off Summer Lane.
- 2.7. An interpretation board will be provided at the entrance to the Core Open Space. This will include a map depicting the footpath arrangement (and showing the circular walk/s). It will also state that dogs can be exercised off the lead and direct users to pick up their dog's faeces and use the dog bin provided. Furthermore, the sign will alert visitors to the sensitivity of Pagham Harbour and encourage local residents to use the Core Open Space as opposed to traveling to the SPA / Ramsar site.

3. CORE OPEN SPACE MANAGEMENT

- 3.1. This section outlines the iterative management plan for the Core Open Space, including the initial habitat creation works required together with arrangements for the ongoing management to ensure that it will continue to function effectively in perpetuity.
- 3.2. In producing the management plan for the Core Open Space, key consideration has been given to the works which are required to facilitate and promote recreational use, in line with its function of attracting visitors away from Pagham Harbour SPA / Ramsar site.
- 3.3. All works involving the delivery of the open space outlined below, and the future management of habitats will be undertaken in accordance with best practice following relevant and due process. Advice will be sought from a suitably qualified ecologist in order to ensure that potential adverse effects on protected and notable species are avoided, in the event that such species are present in the future, following habitat creation measures.

Current Management

- 3.4. The arable field is currently subject to intensive agricultural management, with narrow vegetated field margins to the north south and east. The western boundary is currently not defined by any feature.

Capital Works

3.5. *Grassland Creation*

- 3.5.1. New species rich grassland will be created throughout the Core Open Space. A proprietary general purpose meadow mix such as Emorsgate EM2 is proposed. The following approach, which is a recognised means of creating good quality grassland on ex-arable land, would be appropriate:
 - Herbicide application to remove Couch Grass and other pernicious arable weed species;
 - Loose crop material removed;
 - Initial cultivation to encourage seed germination (weed species);
 - Second cultivation;
 - Broadcast of seed mixture (ideally early September);
 - Use of Cambridge Rollers to ensure seed has good contact with seed bed;
 - The sward will be topped no lower than 20cm three times during the first growing season;
 - Thereafter, cutting no lower than 20cm will be undertaken in early spring and again in the autumn; and
 - No fertilisers will be applied.

3.6. *Hedgerow / tree and scrub Planting*

- 3.6.1. Only native and wildlife beneficial trees and shrubs will be used within the Core Open Space. Native shrub species will also be used within hedgerow planting associated with the boundaries of the more formal open space provision to the south.
- 3.6.2. The following represent suitable species for inclusion within boundary hedgerow planting:
- Hawthorn
 - Blackthorn
 - Hazel
 - Holly
 - Guelder Rose
 - Crab Apple
- 3.6.3. The above, together with tree species such as Rowan, Silver Birch, Beech and Pedunculate Oak would be suitable for inclusion in the copse style planting proposed for the Core Open Space.
- 3.6.4. All planting would be undertaken in line with relevant guidance and best practice in relation to ground preparation, timings and densities.

3.7. *Pathways*

- 3.7.1. In order to maintain the semi-natural aesthetic of the Core Open Space a mown path will be maintained to provide routes throughout.
- 3.7.2. These pathways will be clear of dense vegetation to enable visibility along the walks to increase the perception of a safe environment.

3.8. *Installation of Waymarkers and Signs*

- 3.8.1. A number of waymarkers will be installed in selected locations to demark the route and to encourage its use by visitors to the site.
- 3.8.2. In addition new signs will be provided adjacent to the entrance of the Core Open Space entrance. These will encourage people to visit the Core Open Space and will illustrate the pathways available for users.

3.9. *Segregation from formal open space provision*

- 3.9.1. Any play areas delivered within the more formal element of open space provision will be fenced to prevent access to these areas by dogs. Signs will be erected informing the public that dogs are not permitted in such areas.

Ongoing Management and Maintenance Works

3.10. *Maintenance of Tracks, Waymarkers and Signs*

- 3.10.1. In order to ensure that the pathways, waymarkers and signs which are to be provided within the Core Open Space are in appropriate

condition, an initial review of the condition of these features will be undertaken a year after the Core Open Space is opened.

- 3.10.2. Should any works be required (e.g. remedial works to improve the condition of the tracks, these will be implemented immediately.
- 3.10.3. Following the initial check, these features of the Core Open Space will be subject to an inspection (e.g. every two years) with any necessary remedial works undertaken as soon as is practical.
- 3.10.4. In relation to footpaths; these will be mown grass paths subject to regular cutting throughout the growing season.

3.11. *Tree and Scrub Management*

- 3.11.1. Tree and scrub management will be minimal. The aim will be to retain the extent of that planted initially, preventing losses to grassland habitat over time. Following the defects liability period for new planting it is envisaged that direct management will not be necessary.
- 3.11.2. Grassland management (see below) will help prevent the encroachment of scrub into grassland habitat over time.

3.12. *Grassland Management*

- 3.12.1. Management of grassland in the Core Open Space will be in the form of a single cut undertaken in late summer and a further cut in late autumn. The cut will be undertaken on a rotational basis, with some areas left to grow longer. On a precautionary basis, management works will be undertaken using a methodology to ensure that potential impacts on reptiles and ground nesting birds are avoided (e.g. by ensuring that the sward height is maintained at a minimum of 150mm), and advice sought from a suitably qualified ecologist where necessary.
- 3.12.2. The mown pathways through the COS will be subject to regular mowing, most likely undertaken on a monthly basis between April and October. The frequency of mowing each year will depend on site conditions and weather, and will be amended accordingly to ensure that the route remains open and accessible for users.
- 3.12.3. Management of grassland within the more formal element of open space provision will most likely be of a more intensive nature (dependent on detailed design and use).

3.13. *Arrangements for review*

- 3.13.1. It is envisaged that any detailed Core Open Space Management Plan will be subject to review (e.g. every 5 years).