Cheshire Wildlife Trust

Frodsham Solar DCO - EN010153

Response to first set of Written Questions

Cheshire Wildlife Trust (CWT)

19 January 2026

Q4.0.6: Consideration of reptiles in the Environmental Statement

Are you satisfied with the applicant's relevant representation response (reference CWACC7.85 [PD2-027]) that reptiles have been fully and appropriately considered in the Environmental Statement? If no, please provide justification and relevant evidence to support your position.

We do not believe that the applicants have adequately considered the reptiles on the site.

The desk search for reptiles in the area was limited to 2km, which would not (and clearly has not) capture species records for the wider area. Despite the applicant's claims that "the closest reptile was recorded at Sandiway Golf Course and LWS, approximately 13 km southeast of the Main Development Area", there is a known population of slow worms in the Helsby Allotments (a designated Local Wildlife Site for this reason), about 2.3km from the development site. It is likely a remnant population from a time when they were more widely dispersed in the landscape, which used to be less fragmented and better habitat. The presence of this isolated population within a residential area indicates that other remnant populations could be present in the area, for example in the scrub along the railway lines, or in the scrubby and rough grassland at Frodsham Marshes. Slow worms are highly sedentary. While this characteristic makes them unlikely to colonise new areas, it also means that they would easily get trapped within a site bounded by barriers to dispersal. Their restriction to one spot also makes them easy to miss if their exact location is not surveyed. Unless every single suitable habitat on the site has been surveyed for reptiles, the presence of reptiles cannot be excluded. It is therefore imperative that the surveys be as thorough and robust as they could possibly be. This is not the case of the surveys undertaken to date, which are out of date, do not meet CIEEM standards, and do not cover the entire site (the NBBMA having been excluded). Better surveys will be required in order to thoroughly assess the impacts to reptiles.

Q4.1.2: Badger

Paragraph 7.7.32 of Terrestrial Ecology [APP-040] notes that habitats will be largely retained and protected during the construction process. Can you please provide your comments on this statement and can NE confirm whether you intend to grant or refuse a license to interfere with a badger sett for the purposes of the proposed development?

We defer to CWACC's comments on this matter.

Q4.1.3: Badger and Otter

Are you satisfied with the applicant's relevant representation response (reference CWACC7.88 [PD2-027]) that the proposed development would not adversely impact wildlife corridors or buffers? If no, please provide justification and relevant evidence to support your position.

The only otter surveys that have been done[1] seem to only cover about half of the site, and no further surveys were conducted to determine whether the "unidentified mammal holes" were in fact used by otters. Furthermore, these "unidentified mammal holes" were located in the one part of the site that will be fenced off to otters, completely blocking off any wildlife corridors and buffers to the wider Mersey SSSI they would currently be using. While it is clearly to limit predation on the birds in the NBBMA, In the SADA, the movement of badgers and otters will also be restricted by fencing, and though the design claims to include badger gates, this is inevitably a restriction of their movement. This would likely impact their foraging and commuting habits by constraining their routes, and it could also increase competition between clans as they are forced to use the fewer routes and foraging areas available to them. It is difficult to predict how much disturbance would be caused to the badgers as they are resilient and adaptable animals, but if badgers and their setts are disturbed during construction as well, the severing of wildlife corridors is likely to compound those effects.

Q4.4.2: NBBMA

Are you satisfied with: i) The applicant's Cleeve Hill Solar Park mitigation method to calculate the amount of NBBMA required to accommodate the types of non-breeding bird utilising the OL ii) The relevant representation response (reference CWACC7.51 [PD2-027]) that the NBBMA would provide adequate mitigation. If no, please provide a summary and reasons for your position.

We are **not satisfied** with the Cleve Hill approach to mitigation. The approach was already contentious for its own proposals, with Kent Wildlife Trust (KWT) submitting several objections arguing that "the calculations presented are insufficiently robust, and the predicted outcomes overly optimistic"[2]. We recommend that the Examiners read KWT's response as it raises many of the same issues as we are raising ourselves, namely the use of mitigation areas that already have management requirements, the underestimation of bird usage of the site in the calculations, and the disregard for basic and precautionary

[1] Figure 3, Environmental Statement: Volume 2 Appendix 7-2: Protected Ecological Species Baseline Report; Doc Ref: EN010153/DR/6.2

[2] Additional submission: Kent Wildlife Trust consultation response (13/07/2018)

principles. As they elegantly explain: “An enhancement in the outcome for a one ecological receptor does not mitigate for a negative impact on another”. If the Cleve Hill approach did not work for Cleve Hill, it certainly does not work for Frodsham Marshes.

We take issue with the basic principles and assumptions made, as well as with the methodology employed to calculate the required mitigation, as described in Annex 1 of the Outline Non-Breeding Bird Mitigation Strategy[3].

First and foremost, the applicants have claimed throughout the application that the NBBMA/Cell 3 will be “retained” and “enhanced”. Not only is this false, but it greatly minimises the impacts that the scheme will have on that area. If Cell 3 is completely reengineered for the purposes of habitat creation, this means that the entire area will be destroyed and recreated, which is vastly different from retention and enhancement. The large-scale engineering works would result in the complete suspension of the area’s ecological function for a period of time during its construction, impacts which will not be mitigated/compensated for elsewhere. These impacts are further discussed in sections Q4.5.4: Impacts on Local Wildlife Site (LWS) and Q4.5.8: Biodiversity net gain proposal.

When assessing Annex 1 specifically, a number of erroneous assumptions have been made in the introductory paragraphs that belie the poor understanding of the ecological principles underpinning the need for mitigation.

The applicants state that “scaling compensation to the entire SADA potentially overestimates the functional land requirement, whereas a like-for-like approach based on the actual functional area (predominantly Cell 3) provides a more realistic basis for mitigation scale”. Calling Cell 3 the “actual functional area” assumes that the number of birds using the area is the only measure of value of the land, whereas in reality its value comes from its size, connectivity, relative lack of disturbance, and proximity to other important sites for wildlife. This should be mitigated for in addition to the use by birds, and for which 63ha is nowhere near sufficient.

The applicants also state that “there is no agreed metric that exists to calculate what the non-linear habitat enhancements and additive mitigation being implemented as part of the NBBMA design”. It is unclear what the applicants think that the BNG metric is used for, if not for this exact purpose. In fact, the applicants have provided completed a BNG metric exclusively for the NBBMA/Cell 3, which clearly shows that the newly created habitat will not even provide a 10% net gain for itself, let alone for the rest of the site[4].

[3] Doc Reference: EN010153/DR/7.13 P02] V2
[4] Additional submission: NBBMA/Cell 3 BNG metric

There is also a frustrating lack of justification for the poorly detailed methodology used to calculate the mitigation area required.

The calculations only include 3 species of birds (Curlew, Lapwing, and Golden Plover). While it is true that the Cleve Hill approach only used 3 species (Dark-bellied Brent Goose, Golden Plover and Lapwing), this is because these were the only species predicted to be impacted by the development in their assessment[5]. This clearly does not apply to the Frodsham Solar Farm, where the "SPA species" requiring mitigation include "wintering wildfowl and waders, migrating birds in spring and autumn, pintail, teal, shelduck, wigeon, dunlin, curlew, redshank, plover"[6]. No justification has been provided as to why these additional species have not been included in the calculations for mitigation.

However, much area for mitigation is calculated (once redone to take into account the correct species), the mitigation should not be on land that is already under (however poor) management for wildlife. Mitigation works the following way: land that is good for wildlife is destroyed; therefore, land that is not good for wildlife is made good for wildlife to compensate. This is the most basic principle of "additive mitigation", and it is being blatantly ignored. The use of Cell 3 for mitigation purposes cannot be justified.

Finally, the methodology, specific equations, and justification for the calculations have not been provided, making it very difficult to assess (and requiring a lot of digging through the Cleve Hill examination documents). We request that these be submitted for further review, and that they include the following:

- how the hectarage of mitigation has been determined from the bird days
- which "literature" is referred to
- why lapwing and plover have been combined in this way, as this was not the methodology used for Cleve Hill (where it was indeed assumed that plover and lapwing mitigation area needs were not additional, but the higher of the two hectarage requirements was applied for both)[7]
- any justification for any of the decisions that were made regarding the calculations

It therefore follows that we are **not** satisfied with the mitigation proposed by the NBBMA, neither with the overarching principles nor with the details of the calculations.

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[5] Additional submission: Cleve Hill Solar Park ES Vol 4 – Technical Appendix A9.1 Ornithological Technical Appendix; Doc Ref 6.4.9.1; paragraph 102

[6] Outline Non-Breeding Bird Mitigation Strategy; Doc Reference: EN010153/DR/7.13 P02] V2; paragraphs 1.3.4-5, 1.4.1

[7] Additional submission: Cleve Hill Solar Park ES Vol 4 – Technical Appendix A9.1 Ornithological Technical Appendix; Doc Ref 6.4.9.1; paragraph 132

Q4.4.6: Mersey SSSI

Are you satisfied that the mitigations proposed by the applicant will mitigate any harmful aspects of the proposed development on the Mersey SSSI and, where possible, would conserve and enhance the SSSI affected by the proposed development?

The measures set out in section 2.8 of the oLEMP[8] are likely to have positive impacts on the Canal Pools associated with the Mersey SSSI. However, the loss of functionally linked land to the Mersey Estuary will have lasting negative impacts on the SSSI and the bird populations it is designated for. As discussed in our answer to Q4.4.2: NBBMA, the loss of functionally linked land is not adequately compensated for, therefore neither are the impacts to the Mersey SSSI and the larger SPA/SAC/Ramsar site.

The Mersey Estuary (the SSSI/SPA/SAC/Ramsar as well as its functionally linked land) provide one of the few large-scale havens for populations of threatened species (birds, mammals, plants) in the North-West. The loss of its functionally linked land will constrain the remaining habitats and species to smaller areas, such as the NBBMA, making them more vulnerable to external pressures (disease outbreaks, other developments, pollution, climate change, etc). Most of the species that the Mersey SSSI is designated for are declining at worst and stabilising at best[9], making them already vulnerable to disturbance, particularly from development. The impacts of a development such as the Frodsham Solar Farm have consequences that extend beyond the red line boundary, as many species are mobile and volatile, and rely on the connectivity and diversity of habitats. If they no longer have access to their habitats, weak populations might be unable to reproduce successfully or abandon the area, leading to local extinction. This could then have knock-on effects to the wider estuary, which will be under more pressure to host all its various species without the buffer of Frodsham Marshes.

Q4.5.1: Environmental Statement conclusions for terrestrial ecology

Are you content with the applicant's assessment in its Terrestrial Ecology Chapter 7 (Vol 1) [APP-040] that there would be no residual significant effects as a consequence of the proposed development? If you disagree with the applicant's assessment, please provide justification and relevant evidence to support your position.

[8] Outline Landscape and Ecology Management Plan Appendix B - Outline Non-Breeding Bird Mitigation Strategy (oNBBMS); Doc Ref: EN010153/DR/7.13

[9] WeBS Official Statistics | Advisor to Government on Nature Conservation | JNCC

We disagree with the conclusions described in section 7.11 Conclusions of the Terrestrial Ecology chapter[10] .

We do not believe that the BNG has been calculated correctly (see Q4.5.8: Biodiversity net gain proposal and Q4.5.7: Biodiversity net gain metric) and therefore we dispute the claims of a 10% increase in biodiversity units in paragraph 7.11.2.

"Retained" or "enhanced" features are actually likely to be degraded (such as the grassland under panels, see Q4.5.4: Impacts on Local Wildlife Site (LWS)), or downright destroyed (such as Cell 3, see Q4.4.2: NBBMA), despite the claims made in paragraph 7.11.3.

There are likely to be negative overall impacts to the habitats onsite (discussed in Q4.4.2: NBBMA, Q4.5.5: Frodsham, Helsby and Ince Marshes LWS, and Q4.5.8: Biodiversity net gain proposal), despite the claims made in paragraph 7.11.4.

There are likely to be negative impacts to the Local Wildlife Site (discussed in Q4.5.4: Impacts on Local Wildlife Site (LWS)), despite the claims made in paragraph 7.11.6.

We therefore strongly disagree with the overall conclusion that "with the incorporated mitigation and enhancement measures, no significant residual adverse effects are predicted to occur upon any important terrestrial ecology feature as a result of the construction, operation or decommissioning of the Proposed Development" as claimed in paragraph 7.11.9.

Q4.5.4: Impacts on Local Wildlife Site (LWS)

Can you advise if you agree with the applicant's assessment that although there would be significant temporary adverse effects on Frodsham, Helsby and Ince Marshes LWS during the construction phase, and that there would be significant positive effects in the medium-long term? If you disagree with the applicant's assessment, please provide justification and evidence to substantiate your position.

According to the Local Wildlife Site Selection Criteria[11], Local Wildlife Sites are "sites with 'substantive nature conservation value'. They are defined areas identified and selected locally for their nature conservation value, based on important, distinctive and threatened habitats and species with a national, regional and (importantly) a local context".

We vehemently refute the claim that the development will have "significant positive effects in the medium-long term". Much of the Local Wildlife Site's value derives from its size and

[10] ES Terrestrial Ecology Chapter 7; doc ref: EN010153/DR/6.1
[11] Additional submission: Local Wildlife Site Selection Criteria for the Cheshire region (2014)

connectivity, both of which will be heavily compromised by the development. Fragmentation caused by fencing and lost habitats will result in a severing of the wildlife corridors throughout the site. The development of the area will remove the potential for habitat restoration and landscape-scale nature recovery works, which are crucial to conservation work and would be particularly effective on this site.

Presumably the applicants' claims of long-term benefits to the LWS as a whole are based on the enhancement of the NBBMA/Cell 3 and the management of small pockets of newly created habitat throughout the development. It is important to note that newly created habitat does not count towards the LWS criteria until it is completely established and stable, and functioning to support the species it may have been designated for. The LWS Criteria Guidance states that newly created grasslands can only qualify once they've been established for approximately 20 years, and while no such provision is made for other habitats, this temporal condition is likely to apply to newly created wetlands as well. If Cell 3 is "completely reengineered"[12], it would have to be removed from the LWS boundary as it would no longer serve its designated ecological purpose during construction and is likely to take several years to reestablish enough to qualify. This means that claims of enhancement to the LWS derived from habitat creation/enhancement of the NBBMA are erroneous. They are unlikely to have any benefits outside of their localised range and will certainly not offset the extensive damages to the rest of the Local Wildlife Site. More likely is that the effects of development will exacerbate the ongoing disturbance and damage that the site has experienced over the last century (significant cumulative impacts from the wind farm, Protos, ship canal, pollution from the wider industrial landscape).

If the various pending applications for development on the site are approved, the red line boundaries will cover more than 67% of the Local Wildlife Site. This does not bode well for its next review, which is likely to require a revision of the boundary or even a de-designation.

Q4.5.5: Frodsham, Helsby and Ince Marshes LWS

If any party believes the applicant's significance of effects conclusion omitted any qualifying features associated with Frodsham, Helsby and Ince Marshes LWS, please provide justification and evidence to substantiate your position.

The Assessment of Frodsham, Helsby and Ince Marshes Local Wildlife Site[13] goes through the LWS criteria and assesses the site against its qualifying features, concluding that all criteria are still met. A few criteria for which the site is designated have not been assessed

[12] Information to Inform Habitats Regulations Assessment (Updated); Doc ref: EN010153/DR/5.3
[13] Technical Appendix 7.5; Document Ref: EN010153/DR/6.2

(Coastal and Floodplain Grazing Marsh, Saltmarsh and Mudflats, and Mosaics), and while there is no justification for this omission, it is assumed that they are not present within the site boundary. However, we question the omission of criterion H27 Mosaics, as many of the habitats mapped in the Habitat Plans in the Habitats Baseline Report[14] have multiple habitat codes, which implies a mosaic.

However, the Assessment[15] does not provide any detail as to how the qualifying features will be impacted by the development, which would provide the evidence necessary to substantiate the applicant's conclusion of significant effects. While these are touched on in the chapter on Terrestrial Ecology[16], they should have been laid out more clearly and systematically to allow for more thorough assessment.

I will go through the qualifying criteria below to describe the potential impacts to those features, which could then impact the LWS's designation for them. Whether this ends up being the case would have to be determined through detailed surveys of the LWS post-development and a reassessment of the site against the criteria, but it is the applicant's responsibility at this stage to demonstrate that the qualifying features will not be negatively impacted by the scheme. If this cannot be done with a high degree of certainty, then claims of "benefits to the LWS" cannot be substantiated.

H7 Neutral Grassland and H11 Restorable Grassland: at the moment, the grassland across the LWS is vast and continuous, characteristics that are likely to be compromised by the development. The grassland under the panels is considered by the applicants to be "retained", though we question the retention of its quality and its ecological function. Light availability is a fundamental driver of grassland community structure and directly affects the composition of wildflowers, grasses, rushes and sedges within the sward. Studies have found that areas directly beneath solar panels may receive as little as 30% of total daily light inputs and areas at the edge of the panels 40-70%. Where species-rich grasslands pre-exist, this fundamental change will shift the species composition to a more shade-tolerant community reducing the number of flowering species associated with grasslands as they struggle to compete with vigorous shade-tolerant species. Grassland plant communities associated with high light availability (such as NVC MG5 and MG6) will in time be replaced by less diverse communities such as modified grasslands NVC MG1, MG7, MG9 and MG10 if solar panels are introduced. If solar panels are installed on areas of low grassland diversity (such as NVC MG7) it may be possible to increase species diversity if habitat creation between the panels is undertaken, however this is highly unlikely to

[14] Environmental Statement: Volume 2 Appendix 7-1; Document Ref: EN010153/DR/6.2
[15] Technical Appendix 7.5; Document Ref: EN010153/DR/6.2
[16] Environmental Statement: Volume 1 Chapter 7; Document Ref: EN010153/DR/6.1

achieve an equivalent value to a pre-existing diverse grassland. The fundamental determining factor for the overall impact of such a scheme is the diversity of the pre-existing habitat on the site and what fauna and flora it currently supports.

H18 Marsh Fens, swamps, bogs and reedbeds: there is currently a net loss of reedbeds, which could impact the viability of this qualifying feature.

H24 Wildlife Corridors Wildlife corridors / buffers: As explained in the previous question, fragmentation will lead to loss of connectivity and a reduction of buffers. This could also impact the viability of this qualifying feature.

H26 Other Qualifiers Accessible Natural Greenspace: This feature will probably be enhanced by development, as they have included provisions for accessibility in the design of the scheme.

S2 Birds: The primary mitigation area for birds is the Cell 3/NBBMA, which as previously mentioned might have to be removed from the LWS boundary if it is completely reengineered. Regardless, breeding birds are likely to be impacted by the scheme, as we have made clear that the Skylark mitigation area is nowhere near enough mitigation to compensate for loss of area across the site. While it is unclear how the rest of the site will be used by birds after development, reduction in overall bird populations (particularly if the NBBMA is discounted) cannot be ruled out.

S13 Species Vascular Plants: The criterion is met through its populations of spindle, including the one present in the site boundary. Can the applicants demonstrate that the spindle will not be affected by the development?

H2 wet woodland: The wet woodland is set to be retained, though further details (exact location, likely impacts) would be helpful to determine that the criterion would not be impacted by the development.

H20 Ponds and Ditches: The applicants claim that the ditch network will be improved, though this is difficult to assess without all the necessary BNG information (see Q4.5.7: Biodiversity net gain metric).

H25 High Value Hedges: Hedges are set to be enhanced and improved by the development.

S1 Butterflies and S4 Dragonflies and damselflies: The NBBMA is likely to improve habitat availability for invertebrates, though once again this is likely not to count towards the LWS due to its complete reengineering.

S3 Mammals: As discussed in Q4.1.3: Badger and Otter, fencing and fragmentation are likely to lead to restrict their movement and impact their commuting and foraging behaviour. Especially if they are displaced during construction, there is a chance they would leave the area entirely. Conditions are likely to improve for water voles if the ditch network if improved.

S7 Fresh water fish (mainly European Eels): Mitigation measures have been proposed to ensure that eels are not impacted by the scheme.

It is our role to assess the proposals for their potential worst-case scenario impacts, and it is the applicant's role to provide evidence (beyond declarative statements) to assuage these concerns. We do not consider that enough evidence has been provided to guarantee the prevention of a worst-case scenario, much less to indicate any positive outcomes for the site.

Q4.5.6: Noise assessment

Are you satisfied with the applicant's noise assessment and that there would be no significant effect on any species? If you disagree with the applicant's assessment, please provide justification and relevant evidence to support your position.

We defer to Cheshire West and Chester Council's comments on this matter.

Q4.5.7: Biodiversity net gain metric

Are you satisfied that the latest BNG metric [PD2-032] : i) Follows best practice/guidance? ii) Contains the necessary information? iii) That habitat, hedgerow and watercourse are classified accurately? iv) The metric results are correct? If no, please provide justification and relevant evidence to support your position.

As we do not currently have access to the necessary supporting BNG materials (habitat condition assessments or map of habitats with reference codes, BNG report that details decisions made with regards to classification), our comments regarding BNG are based on any currently available documentation. This includes the latest BGN metrics that have been provided to us and the BNG report[17].

i) Best practice/guidance

We do not believe that the majority of the CIEEM good practice principles[18] have been adhered to, which we detail below:

[17] Biodiversity Net Gain Report; Document Ref: EN010153/DR/7.12
[18] Additional submission: CIEEM Good Practice Principles for Development

- Principle 1. Apply the Mitigation Hierarchy
    - There is no mention of the mitigation hierarchy in the BNG report, no evidence that it has been applied. Which losses were avoided due to the implementation of the hierarchy in the early stages of the project? Why is the project not reaching a 10% net gain in watercourses if BNG was considered at the beginning of the project?
- Principle 2. Avoid losing biodiversity that cannot be offset by gains elsewhere
    - Reedbeds are not being fully compensated, as indicated by the trading rules not being met.
- Principle 3. Be inclusive and equitable
    - I cannot speak to whether other stakeholders were engaged early for involvement in "designing, implementing, monitoring, and evaluating the approach to Net Gain", but we certainly have not been included in any discussions. In fact, when we were consulted later in the process, our concerns about the metric were ignored at the pre-app stage or dismissed in the Consultation Report[19].
- Principle 4. Address risks
    - CIEEM's Practical Guide[20] states that "there should especially be no net reduction in resources for endangered species during a project life cycle, even if there is a gain at some point in the future". This is not adhered to in the Frodsham Solar Farm plans, due to the complete reengineering of Cell 3, which will **significantly reduce the amount of habitat available to SPA birds and most other wildlife on the site during its construction**.
- Principle 5. Make a measurable Net Gain contribution
    - The final assessment will require the applicants to fill out the BNG metric correctly, particularly that the mitigation hierarchy is applied and the habitat trading rules are met, ensuring that the good practice principles are respected.
- Principle 6. Achieve the best outcomes for biodiversity
    - The proposals do not deliver compensation that is equivalent in type or amount. It does not account for the interim extensive losses of habitat within the development site or the compensation site. It does not contribute to nature conservation priorities as identified in the Local Nature Recovery Strategy and it significantly diminishes ecological connectivity by considerably reducing in size a core site (LWS) within the Local Nature

[19] Consultation Report Appendix 10: Section 42 Applicant Response; Doc Ref EN010153/DR/5.2
[20] Additional submission: CIEEM Good Practice Principles for Development, A Practical Guide para 11.5.1

Recovery Strategy. Instead of resulting in more, bigger, better, joined habitat it will result in less, worse, and highly fragmented habitat.

- Principle 7. Be additional
    - CIEEM's Practical Guide[21] advises that "if several biodiversity projects are taking place within one area, good practice requires the BNG design to be clearly additional to the other projects, and to maximise complementary interactions with other projects". The use of an already existing mitigation area for BNG is the antithesis of "clearly additional to other projects". Furthermore, the Frodsham Wind Farm's biodiversity mitigation required by its planning conditions will be invalidated for Cells 2 and 5, and superseded on Cell 3, which is the exact opposite of "complementary interaction".
- Principle 8. Create a Net Gain legacy
    - This is compromised by the fact that after the net gains both on the SADA and the NBBMA can only be secured for as long as the solar farm is in operation, after which the future of these newly created habitats is uncertain.
- Principle 9. Optimise sustainability
    - Despite the fact that the project is for renewable energy infrastructure, environmental sustainability will not be achieved if significant damage or destruction of habitats and species populations occurs.
- Principle 10. Be transparent
    - The lack of transparency has been very frustrating, with the metric not being provided as an excel spreadsheet until specifically asked, with the habitat condition assessments being submitted blank, with the BNG report containing the bare minimum information, and with communication with the applicants being difficult and slow.

ii) Necessary information

We do not have access to the BNG supporting materials (see response to Q4.6.2: NPS EN-1).

However, there are certain issues with the metric and the way that it has been filled out, which make assessment difficult if not impossible. Some habitats are entered as having an area of 0, with no explanation as to why that is. Furthermore, there is no explanation of where each habitat is located on the map, which could be done either through detailed comments in the 'User Comments' column, or with a habitat map that is labelled with the

[21] Additional submission: CIEEM Good Practice Principles for Development, A Practical Guide Table 4.4

'Habitat Reference numbers'. Since neither are available, it is impossible to identify where the parcels are located and therefore assess whether they have been classified correctly.

iii) Habitat, hedgerow, watercourse classification

This cannot be fully assessed until the necessary information is required (see response to question Q4.6.2: NPS EN-1).

However, the applicants have provided additional information regarding the classification of reedbeds[22], which is based on a misinterpretation of the habitat definitions.

- They claim that the reedbed in the NBBMA is not priority reedbed due to its size, even though there is no size specification in the JNCC definition of reedbed priority habitat.
- They claim that the reedbed in the Frodsham Windfarm East does not meet the UKHab definition of reedbed because it is dry, whereas the definition explicitly provides for "reed-dominated vegetation extending onto dry land"[23]; code f2f should only be used if the parcels of Common Reed are <5m wide.
- They also claim that the reedbed in the Wildfowlers location is "not a priority habitat due to extensive willow shrub cover", even though the JNCC reedbed priority habitat definition explicitly states that "carr woodland may be associated with them".

It is also unclear why the reedbed areas are being assessed against the priority habitat definition in the first place, as all reedbeds are priority habitat regardless of their condition (there are no exclusions in the JNCC priority habitat definition) and its status as such is not relevant to the BNG metric.

iv) The metric results are correct

This cannot be fully assessed until the necessary information is provided (see response to question Q4.6.2: NPS EN-1).

Q4.5.8: Biodiversity net gain proposal

Are you satisfied with the Applicant's assessment that the proposed development will deliver a measurable gain in biodiversity units? The project design committed to achieving a minimum increase of 10 % in habitat and hedgerow units and no net loss in watercourse units (paragraph 7.7.66 of ES Chapter 7: Terrestrial Ecology [APP-040]. If no, please provide justification and relevant evidence to support your position.

[22] Appendix C - Further Information on the Classification of Reedbeds, Response to Local Planning Authority and Statutory Environmental Body Relevant Representations; Doc Ref: EN010153/DR/8.5
[23] Additional submission: UK Habitat Classification, V2

We cannot definitively answer this question until we have received all updated BNG supplementary documents. However, we have identified certain concerns based on the metric spreadsheets that we have received as well as claims made in the submitted documents, particularly the BNG Report[24] and its figures. While net gains in hedgerows seem likely, we suspect that once the metric is correctly filled out, measurable net gains for area habitats will not be achieved.

If Cell 3 is to be completely reengineered and recreated, the habitats cannot be considered retained or enhanced (as they are in Figure 2 and seem to be in the BNG metric). **They must be entered into the metric as lost in the habitat baseline tab and recreated in the habitat creation tab.** This is important as the metric accounts for the time during which the habitat is not ecologically functional and the time it takes for the habitat to be fully functional again once created.

Similarly, no justification has been provided as to how the potential/likely degradation of the grassland under the solar panels has been accounted for in the metric. Figure 2 currently suggests that it will be marked as retained, though as discussed in the answer to question Q4.5.5: Frodsham, Helsby and Ince Marshes LWS, there are likely to be impacts to the quality of the existing grassland from the change in light availability.

As has been brought up many times before, trading rules have not been satisfied for the reedbeds; this will result in uncompensated losses of rare and important priority habitat, which is especially important for a wide range of declining bird species. The applicants invoke Rule 4 to justify this loss, stating that "Rule 4 of the metric guidance expressly allows deviation from trading rules where there is clear ecological justification and where the proposed habitats represent the most appropriate outcome for the site context. In this case, compliance with the trading rules on reedbeds would be ecologically inappropriate and contrary to the primary mitigation objectives of the project, i.e., to the aims and objectives of the oNBBMS" [25]. However, this is clearly a misinterpretation of the guidance[26], which states that Rule 4 only applies to projects that involve "highly complex **landscape scale** habitat changes such as creation of heathland, heathland grassland mosaic or other mosaic habitats" (not applicable), "**river re-meandering**" (not applicable), or "large-scale restoration of **natural processes**" (not applicable). Regardless, a large part of the reedbed that is being lost without compensation is in the SADA, where no habitat creation is being done that can justify its loss. For further comments regarding reedbed, see response to question Q4.5.7: Biodiversity net gain metric.

[24] Biodiversity Net Gain Report; Document Ref: EN010153/DR/7.12
[25] Applicant's Response to Other Relevant Representations; Doc Ref EN010153/DR/9.X; section CWT5
[26] What you can count towards a development's biodiversity net gain - GOV.UK

Q4.6.2: NPS EN-1

Can you comment whether paragraph 4.6.7 of NPS EN-1 has been satisfied which notes that the latest version of the biodiversity metric is encouraged and that calculation data for biodiversity baseline and present planned biodiversity net gain outcomes are presented in full as part of the application?

We agree that the latest version of the metric has been used. However, none of the supporting materials required to assess Biodiversity Net Gain have been provided. This includes:

- Condition assessment sheets (filled in version, not just the templates)
- A map of all habitats with their corresponding 'habitat reference numbers'
- An updated BNG report that details and justifies the way that BNG has been determined and calculated

Q4.6.3: NPS EN-1

Are you satisfied that the proposed development meets the following paragraph in NPS EN-1: paragraph 4.6.15 Applications for development consent should be accompanied by a statement demonstrating how opportunities for delivering wider environmental net gains have been considered, and where appropriate, incorporated into proposals as part of good design (including any relevant operational aspects) of the project. If no, please provide justification and relevant evidence to support your position.

No document has been provided as such, though we acknowledge that various commitments and attempts at justifying environmental net gains have been made across other documents, including the Environmental Statement, the Design Approach Document, the BNG report, the Information to Inform HRA, etc. However, as has hopefully been made clear already, we disagree with the conclusions that these attempts will provide any wider environmental net gains, or that these have informed the design of the scheme. This is particularly clear in the fact that the applicants have been "consulting" with us for several years in the pre-app stage, and that none of our concerns around ecological harm have been addressed or assuaged in the final design of the scheme that was submitted to PINS.

Q4.6.4: NPS EN-1

Are you satisfied that the proposed development meets the following paragraph in NPS EN-1: 5.4.22 The design of energy NSIP proposals will need to consider the movement of mobile/migratory species such as birds, fish and marine and terrestrial mammals and their potential to interact with infrastructure.

We agree that the movement of mobile/migratory species have been considered (some surveys have been conducted, some reports submitted, some mitigation), though we do not believe that these considerations are adequate, nor have they been incorporated into the scheme or mitigation proposals in any satisfactory way (see response to Q4.4.2: NBBMA).

Submission ID: S0CDEF6C4

I am including additional document submissions, as we refer to them in our comments and would be useful for the Examiners.
(Apologies, the Cheshire LWS Criteria document has uploaded twice and the portal won't let me remove one; they should be the same document, so only one of them is needed.)

Biodiversity Net Gain

Good practice principles for development

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Contents

Introduction 1

Achieving Biodiversity Net Gain
Establishing good practice
Supporting guidance

Biodiversity Net Gain - Good practice principles for development 2

Principle 1. Apply the Mitigation Hierarchy
Principle 2. Avoid losing biodiversity that cannot be offset by gains elsewhere
Principle 3. Be inclusive and equitable
Principle 4. Address risks
Principle 5. Make a measurable Net Gain contribution
Principle 6. Achieve the best outcomes for biodiversity
Principle 7. Be additional
Principle 8. Create a Net Gain legacy
Principle 9. Optimise sustainability
Principle 10. Be transparent

Acknowledgements 4

Supporting guidance
How you can get involved

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Introduction

Achieving Biodiversity Net Gain

Designing, building, operating and maintaining - each of these stages of a development scheme generates opportunities to help achieve an overall benefit for biodiversity. Realising these opportunities is vital because biodiversity, and the functions it provides, are essential to sustain our society and economy.

Achieving these net gains in biodiversity, where there are wider benefits for society, is more than simply outweighing losses with gains. It requires doing everything possible to avoid losing biodiversity in the first place, as well as involving stakeholders especially as partners. It also requires the gains in biodiversity to be valuable locally, and to make important contributions towards regional and national priorities for nature conservation. In other words, there is a right way to achieve 'Biodiversity Net Gain' that brings about long-lasting and meaningful benefits for our environment, society and economy.

This 'right way' is articulated in standards and guidelines produced by an international community on achieving No Net Loss and Net Gain targets for biodiversity. In the United Kingdom, the government has international and national commitments on biodiversity that include halting the loss of biodiversity and reaching net gains. Development can contribute significantly towards realising these commitments. However, until now there has been no standard for the UK industry on good practice for achieving Biodiversity Net Gain.

Establishing good practice

CIRIA, CIEEM and IEMA have developed the first UK principles on good practice to achieve Biodiversity Net Gain. These principles provide a framework that helps improve the UK's biodiversity by contributing towards strategic priorities to conserve and enhance nature while progressing with sustainable development. They also provide a way for industry to show that projects followed good practice.

It is important that these principles are tested, refined and improved through feedback and review. CIRIA, CIEEM and IEMA will undertake a first review within 12 months.

Supporting guidance

The principles are broad by necessity so that they apply to a wide-ranging industry. This means that their proper interpretation is critical. CIRIA, CIEEM and IEMA are developing guidance that will contain practical advice on implementing the Net Gain principles and definitions of key terms. This guidance will be available in 2017, and a steering group will be overseeing its production and consultation with a variety of stakeholders.

Part of that stakeholder consultation is discussing a credible, proportionate way to audit implementation of Biodiversity Net Gain. While this is in progress, developments claiming to achieve Biodiversity Net Gain must provide evidence that clearly demonstrates they have implemented and adhered to the good practice principles.

Biodiversity Net Gain

Good practice principles for development

Biodiversity Net Gain is development that leaves biodiversity in a better state than before. It is also an approach where developers work with local governments, wildlife groups, land owners and other stakeholders in order to support their priorities for nature conservation. These ten principles set out good practice for achieving Biodiversity Net Gain and must be applied all together, as one approach.

Principle 1. Apply the Mitigation Hierarchy

Do everything possible to first avoid and then minimise impacts on biodiversity. Only as a last resort, and in agreement with external decision-makers where possible, compensate for losses that cannot be avoided. If compensating for losses within the development footprint is not possible or does not generate the most benefits for nature conservation, then offset biodiversity losses by gains elsewhere.

Principle 2. Avoid losing biodiversity that cannot be offset by gains elsewhere

Avoid impacts on irreplaceable biodiversity - these impacts cannot be offset to achieve No Net Loss or Net Gain.

Principle 3. Be inclusive and equitable

Engage stakeholders early, and involve them in designing, implementing, monitoring and evaluating the approach to Net Gain. Achieve Net Gain in partnership with stakeholders where possible, and share the benefits fairly among stakeholders.

Principle 4. Address risks

Mitigate difficulty, uncertainty and other risks to achieving Net Gain. Apply well-accepted ways to add contingency when calculating biodiversity losses and gains in order to account for any remaining risks, as well as to compensate for the time between the losses occurring and the gains being fully realised.

Principle 5. Make a measurable Net Gain contribution

Achieve a measurable, overall gain[1] for biodiversity and the services ecosystems provide while directly contributing towards nature conservation priorities.

1 Net Gain has been described as a measurable target for development projects where impacts on biodiversity are outweighed by a clear mitigation hierarchy approach to first avoid and then minimise impacts, including through restoration and / or compensation. Adhering to these Net Gain principles (i.e. pursuing all principles together) will help in under-pinning good practice for achieving and sustaining Net Gain.

Principle 6. Achieve the best outcomes for biodiversity

Achieve the best outcomes for biodiversity by using robust, credible evidence and local knowledge to make clearly-justified choices when:

- Delivering compensation that is ecologically equivalent in type, amount and condition, and that accounts for the location and timing of biodiversity losses
- Compensating for losses of one type of biodiversity by providing a different type that delivers greater benefits for nature conservation
- Achieving Net Gain locally to the development while also contributing towards nature conservation priorities at local, regional and national levels
- Enhancing existing or creating new habitat
- Enhancing ecological connectivity by creating more, bigger, better and joined areas for biodiversity

Principle 7. Be additional

Achieve nature conservation outcomes that demonstrably exceed existing obligations (i.e. do not deliver something that would occur anyway).

Principle 8. Create a Net Gain legacy

Ensure Net Gain generates long-term benefits by:

- Engaging stakeholders and jointly agreeing practical solutions that secure Net Gain in perpetuity[2]
- Planning for adaptive management and securing dedicated funding for long-term management
- Designing Net Gain for biodiversity to be resilient to external factors, especially climate change
- Mitigating risks from other land uses
- Avoiding displacing harmful activities from one location to another
- Supporting local-level management of Net Gain activities

Principle 9. Optimise sustainability

Prioritise Biodiversity Net Gain and, where possible, optimise the wider environmental benefits for a sustainable society and economy.

Principle 10. Be transparent

Communicate all Net Gain activities in a transparent and timely manner, sharing the learning with all stakeholders.

2 Biodiversity compensation should be planned for a sustained Net Gain over the longest possible timeframe. For development in the UK, the expectation is that compensation sites will be secured for at least the lifetime of the development (e.g. often 25-30 years) with the objective of Net Gain management continuing in the future.

Acknowledgements

Principal Co-ordinating Author	
Julia Baker	Balfour Beatty

Project Team and Contributors	
Martina Girvan	Arcadis
Neil Harwood	Arup
Claire Wansbury	Atkins
Sally Hayns	CIEEM
Owen Jenkins	CIRIA
Michael Small (Project Manager)	CIRIA
Nick Blyth	IEMA
Alex Saponja	Interserve
Bob Edmonds	SLR Consulting

The project team consisted of staff representatives from the three partner organisations, together with industry members of each organisation.
We would like to thank the numerous stakeholders who provided comment on earlier drafts of the principles in the form of online surveys, a consultation workshop and a webinar.

The Biodiversity Net Gain good practice principles were first drafted based on several sources: responses to the UK government's 2013 Green Paper Consultation on Biodiversity Offsetting; experience gained from the national pilot on biodiversity offsetting led by the UK's Department for Environment, Food and Rural Affairs; experience from Network Rail Infrastructure Projects' and from other leading corporations' work on net positive approaches; and also on principles developed for the international community by the Business and Biodiversity Offset Programme.

The draft principles were refined following initial consultation with various stakeholders including government, NGOs, regulators and private and public-sector organisations. The refined version was presented to over 450 professionals during a webinar where the majority supported this approach to Biodiversity Net Gain and the principles. The principles were revised based on feedback received during the webinar, assessed by the project team and the final set are presented in this document. It is envisaged that the principles will be further refined following a period of application, feedback and review.

Supporting guidance

The principles are broad by necessity so that they apply to a wide-ranging industry. This means that their proper interpretation is critical. CIRIA, CIEEM and IEMA are developing guidance that will contain practice advice on implementing the Net Gain principles and definitions of key terms. This guidance will be available in 2017, and a steering group will be overseeing its production and consultation with a variety of stakeholders.

Part of that stakeholder consultation is discussing a credible, proportionate way to audit implementation of Biodiversity Net Gain. While this is in progress, developments claiming to achieve Biodiversity Net Gain must provide evidence that clearly demonstrates they have implemented and adhered to the good practice principles.

How you can get involved

If you would like to be kept informed of progress with our Biodiversity Net Gain practical guidance, please visit www/ciria.org/netgain for further information.

If you are able to sponsor or otherwise contribute towards the cost of developing the Biodiversity Net Gain practical guidance, please contact [redacted]

Biodiversity Net Gain

Good practice principles for development

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Balfour Beatty This initiative has also been supported by Balfour Beatty

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ENVIRONMENTAL STATEMENT
VOLUME 4 - TECHNICAL APPENDIX A9.1
ORNITHOLOGY TECHNICAL APPENDIX

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9 ORNITHOLOGY TECHNICAL APPENDIX

9.1 Introduction

1. This Technical Appendix provides details of the pre-development desk study and baseline bird surveys undertaken to inform the assessment of effects of the Cleve Hill Solar Park (CHSP, 'the Development') on birds that is presented in Chapter 9: Ornithology of the ES.

2. The information comes from three main sources:

- A desk study carried out by Arcus Consultancy Services Ltd (hereafter 'Arcus') to provide context relating to protected sites and historical records of birds at or near the Development site;
- Baseline bird surveys carried out by AECOM between January 2014 and July 2015; and
- Baseline bird surveys carried out by Arcus between September 2015 and April 2018.

3. This Appendix is supported by three additional Appendices:

- Appendix A9.2: Cleve Farm – Breeding Bird Survey Report 2014 & 2015 (AECOM);
- Appendix A9.3: Cleve Farm – Passage Bird Survey Report 2015 (AECOM); and
- Appendix A9.4: Cleve Farm – Wintering Bird Survey Report 2013/14 & 2014/15 (AECOM).

9.2 Terminology

4. The 'Core Survey Area' (CSA) is defined on Figure A9.1 and is broadly the area that was proposed to contain the solar farm infrastructure, before design iterations and development design mitigation began. The various survey and desk study areas have largely been based on varying extents around the CSA.

5. Terms used to define study or survey areas are defined in each Section below and displayed on the Figures.

9.3 Desk Study

6. A search was undertaken with the following data-providers for information relevant to the assessment of potential effects of the Development on birds:

- Multi-Agency Geographic Information for the Countryside (MAGIC): statutory designated sites of ornithological interest within 5 km of the CSA (Figure A9.1), this was extended to 10 km for Special Protection Areas (SPA);
- Kent & Medway Biological Records Centre (K&MBRC): designated sites (statutory and non-statutory) within 5 km and bird species records within 2 km of the CSA (Figure A9.1);
- National Biodiversity Network (NBN): the NBN Gateway was interrogated for records of bird species records within 2 km of the CSA (Figure A9.1);
- British Trust for Ornithology, Wetland Bird Survey (BTO, WeBS): summary WeBS Core Count data for the Swale Estuary for the most recently available 5-year period, detailed Core Count data for the South Swale NNR WeBS count sector for the most recently available 5-year period and WeBS Low-tide Count data for the Swale Estuary for any years in which WeBS Low Tide Counts were carried out;

- Kent Wildlife Trust (KWT): honorary warden monthly and annual reserve and WeBS reports for the South Swale LNR; and
- Kent Ornithological Society (KOS): known barn owl nest sites monitored by KOS within 5 km of the CSA. Ringing data from the South Swale reserve were also supplied.

9.3.1 Designated Sites

7. Statutory and non-statutory designated sites for nature conservation within 5 km (and SPAs within 10 km) of the Core Survey Area are identified in Chapter 9, Section 9.3.1 and Figure 9.2 in Volume 2: Figures of the ES.

9.3.2 Species Records

9.3.2.1 Kent & Medway Biological Records Centre

8. K&MBRC provided a summary of bird records for Ordnance Survey (OS) grid squares:

- Tetrads (2 ×2 km) – TR06B, C, G, H, L, M, R & S (including the 1-km squares they contain; and
- 1-km squares (1 × 1 km) – TQ9963, TQ9964, TR0161, TR0166, TR0261, TR0266, TR0361, TR0366, TR0461, TR0466, TR0561, TR0566, TR0661, TR0666 and TR0766.

9. The data provided summarise the 101,407 bird records for the search area. The very large number of records is a reflection of the proximity of some sites, such as Oare Marshes, that are very well covered by birdwatchers.

10. The summary data are not repeated here, but in the preliminary assessment in Chapter 9: Ornithology, reference is made in the baseline summary to the status of the species where it is identified as an Important Ecological Feature.

11. K&MBRC also provided additional details of breeding records of Wildlife & Countryside Act (WCA) Schedule 1 breeding birds. Information pertaining to locations of Schedule 1 breeding species is potentially sensitive and hence is not published within this Appendix; the reco0rds included avocet, barn owl, bearded tit, Cetti's warbler, garganey, hobby, kingfisher, little ringed plover, little tern, marsh harrier, marsh warbler, Mediterranean gull, Montagu's harrier, Savi's warbler and short-eared owl. Where relevant, information is included in the assessment in Chapter 9: Ornithology. However, the only relatively recent records provided (> 2010) were for avocet and bearded tit; all other records were dated pre-2005.

9.3.2.2 NBN

12. A search of the NBN Atlas was made in February 2018 for records of birds within 2 km of the CSA. This yielded over 125,000 records of 195 species. These were distilled down to records from Ordnance Survey (OS) 1-km grid squares within 1 km of the CSA:

13. The records were summarised for the breeding and non-breeding seasons (Tables A9.1 and A9.2).

Table A9.1: Summary of breeding season NBN Atlas records in OS 1-km squares or tetrads that overlap with the CSA

Species	Number of Records	Years Recorded
Arctic tern	2	2008-2011
Avocet	759	1998-2015
Bar-headed goose	17	2002-2008
Bar-tailed godwit	125	1989-2015
Black swan	4	2006-2014
Black tern	9	2007-2015
Blackbird	549	1998-2015
Blackcap	58	2004-2015
Black-headed gull	893	1989-2015
Blue Tit	186	2000-2015
Blue-headed wagtail	1	2011
Brent goose	35	2005-2015
Bullfinch	7	2010-2015
Buzzard	90	2005-2015
Canada goose	73	2006-2015
Carrion crow	406	2006-2015
Cetti's warbler	177	2006-2015
Chaffinch	184	2006-2015
Chiffchaff	56	2006-2015
Coal tit	9	2006-2015
Collared dove	256	2006-2015
Common gull	159	2006-2015
Common sandpiper	88	2006-2015
Common swift	160	2006-2015
Common tern	222	2006-2015
Continental goldcrest	2	2006-2015
Continental robin	129	2006-2015
Coot	548	2006-2015
Cormorant	477	2006-2015
Corn bunting	23	2006-2015
Cuckoo	63	2006-2015
Curlew	294	2006-2015
Curlew sandpiper	148	2006-2015
Dark-bellied brent goose	34	2006-2015
Dunlin	288	2006-2015
Dunnock	160	2006-2015

Species	Number of Records	Years Recorded
Eider	2	2006-2015
Feral pigeon	21	2006-2015
French (red-legged) partridge	17	2006-2014
Gadwall	249	2006-2015
Garden warbler	2	2006-2014
Golden plover	178	2006-2015
Goldfinch	228	2006-2015
Grasshopper warbler	5	2007-2014
Great black-backed gull	136	2006-2015
Great crested grebe	122	2006-2015
Great spotted woodpecker	224	2006-2015
Great tit	84	2006-2015
Green plover (lapwing)	506	2006-2015
Green woodpecker	145	2006-2015
Greenfinch	123	2006-2015
Grey heron	504	2006-2015
Grey partridge	13	2006-2015
Grey plover	69	2006-2015
Grey wagtail	13	2006-2015
Greylag goose	451	2006-2015
Herring gull	403	2006-2015
House martin	114	2006-2015
House sparrow	436	2006-2015
Jack snipe	1	2006
Jackdaw	116	2006-2015
Jay	10	2006-2015
Kestrel	297	2006-2015
Kingfisher	21	2006-2015
Knot	58	2006-2015
Lesser black-backed gull	141	2006-2015
Lesser redpoll	3	2006-2013
Lesser whitethroat	21	2007-2015
Linnet	12	2006-2014
Little grebe	267	2006-2015
Long-tailed tit	7	2004-2013
Magpie	38	2004-2015
Mallard	14	2005-2018
Meadow pipit	5	2006-2015

Species	Number of Records	Years Recorded
Mistle thrush	3	2004-2005
Moorhen	14	2005-2015
Mute swan	9	2005-2015
Oystercatcher	12	2005-2014
Pheasant	6	2005-2007
Pied wagtail	3	2007-2011
Pied/white wagtail	2	2013-2015
Red-breasted merganser	1	2008
Redshank	11	2006-2016
Reed bunting	7	2006-2015
Reed warbler	8	2006-2014
Ringed plover	5	1993-2012
Rook	2	2005-2007
Sand martin	1	2006
Sedge warbler	3	2006
Shelduck	8	2005-2015
Snipe	2	2008-2009
Song thrush	1	2008
Sparrowhawk	1	2011
Spotted redshank	1	2007
Starling	25	2005-2015
Stock dove	9	2005-2011
Stonechat	5	2005-2008
Swallow	20	2005-2015
Teal	24	1993-2011
Tufted duck	15	2005-2011
Turnstone	5	2006-2015
Turtle dove	8	2005-2012
Water rail	2	2006-2011
Wheatear	3	2006-2010
Whimbrel	9	2006-2011
Whitethroat	7	2005-2011
Woodpigeon	26	2005-2013
Wren	9	2005-2013
Yellow wagtail	18	2005-2015
Yellowhammer	1	2006

Table A9.2: Summary of non-breeding season NBN Atlas records in OS 1-km squares or tetrads that overlap with the CSA

Species	Number of Records	Years recorded
Arctic skua	7	2005-2014
Arctic tern	2	2005-2008
Avocet	475	1998-2015
Bar-headed goose	5	2006
Barn owl	33	2006-2015
Barnacle goose	8	1988-2015
Bar-tailed godwit	202	1989-2015
Bean goose	1	2006
Bearded tit	196	2000-2015
Black brant	1	2012
Black swan	1	2009
Blackbird	449	1988-2015
Blackcap	4	2006-2015
Black-headed gull	659	1988-2015
Blue tit	246	2001-2015
Brambling	2	2004-2010
Brent goose	150	2004-2015
Bullfinch	5	2006-2013
Buzzard	65	2005-2015
Canada goose	18	1988-2015
Carrion crow	342	2006-2015
Cetti's warbler	133	2006-2015
Chaffinch	119	2006-2015
Chiffchaff	12	2006-2015
Collared dove	206	2006-2015
Common guillemot	3	2007-2013
Common gull	249	2006-2015
Common sandpiper	11	2006-2015
Common scoter	10	2007-2014
Common swift	2	2006
Common tern	19	2006-2015
Continental goldcrest	11	2007-2015
Continental robin	210	2006-2015
Coot	412	2006-2015
Cormorant	370	1990-2015
Corn bunting	14	2006-2015

Species	Number of Records	Years recorded
Curlew	355	2006-2015
Curlew sandpiper	73	2006-2015
Dark-bellied brent goose	100	1990-2015
Dunlin	391	2006-2015
Dunnock	128	2006-2015
Eider	5	1990-2013
Feral pigeon	21	2006-2015
Fieldfare	42	2006-2015
Firecrest	3	2007-2015
French (red-legged) partridge	4	2006-2013
Gadwall	1376	2006-2015
Gannet	4	2007-2009
Golden plover	238	1990-2015
Goldeneye	6	1988-2013
Goldfinch	202	2006-2015
Goosander	3	2007-2015
Great black-backed gull	183	2006-2015
Great crested grebe	133	1990-2015
Great grey shrike	2	2007-2015
Great northern diver	18	2006-2013
Great skua	5	2007-2013
Great spotted woodpecker	15	2006-2015
Great tit	81	2006-2015
Green plover	434	1988-2015
Green sandpiper	25	2006-2015
Green woodpecker	121	2006-2015
Greenfinch	132	2006-2015
Greenshank	88	2006-2015
Grey heron	322	1988-2015
Grey partridge	5	2006-2013
Grey phalarope	1	2007
Grey plover (lapwing)	248	2006-2015
Grey wagtail	7	2006-2014
Greylag goose	281	2006-2015
Harris's hawk	2	2007
Herring gull	340	1990-2015
Hooded crow	2	2007
Horned grebe	6	2007-2013

Species	Number of Records	Years recorded
House martin	25	2006-2015
House sparrow	259	1990-2015
Jack snipe	10	2006-2014
Jackdaw	91	2006-2015
Jay	14	2006-2015
Kestrel	276	2006-2015
Kingfisher	77	2006-2015
Kittiwake	5	2006-2012
Knot	92	2006-2015
Lapland bunting	1	2007
Leach's petrel	1	2009
Lesser black-backed gull	91	1990-2015
Lesser redpoll	1	2012
Lesser whitethroat	9	2012
Linnet	7	2007-2014
Little auk	1	2015
Little egret	22	2001-2015
Little grebe	246	2006-2015
Little stint	4	2006-2015
Long-tailed tit	17	2004-2015
Magpie	36	2004-2015
Mallard	20	1992-2015
Meadow pipit	9	2006-2015
Mistle thrush	2	2013
Moorhen	7	2004-2014
Mute swan	14	1993-2014
Oystercatcher	66	1992-2015
Pheasant	6	2005-2015
Pied wagtail	8	2006-2015
Pied/white wagtail	2	2004-2015
Raven	1	2015
Red-breasted merganser	9	1992-1993
Redshank	80	1992-2015
Red-throated diver	1	1992
Redwing	1	2013
Reed bunting	9	2005-2015
Ringed plover	11	1993-2011
Rock pipit	1	2014

Species	Number of Records	Years recorded
Rook	6	2006-2015
Ruddy duck	1	2008
Sandwich tern	2	2006-2007
Shelduck	47	1992-2015
Skylark	6	
Snipe	5	2001-2010
Snow bunting	1	2005
Sparrowhawk	3	2007-2012
Spotted redshank	3	2008-2011
Starling	26	2005-2015
Stock dove	4	2006-2015
Stonechat	5	2005-2009
Swallow	8	2006-2008
Teal	14	1993-2015
Tufted duck	9	2006-2010
Turnstone	33	1993-2014
Turtle dove	8	2005-2012
Water rail	1	2006
Wheatear	5	2006-2010
Whimbrel	1	2007
Whinchat	1	2007
Whooper swan	1	2013
Willow warbler	2	2007-2008
Wood sandpiper	1	2007
Woodpigeon	19	2005-2015
Wren	5	2006-2010
Yellow wagtail	3	2006-2010

9.3.2.3 BTO – WeBS [1]

Swale Estuary Core Counts

14. WeBS Core Counts for The Swale over the 5-year reporting period from winter 2011/12 to 2015/16 were extracted from the BTO WeBS Report Online[2]. Table A9.3 provides the peak count for each species in each WeBS reporting year (July to June), the month in which the peak count occurs and the most recent 5-year mean peak count.

[1] Data were supplied by the British Trust for Ornithology, the Royal Society for the Protection of Birds and the Joint Nature Conservation Committee (the last on behalf of the statutory nature conservation bodies: Natural England, Natural Resources Wales and Scottish Natural Heritage and the Department of Agriculture, Environment and Rural Affairs, Northern Ireland) in association with the Wildfowl and Wetlands Trust.
[2] https://blx1.bto.org/webs-reporting/

† Species which are regularly present in the Swale Estuary in numbers exceeding the threshold for international importance.

* Species which are regularly present in the Swale Estuary in numbers exceeding the threshold for British national importance.

Table A9.3: WeBS Core Count summary for the Swale Estuary

	Peak Count						
Species	**2012/13**	**2013/14**	**2014/15**	**2015/16**	**2016/17**	**Month of peak count**	**5-yr mean peak count**
Mute Swan	86	122	45	44	133	Jun	86
Bewick's Swan	16	0	0	0	2	Jan	4
Whooper Swan	2	0	0	0	0		0
White-fronted Goose (European)*	210	35	50	[280]	180	Feb	151
Greylag Goose (British/Irish)	830	300	194	[728]		Nov	545
Bar-headed Goose	0	0	0	1	0		0
Canada Goose	172	[301]	230	124	564	Jan	278
Barnacle Goose (naturalised)	5	0	7	1	0		3
Brent Goose (Dark-bellied) †	2,497	2,288	1,418	3,326	2,979	Mar	2,502
Brent Goose (Light-bellied)	1	1	0	0	0		0
Brent Goose (Black Brant)	1	1	0	0	0		0
Red-breasted Goose	1	0	0	0	0		0
Egyptian Goose	0	0	0	2	1	Aug	1
Ruddy Shelduck	1	0	0	0	0		0
Shelduck*	672	568	[570]	[1,345]	1,892	Jan	1,119
Wigeon*	13,641	[10,441]	6,393	16,414	17,851	Dec	13,575
Gadwall	130	45	[126]	56	[91]	Nov	90
Teal*	6,005	[845]	[821]	[1,594]	2,743	Nov	4,374
Mallard	1,029	714	912	[408]	1,643	Nov	1,075
Pintail	292	[57]	65	133	[83]	Jan	163
Garganey	0	0	1	0	2	Apr	1
Shoveler	127	[186]	[110]	176	138	Feb	157
Red-crested Pochard	0	1	0	0	0		0
Pochard	85	158	[39]	48	54	Feb	86
Tufted Duck	166	223	[175]	98	126	Mar	158
Scaup	1	0	[2]	0	2	Jan	1
Common Scoter	2	[2]	[4]	0	[6]	Nov	3
Goldeneye	6	3	4	0	2	Jan	3
Red-breasted Merganser	18	21	7	[6]	9	Nov	14
Goosander	0	0	0	1	3	Feb	1
Red-throated Diver	15	2	0	[1]	3	Nov	5
Great Northern Diver	0	0	0	1	0		0
Little Grebe	47	[35]	[50]	32	81	Dec	53
Great Crested Grebe	47	38	33	31	25	Mar	35
Red-necked Grebe	0	1	0	0	0		0
Slavonian Grebe	1	0	0	0	0		0

Species	Peak Count 2012/13	2013/14	2014/15	2015/16	2016/17	Month of peak count	5-yr mean peak count
Black-necked Grebe	0	0	0	0	1	Nov	0
Cormorant	132	[64]	259	68	220	Oct	170
Little Egret*	83	131	139	97	95	Oct	109
Great White Egret	0	0	0	1	1	Sep	0
Grey Heron	24	[28]	18	26	42	Oct	28
Purple Heron	0	0	0	0	1	Sep	0
Spoonbill	0	0	0	1	3	Oct	1
Water Rail	5	3	6	2	[5]	Nov	4
Moorhen	13	[43]	13	19	42	Nov	26
Coot	757	859	387	677	628	Feb	662
Crane	0	0	0	0	1	Oct	0
Oystercatcher*	4,493	896	3,916	4,677	6,278	Oct	4,052
Avocet*	351	533	325	1,034	430	Oct	535
Ringed Plover	313	100	105	[314]	430	Sep	252
Golden Plover	1,863	[1,700]	[1,220]	[2,310]	2,300	Dec	2,158
Grey Plover*	1,936	704	964	975	783	Feb	1,072
Lapwing	7,282	[5,610]	1,825	[8,046]	6,794	Jan	5,987
Knot	2,430	1,958	320	4,670	[3.589]	Nov	2,593
Sanderling*	795	95	16	[6]	30	Jan	234
Little Stint	1	0	2	1	3	Sep	1
Curlew Sandpiper	0	0	11	1	3	Sep	3
Dunlin*	7,086	3,377	5,932	5,272	[7,156]	Nov	5,765
Ruff*	6	[15]	9	[27]	12	Oct	14
Jack Snipe	0	1	1	1	1	Nov	1
Snipe	55	24	103	50	31	Oct	53
Long-billed Dowitcher	0	0	0	0	1	Oct	0
Black-tailed Godwit†	756	2,402	1,320	2,777	1,760	Sep	1,803
Bar-tailed Godwit*	1,207	254	206	1,490	1,175	Feb	866
Whimbrel	15	2	13	62	20	Jul	22
Curlew	1,022	1,014	430	1,085	1,571	Oct	1,024
Common Sandpiper	8	8	5	9	5	Aug	7
Green Sandpiper	11	4	1	2	11	Sep	6
Spotted Redshank	16	[10]	19	7	17	Oct	15
Greenshank*	19	[29]	23	9	9	Oct	18
Redshank	812	[569]	932	[983]	881	Oct	902
Turnstone	423	360	226	358	418	Jan	357
Kittiwake	0	0	16	0	0		3
Black-headed Gull	1,792	3,660	3,970	2,400	1,960	May	2,756
Little Gull	0	0	[37]	0	0		7
Mediterranean Gull*	10	19	91	220	240	Apr	116
Common Gull	71	26	13	20	18	Oct	30

Species	Peak Count 2012/13	2013/14	2014/15	2015/16	2016/17	Month of peak count	5-yr mean peak count
Lesser Black-backed Gull	43	14	55	8	8	Aug	26
Herring Gull	439	25	44	13	38	Dec	112
Great Black-backed Gull	8	[5]	6	[18]	4	Dec	9
Little Tern	15	4	[4]	2	0		5
Sandwich Tern	92	6	2	5	9	Sep	23
Common Tern	31	8	[8]	9	4	May	13
Kingfisher	3	1	2	3	2	Dec	2

South Swale NNR WeBS Sector Core Counts

15. Monthly WeBS Core Counts for the South Swale NNR Count Sector over the 5-year reporting period from winter 2011/12 to 2015/16 were provided by WeBS in March 2018 through a data request to the BTO. Table A9.4 provides the peak count in the sector for each species in each WeBS reporting year (July to June) and the 5-year mean peak count.

† Species which are regularly present in the South Swale NNR WeBS Count Sector in numbers exceeding the threshold for international importance (the 5-year peak mean count exceeds the threshold).

* Species which are regularly present in the South Swale NNR WeBS Count Sector in numbers exceeding the threshold for British national importance (the 5-year peak mean count exceeds the threshold).

Table A9.4: WeBS Core Count summary for the South Swale NNR Count Sector

Species	Peak Count 2011/12	2012/13	2013/14	2014/15	2015/16	5-yr mean peak count
Mute Swan	27	60	36	8	4	27
Bewick's Swan	0	16	0	0	0	3
Whooper Swan	0	2	0	0	0	0
Greylag Goose (British/Irish)	3	0	1	0	0	1
Brent Goose (Dark-bellied)*	3100	2000	1750	770	1500	1824
Brent Goose (Light-bellied)	0	0	1	0	0	0
Brent Goose (Black Brant)	1	0	1	0	0	0
Red-breasted Goose	0	1	0	0	0	0
Shelduck	62	16	28	16	31	31
Wigeon	52	194	630	350	850	415
Gadwall	4	16	2	2	4	6
Teal	25	40	65	55	85	54
Mallard	14	27	28	14	24	21
Pintail	4	250	2	0	0	51
Shoveler	0	5	10	0	2	3
Tufted Duck	0	2	1	0	0	1

	Peak Count					
Species	**2011/12**	**2012/13**	**2013/14**	**2014/15**	**2015/16**	**5-yr mean peak count**
Common Scoter	0	2	0	1	0	1
Red-breasted Merganser	0	4	0	0	0	1
Goosander	0	0	0	0	1	0
Red-throated Diver	0	5	0	0	1	1
Little Grebe	4	4	3	1	2	3
Great Crested Grebe	17	26	10	16	28	19
Red-necked Grebe	0	0	1	0	0	0
Cormorant	4	5	4	3	4	4
Little Egret*	17	52	75	66	65	55
Grey Heron	1	3	2	5	2	3
Water Rail	1	1	1	0	1	1
Moorhen	0	2	1	0	4	1
Coot	0	0	1	2	1	1
Oystercatcher	302	276	303	400	1000	456
Avocet	3	10	6	6	7	6
Ringed Plover	71	32	100	16	115	67
Golden Plover	300	345	480	440	600	433
Grey Plover	17	65	221	85	56	89
Lapwing	260	115	630	140	300	289
Knot	2	1	500	4	1000	301
Sanderling	0	3	0	0	0	1
Dunlin	206	200	500	300	1500	541
Ruff	0	0	1	5	3	2
Snipe	0	0	0	1	2	1
Black-tailed Godwit	52	7	0	0	1	12
Bar-tailed Godwit	0	2	10	1	500	103
Whimbrel	2	10	2	13	1	6
Curlew	17	8	7	41	88	32
Common Sandpiper	6	5	8	5	4	6
Green Sandpiper	1	0	0	0	1	0
Spotted Redshank	0	0	0	1	0	0
Greenshank	2	2	2	3	1	2
Redshank	221	163	130	310	210	207
Turnstone	75	59	140	75	95	89
Black-headed Gull	390	518	445	0	0	271
Mediterranean Gull	0	3	1	3	1	2
Common Gull	20	21	20	0	1	12
Lesser Black-backed Gull	4	4	2	3	2	3
Herring Gull	8	40	4	23	2	15
Great Black-backed Gull	2	2	1	1	17	5
Little Tern	15	1	4	2	1	5
Sandwich Tern	3	11	6	2	5	5

	Peak Count					
Species	**2011/12**	**2012/13**	**2013/14**	**2014/15**	**2015/16**	**5-yr mean peak count**
Common Tern	3	15	4	9	0	6
Kingfisher	0	1	0	0	1	0

Swale Estuary Low Tide Counts

16. WeBS Low Tide Count data were provided in March 2018 through a data request to the BTO. Low Tide Counts were carried out at the Swale Estuary for WeBS in winters 1992/93, 2001/02 and 2011/12. WeBS Low Tide Counts are carried out monthly between November and February within the survey winter. The estuary is subdivided into smaller Low Tide Count sectors within which the numbers of birds of each species are recorded during the low tide period. Table A9.5 provides the maximum count in the Swale Estuary for each species in each survey winter.

Table A9.5: WeBS Low Tide Count maximum counts for the Swale Estuary in each survey winter

Species	**1992/93**	**2001/02**	**2011/12**
Mute Swan	64	20	40
Bewick's Swan	5	0	0
White-fronted Goose	3	0	0
Greylag Goose (re-established)	96	16	0
Canada Goose	0	1	12
Barnacle Goose	0	9	0
Brent Goose (Dark-bellied)	2,477	1,690	1,446
Brent Goose (Light-bellied)	0	12	4
Shelduck	2,873	2,039	1,546
Wigeon	369	1,187	6,036
Gadwall	4	6	16
Teal	270	692	1,701
Mallard	313	264	613
Pintail	339	503	219
Shoveler	15	166	2
Pochard	0	184	0
Tufted Duck	0	8	0
Eider	3	2	0
Common Scoter	1	2	0
Goldeneye	4	14	2
Red-breasted Merganser	59	21	7
Red-throated Diver	2	0	0
Little Grebe	6	64	25
Great Crested Grebe	19	311	29
Black-necked Grebe	0	1	0
Slavonian Grebe	0	0	1
Cormorant	61	51	39
Shag	1	0	0

Species	1992/93	2001/02	2011/12
Little Egret	0	19	30
Grey Heron	40	14	5
Water Rail	0	2	0
Moorhen	0	3	1
Coot	354	197	0
Oystercatcher	4,253	6,085	4,014
Avocet	53	118	310
Ringed Plover	191	206	172
Golden Plover	420	2,335	2,145
Grey Plover	1,648	1,567	770
Lapwing	6,170	1,941	3,159
Knot	1,303	1,110	2,370
Sanderling	0	47	11
Little Stint	1	0	1
Dunlin	17,279	9,189	9,621
Ruff	24	0	9
Jack Snipe	0	0	1
Snipe	105	82	1
Black-tailed Godwit	1,115	1,580	1,329
Bar-tailed Godwit	518	383	1,159
Whimbrel	0	0	8
Curlew	1,152	1,174	1,079
Green Sandpiper	0	0	1
Common Sandpiper	0	1	0
Spotted Redshank	1	7	7
Greenshank	0	0	4
Redshank	2,126	1,777	1,078
Turnstone	246	389	182
Black-headed Gull	3,352	1,661	2,009
Common Gull	650	437	125
Lesser Black-backed Gull	13	19	11
Herring Gull	546	613	259
Yellow-legged Gull	0	0	1
Great Black-backed Gull	133	63	21
Kingfisher	0	1	0

9.3.2.4 Kent Wildlife Trust

17. KWT provided a number of documents compiled by the South Swale Nature Reserve Honorary Warden including:

- Monthly WeBS reports providing additional detail of bird distribution within the South Swale NNR WeBS Core Count Sector, April 2008 to December 2017;
- Site visit reports for KWT's South Swale Local Nature Reserve carried out by the Honorary Warden providing details of bird abundance and distribution on and around the reserve, March 2008 to November 2017; and

- Annual Bird Reports for KWT's South Swale Local Nature Reserve compiling and summarising information from WeBS counts, wardens' site visits, bird ringing on the reserve and other contributory sightings of birds within the reserve, 2004 to 2017.

18. Information pertaining to Schedule 1 breeding species is sensitive and hence is not published within this Appendix; however, any information that is helpful to the assessment has been used where appropriate.

19. The information contained within these reports has primarily been used to identify the occurrence of specially protected Schedule 1 breeding species and to provide a longer-term historical context to the occurrence and distribution of dark-bellied brent goose, golden plover and lapwing within the arable land that comprises the Development site and is adjacent to KWT's reserve. Where possible the numbers of dark-bellied brent goose, golden plover and lapwing that were recorded in adjacent arable or pasture habitats during each survey visit for WeBS or for general reserve monitoring were extracted from each report. The maximum (peak) counts during each month of each non-breeding season (October to March) were then tabulated (Table A9.6 to A9.8).

Table A9.6: Peak monthly counts of dark-bellied brent goose as recorded by the honorary KWT South Swale LNR warden in arable habitats adjacent to the reserve between 2008/09 and 2016/17

Season	Oct	Nov	Dec	Jan	Feb	Mar	Peak mean count (Nov-Feb)	Notes
2008/09	0	0	0	800	0	16	200	Bird-scarers operating
2009/10	N/C	N/C	0	N/C	0	0	0	Bird-scarers operating
2010/11	0	0	N/C	400	0	0	133	Bird-scarers operating
2011/12	0	0	0	600	2,000	0	650	Bird-scarers operating
2012/13	0	80	0	0	0	0	20	
2013/14	0	1,700	0	1,500	0	0	800	
2014/15	0	770	0	0	900	600	418	
2015/16	0	550	0	0	0	N/C	138	
2016/17	0	1,300	N/C	N/C	2,400	2,000	1,850	

20. The mean average of the seasonal peak-mean counts between 2008/09 and 2016/17 was 468 dark-bellied brent geese.

Table A9.7: Peak monthly counts of golden plover as recorded by the honorary KWT South Swale LNR warden in arable habitats adjacent to the reserve between 2008/09 and 2016/17

Season	Oct	Nov	Dec	Jan	Feb	Mar	Peak mean count (Oct-Mar)	Notes
2008/09	35	0	38	0	0	0	12	Bird-scarers operating
2009/10	N/C	N/C	0	N/C	0	0	0	Bird-scarers operating
2010/11	1,000	175	N/C	0	0	0	235	Bird-scarers operating
2011/12	0	0	300	0	0	0	50	Bird-scarers operating
2012/13	3,000	2,500	23	600	0	450	1,096	
2013/14	480	2	0	0	0	0	80	
2014/15	0	440	0	220	420	0	180	
2015/16	1	0	0	0	0	N/C	0	
2016/17	1100	0	N/C	N/C	0	0	275	

21. The mean average of the seasonal peak mean counts between 2008/09 and 2016/17 was 214 golden plovers.

Table A9.8: Peak monthly counts of lapwing as recorded by the honorary KWT South Swale LNR warden in arable habitats adjacent to the reserve between 2008/09 and 2016/17

Season	Oct	Nov	Dec	Jan	Feb	Mar	Peak mean count (Oct-Mar)	Notes
2008/09	300	0	218	0	0	0	86	Bird-scarers operating
2009/10	N/C	N/C	0	N/C	0	0	0	Bird-scarers operating
2010/11	450	380	N/C	0	8	0	168	Bird-scarers operating
2011/12	118	700	260	0	0	0	180	Bird-scarers operating
2012/13	0	450	0	100	0	5	93	
2013/14	100	440	0	0	5	3	91	
2014/15	250	140	0	300	35	0	121	
2015/16	0	0	0	0	0	N/C	0	
2016/17	140	170	N/C	N/C	130	9	112	

22. The mean average of the seasonal peak mean counts between 2008/09 and 2016/17 was 95 lapwings.

9.3.2.5 Barn Owl Data

23. KOS provided details of the locations of ten barn owl nest sites monitored regularly within 5 km of the CSA up to 2017. Of these, nine are definitely active, one was last used in

2010 and one is unconfirmed. Two active sites and one unconfirmed site are within 1 km of the Core Survey Area.

24. KOS also provided details of the ringing recoveries of barn owl within 5 km of the CSA. These demonstrated that barn owls from the study area are capable of moving locations locally and more widely. Birds ringed within the study area have been recovered up to 98 km away.

9.3.2.6 Ringing Data

25. KOS provided detailed and summary data of birds ringed at the South Swale between 1990 and 2017. The summary data are presented in Table A9.9.

Table A9.9 Number of birds of each species ringed on the South Swale

	1990	1991	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	TOTAL
Mute Swan	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Mallard	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Marsh Harrier	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**
Sparrowhawk	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	**3**
Kestrel	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	4	0	0	**7**
Water Rail	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**
Moorhen	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	**1**
Snipe	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	**1**
Wood Pigeon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	**2**
Barn Owl	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	7	5	4	8	0	4	0	0	0	1	8	**39**
Kingfisher	0	1	0	0	0	3	2	0	2	3	2	4	6	5	7	1	5	3	0	0	1	0	0	0	0	0	0	**45**
Skylark	0	1	1	0	0	2	5	1	0	2	1	1	0	1	0	0	3	0	2	5	2	0	2	2	0	0	2	**33**
Green Woodpecker	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	**1**
Sand Martin	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	2	1	0	**7**
Swallow	1	22	8	0	16	28	10	23	10	4	1	25	0	3	24	35	9	0	1	15	0	4	0	0	13	0	0	**252**
House Martin	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	**3**
Tree Pipit	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Meadow Pipit	0	0	8	0	4	8	22	5	18	36	29	31	57	68	86	66	61	108	20	13	16	7	34	82	44	21	0	**844**
Rock Pipit	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Yellow Wagtail	0	0	0	0	0	10	7	0	10	0	15	34	14	7	10	3	4	1	7	0	1	0	1	7	1	2	1	**135**
Pied Wagtail	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Wren	0	0	2	1	1	0	2	0	2	7	3	2	5	7	4	10	16	6	5	4	3	1	4	7	10	12	1	**115**
Dunnock	0	0	0	0	1	0	0	0	0	0	1	0	0	0	3	0	0	0	0	0	0	0	1	0	1	9	3	**19**

	1990	1991	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	TOTAL
Robin	0	0	0	0	0	0	0	0	0	0	2	0	0	1	1	2	2	0	0	1	0	0	2	2	0	11	2	**26**
Redstart	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Whinchat	2	0	0	0	0	6	3	3	2	9	2	7	6	1	1	2	5	0	1	4	0	0	2	6	0	5	0	**67**
Stonechat	0	0	0	0	1	0	0	0	0	0	1	1	4	4	4	3	11	2	4	1	0	0	0	5	3	3	3	**50**
Wheatear	0	0	0	0	0	0	0	0	0	3	3	4	2	1	1	1	7	2	0	0	1	0	0	0	0	0	0	**25**
Blackbird	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	0	6	4	2	6	1	**22**
Song Thrush	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	**2**
Cetti's Warbler	0	0	0	0	0	0	0	0	0	0	0	0	0	1	8	5	10	1	4	2	2	0	3	5	2	6	0	**49**
Grasshopper Warbler	0	0	0	0	2	1	0	2	0	0	0	0	0	1	0	0	2	0	0	0	0	0	1	1	0	0	1	**11**
Aquatic Warbler	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	**2**
Sedge Warbler	11	6	25	0	26	114	92	111	76	184	89	128	97	112	169	80	130	29	55	108	64	75	126	47	76	87	50	**2167**
Paddyfield Warbler	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Reed Warbler	7	10	77	0	50	195	255	268	172	307	216	197	201	194	272	184	177	120	136	166	64	204	192	104	92	85	70	**4015**
Whitethroat	1	0	0	0	1	2	0	0	1	1	1	3	1	6	6	1	10	0	5	2	4	3	4	1	6	11	4	**74**
Blackcap	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	3	0	**4**
Chiffchaff	0	0	0	0	0	1	0	3	0	2	0	0	0	8	0	1	1	2	7	3	1	1	3	1	7	10	1	**52**
Willow Warbler	0	0	0	0	0	0	1	2	0	0	0	0	0	0	3	0	0	0	0	0	0	0	1	0	0	0	0	**7**
Goldcrest	0	0	0	0	0	0	0	0	0	4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	5	1	1	**12**
Pied Flycatcher	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	**2**
Bearded Tit	3	0	22	0	15	6	38	41	29	48	75	81	74	88	93	93	102	46	63	52	85	50	21	50	16	37	11	**1239**
Long-tailed Tit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	**5**
Blue Tit	0	0	3	0	2	0	1	0	1	1	0	1	6	9	6	4	0	0	0	3	1	0	0	7	9	8	2	**64**
Great Tit	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	**3**
Carrion Crow	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	**2**

	1990	1991	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	TOTAL
Starling	0	1	3	0	0	1	2	6	9	4	1	3	2	1	0	0	0	1	1	0	1	0	0	2	0	0	0	**38**
House Sparrow	0	0	0	0	0	1	0	0	0	1	8	35	1	60	14	0	14	0	24	3	9	0	0	41	4	4	56	**275**
Chaffinch	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	1	0	**5**
Greenfinch	0	0	0	0	0	0	72	60	67	19	20	55	88	22	1	45	1	0	0	0	7	0	2	8	9	0	0	**452**
Goldfinch	0	0	1	0	0	1	9	3	2	8	8	0	5	2	6	0	6	0	0	0	7	0	9	8	9	15	13	**112**
Siskin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	**1**
Linnet	0	0	1	0	1	53	60	42	30	16	46	24	149	35	21	18	62	1	9	2	15	8	1	5	28	18	5	**650**
Redpoll	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	**2**
Snow Bunting	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**
Yellowhammer	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	**2**
Reed Bunting	2	9	22	1	17	69	108	74	45	59	109	127	104	115	176	136	226	119	176	93	92	108	113	218	115	121	50	**2604**
Corn Bunting	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	**4**
Lapland Bunting	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
51 species																												
TOTAL	27	50	174	2	141	504	691	647	476	772	587	768	824	757	918	696	874	447	525	485	371	465	532	608	452	488	287	**13568**

9.4 Breeding Bird Survey

26. Breeding bird surveys were undertaken over three seasons between 2014 and 2016. Surveys in 2014 and 2015 were carried out by AECOM; the survey in 2016 was carried out by Arcus.

27. Full details of the AECOM surveys in 2014 and 2015 are provided in Appendix A9.2. A summary of the survey methods and results is provided in Section 9.4.1.

28. Full details of the Arcus survey in 2016 are provided in Section 9.4.2.

29. The aim of the surveys was to establish the breeding bird populations and spatial distribution within the site and immediately adjacent habitats.

30. The AECOM surveys in 2014 and 2015 were carried out by two surveyors simultaneously covering different parts of the survey area. In 2016, the April survey was undertaken by two surveyors simultaneously, and then the subsequent three surveys in May and June were carried out by a single surveyor on two consecutive mornings. As the survey method maps registrations of birds during each different survey, which are analysed to identify clusters between surveys that represent breeding territory locations, this is not considered to have caused any discrepancy when comparing the results between the different years.

31. The survey results indicate that there were more territories of some species in 2016 than in 2014 or 2015. This is considered to be due to difference in the coverage of the survey area by the different transects used by Arcus and AECOM, where each Arcus survey was longer in duration and had more intensive spatial coverage within the survey area – i.e. the Arcus transect followed all of the ditches in the interior of the site, while the AECOM transect mostly followed the periphery of the survey area with coverage of two ditches running south-north through the interior of the survey area (Appendix A9.2). In terms of the assessment of effects, it is necessary to acknowledge that the Breeding Bird Surveys do not necessarily provide a complete census of all breeding birds within the survey area, but provide an indication of the population sizes of the species present. The 2016 survey, with its more complete coverage of habitats within the survey area, provides the more complete estimate of population sizes.

9.4.1 Breeding Bird Surveys 2014 and 2015

9.4.1.1 Method

32. Breeding Bird Surveys (BBS) were undertaken in 2014 and 2015 using an adapted version of the Common Bird Census (CBC) Methodology[3].

33. Four BBS visits were made between May and July 2014 (Table A9.10) and four BBS visits were made between April and June 2015 (Table A9.11).

34. During each survey visit, a transect was followed within the CSA (Figure A9.2 and Figure 5 in Appendix A9.2) that allowed observation of all major areas of habitat within and immediately adjacent to the site. Appendix A9.2 provides further details of the area and route covered by the survey.

Table A9.10: BBS 2014 dates and weather conditions

Date	Time	Temperature *°C*	Weather	Wind Direction/ Speed *Beaufort Scale*
06/05/2014	09:00 – 12:00 (2x surveyors)	17	Cloudy turning sunny, with moderate wind	SW 3

[3] Marchant, J. (1983). *Common Birds Census Instructions*. British Trust for Ornithology, Thetford.

Date	Time	Temperature *°C*	Weather	Wind Direction/ Speed *Beaufort Scale*
30/05/2014	08:00 – 11:00 (2x surveyors)	17	Cloudy	NE 3-4
20/06/2014	08:45 – 11:30 (2x surveyors)	22	Partly cloudy	N 3
14/07/2014	09:00 – 12:00 (2x surveyors)	17	Sunny	W 4

Table A9.11: BBS 2015 dates and weather conditions

Date	Time	Temperature *°C*	Weather	Wind Direction/ Speed *Beaufort Scale*
22/04/2015	08:00 – 11:00 (2x surveyors)	9	Sunny, cold and breezy	NE 3
12/05/2015	08:15 – 12:00 (2x surveyors)	15	Breezy, warm, sunny, cloudy towards the end	SW 4-5
03/06/2015	08:30 – 12:00 (2x surveyors)	15	Dry, partly sunny, breezy	SW 3-4
23/06/2015	08:30 – 11:30 (2x surveyors)	14	Warm, breezy, cloud, brightening to sun later	NW 4

35. Field records of all birds were plotted and used to compile territory maps for each species, based on a cumulative assessment of registrations made on all visits within the season. Where behaviour indicative of breeding territories was recorded (e.g. singing males, nest building, aggressive interactions) on two or more occasions in a suitably sized area ('suitable size' being dependent on species), a 'cluster' was drawn around these registrations and the centre point taken as the representative location of the territory. Territory locations were then plotted on a figure to illustrate each species' distribution within the survey area.

36. In addition to the general survey of breeding birds using the adapted CBC method, additional bespoke surveys were carried out for breeding barn owls.

37. Four survey visits were undertaken between April and June 2015 following the standard approach as set out in Gilbert *et al.* (1998)[4] for surveying barn owl. All four visits focused around dusk when barn owls were likely to be most active, thereby maximising the chance of observing the majority of barn owl activity and territorial behaviour. Surveys commenced 30 minutes before dusk, until 1.5 hours after sunset during favourable weather conditions (Table A9.12).

38. A survey route combining walked transects and short vantage point watches was devised that allowed observation of all areas of suitable habitat within and adjacent to the CSA. Any presence of barn owl was recorded following the standard CBC notation[3]. There were no structures within or immediately adjacent to the CSA that were suitable for nesting barn owl, therefore no potential nest-site inspections were carried out.

[4] Gilbert, G., Gibbons, D.W. and Evans, J. (1998). *Bird Monitoring Methods*. RSPB: Sandy.

Table A9.12: Barn owl survey 2015 dates and weather conditions

Date	Time	Temperature *°C*	Weather
21/04/2015	20:00 – 22:00 (2x surveyors)	9	Clear
11/05/2015	20:30 – 22:30 (2x surveyors)	15	Mild, windy, clear to partly cloudy later
02/06/2015	20:30 – 22:30 (2x surveyors)	15	Cool, dry, breezy, partly cloudy
22/06/2015	21:00 – 23:00 (2x surveyors)	12	Partly cloudy, cool and breezy

9.4.1.2 Breeding Bird Survey 2014 and 2015 Results

39. Table A9.13 provides a summary of the results of the BBS in 2014 and 2015, including the number of confirmed territories of species of conservation concern. Figures A9.3 and A9.4 show the confirmed territories of species of conservation concern.

- *B = breeding (number of confirmed territories in brackets)*
- *P = possible breeding or breeding nearby (off site)*
- *V = visitor/resting/foraging only*
- *F = flying over the site only*
- *I = Introduced/Feral species*

Table A9.13: BBS results summary 2014 and 2015

Species	Conservation Status*	Breeding 2014	Breeding 2015
Mute swan		P	P
Dark-bellied brent goose	NERC S41	V	
Greylag goose	Feral population	I	I
Shelduck		V	V
Mallard		P	P
Red-legged partridge	None	I	I
Pheasant	None	I	I
Grey heron		V	V
Little egret	Annex 1	V	V
Cormorant		F	F
Sparrowhawk		V	
Marsh harrier	Annex 1; Sch 1	B (1)	P
Buzzard		V	V
Moorhen		B	B
Coot			B
Oystercatcher		V	V
Lapwing	NERC S41	V	V
Ringed plover			V

Species	Conservation Status*	Breeding 2014	Breeding 2015
Curlew	NERC S41	V	V
Snipe		P	P
Black-headed gull		V	V
Herring gull	NERC S41	F	F
Lesser black-backed gull		F	F
Feral pigeon	None	I	
Stock dove		P	P
Woodpigeon		B	B
Turtle dove	NERC S41	P/V	P/V
Collared dove			P
Cuckoo	NERC S41	B (1)	P
Barn owl	Sch 1		P
Swift		F	F
Green woodpecker		B	B
Kestrel		V	V/P
Hobby	Sch 1	V	
Peregrine	Annex 1; Sch 1	P	P
Jay			P
Magpie		B	P
Jackdaw			V
Rook			V
Carrion crow		V	V
Blue tit		B	B
Great tit		B	B
Bearded tit	Sch 1		B (3)
Skylark	NERC S41	B (55)	B (35)
Swallow		V	F
House martin		V	F
Cetti's warbler	Sch 1	P	B (2)
Chiffchaff		B	B
Sedge warbler		B	B
Reed warbler		B	B
Blackcap		B	B
Garden warbler			P
Whitethroat		B	B
Wren		B	B
Starling	NERC S41	P	P
Blackbird		B	B

Species	Conservation Status*	Breeding 2014	Breeding 2015
Song thrush	NERC S41	P	
Robin		B	B
Stonechat		B	B
Wheatear			V
House sparrow	NERC S41	B (4)	B (4)
Dunnock	NERC S41	B (3)	B (3)
Yellow wagtail	NERC S41	B (10)	B (6)
Pied wagtail		B	B
Meadow pipit		B (1)	P
Chaffinch		B	B
Linnet	NERC S41	B (3)	B (3)
Goldfinch		B	B
Yellowhammer	NERC S41		P
Reed bunting	NERC S41	B (41)	B (32)

** Annex 1 = listed on Annex 1 of the European Birds Directive.*
Sch 1 = listed on Schedule 1 of the Wildlife and Countryside Act.
NERC S41 = listed as a species of principal importance on Section 41 of the Natural Environment and Rural Communities Act.
Colour = Red, Amber or Green listed in Birds of Conservation Concern 4 [5].

40. The barn owl survey detected a single barn owl hunting over rough grassland in the KWT reserve between the CSA and the sea wall to the north of the CSA. There were three further observations of single birds between July and September hunting along the ditches during the bat surveys undertaken for the ecological assessment.

9.4.2 Breeding Bird Survey 2016

9.4.2.1 Method

41. A BBS was undertaken between April and June 2016 (Table A9.14) covering the same CSA and following the same method of survey and analysis outlined in Section 9.4.1 for the 2014 and 2015 breeding seasons. Spatial coverage of the CSA was more complete in 2016 than in 2014 and 2015, as all of the ditches crossing the CSA were walked by the surveyor.

42. Some visits were completed by a single surveyor over two consecutive days, with the east and west sections of the site surveyed separately during visits lasting up to 4.5 hours.

[5] Eaton, M.A., Aebischer, N.J., Brown, A.F., Hearn, R.D., Lock, L., Musgrove, A.J., Noble, D.G., Stroud, D.A. & Gregory, R.D. (2015). Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man. *British Birds* 108, pp. 708-746 (http://www.britishbirds.co.uk/wp-content/uploads/2014/07/BOCC4.pdf).

Table A9.14: Breeding Bird Survey (BBS) 2016 dates and weather conditions

Date	Time	Temperature *°C*	Weather	Wind Direction/ Speed *Beaufort Scale*
20/04/2016	06:30 – 10:35 (2x surveyors)	9	Sunny, cold and breezy	ESE 1-3
12/05/2016 13/05/2016	05:40 – 10:10 05:35 – 10:00	13 14	Mostly cloudy, cool breeze Early cloud, later sunny	NE 1-3 NE 3
26/05/2016 27/05/2016	05:35 – 10:15 05:35 – 10:10	7-15 10-14	Mostly sunny, some cloud Overcast	SW/W/NW 0-2 ENE/NE 2-3
09/06/2016 10/06/2016	05:35 – 10:25 05:30 – 10:15	13 17	Overcast, cool breeze Cloudy, some hazy sun	NE 2-3 NE change SW 0-1

43. The general breeding bird survey was supplemented by specific searches for breeding raptors and owls between April and August 2016 (Table A9.15), covering accessible land within 2 km of the CSA, but excluding the Isle of Sheppey. A total of six surveys were carried out although, given the large size of the survey area, some visits were completed over two consecutive days.

44. The aim of these surveys was to establish whether any raptors of conservation concern were breeding within or near the CSA based on looking for evidence of breeding/territory holding, as described in Hardey *et al.* (2013)[6]. The surveys were carried out using a series of short VP-style watches suitable areas of habitat to detect signs of breeding raptors and owls. Surveys focussed on marsh harrier and other Annex 1 or Schedule 1 listed species, although observations of common raptor species: buzzard, sparrowhawk and kestrel were also recorded. Local farm buildings/trees or other potential barn owl nest sites were not closely investigated.

Table A9.15: Breeding raptor/owl survey 2016 dates and weather conditions

Date	Time	Weather	Wind Direction/ Speed *Beaufort Scale*
21/04/2016	13:20 – 18:00	Hazy, misty. Gusty cold wind	E to NE 3-4 (gust 5)
22/04/2016	06:00 – 11:00	Cold wind	NE 3 (gust 4)
11/05/2016	12:00 – 16:00	Humid, 17°C	E/ENE 1-3
12/05/2016	10:20 – 14:40	Misty, hazy, warm	NE 4 (gust 5)
25/05/2016	11:00 – 18:30	Cold breeze, overcast, later drizzle	NW 1-2 (gust 3)
07/06/2016	11:05 – 16:00	Hazy, warm, part cloudy	N/NNE 2
08/06/2016	13:00 – 15:30	Hazy, humid, some cloud	NE 2 (gust 3)
21/07/2016	06:15 – 13:05	Cloudy, humid, warm	W 2-3
09/08/2016	11:30 – 18:30	Heat haze, cloud increasing	NW 2-3

[6] Hardey, J., Crick, H.Q.P., Wernham, C.V., Riley, H.T., Etheridge, B. and Thompson, D.B.A. (2013). *Raptors: a Field Guide to Surveys and Monitoring*. 3rd Edition. Stationery Office. Edinburgh.

9.4.2.2 Breeding Bird Survey 2016 Results

45. A total of 72 species were recorded during the 2016 BBS. Of these, thirteen species of conservation concern were recorded holding territory (Table A9.16; Figure A9.5).

Table A9.16: BBS results summary 2016

Species	Conservation Status*	Confirmed Territories	Notes
Oystercatcher		2	Two nesting pairs were identified, both on arable fields in the north of the CSA.
Lapwing	NERC S41	9	A minimum of nine territory holding birds were recorded with display flights frequently observed. Most territories were situated in arable fields in the north and east of the CSA.
Cuckoo	NERC S41	1	One male held territory to the south of the CSA, ranging widely between Nagden Cottage and Coney Banks.
Bearded tit[7]	Sch 1	4	Small numbers of bearded tit were recorded from the reed-filled ditches on all BBS visits, mostly in the KWT nature reserve between the CSA and the seawall. A juvenile was observed on 10th June suggesting at least one pair bred successfully. Territories of this species are not shown on Figure A9.5.
Skylark	NERC S41	75	A common and widespread breeding species within suitable habitat throughout the CSA.
Cetti's warbler	Sch 1	7	Seven territory-holding males were recorded, all at the southern boundary of the CSA.
Song thrush	NERC S41	3	Three territory-holding males were identified, all to the south of the CSA.
Dunnock	NERC S41	9	A minimum of nine territories were recorded, all at or outside the southern boundary of the CSA.
House sparrow	NERC S41	4	A minimum of four, all around buildings to the south of the CSA.
Yellow wagtail	NERC S41	25	A minimum of 25 territories were identified within ditches and arable fields throughout the CSA.
Meadow pipit		5	Five territories were identified, all at the border of the CSA associated with ditch margin or grassland in the KWT nature reserve.
Linnet	NERC S41	3	Four locations, including two in scrub at the west end of the CSA, one in the KWT reserve and one between fields in the southeast of the CSA.
Reed bunting	NERC S41	60	A common species within the CSA. Most territories were in the KWT reserve surrounding the north and west of the CSA, with others scattered around the field boundaries and ditches within the CSA.

[7] Bearded tit do not sing and are a non-territorial species. This figure represents an estimate of the minimum number of pairs within the BBS Area. A full census of this species is outside the scope of the CBC Methodology and detailed territory mapping has not been completed

46. A further 24 territory-holding species not listed as species of conservation concern were also observed during the BBS: water rail, moorhen, little owl, woodpigeon, collared dove, blue tit, great tit, chiffchaff, sedge warbler, reed warbler, blackcap, whitethroat, lesser whitethroat, wren, blackbird, robin, stonechat, chaffinch, greenfinch and goldfinch.

47. Non-breeding species of Birds of Conservation Concern recorded included; mute swan, greylag goose, shelduck, mallard, gadwall, little egret, marsh harrier, kestrel, peregrine, ringed plover, avocet, black-tailed godwit, greenshank, whimbrel, green sandpiper, common gull, Mediterranean gull, black-headed gull, lesser black-backed gull, common tern, little tern, swift, mistle thrush and starling.

48. Eight species of raptors and owls were recorded by the breeding raptor/owl survey. The observations below are a culmination of all sightings during the survey period (including information from other survey types). Raptors, by nature, are scarce and seen less frequently in comparison to passerines, with specific territory holding behaviour rarely observed. Combining the results of all surveys gives the best indication to their local populations.

49. Details of all Schedule 1 and Annex 1 raptor and owl species recorded during the breeding season are summarised in Table A9.17.

Table A9.17: Schedule 1 and Annex 1 Raptor and Owl Species Recorded During the 2016 Breeding Season.

Species	Territories 2016	Notes
Marsh harrier	1 probable	Marsh harrier was recorded frequently on all surveys. There was a probable territory southwest of the CSA, in Ham Marshes, where an adult male was observed feeding recently fledged young. Additionally, a pair was observed 'food passing' over Graveney Marshes, to the east of the CSA in April, but not seen subsequently and are not thought to have bred in this area.
Hobby	0	Hobby was recorded occasionally, mostly to the south and west of the CSA. Up to six were recorded together (Oare Marshes, 12th May) but there was no evidence that they bred within the breeding raptor/owl survey area.
Peregrine falcon	0	Up to two adult birds were seen regularly throughout the breeding season. Birds were observed hunting and perching on pylons within the CSA but there was no evidence of nesting within the breeding raptor/owl survey area.
Barn owl	Unknown – buildings/trees not searched	One was observed hunting at dusk on 19th April, to the west of Cleve Hill Substation. There were no further observations during the breeding season.
Short-eared owl	0	One was observed hunting by the sea wall, in the east of the breeding raptor/owl survey area, between Seasalter and the CSA on 21st April. Additional breeding season observations were made during the FAS on 19th April and 20th July but no territorial behaviour was noted and there was no evidence that this species held territory or bred within the breeding raptor/owl survey area.

50. Kestrel and buzzard were recorded frequently within the breeding raptor/owl survey area. It is likely that both these species bred locally although there was no evidence of either species nesting within the CSA.

51. Tawny owl was recorded during the non-breeding season Nocturnal Surveys. It is likely that this species breeds within the breeding raptor/owl survey area but, due to its nocturnal habits, detecting this species was outside the scope of the baseline surveys.

9.5 Passage/Winter Bird Survey

52. Surveys of birds using the site and surrounding area during the non-breeding season were undertaken during four passage/winter seasons between 2013/14 and 2017/18. Surveys in the 2013/14 and 2014/15 seasons were carried out by AECOM; the surveys in 2015/16 and 2017/18 were carried out by Arcus (Table A9.18).

Table A9.18 Number of survey visits during each non-breeding/passage season; monthly survey summary

Survey	2014								2015								2016								2017			
	Jan	Feb	Mar	Apr	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr
AECOM Winter Farmland Bird Survey	1	1	1				1	1	1	1																		
AECOM Low/High Tide Count Survey	2	2	2				2	2	2	2																		
AECOM Passage Bird Survey						3																						
Arcus High/Low Tide Walkover Survey															2	4	4	4	2	1								
Arcus Passage Bird Survey														1	3													
Arcus Intertidal Walkover Survey															2	4	4	2	2	2								
Arcus Nocturnal Bird Survey																1	1	1	1									

53. There was no survey coverage of winter 2016/17. Arcus consulted with Natural England in December 2016 and there was agreement that coverage of the surveys completed between 2013/14 and 2015/16 was sufficient to enable a thorough assessment of the potential impacts on SPA/Ramsar birds, and other important bird species. However, due to extension of the project timescales following a change in the project partnership, a further winter of survey in 2017/18 was undertaken to provide more up-to-date baseline information on non-breeding bird interests at the site.

54. Full details of the AECOM surveys are provided in Appendix A9.3 and A9.4. A summary of the survey methods and results is provided in Section 9.5.1.

55. Full details of the Arcus surveys in 2015/16 and 2017/18 are provided in Sections 9.5.2 and 9.5.3.

56. The aim of the surveys was to provide baseline data to assess the non-breeding bird populations and spatial distribution within the site and immediately adjacent habitats.

57. During the consultation meeting on 16th December 2016, Arcus clarified to Natural England that the walkover surveys carried out by AECOM between January 2014 and February 2015 and by Arcus between September 2015 and October 2016 were compatible with each other, despite some noticeable discrepancies between maximum counts of some species. AECOM's 'Winter Farmland Bird Surveys' and Arcus' 'High/Low Tide Walkover Surveys', as well as the 'Passage Bird Surveys' carried out by both consultancies all followed similar methodologies – in summary, transects were walked ensuring that the CSA was covered and the number of birds of each species encountered in each field were plotted onto large-scale field maps. In addition to diurnal walkover surveys, Arcus undertook four nocturnal surveys to investigate the use of the CSA by wintering waterbirds at night. The AECOM Winter Farmland Bird Surveys, the Arcus High/Low Tide Walkover Surveys and both Passage surveys did not cover the intertidal area adjacent to the CSA, or at most, only covered a small part of the intertidal habitat. Intertidal count sectors have therefore been assigned a null count in the analyses for those types of survey.

58. AECOM's 'Low/High Tide Count Surveys' and Arcus' 'Intertidal Walkover Surveys' followed the same basic method – in summary, a transect was walked along the sea wall offering views across intertidal areas adjacent to the CSA, as well as views across the CSA. Whilst passerine species and birds foraging or loafing in the ditches and peripheral habitats in the south of the CSA would not have been recorded, accurate counts of larger flocking species including brent goose, golden plover and lapwing were made within the CSA, as well as the intertidal areas by this method.

9.5.1 Passage/Winter Bird Survey Method 2013/14 and 2014/15

59. Winter Bird Surveys were carried out following an adaptation of the British Trust for Ornithology's (BTO) Wetland Bird Survey methodology[8] for the intertidal areas and the BTO's Winter Farmland Bird Survey methodology[9] for the farmland areas.

60. Nine survey visits were made between January and March 2014 for the 2013/14 winter season and 12 visits between November 2014 and February 2015 for the 2014/15 winter season (Table A9.18). In each month surveyed, three separate surveys were undertaken:

- AECOM Low Tide Counts of birds immediately adjacent to the CSA on the Swale Estuary and those in fields within the CSA – these counts were undertaken one hour either side of low tide; the transect followed/area surveyed is shown in Figure 1 of Appendix A9.4;
- ACOM High Tide Counts of birds immediately adjacent to the CSA on the Swale Estuary and those in fields within the CSA – these counts were undertaken one hour either side of high tide; the transect followed/area surveyed is shown in Figure 1 of Appendix A9.4;and
- AECOM Winter Farmland Bird Survey of all areas and habitats within the CSA; the survey did not cover adjacent intertidal habitats; the transect followed/area surveyed is shown in Figure 1 of Appendix A9.4.

61. The Passage Bird Surveys were undertaken also broadly following the BTO's Winter Farmland Bird Survey Methodology[9]. It was however, revised to focus on recording of passage and migratory birds.

62. Three Passage Bird Survey visits were made during October 2014. Each visit was conducted over two consecutive days totalling approximately 6-7 hours per survey. A survey transect was devised that allowed observation of all areas within the CSA and also included parts of the adjacent intertidal habitat (Figure 4 in Appendix A9.3).

[redacted]

[9] Gillings, S., et.al (2008) *BTO Research Report No. 494. Winter Farmland Bird Survey*. BTO, Thetford.

9.5.2 Passage/Winter Bird Survey Method 2015/16

63. Further passage/winter baseline bird surveys were undertaken by Arcus between September 2015 and April 2016. A series of surveys (Table A9.18) were undertaken to provide a sample of the numbers, diversity and spatial distribution of bird species within and adjacent to the CSA. Together the surveys covered an area shown as the 'Winter Bird Survey Area 2015/16 and 2017/18' in Figure A9.6. This area was subdivided into 61 count sectors.

9.5.2.1 Passage Surveys

64. Four Passage Bird Survey visits were undertaken between September and October 2015. The aim of these surveys was to establish the bird interest and use of the CSA and immediate surrounds during the autumn passage period. All bird species observed were recorded.

65. Surveys lasted up to 2.5 hours to cover each half the CSA, using a transect route that covered all major areas of habitat. Passage Surveys were scheduled to cover various stages of the tidal cycle including both high and low tide periods and periods of rising and falling water and covered all areas within the Winter Bird Survey Area 2015/16 and 2017/18.

66. These surveys represent the equivalent of the Passage Bird Surveys conducted during by AECOM in 2015, although the Arcus surveys achieve more extensive coverage of the survey area.

9.5.2.2 High & Low Tide Walkovers

67. High and Low Tide Walkover Surveys were undertaken between November 2015 and April 2016. The aim of these surveys was to establish the bird interest and spatial distribution within the farmland areas of the CSA and adjacent terrestrial habitats during the non-breeding season.

68. A total of nine High Tide Walkovers and eight Low Tide Walkovers were carried out. Each survey visit lasted for up to three hours and the east and west sections of the survey area were covered simultaneously by different observers. Survey times were stratified to cover various stages of the tidal cycle including both high and low tide periods and periods of rising and falling water immediately before/after these times.

69. The High and Low Tide Walkover Surveys represent the equivalent of the Farmland Bird Surveys undertaken by AECOM in the two previous winter seasons.

9.5.2.3 Intertidal Walkover Surveys

70. Intertidal Walkover Surveys were undertaken between November 2015 and April 2016 inclusive. A total of 16 Intertidal Walkover Surveys were carried out. Each survey visit lasted for up to three hours and the east and west sections of the survey area were covered simultaneously by different observers. Survey times were stratified to cover various stages of the tidal cycle including both high and low tide periods and periods of rising and falling water immediately before/after these times.

71. A transect route was used which primarily followed the sea wall, allowing a good view across the Winter Bird Survey Area 2015/16 and 2017/18 in all directions. Coverage focussed on the intertidal areas on the seaward side of the transect route but birds observed within the fields and ditches of the survey area inland of the sea wall were also surveyed. This ensured that accurate counts were made of waterbirds within the fields of the CSA; however, passerines and birds low down in ditches distant from the sea wall were not recorded by this method.

72. These surveys represent the equivalent of the High and Low Tide Surveys conducted by AECOM in the two previous winter seasons.

9.5.2.4 Nocturnal Surveys

73. Nocturnal surveys were undertaken monthly between December 2015 and March 2016, totalling four survey visits. The aim of these surveys was to establish the use of the fields within the CSA by feeding and roosting birds during the night.

74. Observations were made using a combination of binoculars, night-vision optics, and a powerful spotlight. Care was taken to minimise disturbance and avoid the possibility of double-recording birds as they moved around the survey area. All nocturnal surveys were scheduled to coincide with the period over high tide, when the bird usage within the CSA was considered likely to be highest.

75. As during the diurnal Arcus surveys, birds were recorded onto large-scale field maps and assigned to count sectors.

9.5.3 Passage/Winter Bird Survey Method 2017/18

76. Following extension to the project timescales, further surveys were carried out by Arcus in winter 2017/18 to supplement the baseline data and provide the most up-to-date information.

77. During the initial consultation with Natural England in December 2016, it was established that the primary area of concern was the use of the Development site by waterbirds associated with The Swale SSSI/SPA/Ramsar site. It was therefore decided to complete surveys that would provide data on the number of waterbirds using the terrestrial habitats within the Development site, as well as the intertidal area adjacent to the Development site. This is similar to the Intertidal Walkover Surveys completed in 2015/16 and the AECOM High/Low Tide Count Surveys in 2013/14 and 2014/15.

78. A transect around the Winter Bird Survey Area 2015/16 and 2017/18 was followed during each survey. The transect followed the sea wall from the Sportsman at the northeast end of the survey area to Nagden in the southwest of the survey area, then around the southern perimeter of the CSA and across the arable Graveney marshes part of the CSA to Crown Cottages. From there the transect turned southeast between fields to meet the public footpath over Graveney Hill to the Seasalter Road, then along the footpath north by the side of Seasalter Road to the Sportsman. The direction of the transect was reversed between alternate surveys.

79. Between October 2017 and March 2018, surveys were carried out twice each month at low tide covering the period of approximately 2-2.5 hours either side of low tide and twice at high tide, covering the period of approximately 2-2.5 hours either side of high tide; the same was carried out once each month in September 2017 and April 2018.

9.5.4 Passage/Winter Bird Survey Results

80. Records of birds recorded on the field maps were digitised in a GIS and each record was assigned to one of the 61 count sectors. The counts of dark-bellied brent goose, golden plover and lapwing are provided at the end of this Technical Appendix in Section 9.8.

81. As a visual aid to understanding the distribution and abundance of waterbirds around the survey area, the mean numbers of bird-days of each important waterbird species (as well as mallard, ringed plover, turnstone and redshank) in each count sector in each season (2013/14, 2014/15, 2015/16 and 2017/18) has been calculated and shown in Figures A9.7 to A9.27. The mean number of bird-days in each count sector was calculated by taking the mean count of each species in each count sector from each relevant survey (dependent on survey type) in the season and multiplying by the number of days in the core season; for this purpose, the number of days in the season was 182 days (start of October to end of March).

9.5.4.1 Survey Results 2013/14 and 2014/15

82. A combined total of 52 species of conservation concern were recorded during the Winter Bird Surveys; 37 species in 2013/14 and 49 in 2014/15.

83. Table A9.19 provides a summary of the peak counts of all swans, all geese, all ducks, all waders, all gulls and all Annex 1 or Schedule 1 raptor and heron species recorded during the Winter Bird Surveys in 2013/14 and 2014/15. Numbers represent the highest total count made within the survey area during a single visit for each survey type[10]. Species in bold are important component species of The Swale SPA assemblage.

84. Most observations were from intertidal areas, however, fields to the north and northeast of Cleve Hill and Crown Cottages, in the east of the CSA, were used occasionally by foraging and roosting birds during the 2013/14 and 2014/15 winter seasons. Flocks of brent goose numbering up to 3,000 individuals were observed in this area. Small flocks of some wader species were also recorded here, particularly during high tide surveys. Species observed in these fields included ringed plover, golden plover, lapwing, grey plover, dunlin and curlew.

Table A9.19: Summary of peak counts in the survey area during the Winter Bird Surveys in winter 2013/14 [11] and 2014/15.

Species	2013-14			2014-15		
	Low Tide	High Tide	Farmland	Low Tide	High Tide	Farmland
Mute swan	40	29	24	2	10	15
Greylag goose	0	0	0	0	0	5
Brent goose	3011	2500	2000	1006	931	3400
Shelduck	19	6	0	222	44	52
Wigeon	1	110	25	60	315	0
Gadwall	0	1	0	0	0	0
Teal	9	4	0	80	53	4
Mallard	12	11	8	28	17	4
Shoveler	0	6	0	0	0	0
Little egret	3	3	1	6	12	1
Marsh harrier	0	1	0	2	2	3
Hen harrier	0	0	0	0	0	1
Merlin	0	1	0	0	0	0
Peregrine falcon	0	0	0	0	3	1
Oystercatcher	959	20	2	85	213	0
Avocet	131	0	0	240	91	0
Ringed plover	0	29	0	2	29	0
Golden plover	0	2	0	3	0	40
Grey plover	14	6	0	22	65	0
Lapwing	431	400	8	660	92	713

[10] Numbers reported here may differ from numbers quoted in Apendices A9.3 and A9.4 du to differing methods of analysis and extraction of count data from field sheets – e.g. flying birds are excluded in Table A9.19 and the area in which counts are reported differs slightly.
[11] Surveys started in January 2014.

Species	2013-14			2014-15		
	Low Tide	High Tide	Farmland	Low Tide	High Tide	Farmland
Knot	0	0	0	180	50	0
Dunlin	304	225	1	358	356	2
Snipe	0	5	26	0	0	8
Curlew	85	24	14	22	9	24
Redshank	207	218	0	329	189	4
Turnstone	6	72	0	2	84	0
Black-headed gull	22	17	88	55	48	151
Common gull	0	0	8	1	0	0
Lesser black-backed gull	0	0	0	1	0	1
Herring gull	4	0	0	9	4	2
Great black-backed gull	0	0	0	4	0	0
Short-eared owl	0	0	1	0	1	2

85. Additional species of conservation concern recorded included; little grebe, stock dove, kingfisher, bearded tit, skylark, Cetti's warbler, starling, song thrush, redwing, mistle thrush, fieldfare, dunnock, house sparrow, grey wagtail, meadow pipit, rock pipit, linnet, yellowhammer and reed bunting.

9.5.4.2 Survey Results 2015/16

High & Low Tide Walkover

86. A total of 92 species were recorded during the High and Low Tide Walkover Surveys in winter 2015-16, including 63 species of conservation concern.

87. Table A9.20 provides a summary of all swans, all geese, all ducks, all waders, all gulls and all Annex 1 or Schedule 1 raptor and heron species recorded during the High and Low Tide Walkover Surveys in winter 2015/16. Species in bold are important component species of The Swale SPA assemblage.

88. In the arable/grazing marsh terrestrial habitats, observations were widely scattered throughout the CSA, although there were concentrations along the northern edge of the CSA, around Graveney Marshes.

Table A9.20: Summary of species recorded during the High & Low Tide Walkover Surveys in winter 2015/16.

Species	High Tide		Low Tide	
	Total no. of observations	Peak Flock count	Total no. of observations	Peak Flock count
Mute swan	14	7	19	3
Whooper swan	0	0	1	40
Greylag goose	2	4	0	0
Brent goose	9	340	9	370
Shelduck	19	3	14	3
Wigeon	6	19	-	-

Species	High Tide		Low Tide	
	Total no. of observations	Peak Flock count	Total no. of observations	Peak Flock count
Gadwall	2	4	1	8
Teal	34	25	26	20
Mallard	38	10	14	10
Goosander	-	-	1	1
Bittern	1	1	-	-
Little egret	35	2	33	2
Red kite	-	-	1	1
Marsh harrier	36	2	31	3
Merlin	5	1	2	1
Peregrine	13	3	4	1
Oystercatcher	32	140	2	2
Avocet	9	2	5	2
Ringed plover	-	-	3	1
Golden plover	38	800	18	1100
Grey plover	3	1	4	55
Lapwing	68	300	52	290
Knot	-	-	1	650
Dunlin	6	40	3	220
Snipe	59	28	52	3
Black-tailed godwit	-	-	1	1
Bar-tailed godwit	1	1	-	-
Whimbrel	1	3	-	-
Curlew	26	115	12	35
Green sandpiper	6	3	6	1
Greenshank	1	2	2	1
Redshank	129	64	132	16
Turnstone	-	-	1	1
Black-headed gull	17	550	22	500
Common gull	11	30	8	20
Lesser black-backed gull	1	2	-	-
Herring gull	5	1	5	2
Great black-backed gull	1	1	-	-
Short-eared owl	3	1	11	1

89. Additional species of conservation concern recorded included; kestrel, stock dove, bearded tit, skylark, shorelark, Cetti's warbler, starling, song thrush, redwing, mistle thrush, fieldfare, winchat, dunnock, house sparrow, grey wagtail, yellow wagtail, meadow

pipit, rock pipit, house sparrow, brambling, bullfinch, linnet, redpoll, yellowhammer, reed bunting and corn bunting.

Intertidal Walkover Surveys

90. A total of 63 species were recorded during the Intertidal Walkover Surveys in winter 2015/16 including 49 species of conservation concern.

91. Table A9.21 provides a summary of all swans, all geese, all ducks, all waders, all gulls and all Annex 1 or Schedule 1 raptor and heron species recorded during the Intertidal Walkover Surveys in winter 2015/16. Species in bold are important component species of The Swale SPA assemblage.

92. Species diversity was broadly similar to the High/Low Tide Walkover Surveys although, for many species, the number of observations and flock sizes were higher during the Intertidal Walkover Surveys (because more birds used intertidal habitats than farmland habitats).

Table A9.21: Summary of species recorded during the Intertidal Walkover Surveys in winter 2015/16.

Species	Peak survey area count
Mute swan	7
Brent goose	556
Shelduck	151
Wigeon	571
Gadwall	4
Teal	239
Mallard	40
Tufted duck	2
Goldeneye	1
Goosander	1
Little egret	11
Marsh harrier	3
Merlin	1
Peregrine	2
Oystercatcher	845
Avocet	150
Ringed plover	23
Golden plover	2,300
Grey plover	262
Lapwing	898
Knot	1,280
Sanderling	1
Purple sandpiper	1
Dunlin	1,472
Snipe	57

Species	Peak survey area count
Black-tailed godwit	32
Bar-tailed godwit	2,000
Whimbrel	2
Curlew	253
Green sandpiper	5
Greenshank	2
Redshank	234
Turnstone	90
Black-headed gull	550
Mediterranean gull	1
Common gull	30
Herring gull	15
Lesser black-backed gull	2
Great black-backed gull	6
Short-eared owl	1

93. Additional species of Birds of Conservation Concern recorded included: bearded tit, skylark, shorelark, Cetti's warbler, redstart, meadow pipit, linnet, redpoll, corn bunting and snow bunting.

Passage Bird Surveys

94. A total of 59 species of were recorded during the Passage Bird Surveys in autumn 2015 including 34 species of conservation concern.

95. Overall, diversity and numbers were lower than the High/Low Tide Walkover and Intertidal Walkover Surveys but observations showed a similar spatial distribution with the majority of observations of waterbirds in the intertidal habitats and little use of farmland habitats.

Nocturnal Survey results

96. A total of 16 species of were recorded during the four Nocturnal Surveys in winter 2015/16.

97. Golden plover, lapwing and snipe were the most frequently recorded species. There were two observations of redshank and nine of dunlin (including a flock of 10 birds) in fields in the north of the CSA. Overall, observations during the Nocturnal Surveys were widely scatted around the farmland areas within the CSA.

98. Figure A9.28 provides an overview of species locations and numbers during the Nocturnal Surveys in winter 2015/16.

9.5.4.3 Winter Bird Survey Results 2017/18

99. The surveys in winter 2017/18 followed one type of survey method that provided counts of waterbirds using the arable habitats within the CSA, as well as adjacent grazing marsh at Cleve Marshes east of the CSA and the intertidal habitats of the Swale estuary within 500 m north of the CSA and along Faversham Creek.

100. Table A9.22 provides a summary of waterbirds (and little egret) recorded during the surveys in winter 2017/18. Species in bold are important component species of The Swale SPA assemblage.

101. In the arable/grazing marsh terrestrial habitats, observations were widely scattered throughout the CSA, although there were concentrations along the northern edge of the CSA, around Graveney Marshes.

Table A9.22: Peak counts of species recorded during the winter bird surveys in 2017/18.

Species	Peak Count
Mute swan	4
Brent goose	1,798 (in late Sept)
Pink-footed goose	4
Shelduck	115
Shoveler	9
Wigeon	690
Mallard	35
Pintail	1
Teal	160
Little grebe	6
Great crested grebe	6
Black-necked grebe	1
Grey heron	8
Little egret	22
Cormorant	15
Coot	6
Moorhen	2
Oystercatcher	1,187
Avocet	194
Ringed plover	35
Golden plover	1,776
Grey plover	150
Lapwing	1,183
Knot	1,660
Ruff	23
Sanderling	2
Dunlin	3,000
Woodcock	1
Snipe	3
Black-tailed godwit	380
Bar-tailed godwit	150

Species	Peak Count
Curlew	161
Common sandpiper	3
Green sandpiper	4
Greenshank	9
Redshank	370
Turnstone	91

9.6 Bird-days Calculation for Dark-bellied Brent Goose, Golden Plover and Lapwing

102. As a result of the Development and consequent loss of open farmland to solar panels, the assessment predicts that there is potential for negative effects on the wintering populations of dark-bellied brent goose, lapwing and golden plover that use the farmland for foraging or loafing/roosting.

103. This potential adverse effect was recognised at an early stage in the project, therefore the principle of maintaining an undeveloped area of the Development site was identified for habitat management mitigation to provide foraging and resting/roosting opportunities for geese and other waterbirds. This has been referred to as the Arable Reversion Habitat Management Area (AR HMA).

104. Baseline surveys comprised 'snapshot' counts of the number of birds of each species in each count sector. The number of surveys in each month and in each season has varied across the course of the survey period. A number of metrics were explored to describe bird-use of the site. Following consultation with Natural England and the HMSG, it was considered that the most appropriate metric to provide a precautionary measure of average use of the site each season is the 'inter-annual mean of the intra-annual mean of the peak monthly counts' derived from the survey data (hereafter called 'peak-mean'). Survey count data for brent goose, lapwing and golden plover are provided in of Section 9.8.

105. The approach to devising mitigation requirements for loss of foraging resources for wintering waterbirds is to calculate the amount of land and type of management that would be needed to support the number of foraging bird-days that the arable land within the Development site has supported in the four winters studied.

106. The total number of birds of each species in the arable parts of the CSA on each survey were obtained by summing the number of foraging birds in each arable count sector (Section 9.8) on each survey (made during baseline surveys as described in Section 9.5), taking action where necessary to remove double counts (when the same flock of birds was recorded in two different fields on the same survey). The peak-mean counts for the arable area were then calculated for each season (i.e. the intra-annual mean of the highest counts each month) and the means of those seasonal peak-means (i.e. 'inter-annual mean of the intra-annual mean of the peak monthly counts) were obtained for each species by averaging across the seasons (Table A9.23)[12]. This was done to smooth out the variation in the number of surveys in each season.

[12] Preliminary data analysis carried out for the PEIR has been reviewed and revised to ensure consistency with appropriate criteria for the inclusion or exclusion of bird counts, e.g., where birds took off from one field within the Core Survey Area and landed in another, these are the same birds using the site and should be recorded as such. The detailed review of the analysis has led to the removal of such double counting, as well as other details, which has led to minor changes in the baseline data reported in the ES relative to that in the PEIR.

107. Metrics were calculated on the November to February period for brent goose because the number of birds recorded in the arable fields outside this period was almost zero. Metrics for golden plover and lapwing were based on the October to March period, because birds were recorded in the arable fields throughout those months.

Table A9.23: Daily diurnal peak-mean count metrics of brent goose, golden plover and lapwing within the arable part of the CSA

Metric	Brent Goose (Nov-Feb)	Lapwing (Oct-Mar)	Golden Plover (Oct-Mar)
Mean of seasonal monthly peak-means	849.5	307.8	158.3

108. These metrics represent an average number of birds per day within the arable fields of the Development site.

An alternative method to describe the average site use by each species was explored, whereby the highest count of a species in each month across seasons was averaged and summed over the months in the period under consideration. However, this method was dismissed because it was considered that the driving factor behind the variability in numbers was the crop type, which varies with season, rather than the month of the season; however, it is recognised that the month in the season also influences variability because crops have different stages of growth through the season which may make them more or less attractive at different times.

109. Figures A9.40, A9.41 and A9.42 display the crops grown in each season (the date shown being the harvesting year). These were examined to assess the representativeness of the baseline survey sample, particularly in the potential suitability of the crops in the site for geese. Brent geese forage particularly on winter cereal crops, as well as winter oil seed rape, but will also make use of other crops when suitable, for example when spring/winter beans 'chit' as the shoots emerge. In the 10 years between winter 2009/10 to 2018/19, the site has been dominated by (>80%) winter cereal crops during three winters (2009/10, 2011/12 and 2013/14), with smaller but substantive extents of winter cereal (>40%) in a further four winters (2014/15, 2015/16, 2016/17 and 2018/19). Dominance of winter oil seed rape has only been present in winter 2010/12. In the remaining two winters (2012/13 and 2017/18), the site has been dominated by spring cropping (i.e. no crops present during the winter – 2012/13) or a mixture of winter beans and spring cereal (2017/18).

110. Therefore 70% of the last ten years cropping have provided theoretically highly suitable winter cereal crops. These winters have coincided with some of the baseline sample in winters 2013/14, 2014/15 and 2016/17. 75% (three out of four winters) of the sample therefore includes conditions when very suitable foraging conditions were potentially present for geese, compared with 70% of the ten years of cropping information examined. Only in winter 2017/18 of the baseline sample (i.e. 25% of the sample) were conditions less suitable for geese (but appeared to be highly attractive to golden plover and lapwing), when half of the site was winter beans and half was uncropped until the spring. This compares with 20% of the ten years between 2009/10 and 2018/19. The baseline sample is therefore considered to have provided a representative sample of suitability of cropping for brent geese, as well as for golden plover and lapwing.

9.6.1 Bird-days

111. Seasonal bird-days for the arable part of the CSA were calculated by multiplying the peak-mean number of foraging birds by the number of days in the season (brent goose: 120 days; golden plover and lapwing: 182 days). This provides a measure of the utilisation of

the arable area of the Development site and a basis on which to establish an appropriate area within the site to manage for the benefit of birds that will be prevented from using other parts of the site that will be under the solar panels (Table A9.24).

Table A9.24: Brent goose, golden plover and lapwing bird-days (based on peak-mean count metric) within the arable CSA based

Metric	Brent Goose (Nov-Feb)	Lapwing (Oct-Mar)	Golden Plover (Oct-Mar)
Mean of seasonal monthly peak-means	101,940	56,023	28,802

112. In order to illustrate the variability between seasons, Figures A9.7, A9.15 and A9.16 display the seasonal distribution and relative abundance of the three species within the survey area. The metrics used in the figures are based on the mean number of bird-days per season in each count sector.

9.6.2 Mitigation Area

113. It has been agreed with Natural England in principle that loss of arable functionally linked habitat can be mitigated by the provision of an undeveloped area of permanent grassland. This is the provision of the AR HMA within the Development site that has specific management tailored towards enhancing foraging resources for these species – a 'waterbird refuge'. Further details of the location, management and monitoring of the refuge are set out in the Outline LBMP (Technical Appendix A5.2 of the ES).

114. Brent geese prefer to feed on intertidal algae and *Zostera* (Eel Grass) where it is available. However, following a rapid increase in their population and lack of traditional feeding areas, they have expanded their range of feeding sites in recent decades to include agricultural fields inland with a short sward height (e.g. Summers 1990; Rowcliffe & Mitchell 1996, Hassall *et al.* 2001)[13,14,15], where they feed on the vegetation. Golden plover and lapwing generally exhibit preference for feeding in grassland with a short sward height, but also use open arable habitats such as open ploughed land and young winter cereals, preferring large open fields providing good visibility for predators (e.g. Mason and Macdonald 1999; Gillings *et al.* 2007)[16,17]. Lapwing and golden plover feed on surface and soil invertebrates, therefore there is no direct competition between these species and brent goose for foraging resources; the AR HMA is therefore designed in a way that the species can be co-located within the same area (i.e. the mitigation area needed for lapwing, golden plover and brent geese is not additional).

9.6.2.1 Brent Goose

115. In order to mitigate for the loss of foraging resources to brent geese, the waterbird refuge will need to provide for 101,940 brent goose bird-days of feeding potential. This resource for brent goose could be provided through some of the following management options:

[13] Summers, R.W. (1990). The effect of grazing on winter wheat by brent geese *Branta. B. bernicla*. *Journal of Applied Ecology* **29**: 35-40.
[14] Rowcliffe, J.M. and Mitchell, C. (1996). *The Conservation Management of Brent Geese in the UK.* WWT, Slimbridge.
[15] Hassall, M., Riddington, R. and Helden, A. (2001). Foraging behaviour of brent geese, *Branta b. bernicla*, on grasslands: effects of sward length and nitrogen content. *Oecologia* **127**: 97-104.
[16] Mason, C.F. and Macdonald, S.M. (1999). Habitat use by Lapwings and Golden Plover in a largely arable landscape. *Bird Study* **46**: No. 1: 89-99.
[17] Gillings, S., Fuller, R.J. and Sutherland, W. (2007). Winter field use and habitat selection by Eurasian Golden Plovers *Pluvialis apricaria* and Northern Lapwings *Vanellus vanellus* on arable farmland. *Ibis* **149**: 509-520.

- Re-seeding grassland areas (e.g. Percival 1993)[18];
- Grassland cut to produce an optimal short sward of c. 5-7 cm (Hassall *et al*. 2001)[19];
- Grassland of higher sward height with an increased nitrogen content (Percival 1993; Hassall *et al*. 2001)[18,19];
- Sacrificial crops e.g. wheat (McKay *et al*. 1993)[20]; or
- Removal of bird scaring (Bos and Stahl 2003)[21].

116. The optimal management for the refuge is considered to be the conversion of arable land to permanent pasture (grassland). The proposal and rationale for this is set out below and it also fits with the mitigation requirements outlined for golden plover and lapwing.

117. The *Solent Waders and Brent Goose Strategy* website[22] cites an example of a successful refuge:

"In 2009, Portsmouth College developed an area of their playing fields. The grassland area was used by Brent geese and therefore mitigating for the loss of feeding areas was made a condition of their planning permission. The mitigation involved creating a Brent goose "refuge" an area of fenced-off grassland close to the area being lost. The refuge area was a success and post-mitigation monitoring has shown that geese continue to use the site."

118. The AR HMA is, in essence, a high quality managed refuge area mitigating for the loss of a larger lower quality area and, as such, should be as close as is possible to being disturbance free. There is a public footpath running along the sea wall at the northern perimeter of the site. However, the refuge will not be located further inland away from the footpath – the attraction of the proximity of the refuge to the estuary frontage outweighs the possibility of potential disturbance caused by users of the sea wall footpath; furthermore, the sea wall is separated from the Development site by a strip of grazing marsh approximately 50-70 m wide and there may be a high degree of habituation already in practice. Round (1982)[23], for example, studied the inland feeding habits of brent geese in Sussex and found that 70% of birds fed within 200 m of the coast through the winter, 68% of these being on grass.

119. The landowner does not currently employ any deliberate scaring activities to protect crop damage by birds, although this practice has been carried out in the past (e.g. 2008/09 – 2011/12). There would be a commitment to maintain an undisturbed (no scaring) area around the refuge in order to maximise its potential to provide resources for brent geese. This form of management has been proven to increase carrying capacity of land for brent goose; for example, Bos and Stahl (2003)[21] reported a doubling of numbers of spring staging geese on the island in The Netherlands (Schiemonnikoog: Dutch Wadden Sea islands) in the years without scaring.

120. As well as being disturbance-free, it is essential that the refuge is an area known to be capable of supporting geese (as well as golden plover and lapwing). To take this into account in designing the refuge area, the distribution of geese in fields in the CSA were examined (Section 9.8, Figures A9.7, A9.15 and A9.16). Nearly 55% of the brent geese

[18] Percival, S.M. (1993). The effects of reseeding, fertilizer application and disturbance on the use of grasslands by barnacle geese, and the implications for refuge management. *Journal of Applied Ecology* **30**: 437-433.
[19] Hassall, M., Riddington, R. and Helden, A. (2001). Foraging behaviour of brent geese, *Branta b. bernicla*, on grasslands: effects of sward length and nitrogen content. *Oecologia* **127**: 97-104.
[20] McKay, H.V., Bishop, J.D. and Ennis, D.C. (1993). The possible importance of nutritional requirements for dark-bellied brent geese in the seasonal shift from winter cereals to pasture. *Ardea* **82**: 123-132.
[21] Bos, D. and Stahl, J. (2003) Creating new foraging opportunities for Dark-bellied Brent *Branta bernicla* and Barnacle Geese *B. leucopsis* in spring – insights from a large-scale experiment. *Ardea* **91** (2): 153-166. [redacted] accessed 20/05/2017.
[23] Round, P. (1982). Inland feeding by brent geese *Branta bernicla* in Sussex, England. *Biological Conservation* **23**: 15-32.

counted throughout the surveys were in the fields that will make up the 56 ha AR HMA, demonstrating that its location is highly appropriate.

121. Vickery *et al*. (1994)[24] conducted surveys of brent goose in a 20 ha grassland field in Norfolk in order to provide information for proposed Alternative Foraging Areas for the species. This study involved managing different areas with different management regimes (e.g. application of fertilizer, cutting patterns, grazed (cow/sheep), ungrazed etc.) and found that farmland can be managed in a number of ways and can sustain a large number of birds. Vickery *et al*. reported that grassland cut five times and fertilized was grazed at an intensity of 2,097 bird-days per ha, compared with 1,562 bird-days per ha on grass cut twice and left unfertilized.

122. There is other evidence that a managed grassland refuge would be able to support such densities of geese throughout the winter. Round (1982)[23] found that grassland habitat around Chichester Harbour in Sussex supported 1,908 goose-days per ha of heavy grazing. The grassland around Chichester Harbour was just the subject of the study, not habitat specifically managed to be beneficial for brent geese; it is likely therefore that grassland managed correctly as a refuge for geese could support more bird-days through the winter. Owen (1977)[25] reported a carrying capacity of 2,250 goose-days per ha of grassland and suggested that the grass within refuge areas should be mown or heavily grazed by farm stock in summer, though not in late autumn, winter or early spring, when there would be competition with geese for food.

123. Owen (1977)[25] suggested that applications of nitrogenous fertiliser would tend to increase the attractiveness of grass to geese, whilst Bachman (2008)[26] stated that fertilized plots support 200 more goose-days per ha than unfertilized plots and that grassland with fertiliser has the potential to attract and sustain more geese per ha if fertilized. The application of organic matter will be required to provide the best growth and suitable foraging conditions for brent geese. If organic matter, such as farmyard manure, is applied, this will also have benefit to golden plover and lapwing, as invertebrate populations in the AR HMA will be improved.

124. There is increasing evidence that clovers (Trifolium sp.) may be an effective way to attract geese to a site (Owens 1976; McKay *et al*. 1996; McKay *et al*. 2001)[27,28,29]. Clovers are generally high in protein and are nitrogen-fixing plants which can enhance fertility of soil and increase the quality of pasture (Marriott 1988)[30]. McKay *et al*. (2001)[29] found an overwhelming goose grazing response to clover during the first year after re-seeding of a field – with more protein, higher live matter and less fibre than several species of freshly planted grass. It is therefore considered that with the addition of clover into the grassland mix, the carrying capacity in the early life of the refuge can be increased; this may also benefit golden plover and lapwing through provision of appropriate habitat for their invertebrate prey.

[24] Vickery, J.A., Sutherland, W.J. and Lane, S.J. (1994). The management of grass pastures for brent geese. *Journal of Applied Ecology* **31**: 282-290.
[25] Owen, M. (1977). The role of wildfowl refuges on agricultural land in lessening the conflict between farmers and geese in Britain. *Biological Conservation*, **11**: 209-222.
[26] Bachman, D.C. (2008). *Managing grassland pastures at Humboldt Bay National Wildlife Refuge for Aleutian Geese*. Masters of Science In Natural Resources: Wildlife. A Thesis presented to Humboldt State University.
[27] Owens, M. (1976). The selection of winter food by white-fronted geese. *Journal of Applied Ecology* **13**: 715-729.
[28] McKay, H.V., Langton, S.D., Milsom, T.P. and Feare, C.J. (1996). Prediction of field use by brent geese to aid crop management. *Crop Protection* **15**: 259-268.
[29] McKay H.V., Milsom T.P. and Feare C.J. (2001). Selection of forage species and the creation of alternative feeding areas for dark-bellied brent geese *Branta bernicla bernicla* in southern UK coastal areas. *Agriculture Ecosystems & Environment* **84**: 99-113.
[30] Marriott, C.A. (1988). Seasonal variation in white clover content and nitrogen fixing (acetylene reducing) activity in a cut upland sward. Grass and Forage Science 43: 253-262.

125. The current management of the site as arable crops typically renders the majority of the area unsuitable for foraging geese by late February, as the crop sward becomes too high. Winter 2015/16 was very mild and the surveyors noted that the height of the crop sward had already become unsuitable for plovers and geese by late December; hence the site supported comparably few geese during that winter. In winter 2017/18, the arable CSA comprised winter beans and fallow, which were barely used by brent geese at any time in that winter. The managed grassland in the refuge will be capable of sustaining geese for a longer period throughout the winter, until birds depart on northward migration. The refuge should therefore be beneficial in providing permanent resources for longer in the winter season and potentially helping geese to maintain better fitness for migration and productivity.

126. The evidence set out above demonstrates that improved grassland, even during early establishment, is capable of supporting high numbers of brent geese throughout the winter. On the basis of the synopsis above, the AR HMA will support 2,097 foraging brent-goose days per hectare. 101,940 bird-days will therefore require 48.6 ha of functionally available land within the AR HMA.

127. The total area of the AR HMA is approximately 56 ha. However, it is possible that brent geese will not forage close to the solar panels. A review of the literature available regarding goose avoidance of boundary features suggests that there would be lower density of foraging birds within 50 m of constructed boundary features (e.g. Larsen and Madsen, 2000; Harrison *et al*. 2017)[31],[32]. Assuming on a precautionary basis a reduction in density within 50 m of site infrastructure such as the solar PV arrays and the flood protection bund, approximately 50.1 ha of grassland remains functionally available for geese, which exceeds the requirements as set out above.

9.6.2.2 Golden Plover and Lapwing

128. In order to mitigate fully for the loss of foraging resources to lapwing and golden plover, the AR HMA needs to provide for 56,023 lapwing bird-days and 28,802 golden plover bird-days of feeding potential.

129. Gillings *et al*. (2007)[17] reported golden plover densities of 1,560 bird-days per ha and 1,000 lapwing bird-days per ha from mixed arable farmland. However, golden plover and lapwing can be found on a variety of grassland types, including pastures and airfields (Gillings and Fuller 1999)**Error! Bookmark not defined.**. Most studies of habitat use report a strong preference for feeding on grassland, particularly permanent pastures (e.g. Milsom *et al*. 1985, Fuller 1988 and Tucker 1992)[33],[34],[35]. Gillings and Fuller (1999)[36]**Error! Bookmark not defined.** state that the abundance and availability of potential prey items present in different habitats is likely to be an important factor shaping the distribution of plovers between fields. Golden plover and lapwing both consume invertebrates found in field vegetation and just below the soil surface (e.g. earthworms, beetles etc.). Prey availability is probably higher in vegetated fields than bare till because the vegetation insulates the soil surface and creates a suitable microclimate for soil invertebrates which would otherwise be buried deeper below ground (Parr 1992)[37], especially during the winter months. Soil protected by a dense layer of insulating vegetation may remain unfrozen during periods of ground frost and thus render soil invertebrates relatively more surface-active and relatively more available to plovers foraging on grassland than those foraging on cultivated land. Barnard and Thompson (1985)[38] state that earthworms are a common dietary component for golden plover and lapwing and for whose abundance can be estimated. Permanent pastures are richest in earthworms, with less in winter cereals and the least in root crops. In grassland, worm biomass increases as a function of the time since last ploughing, hence permanent pastures attain a higher biomass of earthworms than temporary grasslands. Plover distribution is positively correlated both with the biomass of earthworms and with field age (Gillings and Fuller 1999)**Error! Bookmark not defined.Error! Bookmark not defined.**. Furthermore, both species have higher net rates of energy intake in old compared with recent pasture (Barnard and Thompson 1985)[38]. Tucker (1992)[35] reports that grassland feeding habitat has the potential to support a food biomass density about three-fold greater than arable, however this biomass level takes several years to be realised.

130. In the Lower Derwent Valley, North Yorkshire, lapwings generally preferred short swards and avoided swards more than 10 cm tall (Gregory 1987)[39]. Milsom *et al*. (1998)[40] also demonstrated that both golden plovers and lapwings preferred to feed in fields that had been mown twice, rather than fields that had been mown only once, and unmown fields were virtually avoided. The optimum sward height appeared to be around 7 cm. However, heavy grazing can decrease the diversity and abundance of spiders, surface-active beetles and productivity of emergent flies (Keiller *et al*. 1995)[41]. Conversely, grazing may benefit foraging plovers through 'dunging'. Not only does dung harbour its own invertebrate fauna but soil productivity may be increased as grazing animals convert unavailable nutrients into simpler nutrients which soil invertebrates can readily assimilate (Keiller *et al*. 1995)[41].

131. Based on the above evidence, it is considered reasonable to assume that an increased carrying capacity compared to the existing arable crop rotation can be reached by the introduction of permanent grassland under the correct management (e.g. application of organic matter, cutting regime etc.) when compared with arable farmland. Parr (1992)[37] suggests there is a greater prey availability in grassland; Tucker (1992)[35] suggests there is a three times greater biomass in grassland areas. However, for the purposes of this assessment and under the advice through consultation with Natural England, the precautionary assumption is applied, which is that the grassland would only have similar capacity to that of mixed arable farmland as recorded by Gillings *et al*. (2007)[35]: 1,000 lapwing bird-days/ha and 1,560 golden plover bird-days/ha. These are the capacity values for both lapwing and golden plover within fields used in Gillings' study area and represent simultaneous use, rather than separate, additional usage (i.e., the AR HMA will have capacity for 2,560 lapwing+plover-days/ha over the winter). The four seasons of surveying at the Development site demonstrated that there was a great deal of evidence during the surveys of golden plover and lapwing utilising the same fields in the same season (Section 9.8).

[31] Larsen, J.K. & Madsen, J. (2000). Effects of wind turbines and other physical elements on field utilization by pink-footed geese (*Anser brachyrhynchus*): A landscape perspective. *Landscape Ecol*. 15: 755–764
[32] Harrison, A.L., Petkov, Mitev, D., Popgeorgiev, G., Gove, B. & Hilton, G.M. (2018). Scale-dependent habitat selection by wintering geese: implications for landscape management. *Biodiversity and Conservation* 27:1, 167-188.
[33] Milsom, T.P., Holditch, R.S. and Rochard, J.B.A. (1985). Diurnal use of an airfield and adjacent agricultural habitats by Lapwings *Vanellus vanellus*. *Journal of Applied Ecology* **22**: 313-326.
[34] Fuller, R.J. (1988). Wintering golden plovers in central Buckinghamshire: annual variation in numbers and distribution. *Buckinghamshire Bird Report 1988*: 4-8.
[35] Tucker, G. M. (1992). Effects of agricultural practices on field use by invertebrate-feeding birds in winter. *Journal of Applied Ecology* **29**:779-790.
[36] Gillings, S. and Fuller, R.J. (1999). *Winter Ecology of Golden Plovers and Lapwings: A Review and Consideration of Extensive Survey Methods*. BTO Research Report No. 224. BTO, Thetford.
[37] Parr, R. (1992). The decline to extinction of a population of Golden Plover in north-east Scotland. *Ornis Scandinavica* **23**: 152-158.
[38] Barnard, C.J. and Thompson, D.B.A. (1985). *Gulls and plovers: the ecology and behaviour of mixed species feeding groups*. Croom Helm Ltd, London.
[39] Gregory, R.D. (1987). Comparative winter feeding ecology of Lapwings *Vanellus vanellus* and Golden Plovers *Pluvialis apricaria* on cereals and grassland in the Lower Derwent Valley. *Bird Study* **34**: 244-250.
[40] Milsom, T.P., Ennis, D.C., Haskell, D.J., Langton, S.D. and McKay, H.V. (1998). Design of grassland feeding areas for waders during winter: the relative importance of sward, landscape factors and human disturbance. *Biological Conservation* **84**: 119-129.
[41] Keiller, S.W., Buse, A. and Cherrett, J.M. (1995). *Effects of sheep grazing on upland arthropods in Snowdonia and mid-Wales, 6.* ITE, Bangor.

132. 56,023 lapwing bird-days will therefore require 56.0 ha and 28,802 golden plover bird-days will require 18.5 ha of functionally available land within the AR HMA. These areas are not additional to each other.

133. Taking account of the same boundary restrictions described in paragraph 127 above, approximately 50.1 ha of grassland remains functionally available for lapwing and golden plover. This theoretically falls short of the requirement for lapwing, but well exceeds the requirement from golden plover. Lapwing and golden plover overlap to a large extent in their foraging requirements, feeding on similar invertebrate prey, and therefore assuming they are interchangeable, the AR HMA would support more lapwing-days if there are fewer golden plover-days to support. As there are more than 6 ha spare capacity in the AR HMA for golden plovers, these could be utilised by lapwing and the AR HMA will provide sufficient resources to accommodate the average Development site use based on the baseline survey counts.

134. The mitigation area proposed for golden plover and lapwing can be co-located in the same area and under the same management as that for brent goose. Plovers/lapwing and geese feed on different items, therefore there is not competition for resources between them. Based on the four seasons of baseline surveys, there was almost no coincidence between geese and lapwing/plovers in the same fields at the same time, although the same fields were utilised at different times. The AR HMA area for golden plover and lapwing will consequently be the same extent as for brent goose, at approximately 56 ha.

9.7 Flight Activity Survey

135. Flight Activity Survey (FAS) is usually carried out in relation to wind energy or other developments where collision risk to birds may be an issue if birds fly in the air space to be occupied by development structures. The purpose of the survey in this case was to quantify the use of the site by birds such as marsh harrier, which fly over the ground when hunting for ground-dwelling birds and other animals.

136. The FAS was carried out by Arcus between November 2015 and October 2016.

9.7.1 Method

137. The FAS was undertaken using an adapted version of the methodology described by Scottish National Heritage (2014)[42] for onshore wind farms.

138. The aim of the surveys was to provide detailed data on the flight activity of key target species within the site. The FAS Area was defined as the CSA and any visible area up to 500 m around it (Figure A9.29). Two Vantage Point (VP) locations were selected to provide excellent visual coverage of the FAS Area (Table A9.25; Figure A9.29). The height of flights was recorded using three flight height bands, which provided an indication of how birds were using the survey area; e.g. hunting/foraging low over the ground (0-10 m), moving to/from locations on the site (often changing height bands to/from ground level) or transiting over (typically 10-50 m or > 50m and not changing in height).

Table A9.25: VP locations

VP	OS Grid Coordinates
1	TR 03461 63282
2	TR 04524 63951

[42] Scottish Natural Heritage (SNH) (2014) Recommended bird survey methods to inform impact assessment of onshore wind farms. SNH. May 2014.

139. The primary focus of the surveys was marsh harrier although flight details were recorded for all target species, which included; all swans, all geese, all ducks, all herons, all raptors and owls listed on Annex 1 or Schedule 1, all waders, Mediterranean gull, all terns, and raven. Secondary species included cormorant, all other raptors and owls and selected gulls and passerines in noteworthy numbers.

140. A total of 89 hours of observation were made from each VP between November 2015 and October 2016 inclusive. A breakdown of monthly survey hours from each VP is shown in Table A9.26, with full details of each survey in Table A9.27.

141. Surveys were carried out at various times of day, at various stages of the tidal cycle and were undertaken in a variety of weather conditions, mostly during conditions of at least moderate visibility (1-2 km). Where surveys were undertaken in poor conditions, additional surveys were completed at a later date. Watches usually comprised sessions either two or three hours long, separated by a break of at least 20 minutes in order to avoid observer fatigue.

142. For each target species flight the following details were recorded:

- Unique ID number;
- Species, age and sex (when identification of age and/or sex was possible);
- Number of birds;
- Time;
- Duration of flight within the FAS Area;
- Flying height in three defined height bands (0-10 m, 10-50 m and >50 m), per 15 second interval of the recorded flight duration;
- Bird behaviour (foraging, transiting, display, carrying food/nest material); and
- Reason for end of the flight (either the bird landed or flew out of sight)

143. All target species flight lines were digitised in a GIS and each flight line was cross-referenced to its unique ID number to permit analysis of species and seasonal patterns of activity.

Table A9.26: Monthly FAS breakdown (hours surveyed per VP per month)

VP	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Total
1	6	12	12	8	1	6	13	7	6	6	6	6	**89**
2	6	12	12	6	3	6	13	7	6	6	6	6	**89**

Table A9.27: FAS details

Date	VP	Observer	Start of Hour	End of Hour	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Vis	Frost	Snow
24-Nov-15	VP1	SH	13:00	14:00	3 (4)	W/WNW	4	8	1	2	0	0
24-Nov-15	VP1	SH	14:00	15:00	3 (2)	WNW	0	8	1	2	0	0
24-Nov-15	VP1	SH	15:00	16:00	3 (2)	WNW	0	8	1	2	0	0
24-Nov-15	VP2	MS	13:00	14:00	3 (4)	WNW/W	4	8	1	2	0	0
24-Nov-15	VP2	MS	14:00	15:00	3 (2)	WNW/W	0	8	1	2	0	0
24-Nov-15	VP2	MS	15:00	16:00	3 (2)	WNW	0	8	1	2	0	0
25-Nov-15	VP1	SH	08:00	09:00	2-3 (4)	NW	0	6	2	2	0	0

Date	VP	Observer	Start of Hour	End of Hour	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Vis	Frost	Snow
25-Nov-15	VP1	SH	09:00	10:00	3 (5)	NW	0	6-7	1	2	0	0
25-Nov-15	VP1	SH	10:00	11:00	4 (5)	NW	0	6	1	2	0	0
25-Nov-15	VP2	MS	08:00	09:00	3	NW	0	7	1	2	0	0
25-Nov-15	VP2	MS	09:00	10:00	3-4	NW	0	7	1	2	0	0
25-Nov-15	VP2	MS	10:00	11:00	3-4	NW	0	8	1	2	0	0
15-Dec-15	VP1	SH	13:00	14:00	2 (3)	SW/SSW	1-0	8	1	2	0	0
15-Dec-15	VP1	SH	14:00	15:00	2-3 (4)	SW	0	8	1	2	0	0
15-Dec-15	VP1	SH	15:00	16:00	2-3 (4)	SW	0	8	1	2	0	0
15-Dec-15	VP2	MS	13:00	14:00	3-4	SSE	2	8	2	2	0	0
15-Dec-15	VP2	MS	14:00	15:00	3	SSE	0	2	2	2	0	0
15-Dec-15	VP2	MS	15:00	16:00	3-4	SSW	0	8	2	2	0	0
16-Dec-15	VP1	SH	08:00	09:00	3 (4)	W	0	1-4	1	2	0	0
16-Dec-15	VP1	SH	09:00	10:00	3 (4)	W	0	4-7	1	2	0	0
16-Dec-15	VP1	SH	10:00	11:00	3 (4)	W	0	7-8	1	2	0	0
16-Dec-15	VP2	MS	08:00	09:00	4	SW	0	6	2	2	0	0
16-Dec-15	VP2	MS	09:00	10:00	3-4	SW	0	5	2	2	0	0
16-Dec-15	VP2	MS	10:00	11:00	3-4	SW	0	7	1	2	0	0
22-Dec-15	VP1	SH	13:00	14:00	5-6 (7)	WSW	0-5	8	1	2-1	0	0
22-Dec-15	VP1	SH	14:00	15:00	5-6 (7)	SW	5-0	8	1	2-1	0	0
22-Dec-15	VP1	SH	15:00	16:00	5-6 (7)	SW	2	8-7	1	2	0	0
22-Dec-15	VP2	MS	12:50	13:50	6-7	WSW	2	8	0	2	0	0
22-Dec-15	VP2	MS	13:50	14:50	6-7	WSW	4	8	0	1	0	0
22-Dec-15	VP2	MS	14:50	15:50	4-6	WSW	0	7	0-1	2	0	0
23-Dec-15	VP1	SH	08:00	09:00	2 (3)	SW	0	0	-	2	0	0
23-Dec-15	VP1	SH	09:00	10:00	2-3	SW	0	0	-	2	0	0
23-Dec-15	VP1	SH	10:00	11:00	2-3	SW	0	0	-	2	0	0
23-Dec-15	VP2	MS	08:00	09:00	2-3	SW	0	1	2	2	0	0
23-Dec-15	VP2	MS	09:00	10:00	3	SW	0	0	-	2	0	0
23-Dec-15	VP2	MS	10:00	11:00	3	SW	0	0	-	2	0	0
06-Jan-16	VP1	SH	14:30	15:30	1-2	N	0	8	0-1	2	0	0
06-Jan-16	VP1	SH	15:30	16:30	0-1	N	0	8	0-1	2	0	0
06-Jan-16	VP2	MS	14:30	15:30	1	NW	0	8	0	2	0	0
06-Jan-16	VP2	MS	15:30	16:30	0-1	NW	0	8	0	2	0	0
07-Jan-16	VP1	SH	07:40	08:40	4-5 (6)	SW	5	1	1	2	0	0
07-Jan-16	VP1	SH	08:40	09:40	4-2	SW/SSW	3	8-7	1	2	0	0
07-Jan-16	VP1	SH	10:00	11:00	2-5	WSW	3	7-8	1	2	0	0
07-Jan-16	VP1	SH	11:00	12:00	3-5	WSW/W	3	7-8	1	2	0	0

Date	VP	Observer	Start of Hour	End of Hour	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Vis	Frost	Snow
07-Jan-16	VP2	MS	07:40	08:40	6-7	S	5	8	0	1	0	0
07-Jan-16	VP2	MS	08:40	09:40	5-6	S	4-5	8	0	2	0	0
07-Jan-16	VP2	MS	10:00	11:00	5-6	SW	5	8	0	1	0	0
07-Jan-16	VP2	MS	11:00	12:00	4-5	W	0	8	0	2	0	0
20-Jan-16	VP1	SH	12:40	13:40	0	-	0	8	1	2	0	0
20-Jan-16	VP1	SH	13:40	14:40	0-1	W	0	8	1	2	0	0
20-Jan-16	VP1	SH	14:40	15:40	0-1	W	0	8	1	2	0	0
20-Jan-16	VP2	MS	12:40	13:40	1	SW	0	8	2	2	1	0
20-Jan-16	VP2	MS	13:40	14:40	0-1	SW-W	0	8	2	2	1	0
20-Jan-16	VP2	MS	14:40	15:40	0-1	SW-W	0	8	2	2	1	0
21-Jan-16	VP1	SH	07:30	08:30	0	-	0	6-7	1	2	1	0
21-Jan-16	VP1	SH	08:30	09:30	0-2	SSW	0	8	1	2	1	0
21-Jan-16	VP1	SH	09:30	10:30	2-3	SW/SSW	0	7	1	2	0	0
21-Jan-16	VP2	MS	07:30	08:30	1	SE	0	7	2	2	1	0
21-Jan-16	VP2	MS	08:30	09:30	1-2	SE	0	6	2	2	0	0
02-Feb-16	VP1	SH	14:30	15:30	5-7 (8)	WNW	0	2-3	1	2	0	0
02-Feb-16	VP1	SH	15:30	16:30	5-7	WNW	0	1-2	1	2	0	0
02-Feb-16	VP2	MS	14:35	15:35	6-7	W	0	1	1	2	0	0
02-Feb-16	VP2	MS	15:35	16:35	5-6	W	0	1	1	2	0	0
03-Feb-16	VP1	SH	13:15	14:15	4-5 (6)	NW	0	8	1	2	0	0
03-Feb-16	VP1	SH	14:15	15:15	3-4 (5)	NW	0	3	1	2	0	0
03-Feb-16	VP2	MS	13:15	14:15	3-4	NW	0	8	1	2	0	0
03-Feb-16	VP2	MS	14:15	15:15	3-4	NW	0	4	1	2	0	0
04-Feb-16	VP1	SH	10:00	11:00	3-4 (5)	W	0	7-8	1	2	0	0
04-Feb-16	VP1	SH	11:00	12:00	3-4 (5)	W	0-2	8	1	2	0	0
04-Feb-16	VP2	MS	10:00	11:00	4	W	4	8	1	2	0	0
04-Feb-16	VP2	MS	11:00	12:00	3-4	W	0	7-8	1	2	0	0
16-Feb-16	VP1	SH	12:40	13:40	3-4 (5)	SW	4-0	8	1	2	0	0
16-Feb-16	VP1	SH	13:40	14:40	3-4 (5)	WSW	0	8	1	2	0	0
01-Mar-16	VP2	MS	12:40	13:40	2-3	SW	5	8	0	1	0	0
01-Mar-16	VP2	MS	13:40	14:40	3	SW	0	8	0	2	0	0
02-Mar-16	VP1	SH	08:00	09:00	3-4 (5)	W	0	1-7	1-2	2	0	0
02-Mar-16	VP2	MS	08:00	09:00	3-4	SW	0	0-7	0	2	0	0
19-Apr-16	VP1	SH	14:00	15:00	2-3	E	0	1	2	2	0	0
19-Apr-16	VP1	SH	15:00	16:00	2-4	E/ESE	0	1	2	2	0	0
19-Apr-16	VP1	SH	16:20	17:20	2-3 (4)	E	0	0	-	2	0	0
19-Apr-16	VP1	SH	17:20	18:20	2-3 (4)	E	0	0	-	2	0	0

Date	VP	Observer	Start of Hour	End of Hour	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Vis	Frost	Snow
19-Apr-16	VP1	SH	18:40	19:40	2-3	E	0	0	-	2	0	0
19-Apr-16	VP1	SH	19:40	20:40	2 (1)	E	0	1-2	1	2	0	0
19-Apr-16	VP2	MS	14:00	15:00	3-4	NE	0	1	1	2	0	0
19-Apr-16	VP2	MS	15:00	16:00	3	ENE	0	0-1	1	2	0	0
19-Apr-16	VP2	MS	16:20	17:20	3	ENE	0	0	-	2	0	0
19-Apr-16	VP2	MS	17:20	18:20	3	ENE	0	0	-	2	0	0
19-Apr-16	VP2	MS	18:40	19:40	3	ENE	0	0	-	2	0	0
19-Apr-16	VP2	MS	19:40	20:40	3-2	E	0	1	1	2	0	0
11-May-16	VP1	MS	04:30	05:30	0-1	SE	0	8	0	1	0	0
11-May-16	VP1	MS	05:30	06:30	0-1	SE	0	8	0	1	0	0
11-May-16	VP1	MS	06:50	07:50	1	SE	0	8	0	0	0	0
11-May-16	VP1	MS	07:50	08:50	1	SE	4	8	0	0	0	0
11-May-16	VP1	MS	09:10	10:10	1	E	4	8	0	0-1	0	0
11-May-16	VP1	MS	10:10	11:10	0-2	E-SE	0	8	0	1	0	0
11-May-16	VP2	SH	04:30	05:30	0 (1)	NE	0-1	8	0	0	0	0
11-May-16	VP2	SH	05:30	06:30	0-2	NE	1	8	0	0	0	0
11-May-16	VP2	SH	06:50	07:50	1-2	NE	1	8	0	1	0	0
11-May-16	VP2	SH	07:50	08:50	1-2 (3)	NE	2-1	8	0	1-0	0	0
11-May-16	VP2	SH	09:10	10:10	1-2 (3)	NE	2-3	8	0	0-1	0	0
11-May-16	VP2	SH	10:10	11:10	1-2 (3)	NE	4-5	8	0-1	1	0	0
26-May-16	VP1	SH	13:30	14:30	4 (5)	ENE/E	0	2	2	2	0	0
26-May-16	VP1	SH	14:30	15:30	4 (5)	E	0	2-1	2	2	0	0
26-May-16	VP1	SH	15:30	16:30	4 (5)	E	0	0	-	2	0	0
26-May-16	VP1	SH	16:50	17:50	4-5 (6)	E	0	0-1	2	2	0	0
26-May-16	VP1	SH	17:50	18:50	3 (2)	E	0	0	-	2	0	0
26-May-16	VP1	SH	19:10	20:10	1 (2)	E	0	0	-	2	0	0
26-May-16	VP1	SH	20:10	21:10	1 (2)	E	0	0-2	2	2	0	0
26-May-16	VP2	MS	13:30	14:30	3	NE	0	1-2	1	2	0	0
26-May-16	VP2	MS	14:30	15:30	3	ENE	0	2	1	2	0	0
26-May-16	VP2	MS	15:30	16:30	3	ENE	0	2	1	2	0	0
26-May-16	VP2	MS	16:50	17:50	3	ENE	0	1	1	2	0	0
26-May-16	VP2	MS	17:50	18:50	2-3	ENE	0	0	-	2	0	0
26-May-16	VP2	MS	19:10	20:10	2-3	ENE	0	0	-	2	0	0
26-May-16	VP2	MS	20:10	21:10	2	ENE	0	3	1	2	0	0
08-Jun-16	VP1	MS	04:30	05:30	0	-	4	8	1	2	0	0
08-Jun-16	VP1	MS	05:30	06:30	0	-	0	8	1	2	0	0
08-Jun-16	VP1	MS	06:50	07:50	0	-	0	8	1	2	0	0

Date	VP	Observer	Start of Hour	End of Hour	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Vis	Frost	Snow
08-Jun-16	VP1	MS	07:50	08:50	1	W	0	4	1	2	0	0
08-Jun-16	VP1	MS	09:10	10:10	2	NE	0	1	2	2	0	0
08-Jun-16	VP1	MS	10:10	11:10	2	NE	0	0	-	2	0	0
08-Jun-16	VP1	MS	11:10	12:10	2	NW-NE	0	0	-	2	0	0
08-Jun-16	VP2	SH	04:30	05:30	0-1	NW	2+3	8	1+2	2	0	0
08-Jun-16	VP2	SH	05:30	06:30	0-1	NW	2	8	1+2	2	0	0
08-Jun-16	VP2	SH	06:50	07:50	0-1	N	0	8-6	1+2	2	0	0
08-Jun-16	VP2	SH	07:50	08:50	0-1	N	0	4	1+2	2	0	0
08-Jun-16	VP2	SH	09:10	10:10	1-2	NNE	0	2	1+2	2	0	0
08-Jun-16	VP2	SH	10:10	11:10	2 (3)	NNE/NE	0	1	2	2	0	0
08-Jun-16	VP2	SH	11:10	12:10	2 (3)	NE	0	1	1+2	2	0	0
20-Jul-16	VP1	SH	15:00	16:00	3 (4)	SSW	0	0	-	2	0	0
20-Jul-16	VP1	SH	16:00	17:00	3 (4)	SW	0	1	1+2	2	0	0
20-Jul-16	VP1	SH	17:20	18:20	3 (4)	SW	0	2	1+2	2	0	0
20-Jul-16	VP1	SH	18:20	19:20	3 (2)	SW	0	2	1+2	2	0	0
20-Jul-16	VP1	SH	19:40	20:40	3 (2)	SW	0	2	1+2	2	0	0
20-Jul-16	VP1	SH	20:40	21:40	3 (2)	SW	0	2	1+2	2	0	0
20-Jul-16	VP2	MS	15:00	16:00	2	SW	0	0	-	2	0	0
20-Jul-16	VP2	MS	16:00	17:00	2-3	SW	0	0	-	2	0	0
20-Jul-16	VP2	MS	17:20	18:20	2-3	SW	0	0	-	2	0	0
20-Jul-16	VP2	MS	18:20	19:20	2-3	SW	0	0	-	2	0	0
20-Jul-16	VP2	MS	19:40	20:40	2-3	SW	0	0	-	2	0	0
20-Jul-16	VP2	MS	20:40	21:40	2	SW	0	0	-	2	0	0
10-Aug-16	VP2	SH	05:00	06:00	3 (4)	NW	0	4	2	2	0	0
10-Aug-16	VP2	SH	06:00	07:00	2-3 (4)	NW	0	4	1	2	0	0
10-Aug-16	VP2	SH	07:20	08:20	4 (5)	NW	0	7-6	1+2	2	0	0
10-Aug-16	VP2	SH	08:20	09:20	4 (5)	NW	0	6	1+2	2	0	0
10-Aug-16	VP2	SH	09:40	10:40	4 (5)	NW	0	5-6	1+2	2	0	0
10-Aug-16	VP2	SH	10:40	11:40	4 (5)	NW	2	5-7	1+2	2	0	0
11-Aug-16	VP1	SH	05:00	06:00	2-3 (4)	WSW	0	8	1	2	0	0
11-Aug-16	VP1	SH	06:00	07:00	1-2 (3)	WSW	2	8	1	2	0	0
11-Aug-16	VP1	SH	07:20	08:20	2-3	SW/WSW	1	8	1	2	0	0
11-Aug-16	VP1	SH	08:20	09:20	2-3	W	2	8	1	2	0	0
11-Aug-16	VP1	SH	09:40	10:40	3 (4)	WSW	0	8	1	2	0	0
11-Aug-16	VP1	SH	10:40	11:40	3 (4)	SW/WSW	0	8	1	2	0	0
27-Sep-16	VP1	SH	12:20	13:20	3-4 (5)	SW	0	5-7	1+2	2	0	0
27-Sep-16	VP1	SH	13:20	14:20	3-4 (5)	SW	0	7-8	1	2	0	0

Date	VP	Observer	Start of Hour	End of Hour	Wind Speed	Wind Direction	Rain	Cloud Cover	Cloud Height	Vis	Frost	Snow
27-Sep-16	VP1	SH	14:40	15:40	3 (4)	SW	0	8	1	2	0	0
27-Sep-16	VP1	SH	15:40	16:40	3 (4)	SW	0	8	1	2	0	0
27-Sep-16	VP1	SH	17:00	18:00	2-3 (4)	SW	0	8	1	2	0	0
27-Sep-16	VP1	SH	18:00	19:00	2-3	SW	0-1	8-7	1+2	2	0	0
27-Sep-16	VP2	MA	12:20	13:20	5-6	SSW	0	7	2	2	0	0
27-Sep-16	VP2	MA	13:20	14:20	5	SSW	0	8	2	2	0	0
27-Sep-16	VP2	MA	14:40	15:40	4-5	SW	0	8	2	2	0	0
27-Sep-16	VP2	MA	15:40	16:40	4	SW	0	8	2	2	0	0
27-Sep-16	VP2	MA	17:00	18:00	5	SW	0	8	2	2	0	0
27-Sep-16	VP2	MA	18:00	19:00	3-4	SW	0	8	2	2	0	0
17-Oct-16	VP1	SH	06:45	07:45	0	-	0	1	2	2	0	0
17-Oct-16	VP1	SH	07:45	08:45	0-1	SW	0	1-2	2	2	0	0
17-Oct-16	VP1	SH	09:05	10:05	1-2	SW	2	5	1+2	2	0	0
17-Oct-16	VP1	SH	10:05	11:05	2-3	SW	0	5	1+2	2	0	0
17-Oct-16	VP1	SH	11:25	12:25	2-3	SW	2	5	1+2	2	0	0
17-Oct-16	VP1	SH	12:25	13:25	2-3	SW	2	5	1+2	2	0	0
17-Oct-16	VP2	MA	06:45	07:45	2	SSW	0	1	2	2	0	0
17-Oct-16	VP2	MA	07:45	08:45	2	SSW	0	1	2	2	0	0
17-Oct-16	VP2	MA	09:05	10:05	3	SSW	2	3	2	2	0	0
17-Oct-16	VP2	MA	10:05	11:05	4	SSW	0	4	2	2	0	0
17-Oct-16	VP2	MA	11:25	12:25	3	SSW	0	4	2	2	0	0
17-Oct-16	VP2	MA	12:25	13:25	3	SSW	2	5	2	2	0	0

Wind Speed: according to the Beaufort scale (0-12)
Wind Direction: according to 16-point compass
Rain: 0 = None; 1 = Drizzle/Mist; 2 = Light showers; 3 = Heavy showers; 4 = Light rain; 5 = Heavy rain
Cloud Cover: in eighths of sky (oktas)
Cloud Height: 0 = <150m; 1 = 150–500m; 2 = >500m
Vis: Visibility 0 = <1km; 1-2km; 2 = >2km
Frost: 0 = none; 1 = ground frost; 2 = all day frost
Snow: 0 = none; 1 = on site; 2 = high ground only

9.7.2 Results

144. A total of 818 flights were recorded from 30 target species (Table A9.28; Figures A9.30 to A9.38).

Table A9.28: Flight Activity Survey Results Summary

Species (Species Code)	Total Number of Flights	Maximum number of Birds in Flight	Mean Number of Birds per Flight	Figure Reference
Mute Swan (MS)	15	7	2.87	A9.30
Greylag goose (GJ)	9	13	4.44	A9.30
Brent Goose (DB)	26	250	27.27	A9.30

Species (Species Code)	Total Number of Flights	Maximum number of Birds in Flight	Mean Number of Birds per Flight	Figure Reference
Shelduck (SU)	12	2	1.92	A9.31
Shoveler (SV)	1	9	9	A9.31
Gadwall (GA)	2	12	7	A9.31
Wigeon (WN)	4	45	19	A9.31
Mallard (MA)	72	70	3.76	A9.31
Teal (T.)	4	160	65.75	A9.31
Little egret (ET)	41	3	1.12	A9.32
Grey heron (H.)	89	2	1.07	A9.32
Red kite (KT)	2	1	10	A9.33
Marsh harrier (MR)	239	2	1.03	A9.34 & A9.35
Hen harrier (HH)	2	1	1	A9.33
Merlin (ML)	4	1	1	A9.33
Hobby (HY)	7	1	1	A9.33
Peregrine (PE)	31	1	1	A9.33
Oystercatcher (OC)	14	22	2.76	A9.36
Golden plover (GV)	50	900	110.62	A9.36
Lapwing (L.)	119	450	45.61	A9.37
Dunlin (DN)	1	2	2	A9.38
Snipe (SN)	4	1	1	A9.38
Curlew (CU)	13	105	43.69	A9.38
Green sandpiper (GE)	12	2	1.25	A9.38
Redshank (RK)	9	2	1.11	A9.38
Mediterranean gull (MU)	9	2	1.78	A9.39
Common tern (CN)	1	1	1	A9.39
Barn owl (BO)	1	1	1	A9.40
Short-eared owl (SE)	10	1	1	A9.40
Raven RN)	15	3	1.53	A9.40

145. Secondary Species recorded included: frequent cormorant flights transiting across the survey area, occasional buzzards and frequent kestrels hunting within the Core Survey Area and adjacent grazing marsh and South Swale reserve, and very occasional sparrowhawk.

146. Table A9.29 provides the details of all recorded target species flights.

Age: A = adult; I = immature; J = juv; 1W, 2W = 1st winter, 2nd winter etc; 1S, 2S = 1st summer, 2nd summer etc; 1Y, 2Y = 1st year, 2nd year etc
Sex: M = male; F = female; PR = pair
Flight ID = unique identifying reference number

Table A9.29: Flight Details

Species Code	Date	Time	VP	Flight ID	No. of Birds	Duration (s)	Age (if known)	Sex (if known)	Behaviour	% of Flight at 0-10 m	% of Flight at 10-50 m	% of Flight at >50 m
MS	25-Nov-15	09:58	VP1	154	1	16	A		Transit	100.0	0.0	0.0
MS	25-Nov-15	09:26	VP2	179	1	105	A		Transit	100.0	0.0	0.0
MS	25-Nov-15	09:58	VP2	182	1	45	A		Transit	100.0	0.0	0.0
MS	22-Dec-15	14:05	VP1	452	1	26	A		Transit	0.0	100.0	0.0
MS	06-Jan-16	14:55	VP2	287	1	90	A		Transit	100.0	0.0	0.0
MS	21-Jan-16	09:12	VP1	409	2	25	A		Transit	50.0	50.0	0.0
MS	02-Feb-16	16:15	VP2	540	1	30			Transit	100.0	0.0	0.0
MS	16-Feb-16	13:54	VP1	570	1	15	A		Transit	100.0	0.0	0.0
MS	17-Oct-16	07:48	VP1	926	2	26			Transit	100.0	0.0	0.0
MS	17-Oct-16	10:26	VP1	940	7	77			Transit	100.0	0.0	0.0
MS	17-Oct-16	07:41	VP2	931	2	87			Transit	100.0	0.0	0.0
MS	17-Oct-16	10:45	VP2	946	7	175			Transit	100.0	0.0	0.0
MS	17-Oct-16	08:30	VP2	934	7	45			Transit	100.0	0.0	0.0
MS	17-Oct-16	08:32	VP2	935	7	32			Transit	100.0	0.0	0.0
MS	17-Oct-16	12:28	VP2	963	2	60			Transit	100.0	0.0	0.0
GJ	25-Nov-15	09:15	VP2	177	13	135			Transit	0.0	30.0	70.0
GJ	07-Jan-16	07:57	VP1	256	1	266			Transit	0.0	88.9	11.1
GJ	21-Jan-16	08:25	VP2	298	1	84			Transit	0.0	0.0	100.0
GJ	16-Feb-16	12:57	VP1	564	3	15			Transit	100.0	0.0	0.0
GJ	19-Apr-16	19:02	VP1	627	4	201			Transit	35.7	64.3	0.0
GJ	19-Apr-16	19:38	VP2	896	3	142			Transit	0.0	70.0	30.0
GJ	08-Jun-16	07:22	VP1	747	6	54	A		Transit	0.0	100.0	0.0
GJ	08-Jun-16	07:25	VP1	750	6	156	A		Transit	0.0	0.0	100.0
GJ	17-Oct-16	12:55	VP1	951	3	84			Transit	0.0	0.0	100.0
DB	24-Nov-15	14:05	VP1	109	170	95				85.7	14.3	0.0
DB	24-Nov-15	14:23	VP1	110	8	39			Transit	66.7	33.3	0.0
DB	24-Nov-15	14:32	VP1	111	20	73			Transit	100.0	0.0	0.0
DB	24-Nov-15	15:36	VP1	115	75	43			Transit	66.7	33.3	0.0
DB	24-Nov-15	15:47	VP1	116	35	82			Transit	66.7	33.3	0.0
DB	24-Nov-15	15:34	VP2	132	45	135			Transit	70.0	30.0	0.0
DB	24-Nov-15	15:36	VP2	133	15	60			Transit	100.0	0.0	0.0
DB	25-Nov-15	09:19	VP1	146	2	18			Transit	100.0	0.0	0.0
DB	25-Nov-15	09:32	VP1	148	90	82			Transit	66.7	33.3	0.0
DB	25-Nov-15	09:34	VP1	150	150	25			Transit	100.0	0.0	0.0
DB	25-Nov-15	09:53	VP1	153	45	56			Transit	100.0	0.0	0.0
DB	25-Nov-15	10:31	VP1	158	3	53			Transit	0.0	100.0	0.0
DB	25-Nov-15	09:04	VP2	173	60	30			Transit	100.0	0.0	0.0
DB	25-Nov-15	09:38	VP2	180	40	75			Transit	0.0	100.0	0.0
DB	15-Dec-15	14:20	VP1	204	250	20			Transit	100.0	0.0	0.0
DB	15-Dec-15	15:58	VP1	212	250	33			Transit	100.0	0.0	0.0
DB	16-Dec-15	09:58	VP1	223	100	70			Transit	100.0	0.0	0.0
DB	16-Dec-15	10:03	VP1	224	13	16			Transit	100.0	0.0	0.0
DB	16-Dec-15	10:05	VP1	225	80	33			Transit	100.0	0.0	0.0
DB	16-Dec-15	10:59	VP1	229	70	66			Transit	80.0	20.0	0.0
DB	22-Dec-15	15:13	VP1	457	5	36			Transit	66.7	33.3	0.0
DB	22-Dec-15	12:59	VP2	423	31	102			Transit	0.0	100.0	0.0
DB	23-Dec-15	09:23	VP1	473	50	31			Transit	100.0	0.0	0.0
DB	07-Jan-16	09:13	VP2	272	90	80			Transit	0.0	100.0	0.0
DB	07-Jan-16	09:15	VP2	273	12	40				100.0	0.0	0.0
DB	07-Jan-16	11:34	VP2	279	40	40			Transit	100.0	0.0	0.0
SU	23-Dec-15	10:08	VP1	479	2	22	A	M+F	Transit	100.0	0.0	0.0
SU	11-May-16	09:51	VP1	704	2	39		M&F		33.3	66.7	0.0
SU	11-May-16	05:44	VP2	640	2	18	A	PR	Transit	50.0	50.0	0.0
SU	11-May-16	10:37	VP2	650	2	46	A	PR	Transit	100.0	0.0	0.0

Species Code	Date	Time	VP	Flight ID	No. of Birds	Duration (s)	Age (if known)	Sex (if known)	Behaviour	% of Flight at 0-10 m	% of Flight at 10-50 m	% of Flight at >50 m
SU	11-May-16	06:15	VP2	641	2	17	A	PR	Transit	50.0	50.0	0.0
SU	08-Jun-16	04:34	VP1	730	2	48		M&F	Transit	0.0	100.0	0.0
SU	08-Jun-16	11:40	VP1	771	2	97		M&F	Transit	28.6	42.9	28.6
SU	08-Jun-16	04:46	VP2	791	2	16	A	PR	Transit	100.0	0.0	0.0
SU	08-Jun-16	04:59	VP2	792	2	40	A	PR	Transit	100.0	0.0	0.0
SU	08-Jun-16	06:59	VP2	783	1	43	A		Transit	100.0	0.0	0.0
SU	08-Jun-16	05:06	VP2	793	2	15	A	PR	Transit	100.0	0.0	0.0
SU	08-Jun-16	07:31	VP2	785	2	44	A	PR	Transit	100.0	0.0	0.0
SV	25-Nov-15	10:59	VP2	195	9	45			Transit	0.0	100.0	0.0
GA	19-Apr-16	17:12	VP1	616	2	16	A	M&F	Transit	100.0	0.0	0.0
GA	17-Oct-16	08:39	VP2	936	12	62			Transit	0.0	0.0	100.0
WN	25-Nov-15	09:14	VP2	176	5	45			Transit	0.0	100.0	0.0
WN	16-Dec-15	08:26	VP2	243	20	40				33.3	66.7	0.0
WN	16-Dec-15	09:13	VP2	246	45	175			Transit	0.0	100.0	0.0
WN	23-Dec-15	10:08	VP2	446	6	45			Transit	0.0	100.0	0.0
MA	24-Nov-15	13:55	VP1	106	5	38			Transit	33.3	66.7	0.0
MA	24-Nov-15	14:32	VP2	125	4	15			Transit	100.0	0.0	0.0
MA	25-Nov-15	08:33	VP2	168	2	30			Transit	0.0	100.0	0.0
MA	25-Nov-15	09:12	VP2	175	70	69			Transit	0.0	100.0	0.0
MA	25-Nov-15	10:38	VP2	190	2	30			Transit	0.0	100.0	0.0
MA	25-Nov-15	10:59	VP2	194	24	45			Transit	0.0	100.0	0.0
MA	23-Dec-15	10:08	VP2	445	15	65			Transit	0.0	100.0	0.0
MA	07-Jan-16	08:40	VP1	260	2	23	A	M	Transit	0.0	100.0	0.0
MA	20-Jan-16	14:29	VP2	348	2	25			Transit	0.0	100.0	0.0
MA	16-Feb-16	13:44	VP1	568	3	24			Transit	50.0	50.0	0.0
MA	16-Feb-16	13:44	VP1	569	2	34			Transit	66.7	33.3	0.0
MA	01-Mar-16	12:58	VP2	581	2	47			Transit	100.0	0.0	0.0
MA	01-Mar-16	13:24	VP2	585	2	20			Transit	0.0	100.0	0.0
MA	01-Mar-16	13:43	VP2	589	2	25				50.0	50.0	0.0
MA	02-Mar-16	08:51	VP2	601	2	20		M&F	Transit	100.0	0.0	0.0
MA	02-Mar-16	08:52	VP2	602	2	62		M&F	Transit	60.0	40.0	0.0
MA	19-Apr-16	16:35	VP1	611	1	41	A	M	Transit	100.0	0.0	0.0
MA	19-Apr-16	16:52	VP1	612	1	29	A	M	Transit	100.0	0.0	0.0
MA	19-Apr-16	16:56	VP1	613	1	165	A	M	Transit	83.3	16.7	0.0
MA	19-Apr-16	19:42	VP1	631	3	75	A	M&F	Transit	16.7	83.3	0.0
MA	19-Apr-16	17:33	VP1	618	1	20			Transit	100.0	0.0	0.0
MA	19-Apr-16	20:16	VP1	634	3	29			Transit	50.0	50.0	0.0
MA	19-Apr-16	20:20	VP1	635	2	18	A	PR	Transit	50.0	50.0	0.0
MA	19-Apr-16	17:50	VP1	620	2	17	A	PR	Transit	100.0	0.0	0.0
MA	19-Apr-16	20:31	VP1	636	2	15	A	PR	Transit	50.0	50.0	0.0
MA	19-Apr-16	17:57	VP1	621	2	32	A	PR	Transit	100.0	0.0	0.0
MA	19-Apr-16	18:10	VP1	625	2	17	A	PR	Transit	50.0	50.0	0.0
MA	19-Apr-16	18:41	VP2	892	1	55			Transit	100.0	0.0	0.0
MA	19-Apr-16	19:17	VP2	893	1	23				100.0	0.0	0.0
MA	19-Apr-16	14:34	VP2	870	1	53			Transit	0.0	0.0	100.0
MA	19-Apr-16	14:42	VP2	872	3	48			Courtship	0.0	100.0	0.0
MA	19-Apr-16	17:59	VP2	891	1	25		M		100.0	0.0	0.0
MA	19-Apr-16	20:23	VP2	900	4	30			Courtship	100.0	0.0	0.0
MA	19-Apr-16	15:22	VP2	876	4	43			Courtship	0.0	0.0	100.0
MA	19-Apr-16	15:27	VP2	877	3	147			Courtship	0.0	30.0	70.0
MA	11-May-16	05:21	VP1	689	3	25		M&F	Courtship	0.0	100.0	0.0
MA	11-May-16	09:14	VP1	698	2	42		M&F		75.0	25.0	0.0
MA	11-May-16	09:29	VP1	699	2	40		M&F		75.0	25.0	0.0
MA	11-May-16	08:31	VP1	694	1	25		M		100.0	0.0	0.0
MA	11-May-16	09:39	VP1	701	2	36		M	Transit	0.0	100.0	0.0
MA	11-May-16	08:33	VP1	695	2	25		M		100.0	0.0	0.0

Species Code	Date	Time	VP	Flight ID	No. of Birds	Duration (s)	Age (if known)	Sex (if known)	Behaviour	% of Flight at 0-10 m	% of Flight at 10-50 m	% of Flight at >50 m
MA	11-May-16	09:45	VP1	702	1	20		M	Transit	0.0	100.0	0.0
MA	11-May-16	08:38	VP1	696	1	35		F		33.3	66.7	0.0
MA	11-May-16	09:49	VP1	703	6	16		M&F		100.0	0.0	0.0
MA	11-May-16	08:39	VP1	697	2	20		M		100.0	0.0	0.0
MA	11-May-16	04:42	VP2	638	2	26	A	PR	Transit	50.0	50.0	0.0
MA	11-May-16	06:59	VP2	642	4	27	A	M&F	Transit	100.0	0.0	0.0
MA	11-May-16	09:12	VP2	648	3	27	A	M&F	Transit	100.0	0.0	0.0
MA	11-May-16	05:36	VP2	639	2	42	A	PR	Transit	66.7	33.3	0.0
MA	11-May-16	07:06	VP2	643	4	20	A	M&F	Transit	100.0	0.0	0.0
MA	11-May-16	10:15	VP2	649	2	39	A	PR	Transit	100.0	0.0	0.0
MA	11-May-16	07:09	VP2	644	4	64	A	M&F	Transit	60.0	40.0	0.0
MA	11-May-16	07:10	VP2	645	2	24	A	M&F	Transit	0.0	100.0	0.0
MA	11-May-16	07:10	VP2	646	2	15	A	M	Transit	50.0	50.0	0.0
MA	11-May-16	07:23	VP2	647	1	43	A	M	Transit	66.7	33.3	0.0
MA	26-May-16	19:14	VP1	653	1	23	A	M	Transit	100.0	0.0	0.0
MA	26-May-16	17:10	VP1	681	2	50	A	M	Transit	50.0	50.0	0.0
MA	26-May-16	19:23	VP1	654	1	30	A	M	Transit	100.0	0.0	0.0
MA	26-May-16	20:47	VP1	663	2	62	A	PR	Transit	80.0	20.0	0.0
MA	26-May-16	20:09	VP2	724	2	32	A	M&F		100.0	0.0	0.0
MA	08-Jun-16	04:32	VP1	729	4	55			Transit	0.0	100.0	0.0
MA	08-Jun-16	05:28	VP1	732	2	50		M&F	Transit	50.0	50.0	0.0
MA	08-Jun-16	05:29	VP1	733	2	48		M&F	Transit	0.0	100.0	0.0
MA	08-Jun-16	11:16	VP1	769	1	65	A	M	Transit	0.0	100.0	0.0
MA	08-Jun-16	07:32	VP1	751	1	78		M	Transit	0.0	66.7	33.3
MA	08-Jun-16	08:38	VP1	757	2	61		M&F	Transit	60.0	40.0	0.0
MA	08-Jun-16	06:50	VP2	782	2	90	A	PR	Transit	85.7	14.3	0.0
MA	08-Jun-16	07:35	VP2	786	1	15		F	Transit	100.0	0.0	0.0
MA	10-Aug-16	06:11	VP2	823	2	33	A	PR	Transit	0.0	100.0	0.0
MA	27-Sep-16	17:34	VP1	919	5	38			Transit	100.0	0.0	0.0
MA	27-Sep-16	16:24	VP2	916	8	60			Hunting / Foraging	0.0	100.0	0.0
MA	17-Oct-16	07:38	VP2	929	6	50			Transit	0.0	100.0	0.0
T.	16-Dec-15	08:26	VP2	244	100	35				100.0	0.0	0.0
T.	16-Dec-15	09:13	VP2	247	160	190				100.0	0.0	0.0
T.	16-Feb-16	13:36	VP1	567	1	23		F	Transit	100.0	0.0	0.0
T.	19-Apr-16	20:32	VP1	637	2	16			Transit	100.0	0.0	0.0
ET	25-Nov-15	10:04	VP1	155	1	33	A		Transit	100.0	0.0	0.0
ET	25-Nov-15	10:38	VP1	159	1	29			Transit	100.0	0.0	0.0
ET	25-Nov-15	08:14	VP2	166	1	30			Transit	100.0	0.0	0.0
ET	15-Dec-15	13:06	VP1	196	1	26			Transit	100.0	0.0	0.0
ET	15-Dec-15	13:10	VP1	197	1	43			Transit	100.0	0.0	0.0
ET	15-Dec-15	14:40	VP1	207	1	37			Transit	100.0	0.0	0.0
ET	22-Dec-15	15:33	VP1	459	1	36			Transit	100.0	0.0	0.0
ET	22-Dec-15	12:52	VP2	422	1	27			Transit	100.0	0.0	0.0
ET	22-Dec-15	13:05	VP2	424	1	126			Transit	77.8	22.2	0.0
ET	20-Jan-16	12:50	VP1	361	1	65			Transit	80.0	20.0	0.0
ET	20-Jan-16	12:50	VP1	362	1	32			Transit	100.0	0.0	0.0
ET	20-Jan-16	14:44	VP2	352	1	53			Transit	0.0	100.0	0.0
ET	21-Jan-16	08:55	VP1	405	1	21			Transit	100.0	0.0	0.0
ET	04-Feb-16	10:43	VP1	515	1	28			Transit	100.0	0.0	0.0
ET	04-Feb-16	11:46	VP1	524	1	44			Transit	100.0	0.0	0.0
ET	16-Feb-16	12:50	VP1	563	1	49			Transit	100.0	0.0	0.0
ET	16-Feb-16	14:35	VP1	577	1	18			Transit	100.0	0.0	0.0
ET	19-Apr-16	14:18	VP1	605	1	15			Transit	100.0	0.0	0.0
ET	19-Apr-16	19:24	VP1	629	2	46			Transit	0.0	100.0	0.0
ET	19-Apr-16	15:38	VP1	608	1	27			Transit	100.0	0.0	0.0
ET	19-Apr-16	14:17	VP2	867	1	70			Transit	0.0	100.0	0.0

Species Code	Date	Time	VP	Flight ID	No. of Birds	Duration (s)	Age (if known)	Sex (if known)	Behaviour	% of Flight at 0-10 m	% of Flight at 10-50 m	% of Flight at >50 m
ET	19-Apr-16	14:48	VP2	873	1	30				100.0	0.0	0.0
ET	19-Apr-16	15:55	VP2	881	1	50			Transit	0.0	0.0	100.0
ET	26-May-16	14:21	VP1	667	1	91			Transit	100.0	0.0	0.0
ET	26-May-16	17:44	VP1	683	2	87			Transit	50.0	50.0	0.0
ET	26-May-16	18:14	VP2	717	1	50			Transit	0.0	0.0	100.0
ET	26-May-16	15:03	VP2	711	1	94			Transit	100.0	0.0	0.0
ET	26-May-16	20:28	VP2	726	3	97			Transit	0.0	0.0	100.0
ET	26-May-16	15:34	VP2	712	2	106			Transit	100.0	0.0	0.0
ET	08-Jun-16	09:10	VP1	758	1	40			Transit	0.0	0.0	100.0
ET	08-Jun-16	07:05	VP1	742	1	32	A		Transit	0.0	100.0	0.0
ET	08-Jun-16	07:17	VP1	746	1	80			Transit	0.0	0.0	100.0
ET	08-Jun-16	10:57	VP1	766	1	130			Transit	0.0	22.2	77.8
ET	08-Jun-16	07:23	VP1	748	1	85			Transit	0.0	0.0	100.0
ET	08-Jun-16	11:47	VP1	772	1	126			Transit	0.0	100.0	0.0
ET	08-Jun-16	09:34	VP2	775	1	44			Transit	0.0	100.0	0.0
ET	08-Jun-16	08:26	VP2	790	1	66			Transit	20.0	80.0	0.0
ET	08-Jun-16	06:23	VP2	801	1	168			Transit	0.0	100.0	0.0
ET	10-Aug-16	05:50	VP2	822	1	100			Transit	42.9	57.1	0.0
ET	10-Aug-16	09:01	VP2	830	1	102			Transit	28.6	71.4	0.0
ET	11-Aug-16	10:38	VP1	837	1	37			Transit	100.0	0.0	0.0
H.	24-Nov-15	13:24	VP2	119	1	30			Transit	100.0	0.0	0.0
H.	24-Nov-15	13:48	VP2	121	1	15			Transit	100.0	0.0	0.0
H.	24-Nov-15	13:54	VP2	122	1	15	A		Transit	100.0	0.0	0.0
H.	24-Nov-15	14:03	VP2	124	2	75	A+J		Hunting / Foraging	100.0	0.0	0.0
H.	24-Nov-15	15:17	VP2	129	1	60	A		Hunting / Foraging	40.0	60.0	0.0
H.	24-Nov-15	15:21	VP2	131	2	60	A+J		Transit	100.0	0.0	0.0
H.	15-Dec-15	13:02	VP2	230	1	33	1W		Transit	100.0	0.0	0.0
H.	15-Dec-15	13:17	VP2	231	1	37			Transit	100.0	0.0	0.0
H.	16-Dec-15	09:11	VP1	220	1	15			Transit	100.0	0.0	0.0
H.	22-Dec-15	15:17	VP1	458	1	74			Transit	40.0	60.0	0.0
H.	22-Dec-15	15:19	VP2	428	1	32			Transit	100.0	0.0	0.0
H.	23-Dec-15	09:02	VP1	471	1	75	A		Transit	100.0	0.0	0.0
H.	06-Jan-16	15:01	VP2	288	1	35	A		Transit	100.0	0.0	0.0
H.	07-Jan-16	11:33	VP1	266	1	15			Transit	100.0	0.0	0.0
H.	07-Jan-16	08:14	VP2	270	1	40			Transit	100.0	0.0	0.0
H.	21-Jan-16	08:09	VP1	396	1	47			Transit	100.0	0.0	0.0
H.	02-Feb-16	16:16	VP2	541	1	160			Transit	100.0	0.0	0.0
H.	02-Feb-16	16:16	VP2	542	1	135			Transit	100.0	0.0	0.0
H.	02-Feb-16	16:20	VP2	543	2	48			Transit	100.0	0.0	0.0
H.	04-Feb-16	10:51	VP2	561	1	50			Transit	100.0	0.0	0.0
H.	01-Mar-16	13:08	VP2	583	1	36			Transit	100.0	0.0	0.0
H.	01-Mar-16	13:17	VP2	584	1	140			Transit	0.0	100.0	0.0
H.	01-Mar-16	13:27	VP2	586	1	41			Transit	100.0	0.0	0.0
H.	19-Apr-16	18:45	VP1	626	1	18	A		Transit	100.0	0.0	0.0
H.	19-Apr-16	19:21	VP1	628	1	16	A		Transit	100.0	0.0	0.0
H.	19-Apr-16	18:04	VP1	622	1	46	A		Transit	0.0	100.0	0.0
H.	19-Apr-16	18:09	VP1	624	1	113	A		Transit	100.0	0.0	0.0
H.	19-Apr-16	16:20	VP2	886	1	63				20.0	40.0	40.0
H.	19-Apr-16	19:21	VP2	894	1	58				100.0	0.0	0.0
H.	19-Apr-16	19:33	VP2	895	2	90				100.0	0.0	0.0
H.	19-Apr-16	17:34	VP2	890	1	35				100.0	0.0	0.0
H.	19-Apr-16	20:00	VP2	897	1	98			Transit	28.6	71.4	0.0
H.	19-Apr-16	14:49	VP2	874	1	45				100.0	0.0	0.0
H.	19-Apr-16	15:49	VP2	880	1	63				20.0	80.0	0.0
H.	11-May-16	05:46	VP1	690	1	20			Transit	0.0	100.0	0.0
H.	11-May-16	09:38	VP1	700	2	29	A		Transit	0.0	100.0	0.0

Species Code	Date	Time	VP	Flight ID	No. of Birds	Duration (s)	Age (if known)	Sex (if known)	Behaviour	% of Flight at 0-10 m	% of Flight at 10-50 m	% of Flight at >50 m
H.	11-May-16	11:07	VP1	705	1	43				100.0	0.0	0.0
H.	26-May-16	13:33	VP1	665	1	65	A		Transit	100.0	0.0	0.0
H.	26-May-16	13:45	VP1	666	1	171	A		Transit	25.0	75.0	0.0
H.	26-May-16	19:33	VP1	655	1	40	A		Transit	0.0	100.0	0.0
H.	26-May-16	14:27	VP1	668	1	61	A		Transit	100.0	0.0	0.0
H.	26-May-16	17:59	VP1	684	1	61	A		Transit	40.0	60.0	0.0
H.	26-May-16	19:40	VP1	657	1	101	J		Transit	100.0	0.0	0.0
H.	26-May-16	20:03	VP1	660	2	134	A		Transit	0.0	100.0	0.0
H.	26-May-16	16:02	VP1	676	1	158	A			0.0	0.0	100.0
H.	26-May-16	16:04	VP1	677	1	120	A			0.0	100.0	0.0
H.	26-May-16	20:05	VP2	723	1	88			Transit	0.0	100.0	0.0
H.	26-May-16	18:19	VP2	718	1	104	A		Transit	28.6	28.6	42.9
H.	26-May-16	14:54	VP2	710	1	57	A		Transit	100.0	0.0	0.0
H.	26-May-16	21:08	VP2	728	1	75			Transit	0.0	0.0	100.0
H.	08-Jun-16	06:51	VP1	738	1	60	A		Transit	0.0	0.0	100.0
H.	08-Jun-16	06:53	VP1	739	1	35	A		Transit	0.0	0.0	100.0
H.	08-Jun-16	09:14	VP1	759	1	97	A		Transit	0.0	0.0	100.0
H.	08-Jun-16	07:06	VP1	743	1	35	A		Transit	0.0	100.0	0.0
H.	08-Jun-16	06:22	VP1	735	1	172			Transit	0.0	0.0	100.0
H.	08-Jun-16	07:23	VP1	749	1	85	A		Transit	0.0	0.0	100.0
H.	08-Jun-16	07:36	VP1	752	1	20	A		Transit	0.0	100.0	0.0
H.	08-Jun-16	08:05	VP1	754	1	25	A		Transit	0.0	100.0	0.0
H.	08-Jun-16	05:12	VP2	794	1	61	A		Transit	100.0	0.0	0.0
H.	08-Jun-16	05:50	VP2	795	1	118	A		Transit	0.0	100.0	0.0
H.	08-Jun-16	06:10	VP2	798	1	155	A		Transit	0.0	100.0	0.0
H.	08-Jun-16	06:20	VP2	800	1	63	A		Transit	0.0	100.0	0.0
H.	20-Jul-16	20:03	VP2	863	1	35	A		Transit	100.0	0.0	0.0
H.	20-Jul-16	21:38	VP2	866	1	48			Transit	100.0	0.0	0.0
H.	10-Aug-16	09:58	VP2	833	2	33			Transit	100.0	0.0	0.0
H.	10-Aug-16	08:31	VP2	828	1	242	A		Transit	76.5	23.5	0.0
H.	10-Aug-16	06:29	VP2	825	1	194	A		Transit	0.0	100.0	0.0
H.	10-Aug-16	06:41	VP2	826	1	171	A		Transit	66.7	33.3	0.0
H.	11-Aug-16	06:18	VP1	848	1	21	A		Transit	100.0	0.0	0.0
H.	11-Aug-16	08:33	VP1	843	1	21	A		Transit	100.0	0.0	0.0
H.	11-Aug-16	06:50	VP1	850	1	15	A		Transit	100.0	0.0	0.0
H.	27-Sep-16	17:14	VP1	918	1	75			Transit	83.3	16.7	0.0
H.	27-Sep-16	15:51	VP1	908	1	75			Transit	33.3	66.7	0.0
H.	27-Sep-16	13:03	VP1	903	1	15			Transit	100.0	0.0	0.0
H.	27-Sep-16	16:18	VP1	909	1	33			Transit	100.0	0.0	0.0
H.	27-Sep-16	18:43	VP1	920	1	37			Transit	100.0	0.0	0.0
H.	27-Sep-16	14:14	VP1	904	1	29			Transit	100.0	0.0	0.0
H.	27-Sep-16	18:47	VP1	921	1	51			Transit	100.0	0.0	0.0
H.	27-Sep-16	15:48	VP2	911	1	24			Transit	100.0	0.0	0.0
H.	27-Sep-16	17:14	VP2	922	1	135			Transit	70.0	30.0	0.0
H.	27-Sep-16	15:57	VP2	912	1	20			Transit	100.0	0.0	0.0
H.	27-Sep-16	15:58	VP2	913	1	48			Transit	100.0	0.0	0.0
H.	27-Sep-16	16:10	VP2	914	1	77			Transit	66.7	33.3	0.0
H.	27-Sep-16	16:12	VP2	915	1	105			Transit	100.0	0.0	0.0
H.	27-Sep-16	18:40	VP2	924	1	23			Transit	100.0	0.0	0.0
H.	17-Oct-16	09:05	VP1	937	1	127			Transit	100.0	0.0	0.0
H.	17-Oct-16	09:13	VP1	938	1	70			Transit	100.0	0.0	0.0
H.	17-Oct-16	09:05	VP2	942	1	55			Transit	75.0	25.0	0.0
H.	17-Oct-16	09:40	VP2	943	1	70			Transit	0.0	0.0	100.0
KT	08-Jun-16	10:04	VP1	763	1	198			Transit	0.0	0.0	100.0
KT	08-Jun-16	10:41	VP1	765	1	50			Transit	0.0	100.0	0.0
MR	24-Nov-15	14:04	VP1	107	1	183			Hunting / Foraging	69.2	30.8	0.0

Species Code	Date	Time	VP	Flight ID	No. of Birds	Duration (s)	Age (if known)	Sex (if known)	Behaviour	% of Flight at 0-10 m	% of Flight at 10-50 m	% of Flight at >50 m
MR	24-Nov-15	14:54	VP1	113	1	15			Hunting / Foraging	100.0	0.0	0.0
MR	24-Nov-15	15:24	VP1	114	1	34			Hunting / Foraging	66.7	33.3	0.0
MR	24-Nov-15	13:40	VP2	120	1	105	A	M	Transit	100.0	0.0	0.0
MR	24-Nov-15	15:19	VP2	130	1	15	A	M	Hunting / Foraging	100.0	0.0	0.0
MR	24-Nov-15	15:37	VP2	134	1	120	A	M	Transit	0.0	100.0	0.0
MR	24-Nov-15	15:39	VP2	135	1	60			Transit	0.0	100.0	0.0
MR	25-Nov-15	08:06	VP1	136	1	58			Hunting / Foraging	100.0	0.0	0.0
MR	25-Nov-15	08:11	VP1	137	1	70	1W	M	Hunting / Foraging	100.0	0.0	0.0
MR	25-Nov-15	08:27	VP1	138	2	37			Hunting / Foraging	100.0	0.0	0.0
MR	25-Nov-15	08:27	VP1	139	1	76			Hunting / Foraging	100.0	0.0	0.0
MR	25-Nov-15	08:27	VP1	140	1	288	1W	M	Hunting / Foraging	95.0	5.0	0.0
MR	25-Nov-15	08:41	VP1	141	1	29	1W	M	Hunting / Foraging	100.0	0.0	0.0
MR	25-Nov-15	08:47	VP1	142	1	242	1W	M	Hunting / Foraging	82.4	17.6	0.0
MR	25-Nov-15	09:01	VP1	143	1	152	1W	M	Hunting / Foraging	72.7	27.3	0.0
MR	25-Nov-15	09:09	VP1	144	1	223	1W	M	Hunting / Foraging	100.0	0.0	0.0
MR	25-Nov-15	09:26	VP1	147	1	25			Hunting / Foraging	100.0	0.0	0.0
MR	25-Nov-15	09:34	VP1	149	1	34	J	M	Transit	100.0	0.0	0.0
MR	25-Nov-15	09:42	VP1	151	1	40	J	M?	Transit	100.0	0.0	0.0
MR	25-Nov-15	09:43	VP1	152	2	78	J+I		Hunting / Foraging	100.0	0.0	0.0
MR	25-Nov-15	10:07	VP1	156	1	221	J	M	Hunting / Foraging	100.0	0.0	0.0
MR	25-Nov-15	10:17	VP1	157	1	217	A	M	Hunting / Foraging	100.0	0.0	0.0
MR	25-Nov-15	10:51	VP1	160	1	75	I	M	Hunting / Foraging	100.0	0.0	0.0
MR	25-Nov-15	10:55	VP1	161	1	27			Hunting / Foraging	100.0	0.0	0.0
MR	25-Nov-15	08:00	VP2	162	1	180		F	Hunting / Foraging	0.0	100.0	0.0
MR	25-Nov-15	08:08	VP2	163	1	180	A	M	Hunting / Foraging	100.0	0.0	0.0
MR	25-Nov-15	08:08	VP2	164	1	45	A	F	Hunting / Foraging	100.0	0.0	0.0
MR	25-Nov-15	08:11	VP2	165	1	135	A	M	Hunting / Foraging	100.0	0.0	0.0
MR	25-Nov-15	08:26	VP2	167	1	30	A	F	Hunting / Foraging	100.0	0.0	0.0
MR	25-Nov-15	08:50	VP2	171	1	435	A	M	Hunting / Foraging	86.7	13.3	0.0
MR	25-Nov-15	09:19	VP2	178	1	330	A	F	Hunting / Foraging	100.0	0.0	0.0
MR	25-Nov-15	09:54	VP2	181	1	135	A	M	Transit	100.0	0.0	0.0
MR	25-Nov-15	10:02	VP2	183	1	30				100.0	0.0	0.0
MR	25-Nov-15	10:04	VP2	184	1	165	A	M	Hunting / Foraging	100.0	0.0	0.0
MR	25-Nov-15	10:07	VP2	185	1	90	I	M	Hunting / Foraging	100.0	0.0	0.0
MR	25-Nov-15	10:11	VP2	186	1	45		M	Hunting / Foraging	100.0	0.0	0.0
MR	25-Nov-15	10:15	VP2	187	1	30	A	M	Hunting / Foraging	100.0	0.0	0.0
MR	25-Nov-15	10:21	VP2	188	1	255	A	M	Hunting / Foraging	100.0	0.0	0.0
MR	25-Nov-15	10:27	VP2	189	1	300	A	M	Hunting / Foraging	100.0	0.0	0.0
MR	25-Nov-15	10:40	VP2	191	1	30	A	M	Hunting / Foraging	100.0	0.0	0.0
MR	25-Nov-15	10:44	VP2	192	1	285	A	M	Hunting / Foraging	100.0	0.0	0.0
MR	25-Nov-15	10:50	VP2	193	1	120	A	M	Hunting / Foraging	100.0	0.0	0.0
MR	15-Dec-15	13:25	VP1	200	1	105	I		Hunting / Foraging	100.0	0.0	0.0
MR	15-Dec-15	13:37	VP1	202	1	257	2Y	M	Hunting / Foraging	0.0	94.7	5.3
MR	15-Dec-15	14:29	VP1	205	1	191			Hunting / Foraging	7.7	7.7	84.6
MR	15-Dec-15	14:31	VP1	206	1	15			Hunting / Foraging	100.0	0.0	0.0
MR	15-Dec-15	14:42	VP1	208	1	255	2Y	M	Hunting / Foraging	0.0	94.4	5.6
MR	15-Dec-15	14:57	VP1	209	1	350	2Y	M	Hunting / Foraging	4.2	87.5	8.3
MR	15-Dec-15	15:10	VP1	211	1	189		F	Hunting / Foraging	100.0	0.0	0.0
MR	15-Dec-15	13:43	VP2	232	1	42	A	M	Transit	0.0	100.0	0.0
MR	15-Dec-15	14:09	VP2	233	1	340	A	M	Hunting / Foraging	100.0	0.0	0.0
MR	15-Dec-15	14:29	VP2	234	1	234	A	M	Transit	0.0	56.3	43.8
MR	15-Dec-15	15:02	VP2	236	1	306	A	F	Hunting / Foraging	38.1	61.9	0.0
MR	15-Dec-15	15:30	VP2	237	1	210			Transit	0.0	100.0	0.0
MR	16-Dec-15	08:08	VP1	213	1	25			Hunting / Foraging	0.0	0.0	100.0
MR	16-Dec-15	08:18	VP1	215	1	269	I	F	Hunting / Foraging	11.1	83.3	5.6
MR	16-Dec-15	08:19	VP1	216	1	61	I	M	Hunting / Foraging	40.0	60.0	0.0

Species Code	Date	Time	VP	Flight ID	No. of Birds	Duration (s)	Age (if known)	Sex (if known)	Behaviour	% of Flight at 0-10 m	% of Flight at 10-50 m	% of Flight at >50 m
MR	16-Dec-15	08:29	VP1	217	1	80	I	M	Hunting / Foraging	100.0	0.0	0.0
MR	16-Dec-15	08:34	VP1	218	1	623	2Y	M	Hunting / Foraging	92.9	7.1	0.0
MR	16-Dec-15	08:55	VP1	219	1	281	I	M	Hunting / Foraging	21.1	63.2	15.8
MR	16-Dec-15	09:53	VP1	222	1	43	I		Hunting / Foraging	100.0	0.0	0.0
MR	16-Dec-15	10:16	VP1	227	2	311	I	M	Hunting / Foraging	95.2	4.8	0.0
MR	16-Dec-15	10:31	VP1	228	1	255			Transit	0.0	0.0	100.0
MR	16-Dec-15	08:08	VP2	240	1	260	1W		Transit	100.0	0.0	0.0
MR	16-Dec-15	08:08	VP2	241	1	410	1W		Transit	85.7	14.3	0.0
MR	16-Dec-15	08:22	VP2	242	1	233		M	Hunting / Foraging	75.0	25.0	0.0
MR	16-Dec-15	09:33	VP2	249	1	83	2W?	M	Hunting / Foraging	100.0	0.0	0.0
MR	16-Dec-15	10:01	VP2	250	1	292	2W?	M	Hunting / Foraging	90.0	10.0	0.0
MR	16-Dec-15	10:09	VP2	252	1	395	1W		Hunting / Foraging	100.0	0.0	0.0
MR	22-Dec-15	14:41	VP2	427	1	270	A	M	Hunting / Foraging	78.9	21.1	0.0
MR	23-Dec-15	08:11	VP1	461	1	415	I	M	Hunting / Foraging	42.9	57.1	0.0
MR	23-Dec-15	08:48	VP1	467	1	146	I	M	Hunting / Foraging	40.0	60.0	0.0
MR	23-Dec-15	08:48	VP1	468	1	18	J		Hunting / Foraging	100.0	0.0	0.0
MR	23-Dec-15	08:59	VP1	469	1	316	I		Hunting / Foraging	77.3	22.7	0.0
MR	23-Dec-15	09:01	VP1	470	1	183	I		Hunting / Foraging	100.0	0.0	0.0
MR	23-Dec-15	09:12	VP1	472	1	319	I		Hunting / Foraging	81.8	9.1	9.1
MR	23-Dec-15	09:28	VP1	474	1	165	J		Hunting / Foraging	100.0	0.0	0.0
MR	23-Dec-15	09:28	VP1	475	1	307	J		Hunting / Foraging	33.3	66.7	0.0
MR	23-Dec-15	09:31	VP1	476	1	60	I	M	Hunting / Foraging	60.0	40.0	0.0
MR	23-Dec-15	09:47	VP1	477	1	157	1W		Hunting / Foraging	81.8	18.2	0.0
MR	23-Dec-15	09:54	VP1	478	1	294	I	M	Hunting / Foraging	100.0	0.0	0.0
MR	23-Dec-15	10:14	VP1	480	1	181	I		Hunting / Foraging	76.9	23.1	0.0
MR	23-Dec-15	10:24	VP1	481	1	354	I	M	Hunting / Foraging	91.7	8.3	0.0
MR	23-Dec-15	10:40	VP1	482	1	75	I	M	Hunting / Foraging	100.0	0.0	0.0
MR	23-Dec-15	10:51	VP1	484	1	15			Hunting / Foraging	100.0	0.0	0.0
MR	23-Dec-15	10:55	VP1	485	1	170	I		Hunting / Foraging	83.3	16.7	0.0
MR	23-Dec-15	08:19	VP2	429	1	20			Hunting / Foraging	100.0	0.0	0.0
MR	23-Dec-15	08:20	VP2	430	1	354	1W		Hunting / Foraging	100.0	0.0	0.0
MR	23-Dec-15	08:34	VP2	433	1	307	2W	M	Hunting / Foraging	100.0	0.0	0.0
MR	23-Dec-15	08:36	VP2	434	1	160			Transit	27.3	72.7	0.0
MR	23-Dec-15	08:46	VP2	435	1	153	1W		Hunting / Foraging	100.0	0.0	0.0
MR	23-Dec-15	08:50	VP2	436	1	20			Hunting / Foraging	100.0	0.0	0.0
MR	23-Dec-15	08:50	VP2	437	1	25	1W		Hunting / Foraging	100.0	0.0	0.0
MR	23-Dec-15	08:53	VP2	438	1	377	2W	M	Hunting / Foraging	88.5	11.5	0.0
MR	23-Dec-15	08:56	VP2	439	1	60	1W		Hunting / Foraging	100.0	0.0	0.0
MR	23-Dec-15	09:10	VP2	442	1	686	1W		Hunting / Foraging	93.5	6.5	0.0
MR	23-Dec-15	09:38	VP2	443	1	38	1W		Hunting / Foraging	100.0	0.0	0.0
MR	23-Dec-15	10:12	VP2	447	1	212	1W		Transit	66.7	33.3	0.0
MR	23-Dec-15	10:15	VP2	449	1	80			Transit	0.0	50.0	50.0
MR	23-Dec-15	10:40	VP2	450	1	73	2W	M	Hunting / Foraging	100.0	0.0	0.0
MR	23-Dec-15	10:48	VP2	451	1	601	2W		Hunting / Foraging	14.6	80.5	4.9
MR	06-Jan-16	14:36	VP2	285	1	220	2W	M	Hunting / Foraging	80.0	20.0	0.0
MR	06-Jan-16	14:49	VP2	286	1	30	2W	M	Hunting / Foraging	0.0	100.0	0.0
MR	07-Jan-16	09:31	VP1	264	1	103			Hunting / Foraging	100.0	0.0	0.0
MR	07-Jan-16	10:55	VP2	276	1	95			Transit	0.0	100.0	0.0
MR	07-Jan-16	11:17	VP2	277	1	80	2W	M	Transit	50.0	50.0	0.0
MR	07-Jan-16	09:29	VP2	274	1	220	2W	M	Hunting / Foraging	93.3	6.7	0.0
MR	07-Jan-16	11:38	VP2	282	1	30	2W	M	Hunting / Foraging	100.0	0.0	0.0
MR	20-Jan-16	14:08	VP1	378	1	182			Hunting / Foraging	38.5	61.5	0.0
MR	20-Jan-16	14:17	VP1	379	1	44			Hunting / Foraging	100.0	0.0	0.0
MR	20-Jan-16	15:10	VP1	383	1	175			Hunting / Foraging	100.0	0.0	0.0
MR	20-Jan-16	15:21	VP1	385	1	67			Hunting / Foraging	100.0	0.0	0.0
MR	20-Jan-16	15:35	VP1	386	1	95	I		Hunting / Foraging	57.1	42.9	0.0

Species Code	Date	Time	VP	Flight ID	No. of Birds	Duration (s)	Age (if known)	Sex (if known)	Behaviour	% of Flight at 0-10 m	% of Flight at 10-50 m	% of Flight at >50 m
MR	20-Jan-16	14:20	VP2	346	1	20		F	Hunting / Foraging	100.0	0.0	0.0
MR	20-Jan-16	15:05	VP2	356	2	20			Transit	0.0	100.0	0.0
MR	21-Jan-16	07:46	VP1	388	1	19			Hunting / Foraging	50.0	50.0	0.0
MR	21-Jan-16	07:54	VP1	393	1	20			Hunting / Foraging	100.0	0.0	0.0
MR	21-Jan-16	08:09	VP1	397	1	16	A	M	Hunting / Foraging	100.0	0.0	0.0
MR	21-Jan-16	08:12	VP1	399	1	85	3W		Hunting / Foraging	0.0	100.0	0.0
MR	21-Jan-16	08:29	VP1	400	1	196	2W	M	Hunting / Foraging	57.1	42.9	0.0
MR	21-Jan-16	08:50	VP1	403	1	146	2W	M	Hunting / Foraging	70.0	30.0	0.0
MR	21-Jan-16	08:51	VP1	404	1	109	2W	M	Hunting / Foraging	87.5	12.5	0.0
MR	21-Jan-16	08:59	VP1	406	1	511	I	M	Hunting / Foraging	71.4	28.6	0.0
MR	21-Jan-16	09:01	VP1	407	1	125			Hunting / Foraging	88.9	11.1	0.0
MR	21-Jan-16	09:35	VP1	413	1	111	I		Hunting / Foraging	100.0	0.0	0.0
MR	21-Jan-16	09:40	VP1	414	1	422	I	M	Hunting / Foraging	10.3	86.2	3.4
MR	21-Jan-16	07:35	VP2	289	1	65	2Y	M	Transit	0.0	100.0	0.0
MR	21-Jan-16	08:12	VP2	295	1	108			Hunting / Foraging	0.0	100.0	0.0
MR	21-Jan-16	08:32	VP2	299	1	330		M	Hunting / Foraging	60.9	39.1	0.0
MR	21-Jan-16	09:11	VP2	309	1	162	1W		Transit	36.4	63.6	0.0
MR	21-Jan-16	09:18	VP2	311	1	340	1W		Hunting / Foraging	100.0	0.0	0.0
MR	21-Jan-16	09:52	VP2	324	1	154	1W		Hunting / Foraging	100.0	0.0	0.0
MR	21-Jan-16	10:20	VP2	332	1	215	A	M	Hunting / Foraging	73.3	26.7	0.0
MR	02-Feb-16	15:36	VP2	532	1	48	A	M	Transit	0.0	100.0	0.0
MR	02-Feb-16	16:33	VP2	544	1	85	A	M	Hunting / Foraging	50.0	50.0	0.0
MR	03-Feb-16	13:23	VP1	486	1	612	2W	M	Hunting / Foraging	70.7	29.3	0.0
MR	03-Feb-16	13:44	VP1	487	1	452	1W		Hunting / Foraging	100.0	0.0	0.0
MR	03-Feb-16	13:58	VP1	488	1	268			Hunting / Foraging	50.0	50.0	0.0
MR	03-Feb-16	14:47	VP1	499	1	137			Hunting / Foraging	100.0	0.0	0.0
MR	03-Feb-16	15:06	VP1	502	1	186	2W	M	Hunting / Foraging	0.0	100.0	0.0
MR	03-Feb-16	13:21	VP2	545	1	246		M	Hunting / Foraging	94.1	5.9	0.0
MR	03-Feb-16	13:41	VP2	546	1	131	1W		Hunting / Foraging	100.0	0.0	0.0
MR	03-Feb-16	14:05	VP2	547	1	222			Transit	0.0	53.3	46.7
MR	03-Feb-16	14:26	VP2	550	1	510	1W		Hunting / Foraging	100.0	0.0	0.0
MR	03-Feb-16	14:41	VP2	552	1	240	1W		Hunting / Foraging	100.0	0.0	0.0
MR	03-Feb-16	15:10	VP2	553	1	36			Transit	0.0	100.0	0.0
MR	04-Feb-16	10:46	VP1	516	1	50	2W	M	Hunting / Foraging	100.0	0.0	0.0
MR	04-Feb-16	11:02	VP1	518	2	38			Hunting / Foraging	0.0	100.0	0.0
MR	04-Feb-16	11:02	VP1	519	1	60			Hunting / Foraging	60.0	40.0	0.0
MR	04-Feb-16	11:02	VP1	520	1	50			Hunting / Foraging	75.0	25.0	0.0
MR	04-Feb-16	11:12	VP1	521	1	49	I		Hunting / Foraging	100.0	0.0	0.0
MR	04-Feb-16	11:17	VP1	522	1	77			Hunting / Foraging	100.0	0.0	0.0
MR	04-Feb-16	11:21	VP1	523	1	420	A	M	Hunting / Foraging	82.8	17.2	0.0
MR	04-Feb-16	10:16	VP2	559	1	216	1W	F	Hunting / Foraging	66.7	33.3	0.0
MR	04-Feb-16	10:30	VP2	560	1	65		M	Transit	100.0	0.0	0.0
MR	04-Feb-16	11:20	VP2	562	1	222		M	Hunting / Foraging	100.0	0.0	0.0
MR	16-Feb-16	14:06	VP1	565	2	20	I	M?	Hunting / Foraging	100.0	0.0	0.0
MR	16-Feb-16	13:59	VP1	572	1	182	A	M	Hunting / Foraging	100.0	0.0	0.0
MR	16-Feb-16	14:09	VP1	573	1	85	A	M	Hunting / Foraging	100.0	0.0	0.0
MR	01-Mar-16	13:02	VP2	582	1	233	A	M	Hunting / Foraging	100.0	0.0	0.0
MR	02-Mar-16	08:00	VP1	593	1	424		M	Hunting / Foraging	72.4	27.6	0.0
MR	02-Mar-16	08:01	VP1	594	1	30			Hunting / Foraging	100.0	0.0	0.0
MR	02-Mar-16	08:15	VP2	596	1	237	1W	M	Hunting / Foraging	43.8	56.3	0.0
MR	02-Mar-16	08:26	VP2	598	1	125	1W	M	Hunting / Foraging	100.0	0.0	0.0
MR	02-Mar-16	08:34	VP2	600	1	17			Hunting / Foraging	100.0	0.0	0.0
MR	19-Apr-16	14:18	VP1	604	1	423		F	Hunting / Foraging	3.4	6.9	89.7
MR	19-Apr-16	16:23	VP1	610	1	443	A	M	Hunting / Foraging	100.0	0.0	0.0
MR	19-Apr-16	17:02	VP1	614	1	156	A	M	Hunting / Foraging	100.0	0.0	0.0
MR	19-Apr-16	19:31	VP1	630	1	152	I	M	Hunting / Foraging	18.2	81.8	0.0

Species Code	Date	Time	VP	Flight ID	No. of Birds	Duration (s)	Age (if known)	Sex (if known)	Behaviour	% of Flight at 0-10 m	% of Flight at 10-50 m	% of Flight at >50 m
MR	19-Apr-16	15:50	VP1	609	1	354	I	F	Hunting / Foraging	70.8	29.2	0.0
MR	19-Apr-16	17:07	VP1	615	1	64	A	M	Hunting / Foraging	100.0	0.0	0.0
MR	19-Apr-16	17:16	VP1	617	1	190	A/I	F	Hunting / Foraging	100.0	0.0	0.0
MR	19-Apr-16	17:43	VP1	619	1	122		F/I	Hunting / Foraging	100.0	0.0	0.0
MR	19-Apr-16	16:23	VP2	887	1	113		F	Hunting / Foraging	75.0	25.0	0.0
MR	19-Apr-16	17:21	VP2	888	1	187			Transit	0.0	100.0	0.0
MR	19-Apr-16	15:57	VP2	882	1	65		F	Hunting / Foraging	20.0	80.0	0.0
MR	26-May-16	13:30	VP1	664	1	235	I	M	Hunting / Foraging	100.0	0.0	0.0
MR	26-May-16	16:50	VP1	680	1	282	I	M	Hunting / Foraging	100.0	0.0	0.0
MR	26-May-16	17:23	VP1	682	1	609	I	M	Hunting / Foraging	100.0	0.0	0.0
MR	26-May-16	19:36	VP1	656	1	121	I	M	Hunting / Foraging	100.0	0.0	0.0
MR	26-May-16	14:27	VP1	669	1	220	I	M	Hunting / Foraging	100.0	0.0	0.0
MR	26-May-16	18:04	VP1	685	1	183	I	M	Hunting / Foraging	100.0	0.0	0.0
MR	26-May-16	18:07	VP1	686	2	101	I	M	Transit	100.0	0.0	0.0
MR	26-May-16	14:48	VP1	671	1	705	I	M	Hunting / Foraging	100.0	0.0	0.0
MR	26-May-16	18:08	VP1	687	1	25	I	M		100.0	0.0	0.0
MR	26-May-16	15:08	VP1	672	1	25			Hunting / Foraging	100.0	0.0	0.0
MR	26-May-16	18:20	VP1	688	1	361	I	M	Hunting / Foraging	100.0	0.0	0.0
MR	26-May-16	20:19	VP1	661	1	112			Hunting / Foraging	100.0	0.0	0.0
MR	26-May-16	15:11	VP1	673	1	1380	I	M	Hunting / Foraging	100.0	0.0	0.0
MR	26-May-16	20:37	VP1	662	1	150			Hunting / Foraging	100.0	0.0	0.0
MR	26-May-16	15:33	VP1	674	1	120		F	Hunting / Foraging	100.0	0.0	0.0
MR	26-May-16	15:35	VP1	675	2	186	I	M&F	Transit	7.7	92.3	0.0
MR	26-May-16	16:22	VP1	678	1	226			Hunting / Foraging	100.0	0.0	0.0
MR	26-May-16	16:57	VP2	715	1	338			Hunting / Foraging	100.0	0.0	0.0
MR	26-May-16	17:10	VP2	716	1	220			Hunting / Foraging	100.0	0.0	0.0
MR	26-May-16	13:44	VP2	708	1	18				100.0	0.0	0.0
MR	26-May-16	14:39	VP2	709	1	197			Hunting / Foraging	100.0	0.0	0.0
MR	26-May-16	16:10	VP2	713	1	413			Hunting / Foraging	100.0	0.0	0.0
MR	26-May-16	16:16	VP2	714	1	85	A	M	Hunting / Foraging	100.0	0.0	0.0
MR	08-Jun-16	09:44	VP1	761	1	120	A	F		0.0	0.0	100.0
MR	08-Jun-16	09:46	VP1	762	1	240	A	M	Hunting / Foraging	100.0	0.0	0.0
MR	08-Jun-16	10:34	VP1	764	1	447	A	F	Hunting / Foraging	73.3	26.7	0.0
MR	08-Jun-16	11:03	VP1	767	1	110	I	M	Transit	0.0	37.5	62.5
MR	08-Jun-16	11:03	VP1	768	1	50	I		Transit	0.0	0.0	100.0
MR	08-Jun-16	12:05	VP1	774	1	360	A	F	Hunting / Foraging	100.0	0.0	0.0
MR	08-Jun-16	08:10	VP1	756	1	18			Hunting / Foraging	100.0	0.0	0.0
MR	20-Jul-16	15:18	VP1	814	1	150	J		Hunting / Foraging	90.9	9.1	0.0
MR	20-Jul-16	15:25	VP1	815	1	369	J		Hunting / Foraging	88.0	12.0	0.0
MR	20-Jul-16	17:32	VP1	808	1	442	J		Hunting / Foraging	83.3	16.7	0.0
MR	20-Jul-16	19:54	VP1	803	1	79	I	M	Transit	100.0	0.0	0.0
MR	20-Jul-16	15:34	VP1	816	1	343	J		Hunting / Foraging	91.3	8.7	0.0
MR	20-Jul-16	17:57	VP1	809	1	119	J		Hunting / Foraging	100.0	0.0	0.0
MR	20-Jul-16	20:08	VP1	804	1	339	I	M	Hunting / Foraging	100.0	0.0	0.0
MR	20-Jul-16	15:54	VP1	817	1	77	J		Hunting / Foraging	100.0	0.0	0.0
MR	20-Jul-16	17:58	VP1	810	2	65	J		Hunting / Foraging	100.0	0.0	0.0
MR	20-Jul-16	16:23	VP1	818	1	162	I	M	Hunting / Foraging	100.0	0.0	0.0
MR	20-Jul-16	18:10	VP1	811	1	633	J		Hunting / Foraging	37.2	62.8	0.0
MR	20-Jul-16	20:34	VP1	806	1	314	J		Hunting / Foraging	100.0	0.0	0.0
MR	20-Jul-16	16:35	VP1	819	1	782	J		Hunting / Foraging	96.2	3.8	0.0
MR	20-Jul-16	18:59	VP1	812	1	86	J		Hunting / Foraging	100.0	0.0	0.0
MR	20-Jul-16	16:38	VP1	820	1	246	I	M	Hunting / Foraging	23.5	29.4	47.1
MR	20-Jul-16	19:11	VP1	813	1	254	J		Hunting / Foraging	88.9	11.1	0.0
MR	20-Jul-16	16:44	VP1	821	1	20	I	M	Hunting / Foraging	100.0	0.0	0.0
MR	20-Jul-16	15:29	VP2	851	1	170	A	F	Hunting / Foraging	100.0	0.0	0.0
MR	20-Jul-16	15:39	VP2	852	1	30	A	F	Hunting / Foraging	100.0	0.0	0.0

Species Code	Date	Time	VP	Flight ID	No. of Birds	Duration (s)	Age (if known)	Sex (if known)	Behaviour	% of Flight at 0-10 m	% of Flight at 10-50 m	% of Flight at >50 m
MR	20-Jul-16	15:44	VP2	853	1	515	A	F	Hunting / Foraging	94.3	5.7	0.0
MR	10-Aug-16	07:36	VP2	827	1	98	J	M	Hunting / Foraging	100.0	0.0	0.0
MR	11-Aug-16	06:08	VP1	847	1	266	J		Hunting / Foraging	100.0	0.0	0.0
MR	11-Aug-16	07:42	VP1	841	1	218	J		Hunting / Foraging	100.0	0.0	0.0
MR	11-Aug-16	06:28	VP1	849	1	115	J		Hunting / Foraging	100.0	0.0	0.0
MR	11-Aug-16	11:03	VP1	839	1	105	I	M	Hunting / Foraging	100.0	0.0	0.0
MR	27-Sep-16	16:23	VP1	910	1	447	A	M	Hunting / Foraging	100.0	0.0	0.0
MR	27-Sep-16	13:05	VP2	906	1	92	A	M	Hunting / Foraging	100.0	0.0	0.0
MR	27-Sep-16	18:32	VP2	923	1	215	A	M	Transit	86.7	13.3	0.0
MR	17-Oct-16	10:54	VP1	941	1	180	J	M	Hunting / Foraging	100.0	0.0	0.0
MR	17-Oct-16	08:40	VP1	928	1	37	A	F	Hunting / Foraging	100.0	0.0	0.0
MR	17-Oct-16	07:40	VP2	930	1	150	J	M	Hunting / Foraging	100.0	0.0	0.0
MR	17-Oct-16	09:52	VP2	944	1	130	J	M	Hunting / Foraging	44.4	55.6	0.0
MR	17-Oct-16	10:47	VP2	947	1	310	J	M	Hunting / Foraging	100.0	0.0	0.0
HH	07-Jan-16	11:34	VP2	280	1	220	A	M	Hunting / Foraging	100.0	0.0	0.0
HH	07-Jan-16	11:45	VP2	283	1	113	A	M	Hunting / Foraging	100.0	0.0	0.0
ML	24-Nov-15	13:11	VP2	118	1	15		F	Hunting / Foraging	50.0	50.0	0.0
ML	25-Nov-15	09:10	VP1	145	1	37		F	Transit	100.0	0.0	0.0
ML	19-Apr-16	17:32	VP2	889	1	49			Hunting / Foraging	100.0	0.0	0.0
ML	17-Oct-16	06:48	VP1	925	1	18		F	Hunting / Foraging	100.0	0.0	0.0
HY	08-Jun-16	10:36	VP2	780	1	17			Hunting / Foraging	50.0	50.0	0.0
HY	08-Jun-16	08:21	VP2	789	1	73	A		Hunting / Foraging	60.0	40.0	0.0
HY	20-Jul-16	17:20	VP1	807	1	170	A		Hunting / Foraging	16.7	83.3	0.0
HY	20-Jul-16	19:48	VP1	802	1	16	A		Hunting / Foraging	0.0	100.0	0.0
HY	10-Aug-16	09:14	VP2	831	1	63	A		Hunting / Foraging	100.0	0.0	0.0
HY	11-Aug-16	05:50	VP1	846	1	119	A		Hunting / Foraging	12.5	87.5	0.0
HY	11-Aug-16	07:52	VP1	842	1	196	A		Hunting / Foraging	14.3	28.6	57.1
PE	15-Dec-15	15:10	VP1	210	1	58	A	M	Hunting / Foraging	100.0	0.0	0.0
PE	16-Dec-15	08:08	VP1	214	1	191	A	M	Hunting / Foraging	30.8	46.2	23.1
PE	16-Dec-15	09:26	VP1	221	1	63	A	M	Hunting / Foraging	80.0	20.0	0.0
PE	23-Dec-15	10:45	VP1	483	1	75	A	M	Hunting / Foraging	50.0	50.0	0.0
PE	06-Jan-16	15:34	VP1	253	1	26	A	M	Hunting / Foraging	100.0	0.0	0.0
PE	06-Jan-16	15:36	VP1	254	1	15	A	M	Transit	100.0	0.0	0.0
PE	06-Jan-16	15:44	VP1	255	1	25	A	M	Transit	50.0	50.0	0.0
PE	07-Jan-16	08:10	VP2	269	1	45		M	Transit	0.0	100.0	0.0
PE	21-Jan-16	09:58	VP1	416	1	127	A	M	Hunting / Foraging	0.0	77.8	22.2
PE	02-Feb-16	15:04	VP1	507	1	117	A	M	Hunting / Foraging	100.0	0.0	0.0
PE	03-Feb-16	14:26	VP1	494	1	65	A		Hunting / Foraging	80.0	20.0	0.0
PE	03-Feb-16	15:00	VP1	501	1	20	A		Transit	50.0	50.0	0.0
PE	03-Feb-16	15:06	VP1	503	1	110	A			50.0	50.0	0.0
PE	03-Feb-16	15:14	VP1	504	1	42	A		Transit	66.7	33.3	0.0
PE	16-Feb-16	14:21	VP1	574	1	214	A	M		60.0	40.0	0.0
PE	16-Feb-16	14:24	VP1	575	1	16	A	F?		0.0	100.0	0.0
PE	19-Apr-16	14:45	VP1	606	1	99	A	M	Hunting / Foraging	42.9	57.1	0.0
PE	19-Apr-16	15:00	VP2	875	1	187		M	Transit	0.0	38.5	61.5
PE	26-May-16	19:53	VP1	658	1	21	A	M	Hunting / Foraging	50.0	50.0	0.0
PE	26-May-16	13:42	VP2	707	1	30	A	M	Transit	0.0	100.0	0.0
PE	20-Jul-16	20:24	VP1	805	1	76	A	M	Transit	33.3	66.7	0.0
PE	20-Jul-16	16:56	VP2	855	1	62	A	M	Transit	0.0	100.0	0.0
PE	11-Aug-16	10:00	VP1	836	1	156	J	M	Hunting / Foraging	9.1	45.5	45.5
PE	11-Aug-16	10:48	VP1	838	1	77		M	Hunting / Foraging	0.0	100.0	0.0
PE	27-Sep-16	12:57	VP1	902	1	15	A	M	Transit	0.0	100.0	0.0
PE	27-Sep-16	12:31	VP2	905	1	300	J	F	Hunting / Foraging	28.6	71.4	0.0
PE	27-Sep-16	16:26	VP2	917	1	67	J	M	Hunting / Foraging	60.0	40.0	0.0
PE	17-Oct-16	12:45	VP1	950	1	115	A	M	Hunting / Foraging	0.0	87.5	12.5
PE	17-Oct-16	11:29	VP2	952	1	62	A	M	Transit	60.0	40.0	0.0

Species Code	Date	Time	VP	Flight ID	No. of Birds	Duration (s)	Age (if known)	Sex (if known)	Behaviour	% of Flight at 0-10 m	% of Flight at 10-50 m	% of Flight at >50 m
PE	17-Oct-16	10:11	VP2	945	1	131			Hunting / Foraging	22.2	44.4	33.3
PE	17-Oct-16	12:07	VP2	960	1	20	A	M	Transit	0.0	100.0	0.0
OC	11-May-16	07:07	VP1	691	2	23				100.0	0.0	0.0
OC	11-May-16	07:29	VP1	692	1	35			Transit	0.0	100.0	0.0
OC	11-May-16	11:06	VP2	652	2	26			Transit	100.0	0.0	0.0
OC	26-May-16	19:59	VP1	659	2	23	A		Transit	50.0	50.0	0.0
OC	26-May-16	19:15	VP2	722	1	18	A			100.0	0.0	0.0
OC	26-May-16	18:23	VP2	719	1	64	A			100.0	0.0	0.0
OC	26-May-16	20:24	VP2	725	1	50	A		Transit	0.0	25.0	75.0
OC	26-May-16	18:35	VP2	720	1	35	A		Transit	100.0	0.0	0.0
OC	26-May-16	20:30	VP2	727	1	35	A		Transit	100.0	0.0	0.0
OC	08-Jun-16	06:55	VP1	741	1	45	A		Transit	100.0	0.0	0.0
OC	08-Jun-16	07:14	VP2	784	1	18			Transit	100.0	0.0	0.0
OC	08-Jun-16	06:02	VP2	796	22	122			Transit	66.7	33.3	0.0
OC	08-Jun-16	06:07	VP2	797	1	27			Transit	100.0	0.0	0.0
OC	08-Jun-16	06:11	VP2	799	2	65			Transit	40.0	60.0	0.0
GP	24-Nov-15	13:11	VP2	117	70	45			Transit	0.0	100.0	0.0
GP	24-Nov-15	15:15	VP2	128	600	60			Transit	20.0	80.0	0.0
GP	15-Dec-15	14:31	VP2	235	6	65			Transit	0.0	100.0	0.0
GP	23-Dec-15	08:04	VP1	460	5	121			Transit	22.2	33.3	44.4
GP	23-Dec-15	08:17	VP1	462	100	75			Transit	33.3	16.7	50.0
GP	23-Dec-15	08:20	VP2	431	1	30			Transit	0.0	100.0	0.0
GP	07-Jan-16	08:39	VP1	259	5	46			Transit	25.0	25.0	50.0
GP	07-Jan-16	08:48	VP2	271	55	45			Transit	0.0	0.0	100.0
GP	07-Jan-16	11:52	VP2	284	45	53			Transit	0.0	0.0	100.0
GP	20-Jan-16	13:29	VP1	373	1	35			Transit	33.3	66.7	0.0
GP	20-Jan-16	13:36	VP1	374	70	32			Transit	66.7	33.3	0.0
GP	20-Jan-16	14:21	VP1	380	200	180				15.4	84.6	0.0
GP	20-Jan-16	12:45	VP2	340	90	155			Transit	0.0	100.0	0.0
GP	20-Jan-16	12:56	VP2	342	85	146				0.0	100.0	0.0
GP	20-Jan-16	13:37	VP2	344	45	50				0.0	100.0	0.0
GP	20-Jan-16	14:31	VP2	350	70	131			Transit	0.0	100.0	0.0
GP	20-Jan-16	14:35	VP2	351	9	24			Transit	0.0	100.0	0.0
GP	21-Jan-16	07:33	VP1	387	36	96			Transit	14.3	14.3	71.4
GP	21-Jan-16	07:54	VP1	392	35	46			Transit	25.0	75.0	0.0
GP	21-Jan-16	07:55	VP1	394	90	18			Transit	50.0	50.0	0.0
GP	21-Jan-16	10:05	VP1	417	280	206			Transit	0.0	100.0	0.0
GP	21-Jan-16	07:59	VP2	293	55	110			Transit	0.0	0.0	100.0
GP	21-Jan-16	08:35	VP2	300	60	50			Transit	0.0	0.0	100.0
GP	21-Jan-16	08:58	VP2	305	9	20			Transit	0.0	100.0	0.0
GP	21-Jan-16	09:04	VP2	307	9	55			Transit	0.0	0.0	100.0
GP	21-Jan-16	09:28	VP2	314	11	40			Transit	0.0	0.0	100.0
GP	21-Jan-16	09:29	VP2	315	310	265			Transit	0.0	0.0	100.0
GP	21-Jan-16	09:43	VP2	321	100	40			Transit	0.0	0.0	100.0
GP	21-Jan-16	10:00	VP2	327	7	50			Transit	0.0	0.0	100.0
GP	21-Jan-16	10:03	VP2	328	510	130			Transit	0.0	44.4	55.6
GP	21-Jan-16	10:08	VP2	330	47	45			Transit	0.0	25.0	75.0
GP	21-Jan-16	10:26	VP2	333	30	35			Transit	0.0	0.0	100.0
GP	21-Jan-16	10:28	VP2	336	30	30			Transit	0.0	100.0	0.0
GP	21-Jan-16	08:10	VP2	338	1	53			Transit	25.0	75.0	0.0
GP	21-Jan-16	08:37	VP2	339	3	55			Transit	0.0	50.0	50.0
GP	02-Feb-16	16:18	VP1	513	100	144			Transit	0.0	50.0	50.0
GP	02-Feb-16	15:21	VP2	531	4	65			Transit	40.0	60.0	0.0
GP	02-Feb-16	15:54	VP2	534	120	50			Transit	25.0	75.0	0.0
GP	02-Feb-16	16:09	VP2	537	280	50			Transit	0.0	50.0	50.0
GP	02-Feb-16	16:14	VP2	539	150	20			Transit	100.0	0.0	0.0

Species Code	Date	Time	VP	Flight ID	No. of Birds	Duration (s)	Age (if known)	Sex (if known)	Behaviour	% of Flight at 0-10 m	% of Flight at 10-50 m	% of Flight at >50 m
GP	03-Feb-16	14:06	VP1	490	9	96			Transit	0.0	71.4	28.6
GP	03-Feb-16	14:30	VP1	498	25	90			Transit	0.0	100.0	0.0
GP	04-Feb-16	10:04	VP2	555	120	95			Transit	0.0	100.0	0.0
GP	04-Feb-16	10:04	VP2	556	900	430			Transit	0.0	13.8	86.2
GP	01-Mar-16	13:33	VP2	587	80	124			Transit	33.3	66.7	0.0
GP	01-Mar-16	13:33	VP2	588	140	40			Transit	0.0	100.0	0.0
GP	01-Mar-16	14:08	VP2	590	160	35			Hunting / Foraging	100.0	0.0	0.0
GP	17-Oct-16	11:35	VP2	955	180	20			Transit	100.0	0.0	0.0
GP	17-Oct-16	11:52	VP2	956	180	30				66.7	33.3	0.0
GP	17-Oct-16	11:55	VP2	959	3	25			Transit	50.0	50.0	0.0
L.	24-Nov-15	13:23	VP1	104	15	20			Transit	50.0	50.0	0.0
L.	24-Nov-15	13:36	VP1	105	150	46			Transit	50.0	50.0	0.0
L.	24-Nov-15	14:04	VP1	108	200	25				100.0	0.0	0.0
L.	24-Nov-15	13:57	VP2	123	6	165			Transit	0.0	50.0	50.0
L.	24-Nov-15	15:11	VP2	126	180	60			Transit	0.0	100.0	0.0
L.	24-Nov-15	15:15	VP2	127	160	75			Transit	0.0	100.0	0.0
L.	25-Nov-15	08:57	VP2	172	120	75			Transit	0.0	100.0	0.0
L.	15-Dec-15	13:14	VP1	198	4	101			Transit	28.6	28.6	42.9
L.	15-Dec-15	13:22	VP1	199	2	26			Transit	50.0	50.0	0.0
L.	15-Dec-15	13:30	VP1	201	5	15			Transit	100.0	0.0	0.0
L.	15-Dec-15	13:48	VP1	203	150	122			Transit	88.9	11.1	0.0
L.	22-Dec-15	14:14	VP1	453	450	125			Transit	11.1	88.9	0.0
L.	22-Dec-15	14:16	VP1	454	85	105			Transit	62.5	37.5	0.0
L.	22-Dec-15	14:34	VP1	455	300	114			Transit	75.0	25.0	0.0
L.	22-Dec-15	14:49	VP1	456	100	47			Transit	75.0	25.0	0.0
L.	22-Dec-15	14:33	VP2	425	7	35			Transit	33.3	66.7	0.0
L.	22-Dec-15	14:35	VP2	426	330	40			Transit	33.3	66.7	0.0
L.	23-Dec-15	08:27	VP1	463	1	51			Transit	25.0	25.0	50.0
L.	23-Dec-15	08:31	VP1	464	430	75			Transit	0.0	100.0	0.0
L.	23-Dec-15	08:34	VP2	432	10	48			Transit	0.0	100.0	0.0
L.	23-Dec-15	09:04	VP2	441	40	80			Transit	0.0	100.0	0.0
L.	07-Jan-16	08:24	VP1	257	34	89			Transit	33.3	33.3	33.3
L.	07-Jan-16	08:34	VP1	258	12	55			Transit	25.0	25.0	50.0
L.	07-Jan-16	11:51	VP1	267	9	27			Transit	50.0	50.0	0.0
L.	07-Jan-16	11:52	VP1	268	40	130			Transit	11.1	33.3	55.6
L.	07-Jan-16	09:00	VP1	261	4	89			Transit	16.7	33.3	50.0
L.	07-Jan-16	09:20	VP1	263	1	82			Transit	33.3	16.7	50.0
L.	07-Jan-16	10:45	VP2	275	6	50			Transit	0.0	100.0	0.0
L.	07-Jan-16	11:38	VP2	281	2	20			Transit	100.0	0.0	0.0
L.	20-Jan-16	13:01	VP1	366	1	54			Transit	75.0	25.0	0.0
L.	20-Jan-16	13:19	VP1	371	3	22			Transit	0.0	100.0	0.0
L.	20-Jan-16	13:36	VP1	375	25	32			Transit	66.7	33.3	0.0
L.	20-Jan-16	13:58	VP1	377	1	79			Transit	16.7	83.3	0.0
L.	20-Jan-16	14:29	VP1	382	5	39			Transit	66.7	33.3	0.0
L.	20-Jan-16	12:56	VP2	341	40	35			Transit	33.3	66.7	0.0
L.	20-Jan-16	13:20	VP2	343	75	55				25.0	75.0	0.0
L.	20-Jan-16	14:00	VP2	345	2	38				33.3	66.7	0.0
L.	20-Jan-16	14:24	VP2	347	1	49			Transit	0.0	100.0	0.0
L.	20-Jan-16	14:31	VP2	349	200	120				11.1	88.9	0.0
L.	21-Jan-16	07:53	VP1	389	6	15			Transit	50.0	50.0	0.0
L.	21-Jan-16	07:53	VP1	390	36	95			Transit	0.0	100.0	0.0
L.	21-Jan-16	07:54	VP1	391	66	46			Transit	25.0	75.0	0.0
L.	21-Jan-16	07:55	VP1	395	7	18			Transit	50.0	50.0	0.0
L.	21-Jan-16	08:12	VP1	398	14	31			Transit	33.3	66.7	0.0
L.	21-Jan-16	08:44	VP1	401	26	38			Transit	0.0	33.3	66.7
L.	21-Jan-16	08:47	VP1	402	25	40			Transit	0.0	0.0	100.0

Species Code	Date	Time	VP	Flight ID	No. of Birds	Duration (s)	Age (if known)	Sex (if known)	Behaviour	% of Flight at 0-10 m	% of Flight at 10-50 m	% of Flight at >50 m
L.	21-Jan-16	09:03	VP1	408	10	36			Transit	33.3	33.3	33.3
L.	21-Jan-16	09:25	VP1	410	1	37			Transit	33.3	66.7	0.0
L.	21-Jan-16	09:42	VP1	415	2	15			Transit	100.0	0.0	0.0
L.	21-Jan-16	10:05	VP1	418	25	206			Transit	42.9	57.1	0.0
L.	21-Jan-16	10:17	VP1	419	1	100			Transit	0.0	100.0	0.0
L.	21-Jan-16	10:19	VP1	420	39	151			Transit	72.7	27.3	0.0
L.	21-Jan-16	07:38	VP2	290	23	50			Transit	0.0	100.0	0.0
L.	21-Jan-16	07:42	VP2	291	7	85			Transit	0.0	100.0	0.0
L.	21-Jan-16	07:43	VP2	292	45	80			Transit	0.0	100.0	0.0
L.	21-Jan-16	08:10	VP2	294	22	53			Transit	25.0	75.0	0.0
L.	21-Jan-16	08:20	VP2	296	100	96			Transit	0.0	100.0	0.0
L.	21-Jan-16	08:37	VP2	301	3	55			Transit	0.0	50.0	50.0
L.	21-Jan-16	08:42	VP2	302	6	90			Transit	0.0	100.0	0.0
L.	21-Jan-16	08:56	VP2	304	12	40				0.0	100.0	0.0
L.	21-Jan-16	09:03	VP2	306	3	35			Transit	0.0	100.0	0.0
L.	21-Jan-16	09:05	VP2	308	8	52			Transit	0.0	100.0	0.0
L.	21-Jan-16	09:25	VP2	312	2	37			Transit	33.3	66.7	0.0
L.	21-Jan-16	09:28	VP2	313	5	50			Transit	0.0	0.0	100.0
L.	21-Jan-16	09:47	VP2	323	1	80			Transit	0.0	0.0	100.0
L.	21-Jan-16	09:56	VP2	325	5	48			Transit	0.0	100.0	0.0
L.	21-Jan-16	10:12	VP2	331	9	35			Transit	0.0	100.0	0.0
L.	21-Jan-16	10:27	VP2	335	12	60			Transit	0.0	100.0	0.0
L.	02-Feb-16	14:35	VP1	505	65	60			Transit	0.0	40.0	60.0
L.	02-Feb-16	14:51	VP1	506	65	64			Transit	20.0	80.0	0.0
L.	02-Feb-16	15:04	VP1	508	190	257			Transit	0.0	100.0	0.0
L.	02-Feb-16	15:26	VP1	509	2	230			Transit	6.3	62.5	31.3
L.	02-Feb-16	15:26	VP1	510	20	105			Transit	0.0	100.0	0.0
L.	02-Feb-16	15:26	VP1	511	50	220			Transit	0.0	100.0	0.0
L.	02-Feb-16	15:41	VP1	512	60	58			Transit	0.0	100.0	0.0
L.	02-Feb-16	15:05	VP2	525	30	35				100.0	0.0	0.0
L.	02-Feb-16	15:05	VP2	526	30	30			Transit	100.0	0.0	0.0
L.	02-Feb-16	15:15	VP2	528	60	20				100.0	0.0	0.0
L.	02-Feb-16	15:19	VP2	529	70	100			Transit	71.4	28.6	0.0
L.	02-Feb-16	15:21	VP2	530	10	110			Transit	50.0	50.0	0.0
L.	02-Feb-16	15:39	VP2	533	29	45			Transit	50.0	50.0	0.0
L.	02-Feb-16	15:54	VP2	535	4	50			Transit	25.0	75.0	0.0
L.	02-Feb-16	16:08	VP2	536	100	132			Transit	11.1	44.4	44.4
L.	03-Feb-16	14:06	VP1	489	70	60			Transit	0.0	100.0	0.0
L.	03-Feb-16	14:07	VP1	492	50	36			Transit	33.3	66.7	0.0
L.	03-Feb-16	14:07	VP1	493	20	36			Transit	0.0	100.0	0.0
L.	03-Feb-16	14:30	VP1	495	56	90			Transit	0.0	100.0	0.0
L.	03-Feb-16	14:31	VP1	496	24	157			Transit	0.0	100.0	0.0
L.	03-Feb-16	14:31	VP1	497	32	100			Transit	28.6	71.4	0.0
L.	03-Feb-16	14:55	VP1	500	11	48			Transit	50.0	50.0	0.0
L.	03-Feb-16	14:06	VP2	548	30	120			Transit	44.4	55.6	0.0
L.	03-Feb-16	14:32	VP2	551	33	40			Transit	0.0	0.0	100.0
L.	04-Feb-16	10:53	VP1	517	4	103			Transit	0.0	28.6	71.4
L.	04-Feb-16	10:04	VP2	557	250	900			Transit	0.0	32.8	67.2
L.	16-Feb-16	13:58	VP1	571	40	22				100.0	0.0	0.0
L.	01-Mar-16	12:43	VP2	580	15	20			Transit	100.0	0.0	0.0
L.	01-Mar-16	14:08	VP2	591	40	20			Hunting / Foraging	100.0	0.0	0.0
L.	19-Apr-16	18:08	VP1	623	1	61	A		Transit	80.0	20.0	0.0
L.	19-Apr-16	14:30	VP2	868	1	40			Transit	0.0	100.0	0.0
L.	19-Apr-16	14:31	VP2	869	1	45			Transit	0.0	100.0	0.0
L.	19-Apr-16	15:29	VP2	878	2	40			Transit	0.0	100.0	0.0
L.	19-Apr-16	15:30	VP2	879	4	125				11.1	88.9	0.0

Species Code	Date	Time	VP	Flight ID	No. of Birds	Duration (s)	Age (if known)	Sex (if known)	Behaviour	% of Flight at 0-10 m	% of Flight at 10-50 m	% of Flight at >50 m
L.	11-May-16	11:04	VP2	651	2	35			Transit	0.0	100.0	0.0
L.	08-Jun-16	08:12	VP2	788	1	32	A		Transit	33.3	66.7	0.0
L.	17-Oct-16	11:54	VP1	949	14	84			Transit	100.0	0.0	0.0
L.	17-Oct-16	10:17	VP1	939	6	24			Transit	100.0	0.0	0.0
L.	17-Oct-16	08:36	VP1	927	3	35			Transit	0.0	0.0	100.0
L.	17-Oct-16	11:33	VP2	953	2	20			Transit	100.0	0.0	0.0
L.	17-Oct-16	11:35	VP2	954	16	30				66.7	33.3	0.0
L.	17-Oct-16	07:50	VP2	932	9	48			Transit	25.0	75.0	0.0
L.	17-Oct-16	11:54	VP2	957	14	25			Transit	50.0	50.0	0.0
L.	17-Oct-16	07:52	VP2	933	1	39			Transit	100.0	0.0	0.0
L.	17-Oct-16	11:55	VP2	958	41	25			Transit	50.0	50.0	0.0
L.	17-Oct-16	11:04	VP2	948	10	27			Transit	100.0	0.0	0.0
L.	17-Oct-16	12:15	VP2	961	50	25			Transit	50.0	50.0	0.0
L.	17-Oct-16	14:40	VP2	964	4	30			Transit	100.0	0.0	0.0
L.	17-Oct-16	13:00	VP2	965	40	20			Transit	100.0	0.0	0.0
L.	17-Oct-16	13:06	VP2	966	5	25			Transit	50.0	50.0	0.0
L.	17-Oct-16	13:14	VP2	967	14	37			Transit	66.7	33.3	0.0
DN	21-Jan-16	10:28	VP2	337	2	30			Transit	0.0	100.0	0.0
SN	20-Jan-16	13:11	VP1	370	1	43			Transit	0.0	100.0	0.0
SN	20-Jan-16	13:42	VP1	376	1	15			Transit	50.0	50.0	0.0
SN	20-Jan-16	15:18	VP1	384	1	38			Transit	0.0	100.0	0.0
SN	21-Jan-16	09:58	VP2	326	1	30			Transit	0.0	0.0	100.0
CU	25-Nov-15	08:40	VP2	169	18	30			Transit	100.0	0.0	0.0
CU	23-Dec-15	09:03	VP2	440	18	48			Transit	25.0	75.0	0.0
CU	23-Dec-15	10:14	VP2	448	18	65			Transit	60.0	40.0	0.0
CU	07-Jan-16	11:21	VP2	278	70	50			Transit	50.0	50.0	0.0
CU	21-Jan-16	09:13	VP2	310	35	30			Transit	100.0	0.0	0.0
CU	21-Jan-16	09:45	VP2	322	1	20			Transit	0.0	0.0	100.0
CU	02-Feb-16	15:15	VP2	527	20	20				100.0	0.0	0.0
CU	02-Feb-16	16:12	VP2	538	30	35				100.0	0.0	0.0
CU	04-Feb-16	10:04	VP2	554	100	54			Transit	50.0	50.0	0.0
CU	02-Mar-16	08:15	VP2	597	50	50				100.0	0.0	0.0
CU	02-Mar-16	08:31	VP2	599	105	53			Transit	50.0	50.0	0.0
CU	02-Mar-16	08:55	VP2	603	100	56			Transit	50.0	50.0	0.0
CU	19-Apr-16	15:19	VP1	607	3	68			Transit	0.0	100.0	0.0
GE	23-Dec-15	08:42	VP1	465	1	16			Transit	100.0	0.0	0.0
GE	23-Dec-15	08:42	VP1	466	1	27			Transit	50.0	50.0	0.0
GE	07-Jan-16	11:18	VP1	265	1	20			Transit	50.0	50.0	0.0
GE	07-Jan-16	09:15	VP1	262	1	15			Transit	100.0	0.0	0.0
GE	20-Jan-16	12:52	VP1	364	2	66			Transit	60.0	40.0	0.0
GE	20-Jan-16	12:53	VP1	365	1	27			Transit	0.0	100.0	0.0
GE	20-Jan-16	13:07	VP1	368	2	119			Transit	50.0	50.0	0.0
GE	20-Jan-16	13:07	VP1	369	1	39			Transit	66.7	33.3	0.0
GE	21-Jan-16	09:26	VP1	411	2	26			Transit	50.0	50.0	0.0
GE	21-Jan-16	09:29	VP2	320	1	30			Transit	0.0	100.0	0.0
GE	04-Feb-16	10:04	VP1	514	1	28			Transit	50.0	50.0	0.0
GE	16-Feb-16	13:16	VP1	566	1	15			Transit	100.0	0.0	0.0
RK	20-Jan-16	12:51	VP1	363	1	15			Transit	100.0	0.0	0.0
RK	20-Jan-16	13:02	VP1	367	1	16			Transit	100.0	0.0	0.0
RK	20-Jan-16	13:24	VP1	372	1	17			Transit	100.0	0.0	0.0
RK	20-Jan-16	14:29	VP1	381	2	39			Transit	66.7	33.3	0.0
RK	20-Jan-16	15:07	VP2	357	1	40			Transit	0.0	100.0	0.0
RK	21-Jan-16	09:26	VP1	412	1	26			Transit	50.0	50.0	0.0
RK	21-Jan-16	08:22	VP2	297	1	55			Transit	0.0	100.0	0.0
RK	03-Feb-16	14:06	VP2	549	1	120			Transit	44.4	55.6	0.0
RK	11-May-16	08:03	VP1	693	1	20			Transit	0.0	100.0	0.0

Species Code	Date	Time	VP	Flight ID	No. of Birds	Duration (s)	Age (if known)	Sex (if known)	Behaviour	% of Flight at 0-10 m	% of Flight at 10-50 m	% of Flight at >50 m
MU	08-Jun-16	09:15	VP1	760	1	45	A		Transit	0.0	0.0	100.0
MU	08-Jun-16	07:06	VP1	744	1	50	A		Transit	0.0	0.0	100.0
MU	08-Jun-16	06:28	VP1	737	2	85	A		Transit	0.0	0.0	100.0
MU	08-Jun-16	07:42	VP1	753	2	56	A		Transit	0.0	100.0	0.0
MU	08-Jun-16	09:35	VP2	776	2	183	2S		Hunting / Foraging	53.8	46.2	0.0
MU	08-Jun-16	09:44	VP2	777	2	243	2S		Hunting / Foraging	47.1	52.9	0.0
MU	08-Jun-16	10:04	VP2	778	2	90	A		Transit	71.4	28.6	0.0
MU	08-Jun-16	10:30	VP2	779	2	24	A		Hunting / Foraging	50.0	50.0	0.0
MU	08-Jun-16	10:59	VP2	781	2	68	A		Hunting / Foraging	60.0	40.0	0.0
CN	26-May-16	19:11	VP2	721	1	165	A		Transit	0.0	100.0	0.0
SE	20-Jan-16	14:49	VP2	353	1	40			Hunting / Foraging	100.0	0.0	0.0
SE	20-Jan-16	14:49	VP2	354	1	340			Hunting / Foraging	91.3	8.7	0.0
SE	20-Jan-16	15:03	VP2	355	1	190			Hunting / Foraging	84.6	15.4	0.0
SE	20-Jan-16	15:10	VP2	358	1	45			Hunting / Foraging	66.7	33.3	0.0
SE	20-Jan-16	15:14	VP2	359	1	502			Hunting / Foraging	100.0	0.0	0.0
SE	20-Jan-16	14:54	VP2	360	1	135				80.0	20.0	0.0
SE	19-Apr-16	20:00	VP1	632	1	15			Hunting / Foraging	100.0	0.0	0.0
SE	19-Apr-16	20:09	VP1	633	1	145			Hunting / Foraging	90.0	10.0	0.0
SE	20-Jul-16	20:28	VP2	864	1	251	A		Hunting / Foraging	100.0	0.0	0.0
SE	20-Jul-16	20:37	VP2	865	1	35	A		Hunting / Foraging	100.0	0.0	0.0
BO	19-Apr-16	20:22	VP2	899	1	25				100.0	0.0	0.0
RN	25-Nov-15	08:46	VP2	170	1	30			Transit	33.3	66.7	0.0
RN	25-Nov-15	09:06	VP2	174	1	45			Transit	0.0	100.0	0.0
RN	16-Feb-16	14:28	VP1	576	1	15			Transit	0.0	100.0	0.0
RN	02-Mar-16	08:21	VP1	595	2	82			Transit	33.3	66.7	0.0
RN	20-Jul-16	17:42	VP2	857	3	35			Transit	0.0	100.0	0.0
RN	20-Jul-16	17:46	VP2	858	2	38			Transit	0.0	100.0	0.0
RN	20-Jul-16	17:58	VP2	860	1	83				50.0	50.0	0.0
RN	20-Jul-16	17:58	VP2	861	1	50				0.0	100.0	0.0
RN	10-Aug-16	10:32	VP2	834	2	267			Courtship	0.0	11.1	88.9
RN	10-Aug-16	06:13	VP2	824	2	15			Transit	100.0	0.0	0.0
RN	10-Aug-16	10:37	VP2	835	2	27			Courtship	0.0	100.0	0.0
RN	11-Aug-16	07:31	VP1	840	1	24	J		Hunting / Foraging	100.0	0.0	0.0
RN	11-Aug-16	08:43	VP1	844	1	15	A		Transit	100.0	0.0	0.0
RN	11-Aug-16	08:56	VP1	845	1	16			Transit	0.0	100.0	0.0
RN	27-Sep-16	15:23	VP1	907	2	252			Transit	0.0	11.8	88.2

9.8 Passage/Winter Bird Survey Counts of Dark-bellied Brent Goose, Golden Plover and Lapwing

Table A9.30: Baseline field counts of foraging dark-bellied brent goose in intertidal (blue), grazing marsh at east end (green) and grazing marsh/reedbed coastal sectors (grey)

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

	Field Number			1	2	3	4	5	6	7	8	9	36	48	61	29	30	31	32	33	34	35	10	11	12	13	14	15	16	17	37
	Field Area (ha)			29.3	21.5	17.9	18.7	28.9	23.0	20.9	16.2	16.7	18.6	14.4	20.1	3.6	6.1	3.1	1.8	3.9	4.2	6.0	3.9	3.6	4.2	6.6	7.3	3.8	4.5	3.6	4.8
SEASON	DATE	TIDE	SURVEY																												
SEASON 1 - WINTER 13/14	09/01/2014	LT	WBS	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	13/01/2014	HT	WBS (Farm)											0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	15/01/2014	HT	WBS	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	07/02/2014	LT	WBS	0	0	0	0	0	16	800	0	0	0	0		200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	10/02/2014	LT	WBS (Farm)											0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12/02/2014	HT	WBS	6	0	0	0	0	0	0	0	0	0	0		120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	05/03/2014	HT	WBS	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	07/03/2014	LT	WBS (Farm)											0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	10/03/2014	LT	WBS	0	0	2	2	0	17	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SEASON 2 - WINTER 14/15	08/10/2014	HT	PBS (West)	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	09/10/2014	HT	PBS (East)	0	0	0	0	0	400	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	16/10/2014	LT	PBS (East)	0	0	0	0	3500	0	0	60	0	0	0		0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0
	17/10/2014	LT	PBS (West)	0	2	49	280	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	22/10/2014	HT	PBS (West)	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	23/10/2014	HT	PBS (East)	0	0	0	0	1	0	0	24	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12/11/2014	HT	WBS (Farm)											0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	13/11/2014	LT	WBS	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	21/11/2014	HT	WBS	0	0	0	0	130	0	1	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	09/12/2014	HT	WBS	0	0	0	0	5	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	10/12/2014	HT	WBS (Farm)											0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	17/12/2014	LT	WBS	1	0	0	12	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	14/01/2015	LT	WBS	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	20/01/2015	LT	WBS (Farm)											0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	21/01/2015	HT	WBS (East)	0	0	0	7	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	18/02/2015	HT	WBS (West)	0	0	0	1	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	24/02/2015	HT	WBS	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25/02/2015	HT	WBS (Farm)											0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	26/02/2015	LT	WBS	0	80	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SEASON 3 - WINTER 15/16	30/09/2015	HT	PASS WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	01/10/2015	LT	PASS WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	28/10/2015	HT	PASS WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	29/10/2015	LT	PASS WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	23/11/2015	LT	LT INT	0	0	203	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	23/11/2015	LT	LT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	24/11/2015	HT	HT INT	0	5	135	1	0	1	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	24/11/2015	HT	HT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	14/12/2015	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	14/12/2015	HT	HT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	15/12/2015	LT	LT INT	0	50	248	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	15/12/2015	LT	LT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Field Number			1	2	3	4	5	6	7	8	9	36	48	61	29	30	31	32	33	34	35	10	11	12	13	14	15	16	17	37
	Field Area (ha)			29.3	21.5	17.9	18.7	28.9	23.0	20.9	16.2	16.7	18.6	14.4	20.1	3.6	6.1	3.1	1.8	3.9	4.2	6.0	3.9	3.6	4.2	6.6	7.3	3.8	4.5	3.6	4.8
SEASON	DATE	TIDE	SURVEY																												
	21/12/2015	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	21/12/2015	HT	NOC													0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	21/12/2015	LT	LT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	22/12/2015	HT	HT INT	0	0	0	74	0	0	0	0	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	22/12/2015	HT	HT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	05/01/2016	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	05/01/2016	LT	LT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	06/01/2016	HT	HT INT	0	0	0	0	0	6	0	520	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	06/01/2016	HT	HT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	19/01/2016	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	19/01/2016	LT	LT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	19/01/2016	LT	NOC													0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	20/01/2016	HT	HT INT	2	5	0	0	0	11	7	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	20/01/2016	HT	HT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	02/02/2016	LT	LT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	03/02/2016	HT	HT INT	0	0	0	0	105	0	0	0	270	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	03/02/2016	LT	LT INT	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	03/02/2016	HT	NOC													0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	04/02/2016	HT	HT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	16/02/2016	LT	LT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	17/02/2016	HT	HT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	01/03/2016	HT	HT INT	0	0	0	0	207	0	74	240	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	02/03/2016	LT	LT INT	0	0	0	0	0	121	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	02/03/2016	LT	LT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	02/03/2016	HT	NOC													0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	03/03/2016	HT	HT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	20/04/2016	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	21/04/2016	HT	HT WO										0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	21/04/2016	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SEASON 4 - Winter 2017/18	26/09/2017	HT	WWO	0	0	0	1	0	600	600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	27/09/2017	LT	WWO	0	0	0	0	0	220	706	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12/10/2017	HT	WWO	0	0	0	0	0	0	785	2	46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	13/10/2017	LT	WWO	0	0	0	0	320	860	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	30/10/2017	LT	WWO	0	0	0	0	6	2	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	31/10/2017	HT	WWO	0	0	0	0	0	0	0	165	620	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	06/11/2017	HT	WWO	0	0	0	0	155	75	0	0	590	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	07/11/2017	LT	WWO	23	57	0	0	3	157	244	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	22/11/2017	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	23/11/2017	LT	WWO	0	22	0	6	205	397	167	98	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	06/12/2017	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	07/12/2017	LT	WWO	0	16	0	0	46	216	0	39	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	20/12/2017	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	750	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	28/12/2017	LT	WWO	1	2	0	0	0	0	0	55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12/01/2018	LT	WWO	0	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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

Table A9.31: Baseline field counts of foraging dark-bellied brent goose in arable count sectors (yellow)

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

	Field Number			18	19	20	21	22	23	24	25	26	27	28	38	39	40	41	42	43	44	45	46	47	49	50	51	52	53	54	55	56	57	58	59	60	TOTAL	ARABLE
	Field Area (ha)			10.1	14.2	17.1	9.9	6.0	14.7	8.8	11.9	7.6	8.3	13.7	10.7	10.7	18.9	10.2	8.1	14.3	19.6	6.8	8.2	4.8	6.5	14.9	24.9	26.1	22.1	9.4	12.2	8.4	3.4	7.7	3.0	16.4		
SEASON	DATE	TIDE	SURVEY																																			
SEASON 1 - WINTER 13/14	09/01/2014	LT	WBS	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3011	3011
	13/01/2014	HT	WBS (Farm)	0	0	0	0	0	0	0	0	0	0	2000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2000	2000
	15/01/2014	HT	WBS	0	0	0	0	0	0	0	0	0	2500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2500	2500
	07/02/2014	LT	WBS	0	0	0	0	0	0	0	0	0	134	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1150	134
	10/02/2014	LT	WBS (Farm)	0	0	0	0	0	0	50	300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	350	350
	12/02/2014	HT	WBS	0	0	0	0	0	0	0	0	0	0	700	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	826	700
	05/03/2014	HT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	07/03/2014	LT	WBS (Farm)	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
	10/03/2014	LT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21	0
SEASON 2 - WINTER 14/15	08/10/2014	HT	PBS (West)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	400	0
	09/10/2014	HT	PBS (East)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	16/10/2014	LT	PBS (East)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3916	0
	17/10/2014	LT	PBS (West)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	22/10/2014	HT	PBS (West)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0
	23/10/2014	HT	PBS (East)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	12/11/2014	HT	WBS (Farm)	0	0	0	0	0	0	0	2000	1400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3400	3400
	13/11/2014	LT	WBS	0	0	0	1000	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1006	1006
	21/11/2014	HT	WBS	0	0	0	0	150	0	650	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	931	800
	09/12/2014	HT	WBS	0	0	0	0	0	0	0	430	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	449	444
	10/12/2014	HT	WBS (Farm)	0	0	0	0	0	0	4	0	500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	504	504
	17/12/2014	LT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0
	14/01/2015	LT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	20/01/2015	LT	WBS (Farm)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	21/01/2015	HT	WBS (East)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	18/02/2015	HT	WBS (West)	0	0	0	0	0	0	900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	908	900
	24/02/2015	HT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25/02/2015	HT	WBS (Farm)	0	0	0	0	0	0	0	0	150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	150	150
	26/02/2015	LT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	980	900
SEASON 3 - WINTER 15/16	30/09/2015	HT	PASS WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	01/10/2015	LT	PASS WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	28/10/2015	HT	PASS WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	29/10/2015	LT	PASS WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	23/11/2015	LT	LT INT	0	0	95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	299	95
	23/11/2015	LT	LT WO	0	373	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	373	373
	24/11/2015	HT	HT INT	0	250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	396	250
	24/11/2015	HT	HT WO	3	290	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	293	293
	14/12/2015	HT	HT INT	0	0	300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	300	300
	14/12/2015	HT	HT WO	0	270	340	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	340	340
	15/12/2015	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	306	0
	15/12/2015	LT	LT WO	0	220	0	0	0	0	0	0	0	0	0	0	390	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	390	390
	21/12/2015	LT	LT INT	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	100

	Field Number			18	19	20	21	22	23	24	25	26	27	28	38	39	40	41	42	43	44	45	46	47	49	50	51	52	53	54	55	56	57	58	59	60	TOTAL	ARABLE
	Field Area (ha)			10.1	14.2	17.1	9.9	6.0	14.7	8.8	11.9	7.6	8.3	13.7	10.7	10.7	18.9	10.2	8.1	14.3	19.6	6.8	8.2	4.8	6.5	14.9	24.9	26.1	22.1	9.4	12.2	8.4	3.4	7.7	3.0	16.4		
SEASON	DATE	TIDE	SURVEY																																			
	21/12/2015	HT	NOC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	21/12/2015	LT	LT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	22/12/2015	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	109	0
	22/12/2015	HT	HT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	05/01/2016	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	05/01/2016	LT	LT WO	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
	06/01/2016	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	526	0
	06/01/2016	HT	HT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	19/01/2016	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	19/01/2016	LT	LT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	19/01/2016	LT	NOC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	20/01/2016	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	0
	20/01/2016	HT	HT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	02/02/2016	LT	LT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	03/02/2016	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	375	0
	03/02/2016	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
	03/02/2016	HT	NOC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	04/02/2016	HT	HT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	16/02/2016	LT	LT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	17/02/2016	HT	HT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	01/03/2016	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	556	0
	02/03/2016	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	121	0
	02/03/2016	LT	LT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	02/03/2016	HT	NOC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	03/03/2016	HT	HT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	20/04/2016	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	21/04/2016	HT	HT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	21/04/2016	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SEASON 4 - Winter 2017/18	26/09/2017	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1201	0
	27/09/2017	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	926	0
	12/10/2017	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	833	0
	13/10/2017	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1180	0
	30/10/2017	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0
	31/10/2017	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	785	0
	06/11/2017	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	820	0
	07/11/2017	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	493	0
	22/11/2017	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	23/11/2017	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	930	0
	06/12/2017	HT	WWO	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
	07/12/2017	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	332	0
	20/12/2017	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	750	0
	28/12/2017	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	58	0
	12/01/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	0
	16/01/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	619	600

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

Table A9.32: Baseline field counts of foraging lapwing in intertidal (blue), grazing marsh at east end (green) and grazing marsh/reedbed coastal sectors (grey)

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

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

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

SEASON 4 - Winter 2017/18

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

Table A9.33: Baseline field counts of foraging lapwing in arable count sectors (yellow)

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

	Field Number			18	19	20	21	22	23	24	25	26	27	28	38	39	40	41	42	43	44	45	46	47	49	50	51	52	53	54	55	56	57	58	59	60	TOTAL	ARABLE
	Field Area (ha)			10.1	14.2	17.1	9.9	6.0	14.7	8.8	11.9	7.6	8.3	13.7	10.7	10.7	18.9	10.2	8.1	14.3	19.6	6.8	8.2	4.8	6.5	14.9	24.9	26.1	22.1	9.4	12.2	8.4	3.4	7.7	3.0	16.4		
SEASON	DATE	TIDE	SURVEY																																			
SEASON 1 - WINTER 13/14	09/01/2014	LT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180	0	0	0	0	0	0	0	0	0	0	431	180
	13/01/2014	HT	WBS (Farm)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	2	0	2	0	0	0	0	0	8	8
	15/01/2014	HT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	400	0
	07/02/2014	LT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	10/02/2014	LT	WBS (Farm)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12/02/2014	HT	WBS	0	0	0	0	0	0	0	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31	30
	05/03/2014	HT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	07/03/2014	LT	WBS (Farm)	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	6	6
	10/03/2014	LT	WBS	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5
SEASON 2 - WINTER 14/15	08/10/2014	HT	PBS (West)	300	180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	600	600
	09/10/2014	HT	PBS (East)	0	0	0	0	0	0	0	120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	16/10/2014	LT	PBS (East)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43	0
	17/10/2014	LT	PBS (West)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	22/10/2014	HT	PBS (West)	0	0	0	0	0	0	0	0	0	0	0	0	150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	170	154
	23/10/2014	HT	PBS (East)	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	12/11/2014	HT	WBS (Farm)	400	0	0	0	0	0	0	0	0	0	313	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	713	713
	13/11/2014	LT	WBS	90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	660	90
	21/11/2014	HT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	09/12/2014	HT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	10/12/2014	HT	WBS (Farm)	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	9
	17/12/2014	LT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	14/01/2015	LT	WBS	0	0	0	0	0	0	0	0	0	0	300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	300	300
	20/01/2015	LT	WBS (Farm)	0	0	0	0	0	0	0	0	0	28	0	0	0	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	0	0	0	0	128	128
	21/01/2015	HT	WBS (East)	0	0	0	0	0	0	0	42	27	0	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	92	91
	18/02/2015	HT	WBS (West)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	24/02/2015	HT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25/02/2015	HT	WBS (Farm)	0	0	0	0	0	0	0	0	0	0	220	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	223	221
	26/02/2015	LT	WBS	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4
SEASON 3 - WINTER 15/16	30/09/2015	HT	PASS WO	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35	20
	01/10/2015	LT	PASS WO	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
	28/10/2015	HT	PASS WO	0	0	225	310	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	390	390
	29/10/2015	LT	PASS WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1
	23/11/2015	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	23/11/2015	LT	LT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	93	0	220	0	290	0	55	240	0	0	898	898
	24/11/2015	HT	HT INT	119	0	0	62	320	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	461	451
	24/11/2015	HT	HT WO	300	40	0	120	120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4	0	18	0	0	0	0	0	0	484	484
	14/12/2015	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	14/12/2015	HT	HT WO	0	0	0	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35	35
	15/12/2015	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28	0
	15/12/2015	LT	LT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	21/12/2015	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	92	0

	Field Number			18	19	20	21	22	23	24	25	26	27	28	38	39	40	41	42	43	44	45	46	47	49	50	51	52	53	54	55	56	57	58	59	60	TOTAL	ARABLE
	Field Area (ha)			10.1	14.2	17.1	9.9	6.0	14.7	8.8	11.9	7.6	8.3	13.7	10.7	10.7	18.9	10.2	8.1	14.3	19.6	6.8	8.2	4.8	6.5	14.9	24.9	26.1	22.1	9.4	12.2	8.4	3.4	7.7	3.0	16.4		
SEASON	DATE	TIDE	SURVEY																																			
	21/12/2015	HT	NOC	5	10	2	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	30	30
	21/12/2015	LT	LT WO	0	0	45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45	45
	22/12/2015	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	81	1
	22/12/2015	HT	HT WO	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	5	5
	05/01/2016	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
	05/01/2016	LT	LT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	06/01/2016	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	262	2
	06/01/2016	HT	HT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0
	19/01/2016	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38	0	0	0	0	0	0	0	0	0	86	38
	19/01/2016	LT	LT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	115	85	150	130	0	0	0	0	0	567	432
	19/01/2016	LT	NOC	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	16	32	16	100	2	40	8	0	10	0	3	228	228
	20/01/2016	HT	HT INT	2	0	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69	14
	20/01/2016	HT	HT WO	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	131	131	30	110	0	45	155	0	0	646	606
	02/02/2016	LT	LT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	03/02/2016	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	437	1
	03/02/2016	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	300	0	0	0	0	0	600	300
	03/02/2016	HT	NOC	0	2	30	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	4	7	2	13	3	0	0	0	10	0	0	72	72
	04/02/2016	HT	HT WO	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	308	8
	16/02/2016	LT	LT WO	0	0	0	0	0	0	0	0	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	154	0	0	0	0	185	0	0	414	414
	17/02/2016	HT	HT WO	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60	0	12	0	0	78	75
	01/03/2016	HT	HT INT	180	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	189	189
	02/03/2016	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	02/03/2016	LT	LT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	02/03/2016	HT	NOC	0	0	1	0	0	1	4	0	12	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	20	20
	03/03/2016	HT	HT WO	0	0	0	0	0	0	0	0	125	125	0	0	0	0	0	0	26	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	277	277
	20/04/2016	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	21/04/2016	HT	HT WO	0	0	0	0	0	2	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	7	7
	21/04/2016	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SEASON 4 - Winter 2017/18	26/09/2017	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	27/09/2017	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0
	12/10/2017	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	13/10/2017	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42	0
	30/10/2017	LT	WWO	0	0	0	0	0	0	0	10	4	14	7	0	0	0	0	0	3	35	30	6	12	0	0	0	0	2	87	0	0	0	0	0	0	136	130
	31/10/2017	HT	WWO	0	0	0	0	0	0	0	0	6	20	8	0	0	0	0	0	0	49	19	14	9	0	0	0	0	0	37	55	0	0	0	0	0	219	217
	06/11/2017	HT	WWO	0	0	0	0	0	0	65	30	5	19	5	0	0	0	0	0	90	18	69	19	0	0	0	0	0	0	39	0	0	0	0	0	0	364	359
	07/11/2017	LT	WWO	0	0	0	0	0	0	0	38	5	19	24	0	0	0	0	0	3	52	24	38	29	0	0	0	0	0	0	0	0	22	0	0	0	257	254
	22/11/2017	HT	WWO	30	300	0	0	0	0	0	78	4	13	27	0	100	0	0	0	0	26	58	30	18	0	0	0	0	0	0	0	0	0	0	0	0	684	684
	23/11/2017	LT	WWO	160	85	0	0	0	0	7	44	7	13	19	0	0	0	0	0	0	88	55	14	15	0	0	0	0	0	67	0	0	0	0	0	0	749	574
	06/12/2017	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	07/12/2017	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0
	20/12/2017	HT	WWO	0	0	1	0	0	0	0	87	6	2	11	0	0	0	0	0	0	84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	293	191
	28/12/2017	LT	WWO	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	53	0	155	2	0	0	0	0	0	0	0	0	0	0	0	0	105	451	316
	12/01/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	371	1
	16/01/2018	HT	WWO	430	0	0	0	0	0	0	115	0	0	0	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	935	585

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

Table A9.34: Baseline field counts of foraging golden plover in intertidal (blue), grazing marsh at east end (green) and grazing marsh/reedbed coastal sectors (grey)

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

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

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

	Field Number			1	2	3	4	5	6	7	8	9	36	48	61	29	30	31	32	33	34	35	10	11	12	13	14	15	16	17	37
	Field Area (ha)			29.3	21.5	17.9	18.7	28.9	23.0	20.9	16.2	16.7	18.6	14.4	20.1	3.6	6.1	3.1	1.8	3.9	4.2	6.0	3.9	3.6	4.2	6.6	7.3	3.8	4.5	3.6	4.8
SEASON	DATE	TIDE	SURVEY																												
	16/01/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	27/01/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	330	0	0	0	0	0	0	0	0	0
	30/01/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	09/02/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	250	200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	15/02/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	21/02/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	26/02/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	01/03/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	4	0
	06/03/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	16/03/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	27/03/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	06/04/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12/04/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table A9.35: Baseline field counts of foraging golden plover in arable count sectors (yellow)

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

	Field Number			18	19	20	21	22	23	24	25	26	27	28	38	39	40	41	42	43	44	45	46	47	49	50	51	52	53	54	55	56	57	58	59	60	TOTAL	ARABLE
	Field Area (ha)			10.1	14.2	17.1	9.9	6.0	14.7	8.8	11.9	7.6	8.3	13.7	10.7	10.7	18.9	10.2	8.1	14.3	19.6	6.8	8.2	4.8	6.5	14.9	24.9	26.1	22.1	9.4	12.2	8.4	3.4	7.7	3.0	16.4		
SEASON	DATE	TIDE	SURVEY																																			
SEASON 1 - WINTER 13/14	09/01/2014	LT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	13/01/2014	HT	WBS (Farm)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	15/01/2014	HT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
	07/02/2014	LT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	10/02/2014	LT	WBS (Farm)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12/02/2014	HT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	05/03/2014	HT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	07/03/2014	LT	WBS (Farm)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	10/03/2014	LT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SEASON 2 - WINTER 14/15	08/10/2014	HT	PBS (West)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	09/10/2014	HT	PBS (East)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	16/10/2014	LT	PBS (East)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	17/10/2014	LT	PBS (West)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	22/10/2014	HT	PBS (West)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	23/10/2014	HT	PBS (East)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	12/11/2014	HT	WBS (Farm)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	13/11/2014	LT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	21/11/2014	HT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	09/12/2014	HT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	10/12/2014	HT	WBS (Farm)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	17/12/2014	LT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	14/01/2015	LT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
	20/01/2015	LT	WBS (Farm)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	21/01/2015	HT	WBS (East)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	18/02/2015	HT	WBS (West)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	24/02/2015	HT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25/02/2015	HT	WBS (Farm)	0	0	0	0	0	0	0	0	0	0	40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	40
	26/02/2015	LT	WBS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SEASON 3 - WINTER 15/16	30/09/2015	HT	PASS WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	01/10/2015	LT	PASS WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	28/10/2015	HT	PASS WO	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	5
	29/10/2015	LT	PASS WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	23/11/2015	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	23/11/2015	LT	LT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29	0	0	29	29
	24/11/2015	HT	HT INT	0	0	0	0	150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	150	150
	24/11/2015	HT	HT WO	0	0	70	270	270	0	0	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	285	285
	14/12/2015	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	14/12/2015	HT	HT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	15/12/2015	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	15/12/2015	LT	LT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	21/12/2015	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Field Number			18	19	20	21	22	23	24	25	26	27	28	38	39	40	41	42	43	44	45	46	47	49	50	51	52	53	54	55	56	57	58	59	60	TOTAL	ARABLE
	Field Area (ha)			10.1	14.2	17.1	9.9	6.0	14.7	8.8	11.9	7.6	8.3	13.7	10.7	10.7	18.9	10.2	8.1	14.3	19.6	6.8	8.2	4.8	6.5	14.9	24.9	26.1	22.1	9.4	12.2	8.4	3.4	7.7	3.0	16.4		
SEASON	DATE	TIDE	SURVEY																																			
	21/12/2015	HT	NOC	0	30	23	10	10	0	0	0	0	0	0	0	20	20	0	0	0	0	0	0	0	0	8	46	0	0	0	0	0	0	0	0	0	167	167
	21/12/2015	LT	LT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	22/12/2015	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	22/12/2015	HT	HT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	05/01/2016	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	05/01/2016	LT	LT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	06/01/2016	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	06/01/2016	HT	HT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	19/01/2016	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	19/01/2016	LT	LT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	130	0	0	0	0	0	1	0	0	134	131
	19/01/2016	LT	NOC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	3	22	32	20	1	4	0	0	1	0	0	89	89
	20/01/2016	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	14	14
	20/01/2016	HT	HT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	200	204	15	75	0	0	10	0	0	399	304
	02/02/2016	LT	LT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	03/02/2016	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500	0
	03/02/2016	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90	0	0	0	0	0	440	90
	03/02/2016	HT	NOC	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	15	0	0	0	0	0	35	35
	04/02/2016	HT	HT WO	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	812	2
	16/02/2016	LT	LT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	0	70	0	0	0	0	0	100	100
	17/02/2016	HT	HT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	456	0	54	0	0	513	513
	01/03/2016	HT	HT INT	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	3
	02/03/2016	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	490	0
	02/03/2016	LT	LT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	410	0
	02/03/2016	HT	NOC	0	0	5	2	100	50	0	0	0	1	100	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	260	260
	03/03/2016	HT	HT WO	0	0	0	0	0	0	0	0	400	400	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	830	800
	20/04/2016	HT	HT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	21/04/2016	HT	HT WO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	21/04/2016	LT	LT INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SEASON 4 - Winter 2017/18	26/09/2017	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0
	27/09/2017	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12/10/2017	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	13/10/2017	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	30/10/2017	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	200	0
	31/10/2017	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	360	0	0	140	110	0	0	0	0	0	0	0	0	0	0	0	610	610
	06/11/2017	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	07/11/2017	LT	WWO	0	0	0	0	0	0	0	0	0	43	28	0	0	0	0	0	0	0	190	0	40	80	0	0	0	0	0	0	0	0	0	0	0	381	381
	22/11/2017	HT	WWO	0	0	0	0	0	0	0	150	50	0	0	0	0	0	0	0	0	0	0	76	0	0	0	0	0	0	0	0	0	0	0	0	0	276	276
	23/11/2017	LT	WWO	0	0	0	0	0	0	0	144	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	148	144
	06/12/2017	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	07/12/2017	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0
	20/12/2017	HT	WWO	0	0	0	0	0	0	0	0	0	225	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	525	225
	28/12/2017	LT	WWO	0	0	0	0	0	0	0	43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55	43
	12/01/2018	LT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	0
	16/01/2018	HT	WWO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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

Figures



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CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- Core Survey Area
- 2 km Desk Study Species Search Area
- Other Designated Site Search Area
- SPA Site Search Area

1:100,000 Scale @ A3

0 2 4 km

NORTH

Produced By: SC	Ref: 2238-REP-252
Checked By: MA	Date: 07/11/2018

Desk Study Areas
Figure A9.1

Cleve Hill Solar Park
Environmental Statement

CLEVE HILL SOLAR PARK

ARCUS

Site Boundary

Core Survey Area

1:20,000 Scale @ A3

0 0.5 1 km NORTH

Produced By: SC	Ref: 2238-REP-253
Checked By: MA	Date: 01/11/2018

Breeding Bird Survey Area
Figure A9.2

Cleve Hill Solar Park
Environmental Statement

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CLEVE HILL SOLAR PARK

ARCUS

Site Boundary

Core Survey Area

Species

- CK Cuckoo
- D. Dunnock
- HS House Sparrow
- LI Linnet
- MR Marsh Harrier
- MP Meadow Pipit
- RB Reed Bunting
- S. Skylark
- YW Yellow Wagtail

1:20,000 Scale @ A3

0 0.5 1 km NORTH

Produced By: SC	Ref: 2238-REP-254
Checked By: MA	Date: 01/11/2018

Breeding Bird Survey Results 2014
Figure A9.3

Cleve Hill Solar Park Environmental Statement

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CLEVE HILL SOLAR PARK

ARCUS

Site Boundary

Core Survey Area

Species

- BR Bearded Tit
- CW Cetti's Warbler
- D. Dunnock
- HS House Sparrow
- LI Linnet
- RB Reed Bunting
- S. Skylark
- YW Yellow Wagtail

1:20,000 Scale @ A3

0 0.5 1 km

NORTH

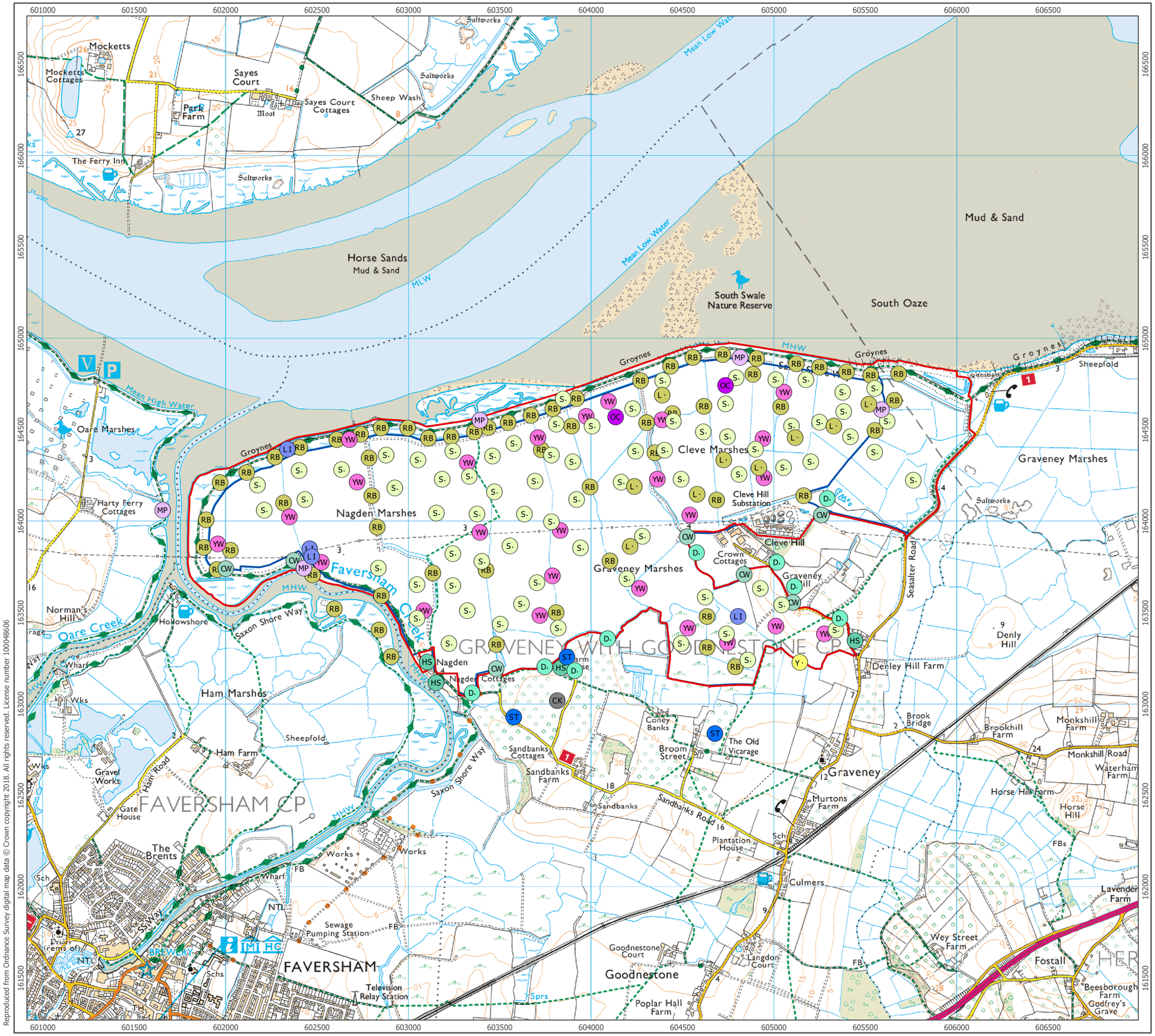
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Checked By: MA	Date: 01/11/2018

Breeding Bird Survey Results 2015
Figure A9.4

Cleve Hill Solar Park Environmental Statement

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P:\Projects\Ornithology\Projects\2238 Cleve Hill\ES Technical Appendix.aprx\2238-REP-255 FigA9.4 Breeding Bird Survey Results 2015



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CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- Core Survey Area

Species

- CW Cetti's Warbler
- CK Cuckoo
- D. Dunnock
- HS House Sparrow
- L. Lapwing
- LI Linnet
- MP Meadow Pipit
- OC Oystercatcher
- RB Reed Bunting
- S. Skylark
- ST Song Thrush
- YW Yellow Wagtail
- Y. Yellowhammer

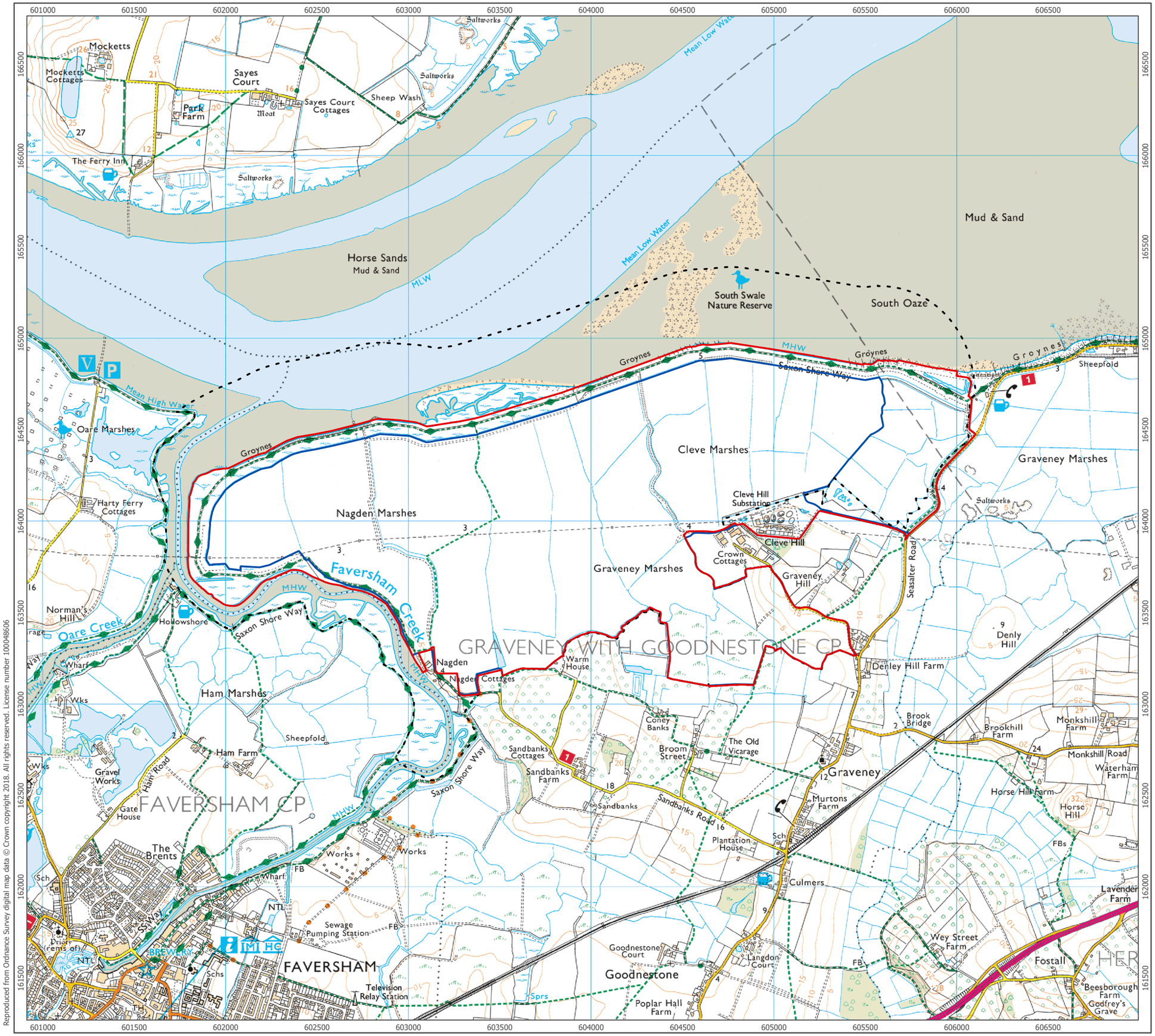
1:20,000 Scale @ A3

0 0.5 1 km NORTH

Produced By: SC	Ref: 2238-REP-256
Checked By: MA	Date: 01/11/2018

Breeding Bird Survey Results 2016
Figure A9.5

Cleve Hill Solar Park Preliminary Environmental Information Report



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P:\Projects\Ornithology\Projects\2238 Cleve Hill\ES Technical Appendix.aprx\2238-REP-257 FigA9.6 Passage-Winter Bird Survey Area

CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- Core Survey Area
- Winter Bird Survey Area 2015/16 and 2017/18

1:20,000 Scale @ A3

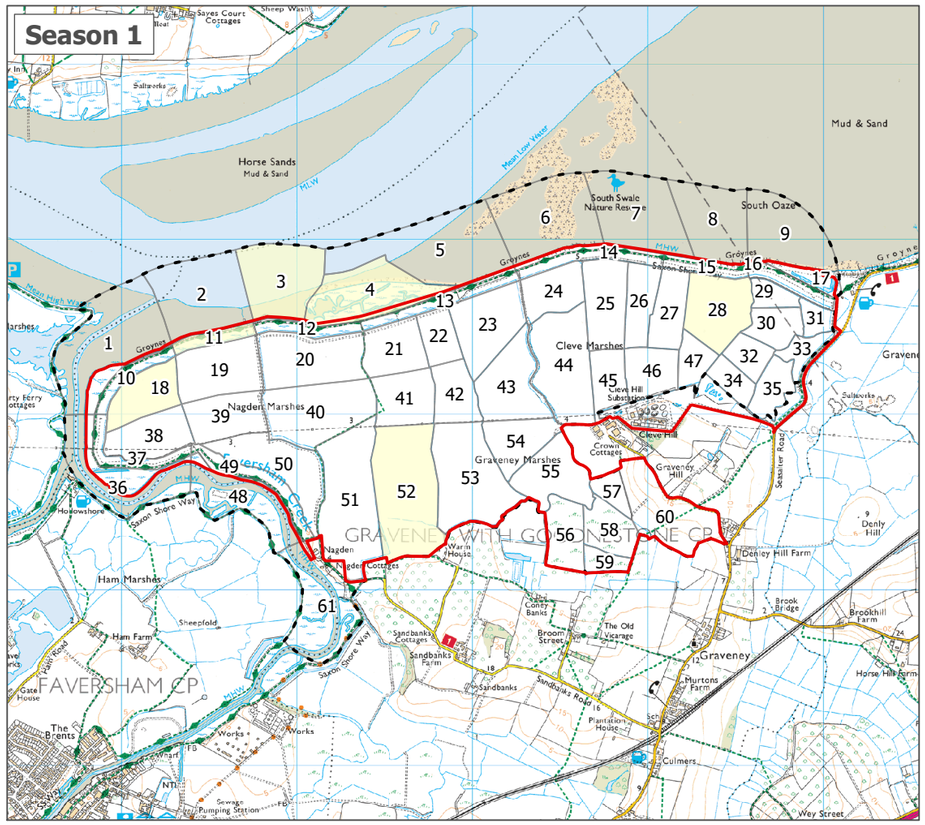
0 0.5 1 km

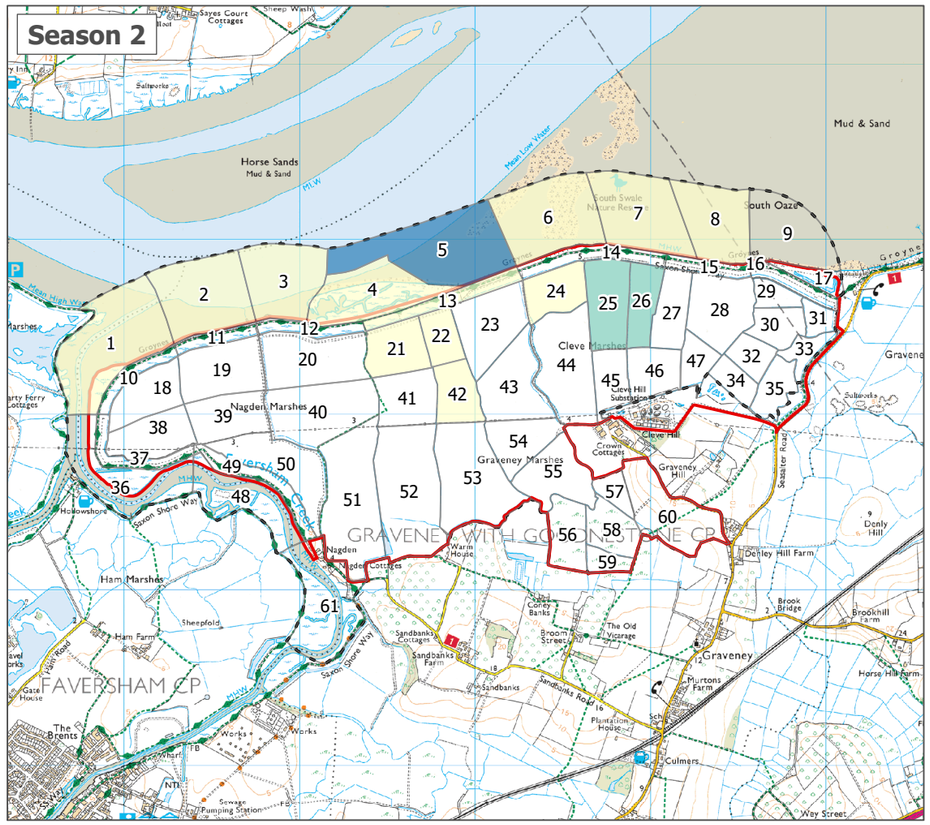
NORTH

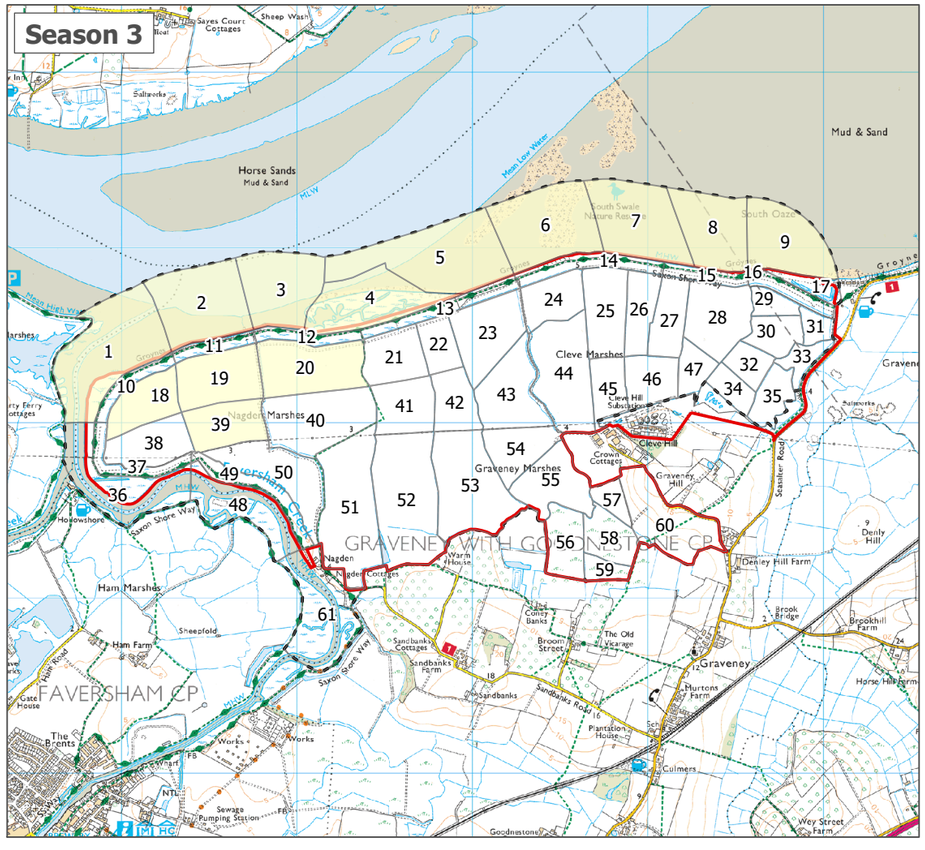
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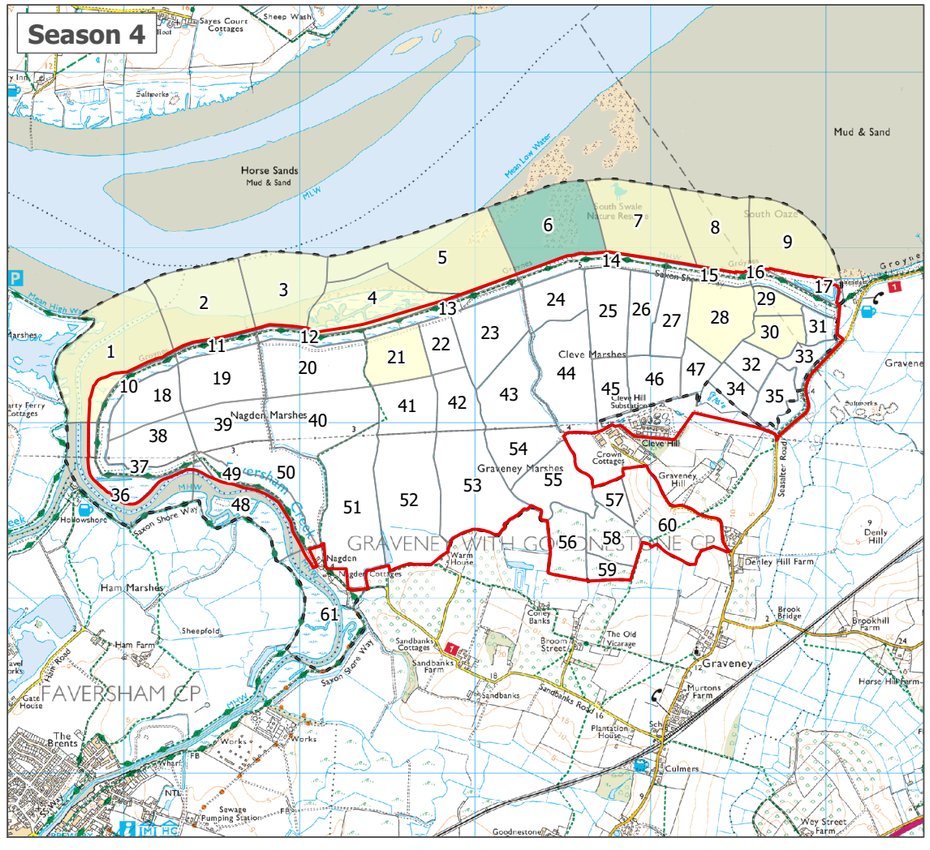
Passage/Winter Bird Survey Area
Figure A9.6

Cleve Hill Solar Park
Environmental Statement









CLEVE HILL SOLAR PARK

ARCUS

Site Boundary

Winter Bird Survey Area 2016/17 and 2017/18

Mallard mean bird days

MeanBirdDays_Combined_cs

- 0
- 1 - 14,000
- 14,000 - 28,000
- 28,000 - 42,000
- 42,000 - 56,000
- 56,000 - 70,000

1:35,000 Scale @ A3

0 0.75 1.5 km

NORTH

Produced By: SC	Ref: 2238-REP-258
Checked By: MA	Date: 14/11/2018

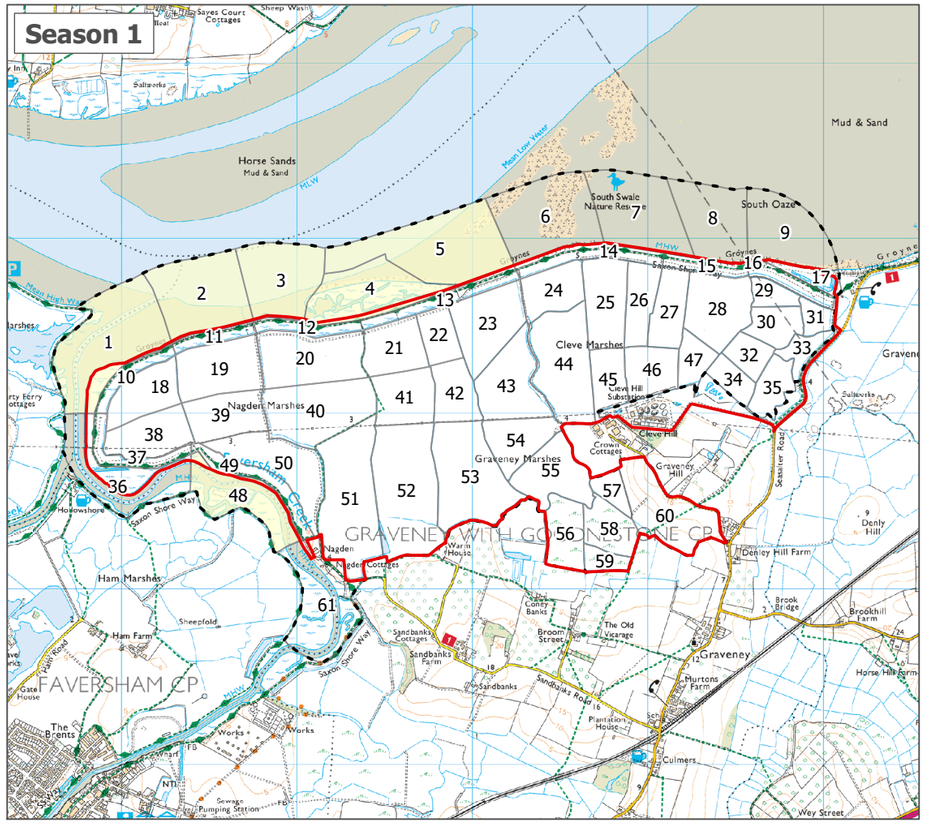
Passage/Winter Bird Survey Results: Dark-bellied Brent Goose

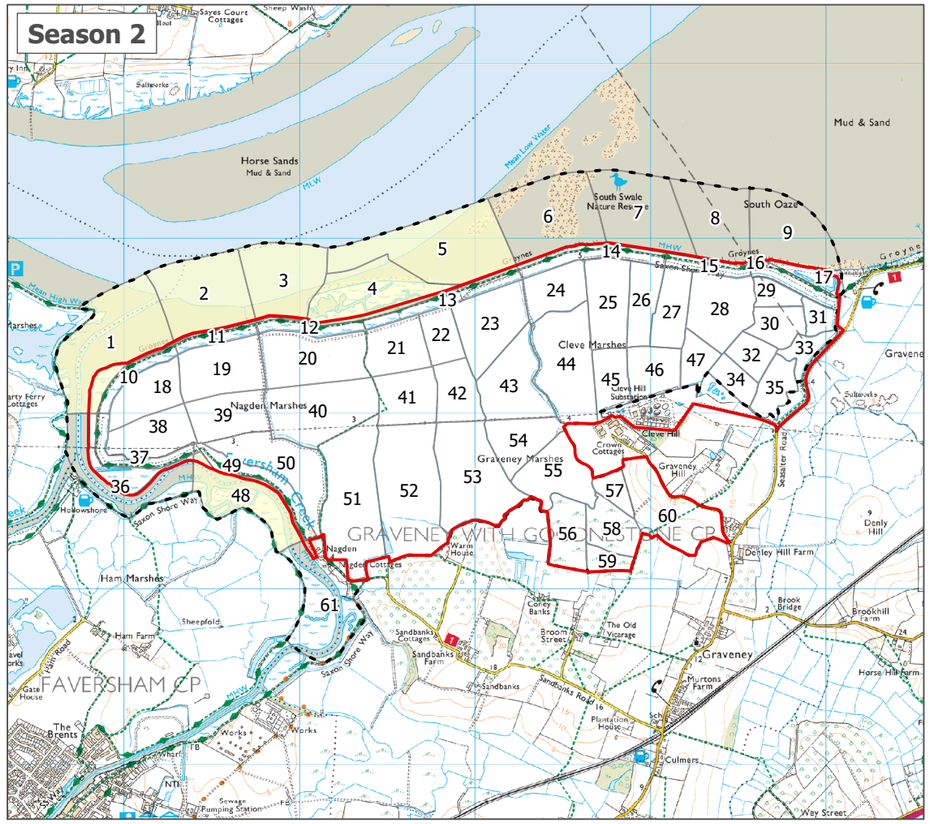
Figure A9.7

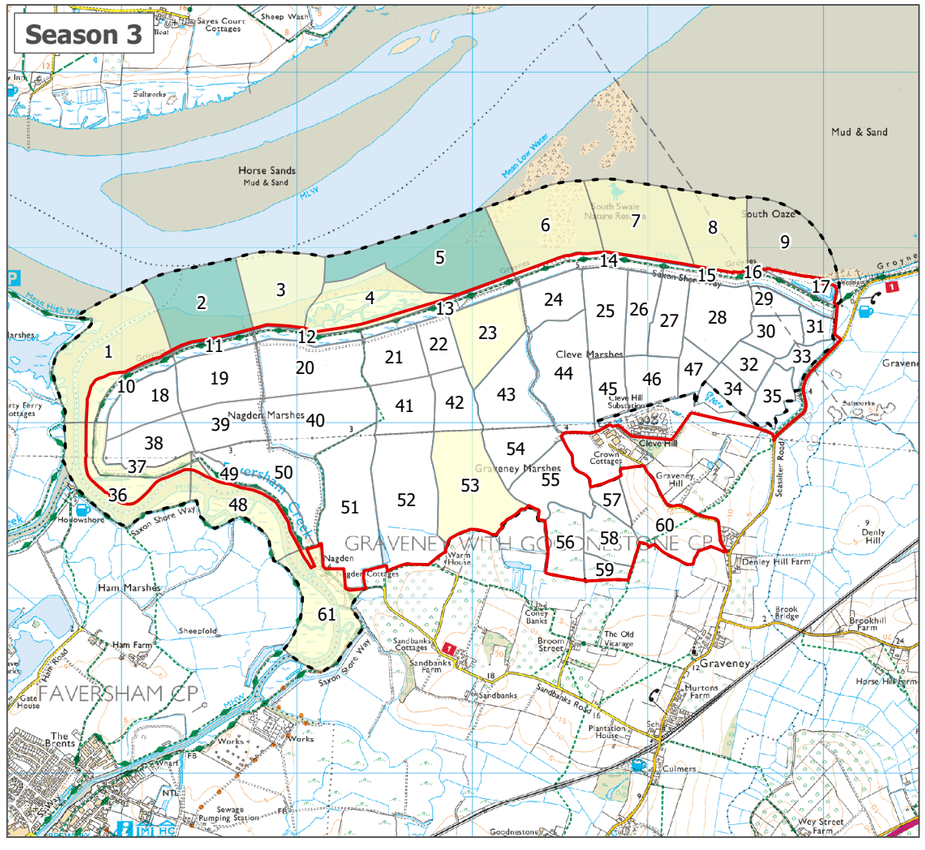
Cleve Hill Solar Park Environmental Statement

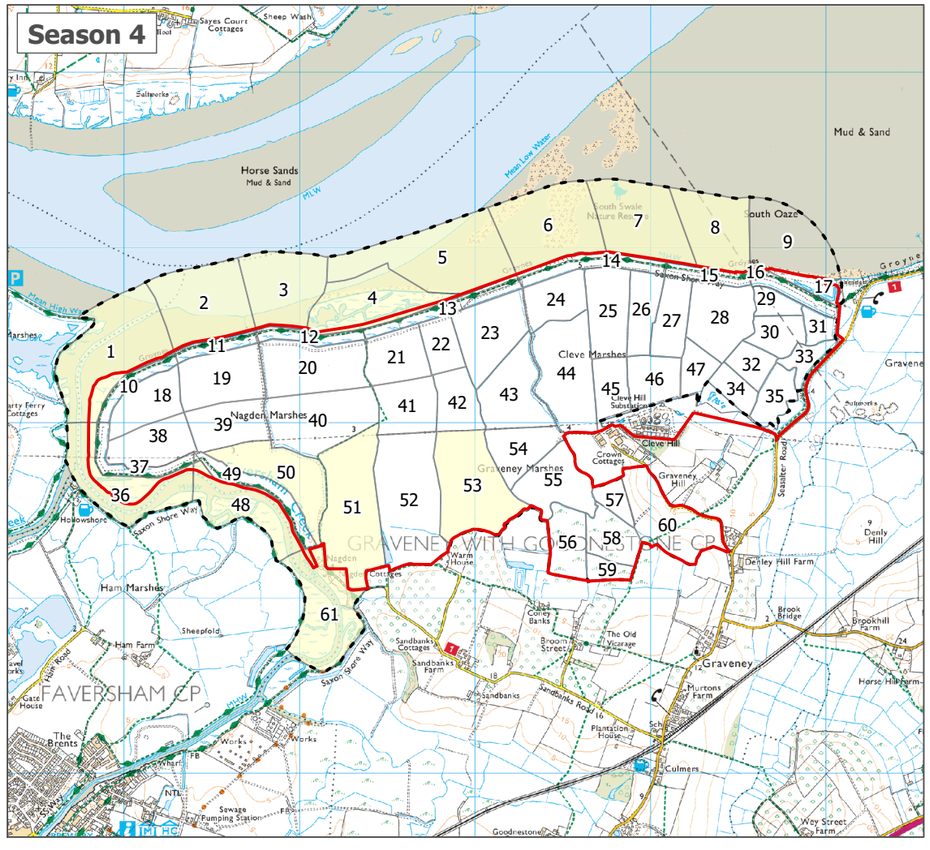
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CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- Winter Bird Survey Area 2016/17 and 2017/18

Shelduck mean bird days

- 0
- 1 - 2,000
- 2,000 - 4,000
- 4,000 - 6,000
- 6,000 - 8,000
- 8,000 - 10,000

1:35,000 Scale @ A3

0 0.75 1.5 km

NORTH

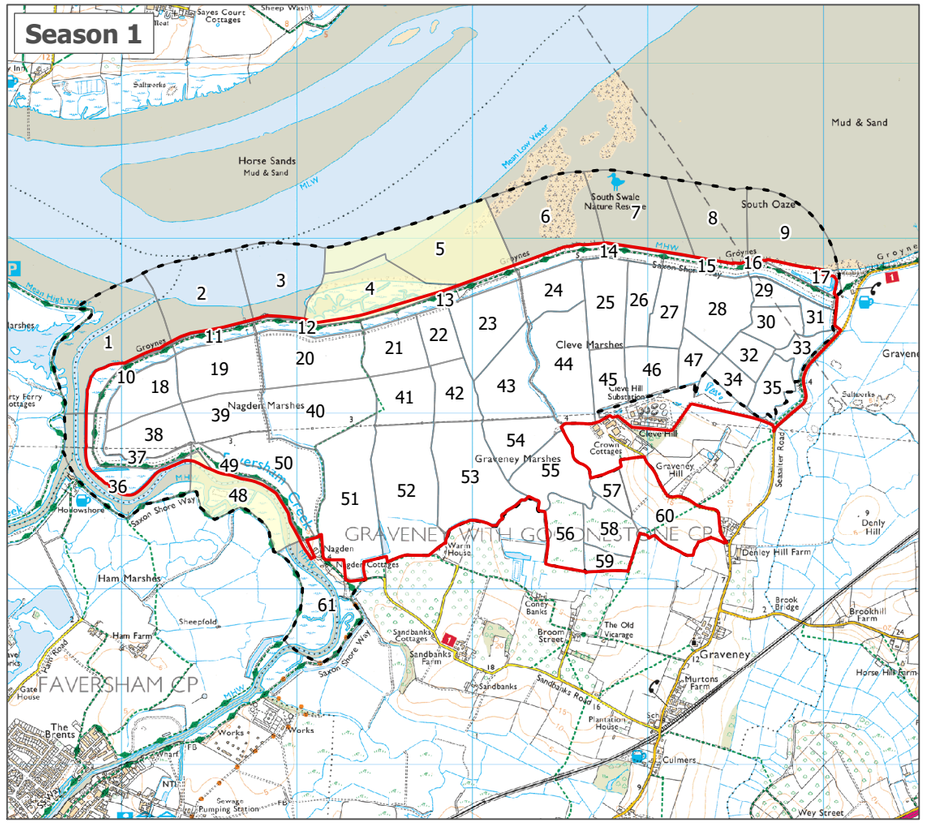
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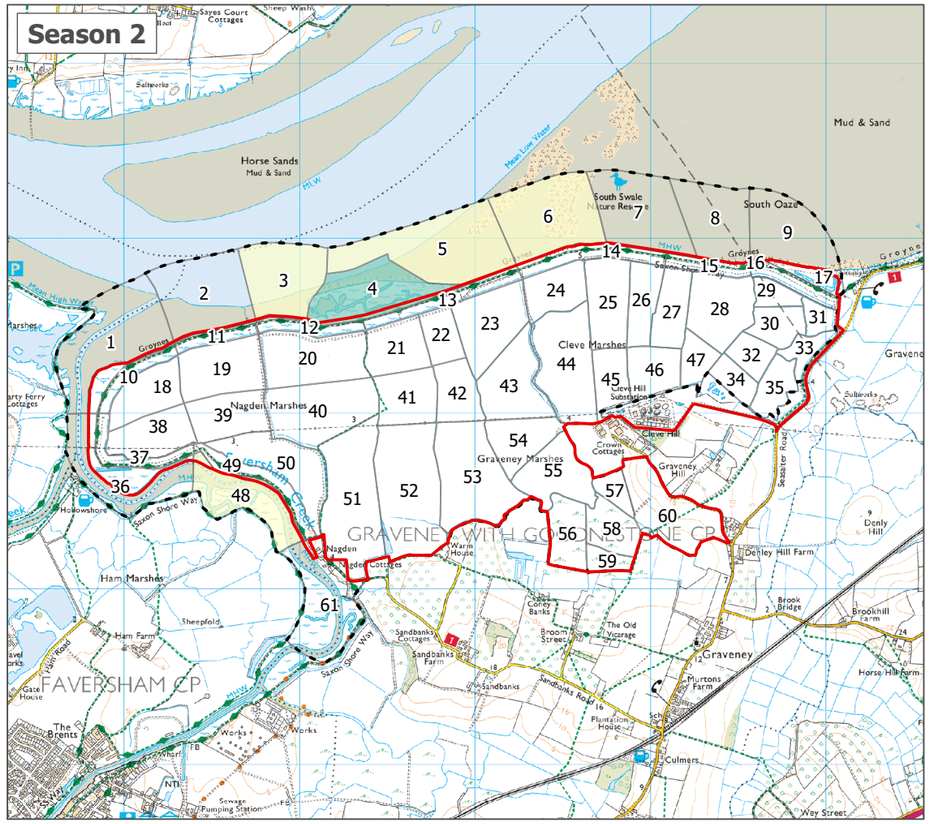
Passage/Winter Bird Survey Results: Shelduck
Figure A9.8

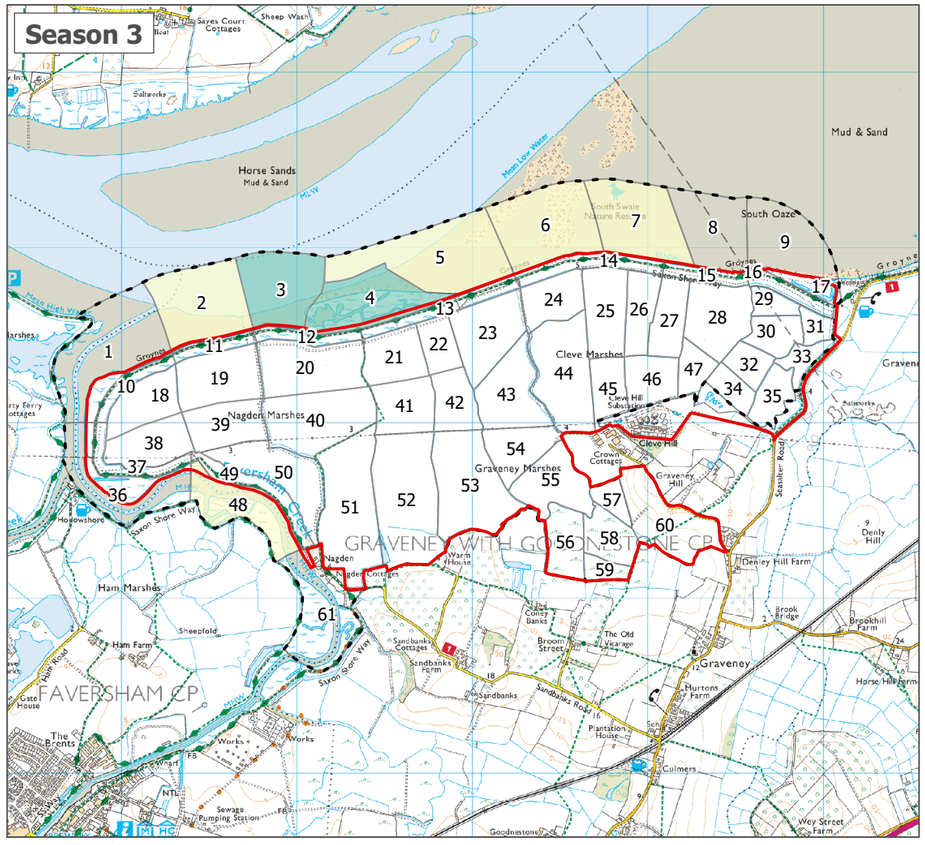
Cleve Hill Solar Park Environmental Statement

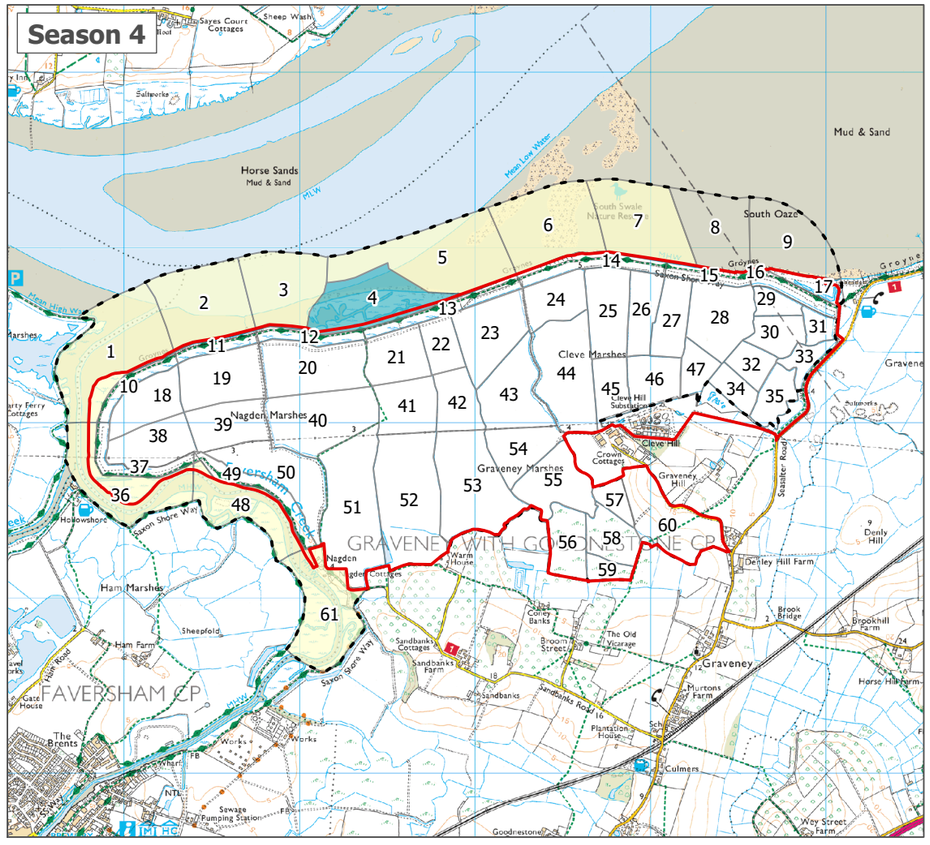
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CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- Winter Bird Survey Area 2016/17 and 2017/18

Wigeon mean bird days

- 0
- 1 - 6,000
- 6,000 - 12,000
- 12,000 - 18,000
- 18,000 - 24,000
- 24,000 - 30,000

1:35,000 Scale @ A3

0 0.75 1.5 km

NORTH

Produced By: SC	Ref: 2238-REP-260
Checked By: MA	Date: 14/11/2018

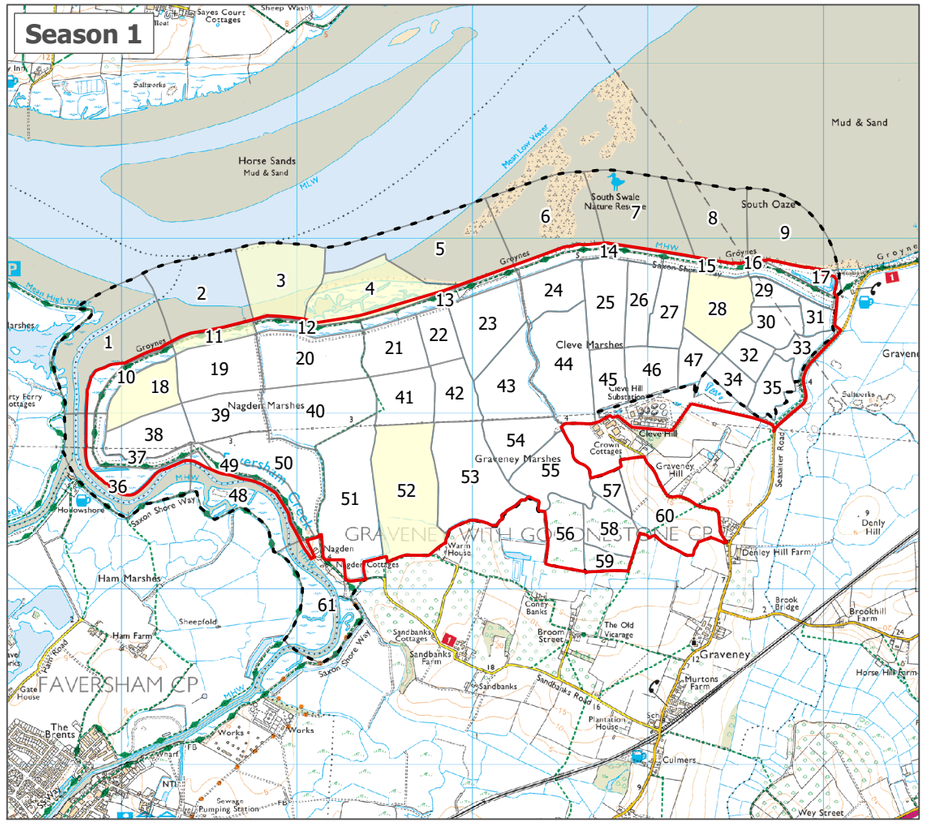
Passage/Winter Bird Survey Results: Wigeon

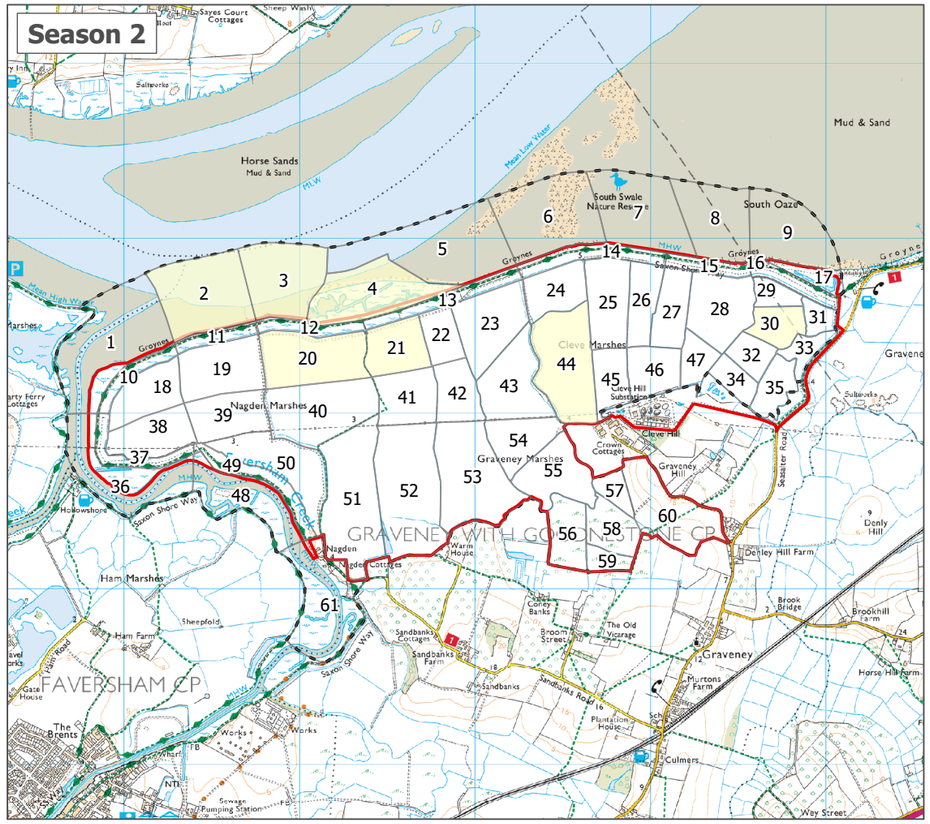
Figure A9.9

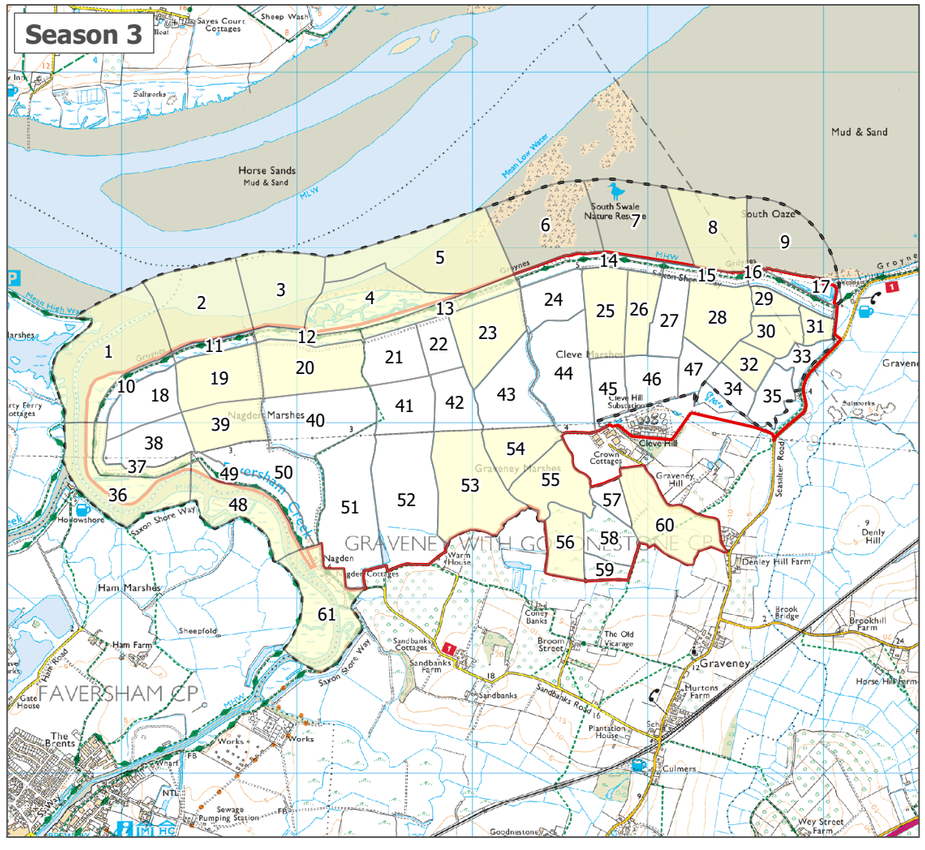
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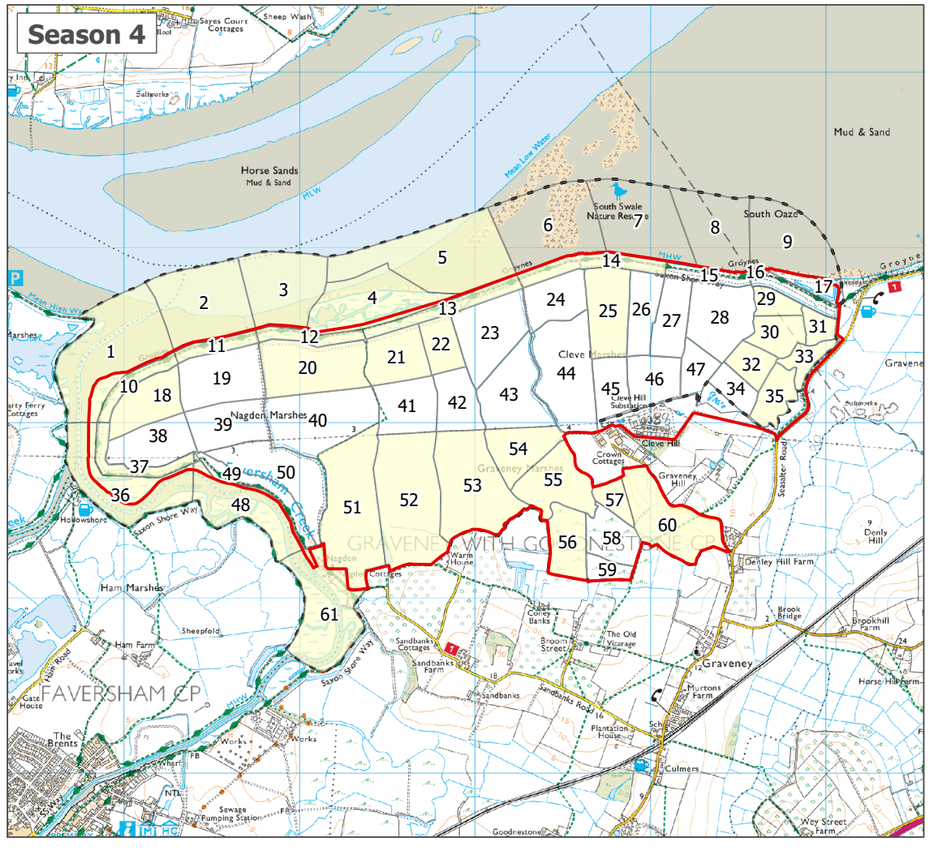
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CLEVE HILL SOLAR PARK

ARCUS

Site Boundary

Winter Bird Survey Area 2016/17 and 2017/18

Mallard mean bird days

- 0
- 1 - 2,000
- 2,000 - 4,000
- 4,000 - 6,000
- 6,000 - 8,000
- 8,000 - 10,000

1:35,000 Scale @ A3

0 0.75 1.5 km

NORTH

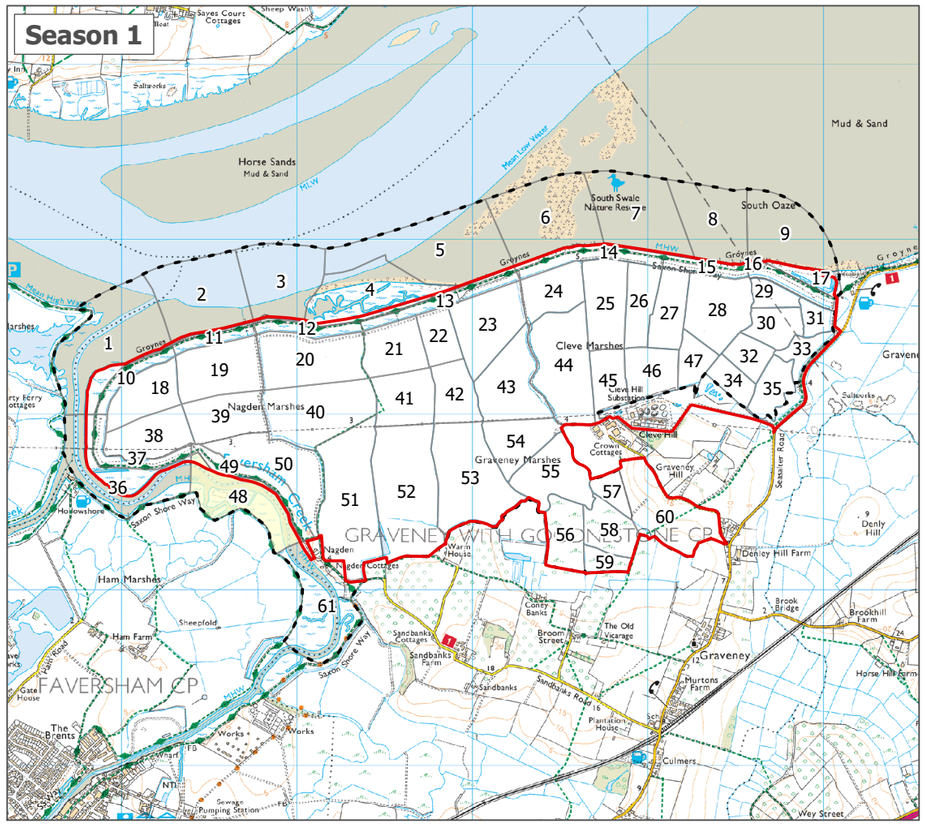
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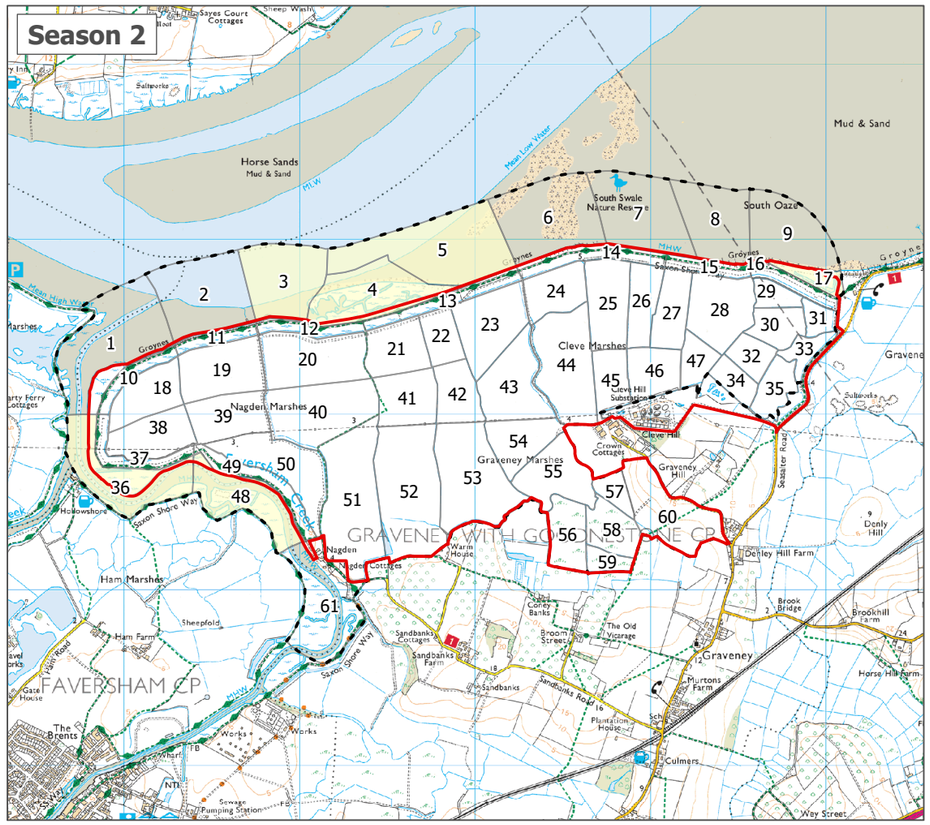
Passage/Winter Bird Survey Results: Mallard

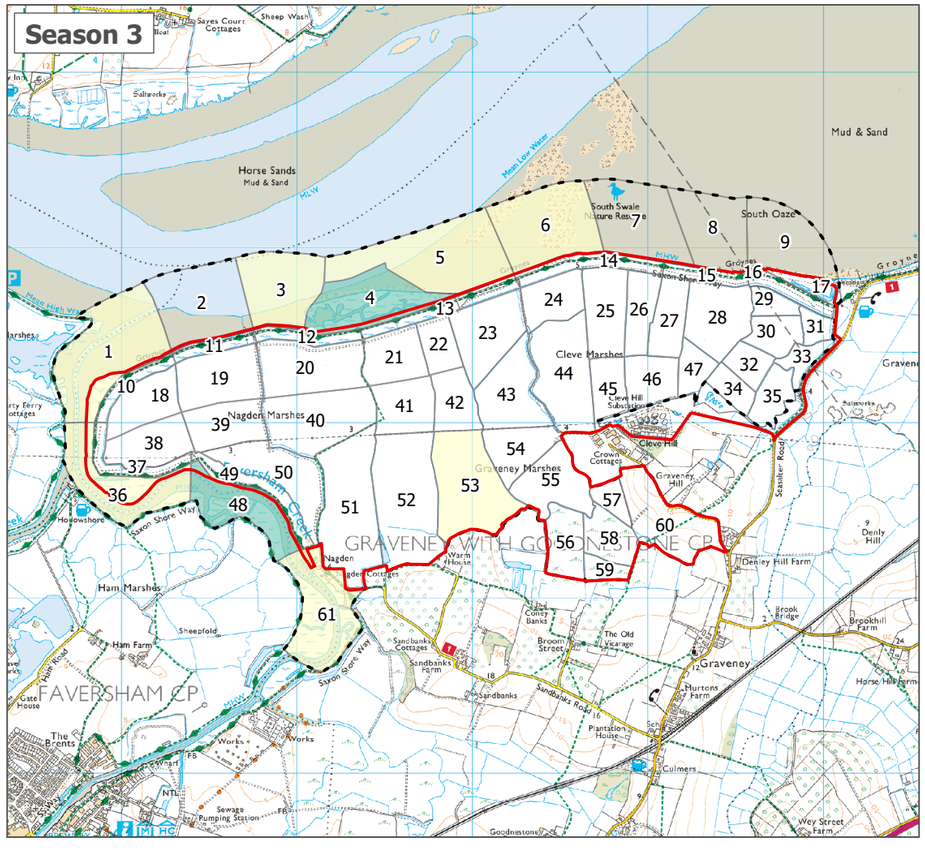
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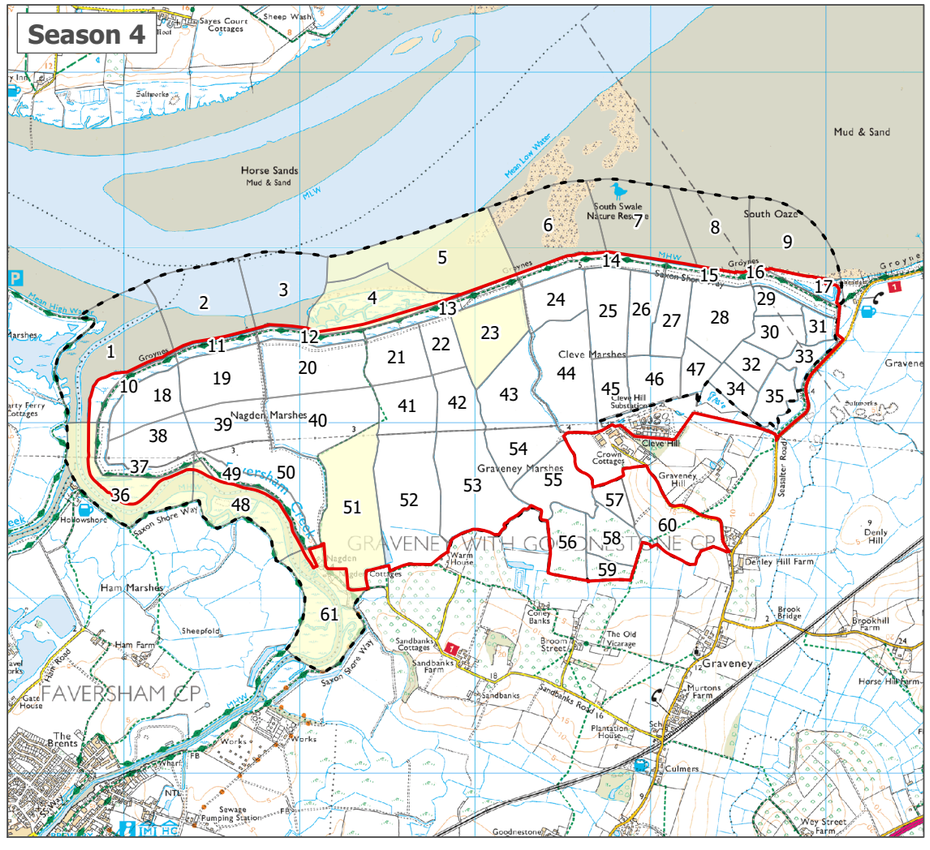
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CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- Winter Bird Survey Area 2016/17 and 2017/18

Teal mean bird days

- 0
- 1 - 2,000
- 2,000 - 4,000
- 4,000 - 6,000
- 6,000 - 8,000
- 8,000 - 10,000

1:35,000 Scale @ A3

0 0.75 1.5 km

NORTH

Produced By: SC	Ref: 2238-REP-262
Checked By: MA	Date: 14/11/2018

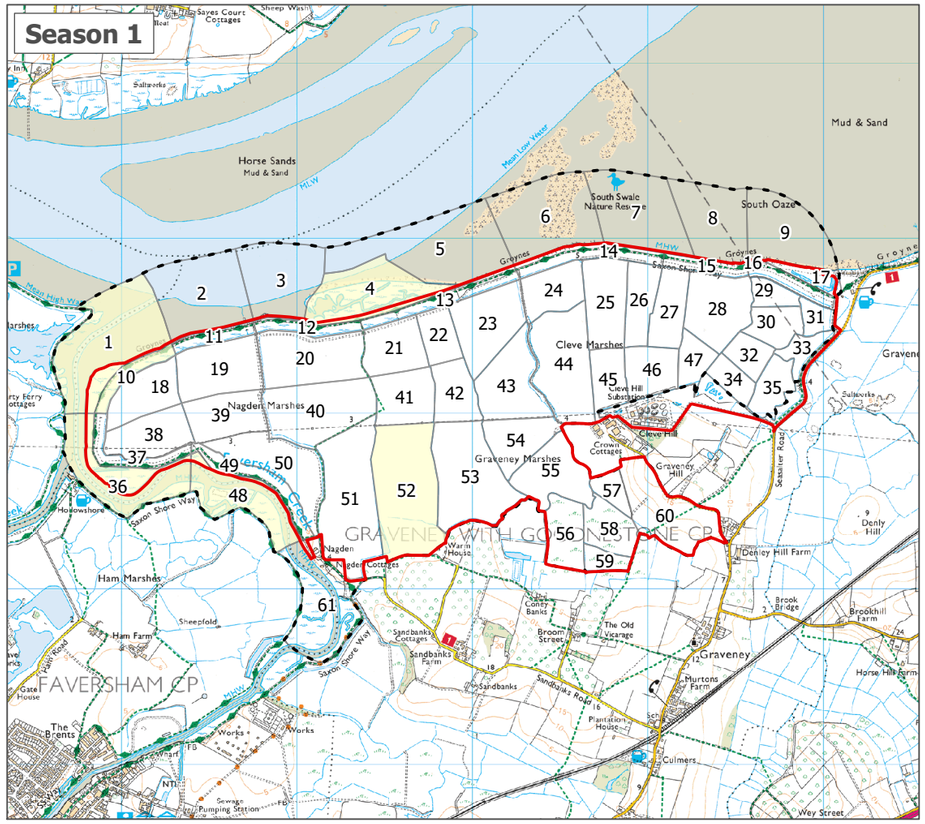
Passage/Winter Bird Survey Results: Teal

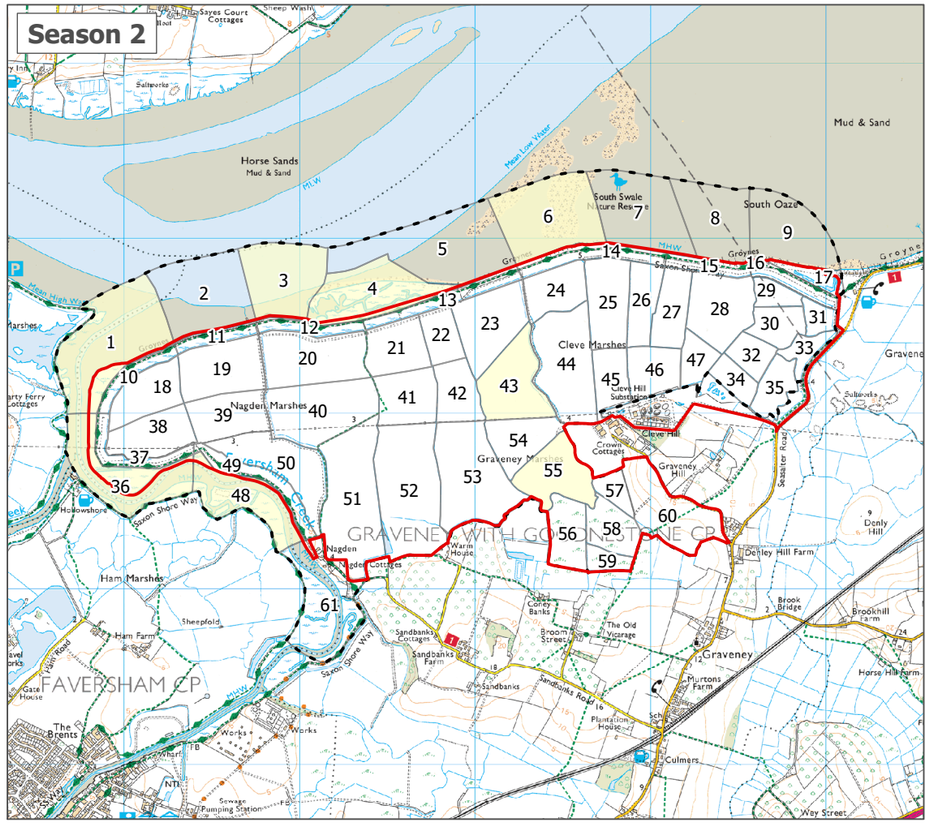
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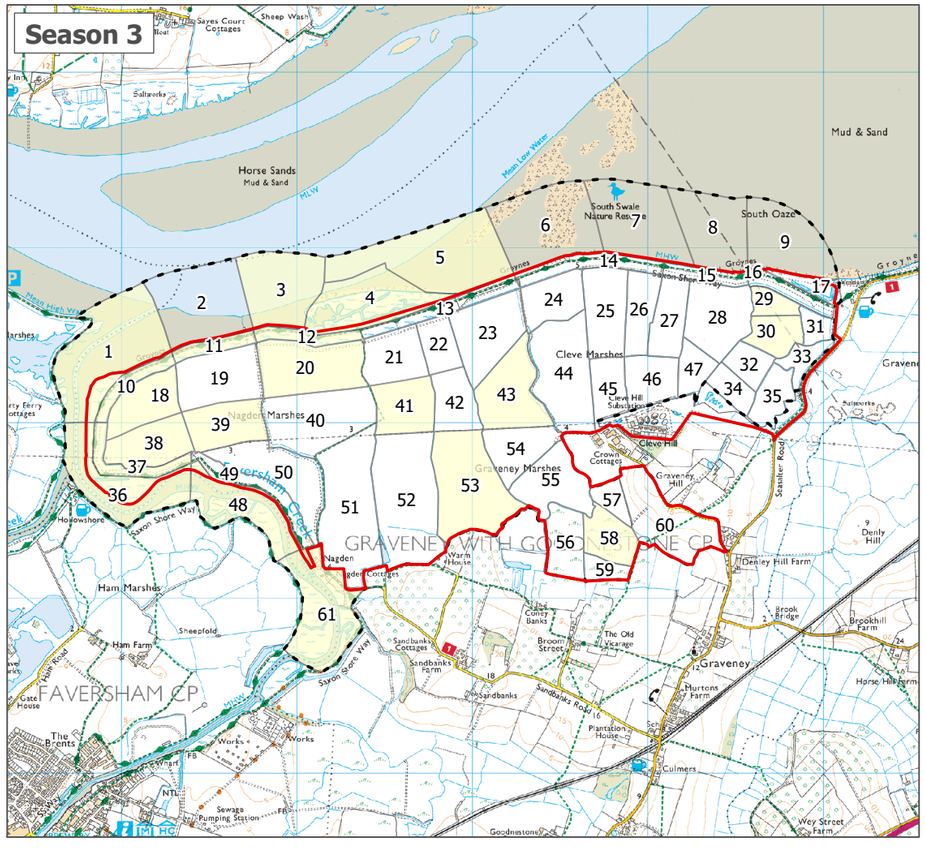
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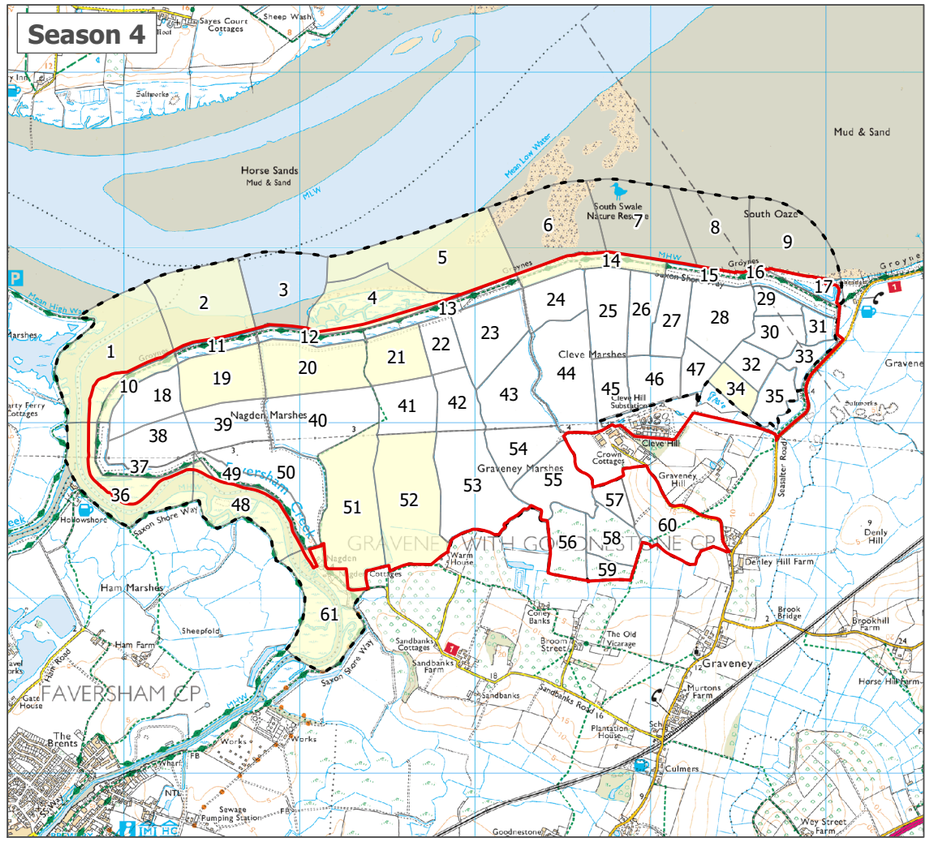
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CLEVE HILL SOLAR PARK

ARCUS

Site Boundary

Winter Bird Survey Area 2016/17 and 2017/18

Little Egret mean bird days

- 0
- 1 - 2,000
- 2,000 - 4,000
- 4,000 - 6,000
- 6,000 - 8,000
- 8,000 - 10,000

1:35,000 Scale @ A3

0 0.75 1.5 km

NORTH

Produced By: SC	Ref: 2238-REP-263
Checked By: MA	Date: 14/11/2018

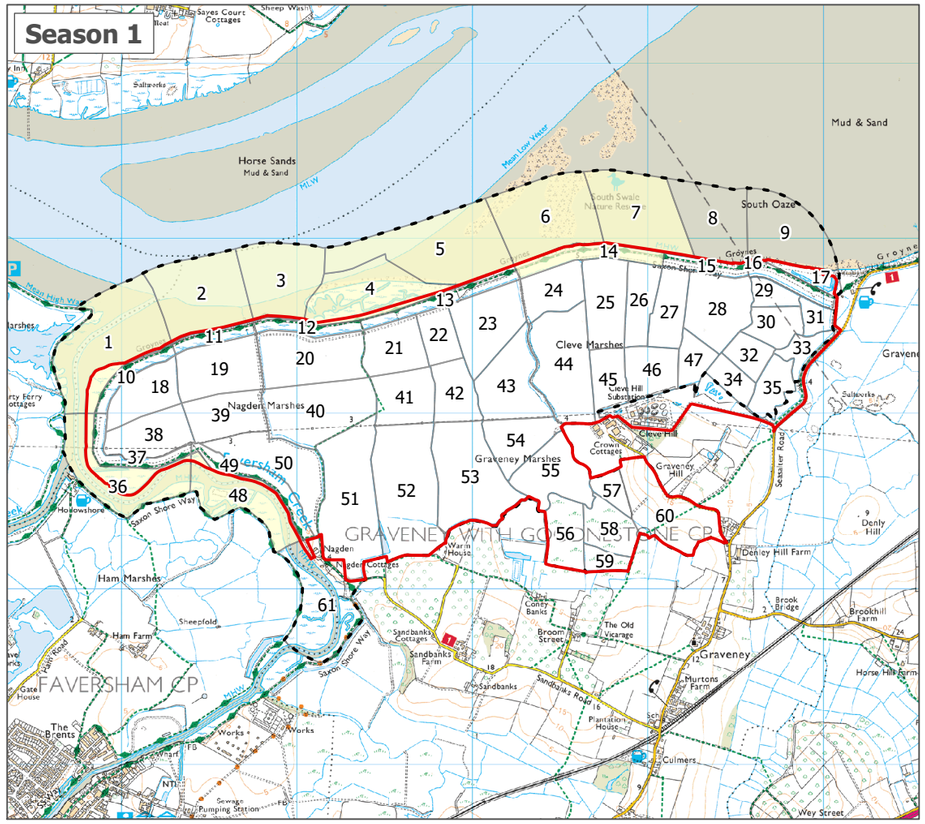
Passage/Winter Bird Survey Results: Little Egret

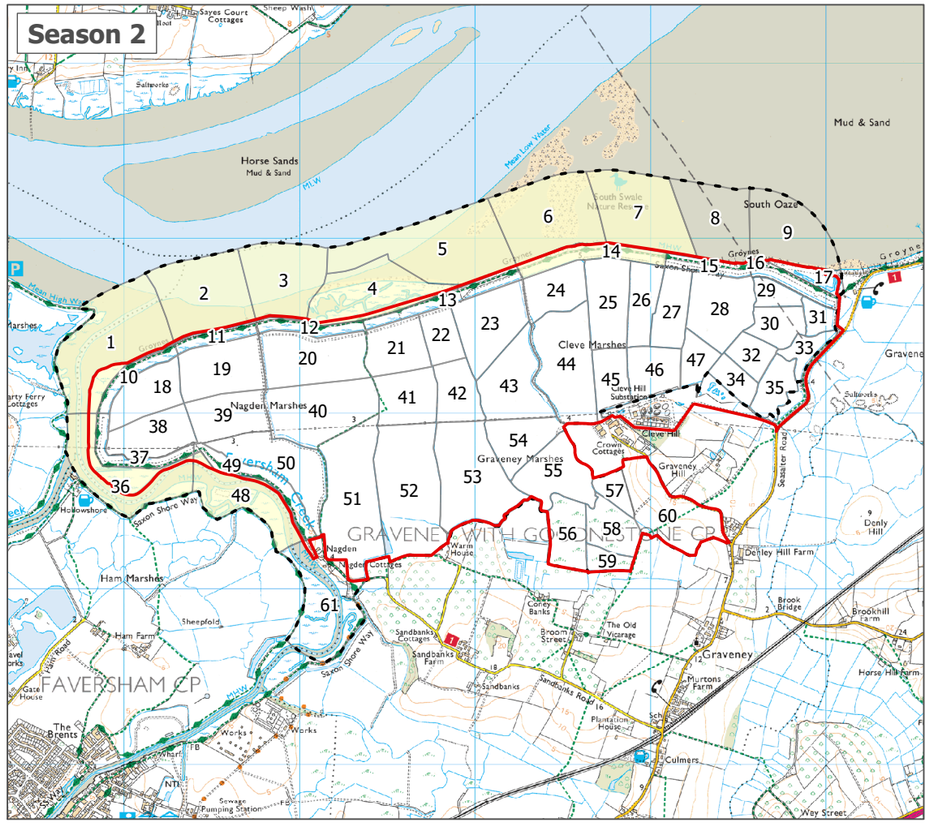
Figure A9.12

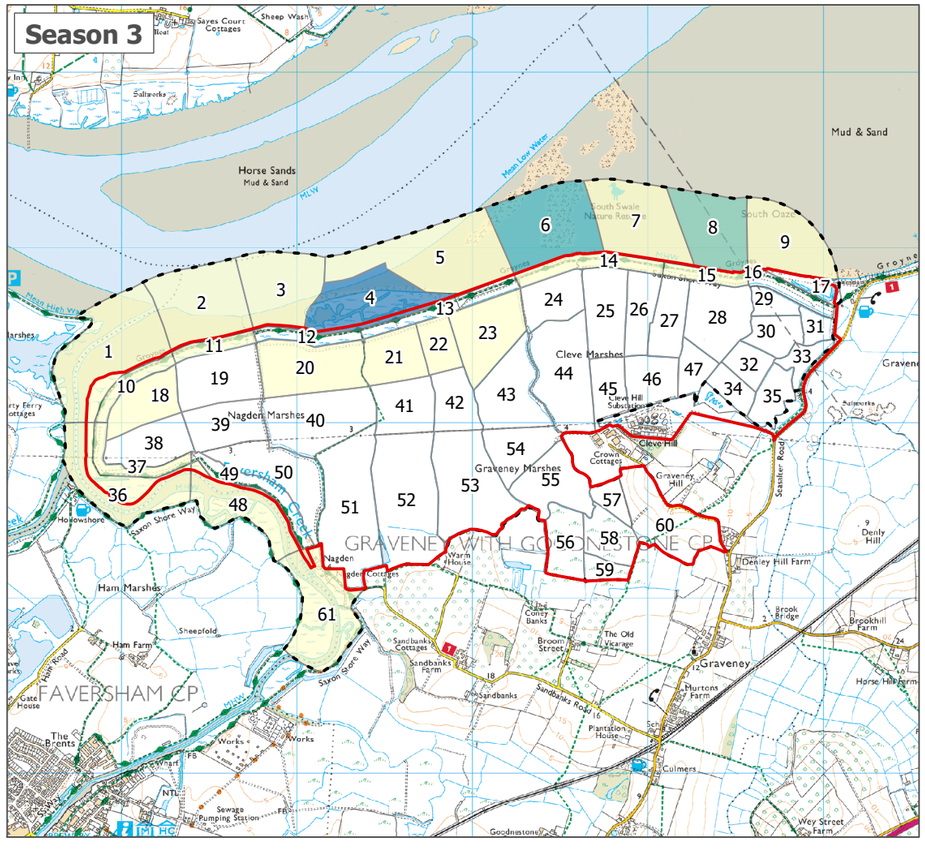
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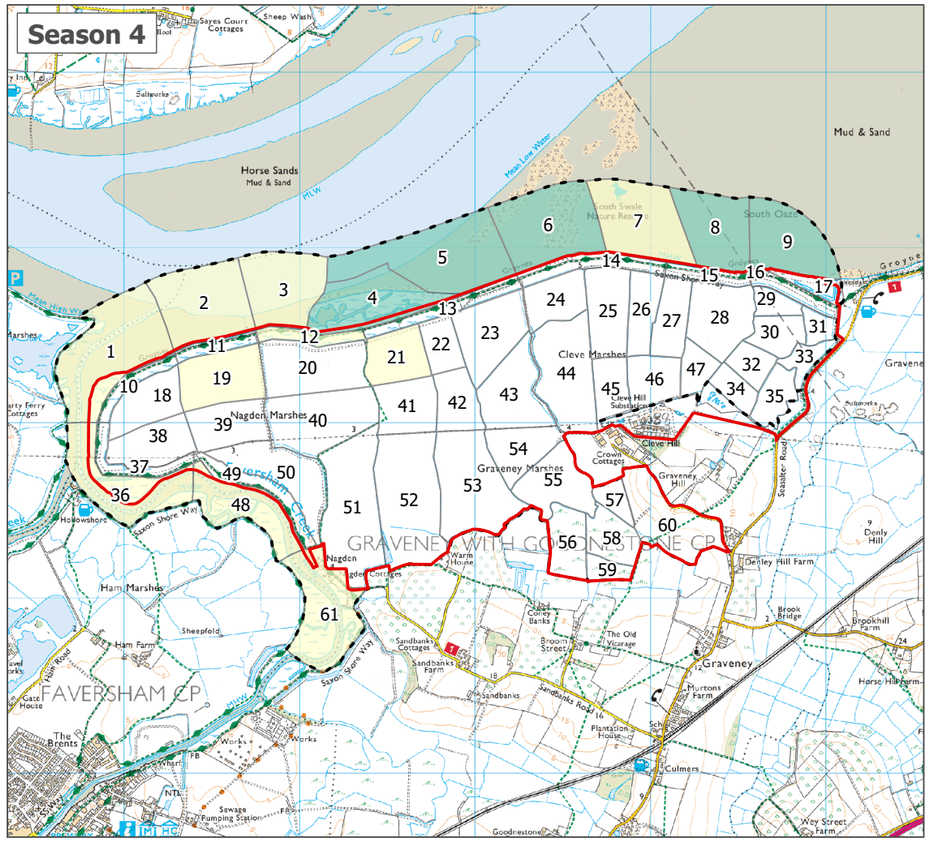
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CLEVE HILL SOLAR PARK

ARCUS

Site Boundary

Winter Bird Survey Area 2016/17 and 2017/18

Oystercatcher mean bird days

- 0
- 1 - 6,000
- 6,000 - 12,000
- 12,000 - 18,000
- 18,000 - 24,000
- 24,000 - 30,000

1:35,000 Scale @ A3

0 0.75 1.5 km

NORTH

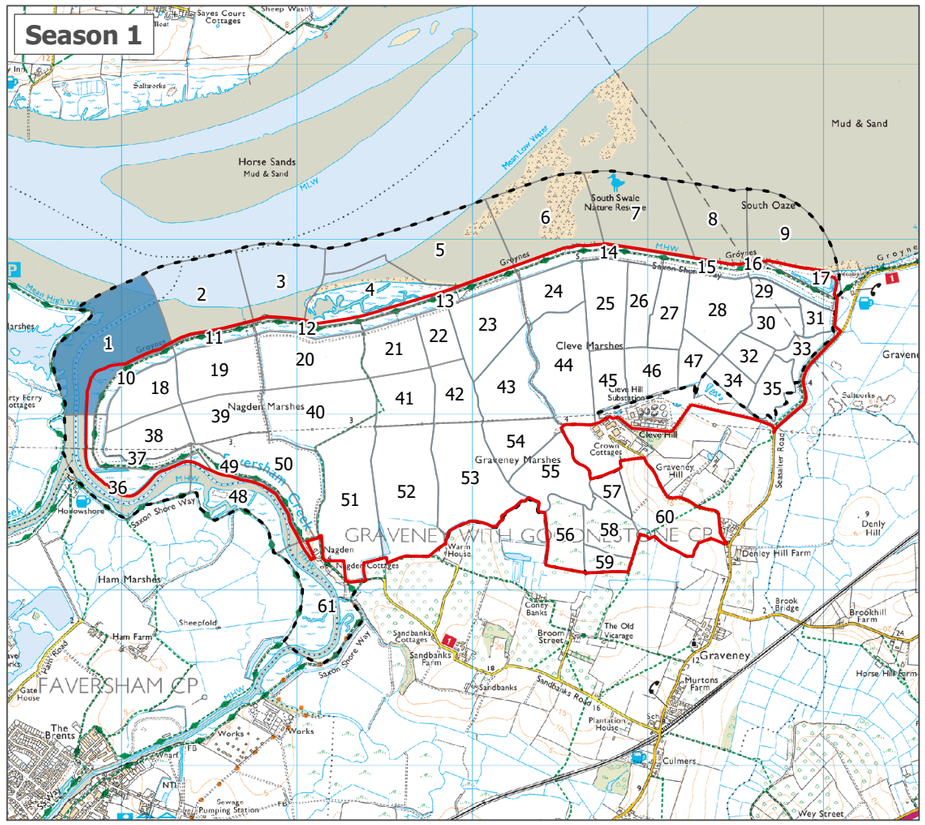
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Checked By: MA	Date: 14/11/2018

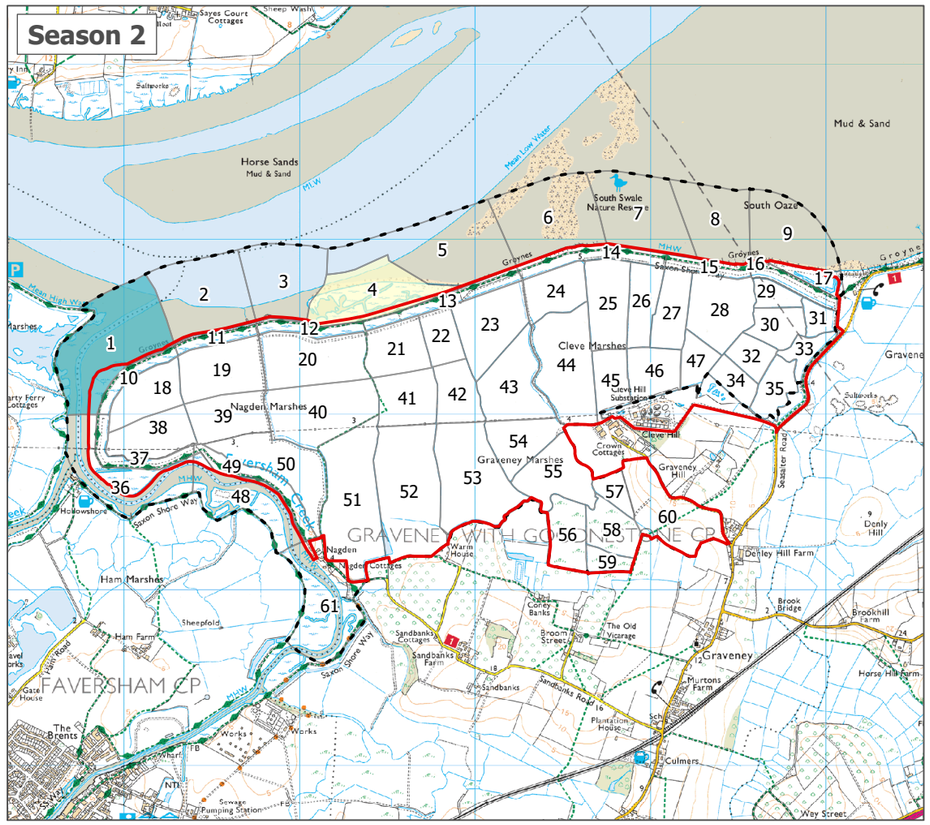
Passage/Winter Bird Survey Results: Oystercatcher
Figure A9.13

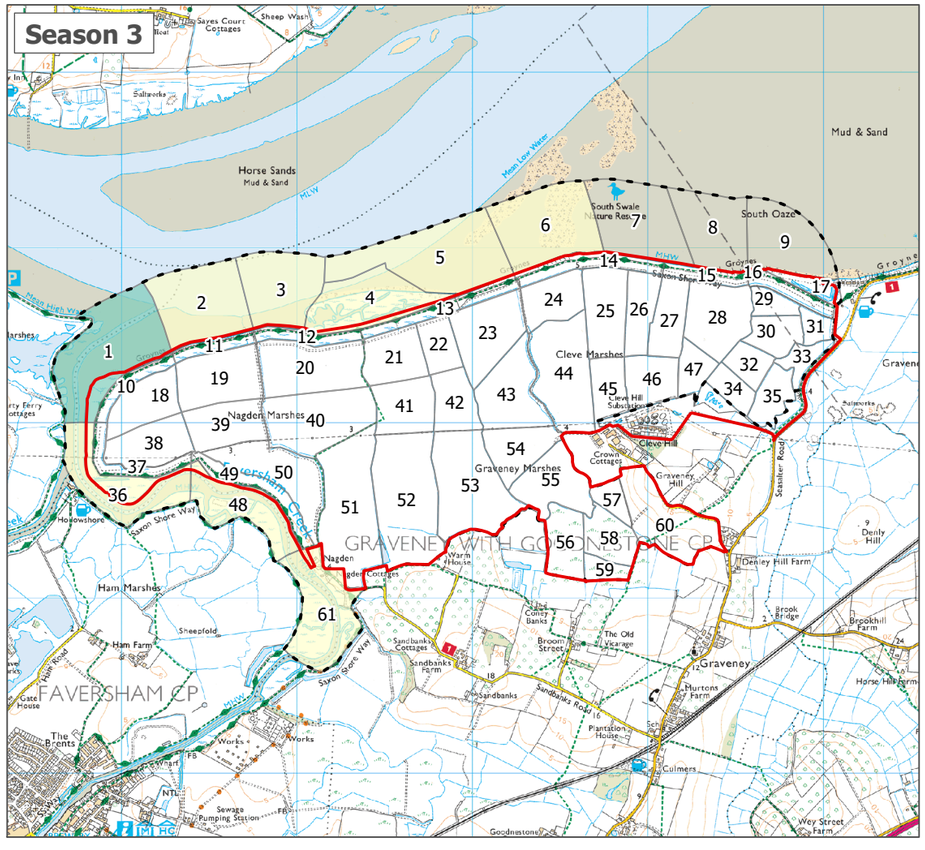
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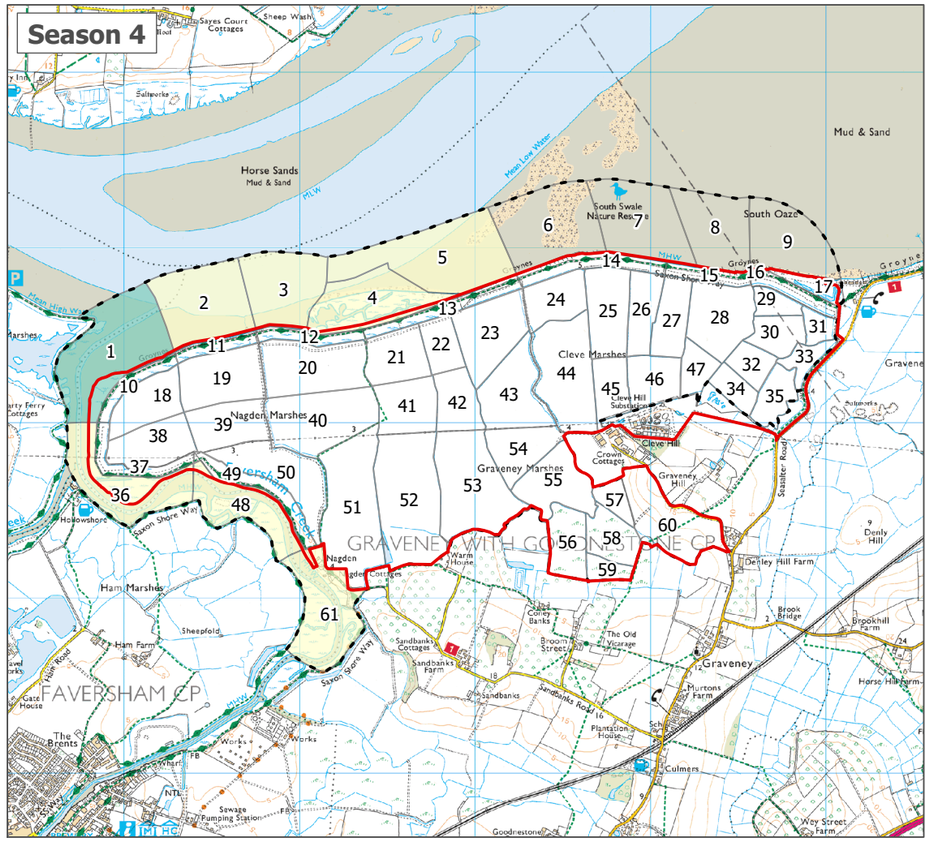
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CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- Winter Bird Survey Area 2016/17 and 2017/18

Avocet mean bird days

- 0
- 1 - 2,000
- 2,000 - 4,000
- 4,000 - 6,000
- 6,000 - 8,000
- 8,000 - 10,000

1:35,000 Scale @ A3

0 0.75 1.5 km

NORTH

Produced By: SC	Ref: 2238-REP-265
Checked By: MA	Date: 14/11/2018

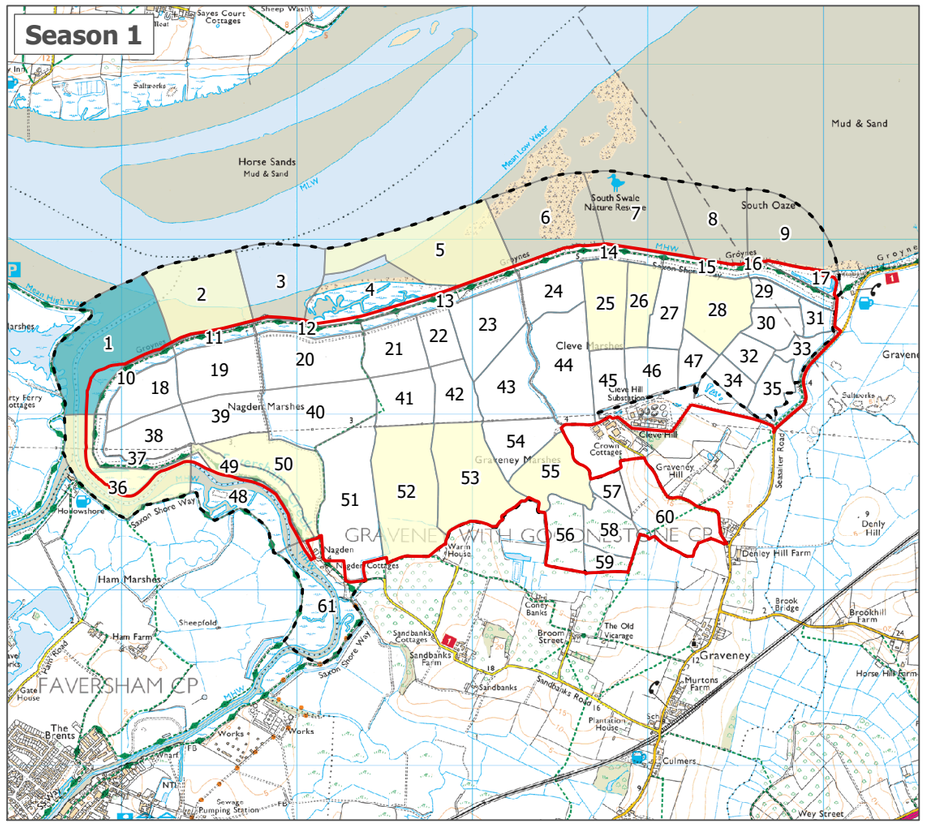
Passage/Winter Bird Survey Results: Avocet

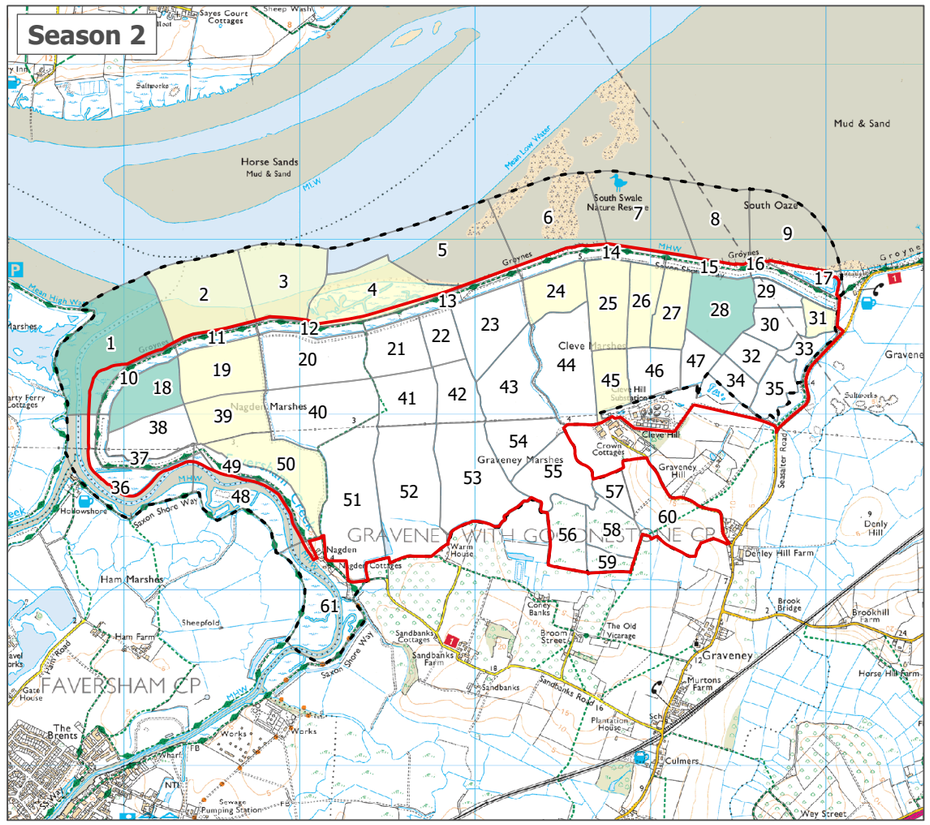
Figure A9.14

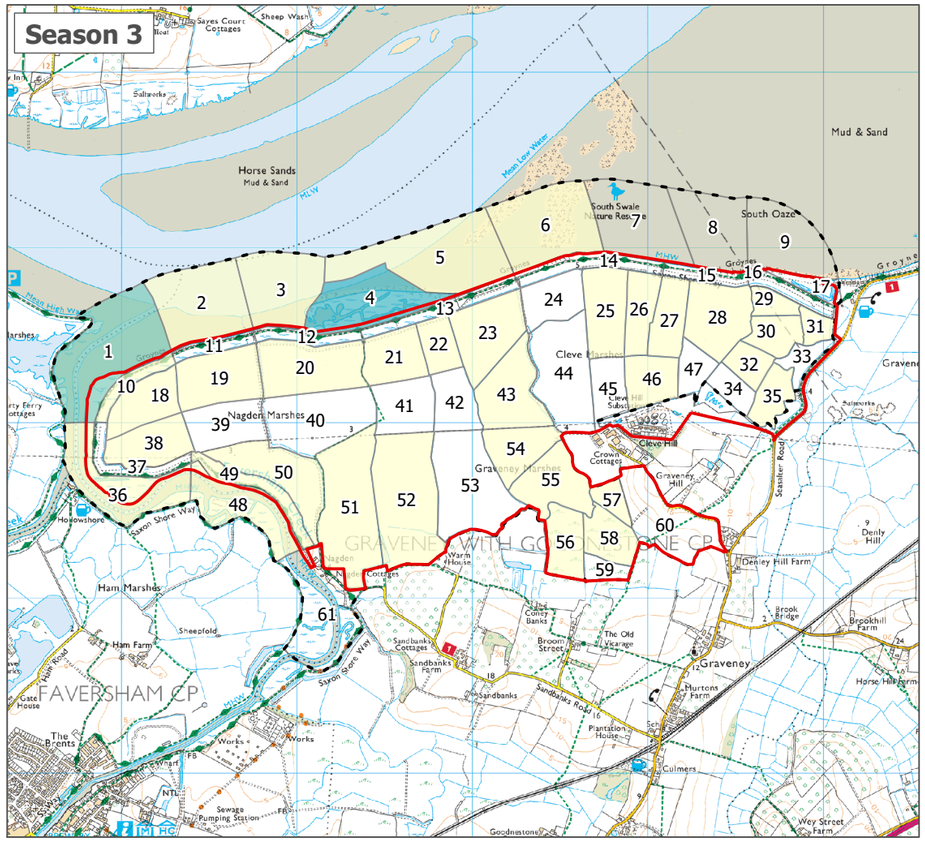
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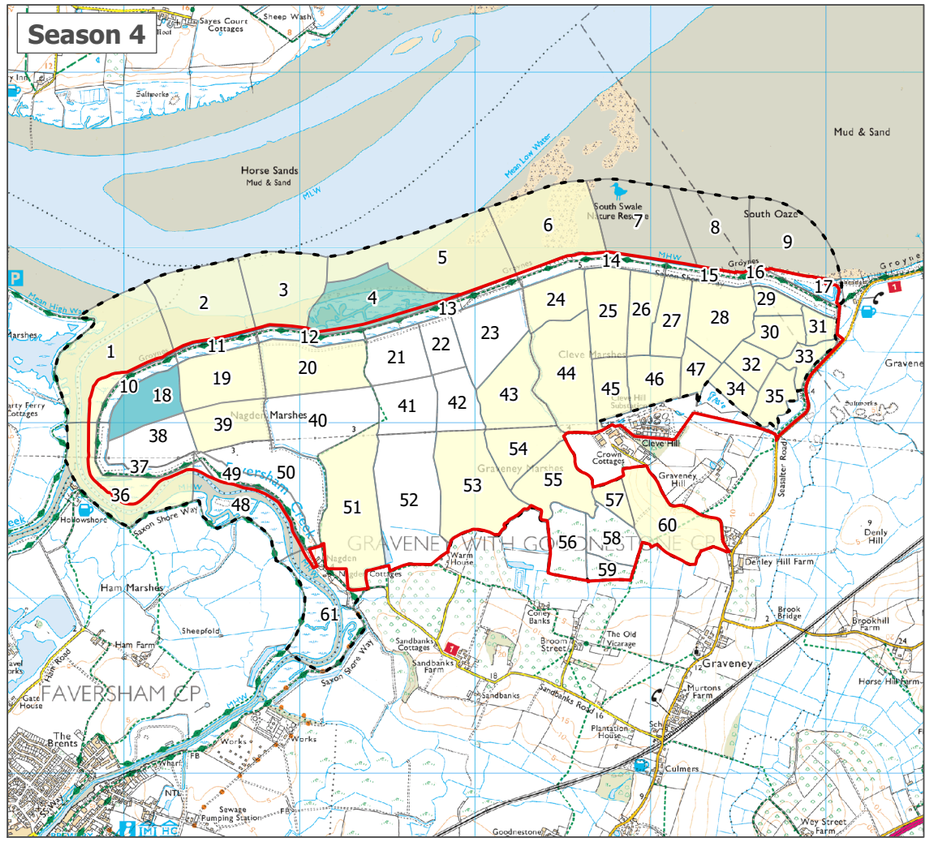
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CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- Winter Bird Survey Area 2016/17 and 2017/18

Lapwing mean bird days

- 0
- 1 - 6,000
- 6,000 - 12,000
- 12,000 - 18,000
- 18,000 - 24,000
- 24,000 - 30,000

1:35,000 Scale @ A3

0 0.75 1.5 km

NORTH

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Checked By: MA	Date: 14/11/2018

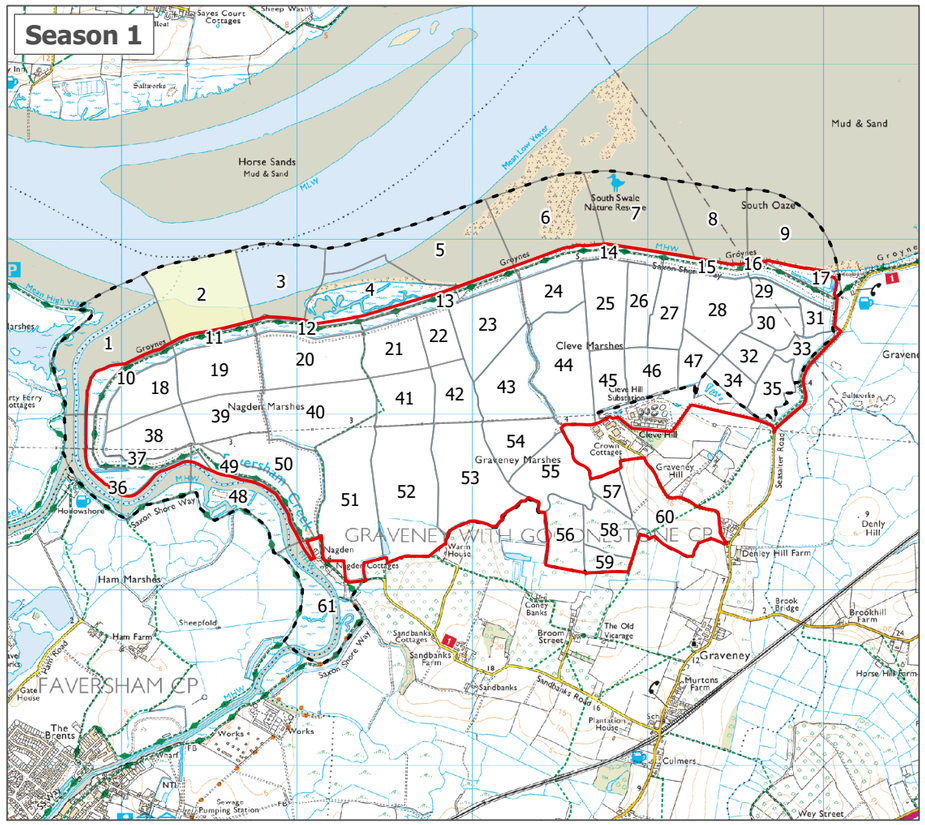
Passage/Winter Bird Survey Results: Lapwing

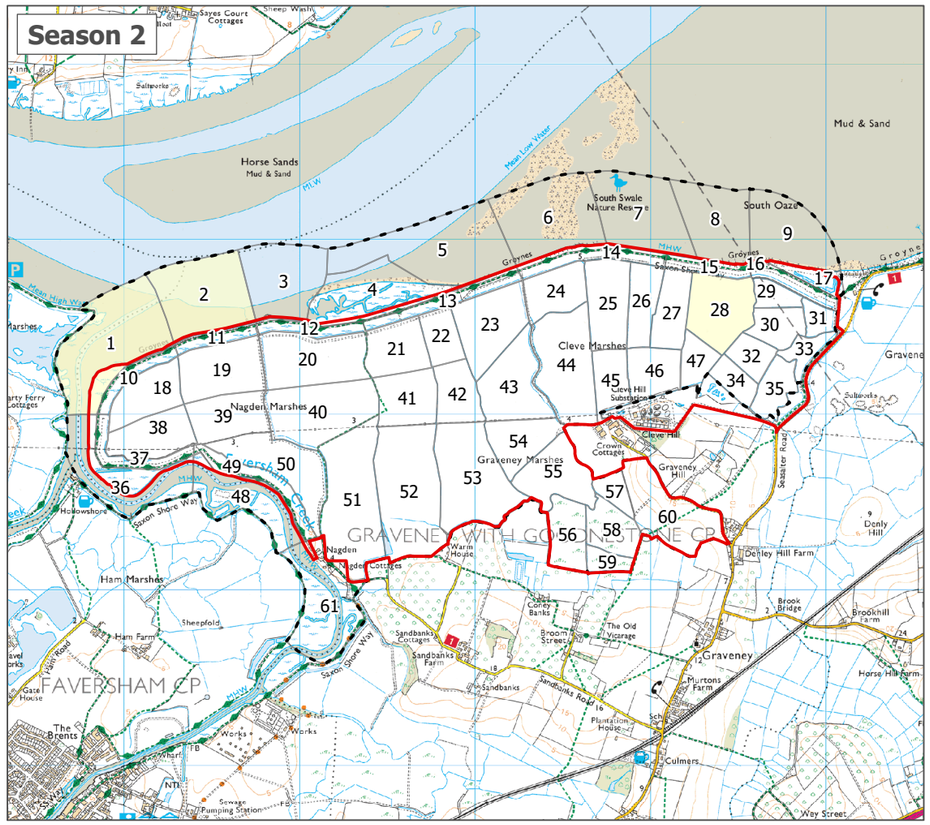
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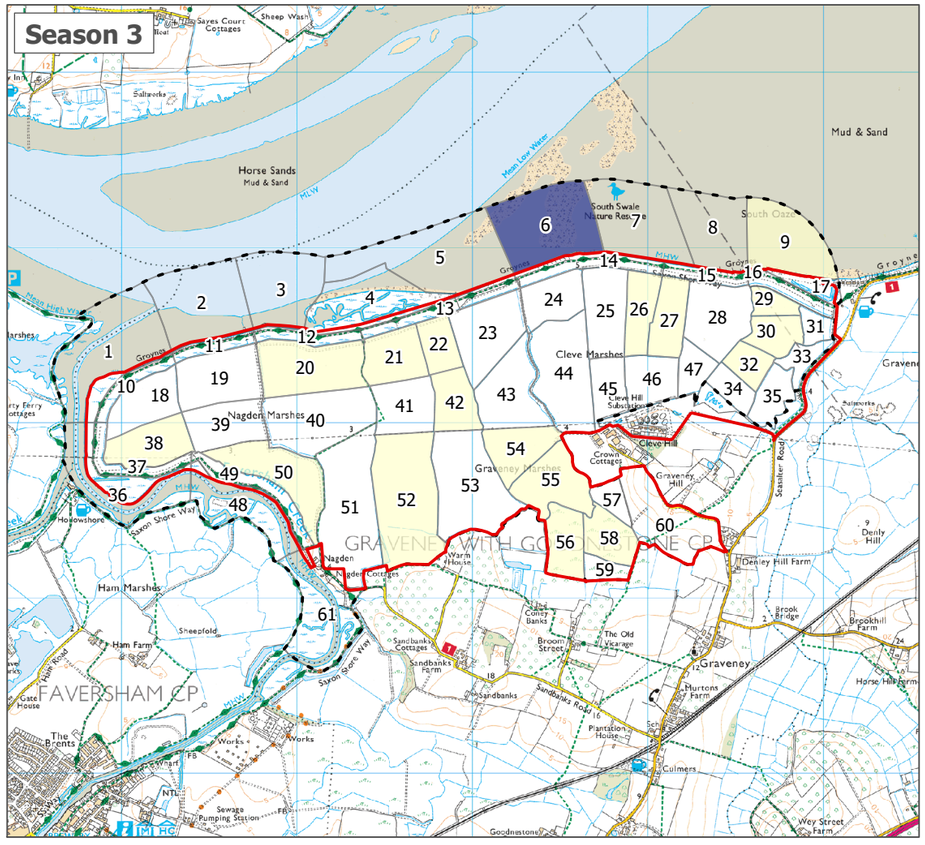
Cleve Hill Solar Park Environmental Statement

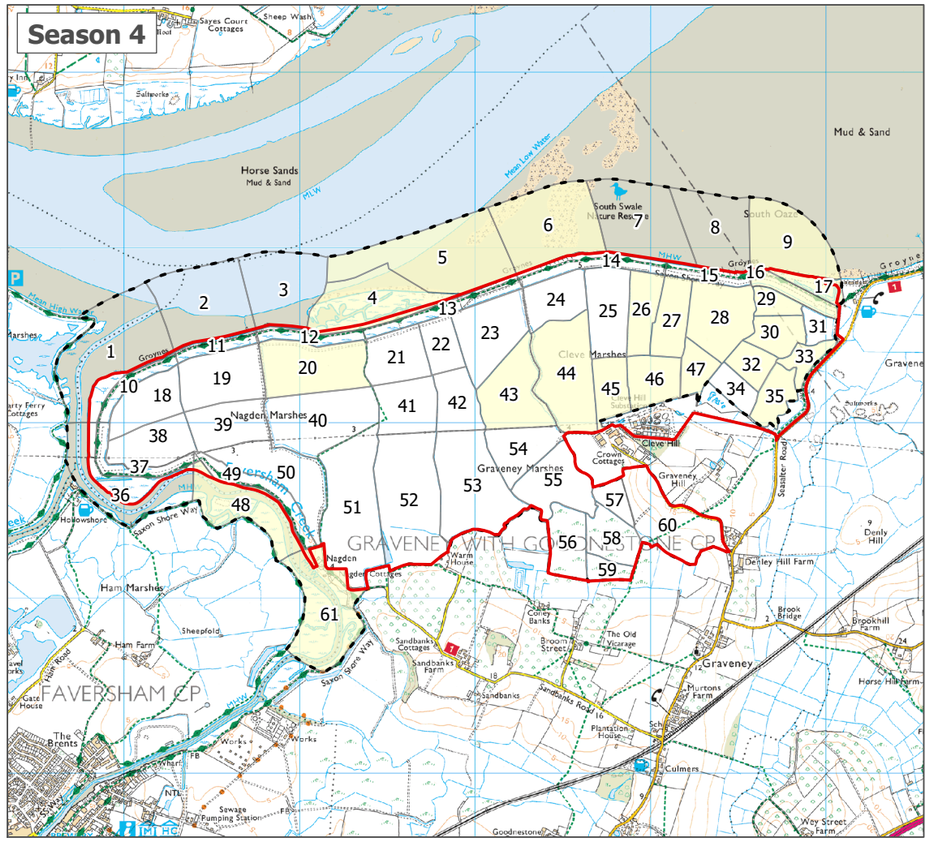
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CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- Winter Bird Survey Area 2016/17 and 2017/18

Golden Plover mean bird days

- 0
- 1 - 13,000
- 13,000 - 26,000
- 26,000 - 39,000
- 39,000 - 52,000
- 52,000 - 65,000

1:35,000 Scale @ A3

0 0.75 1.5 km

NORTH

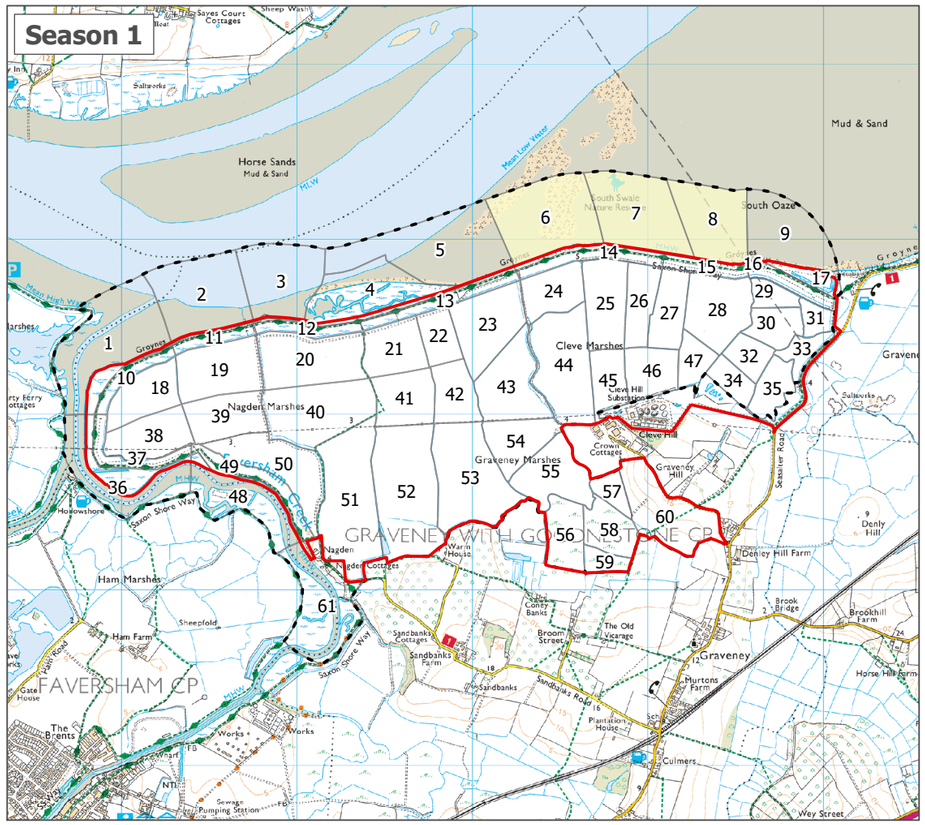
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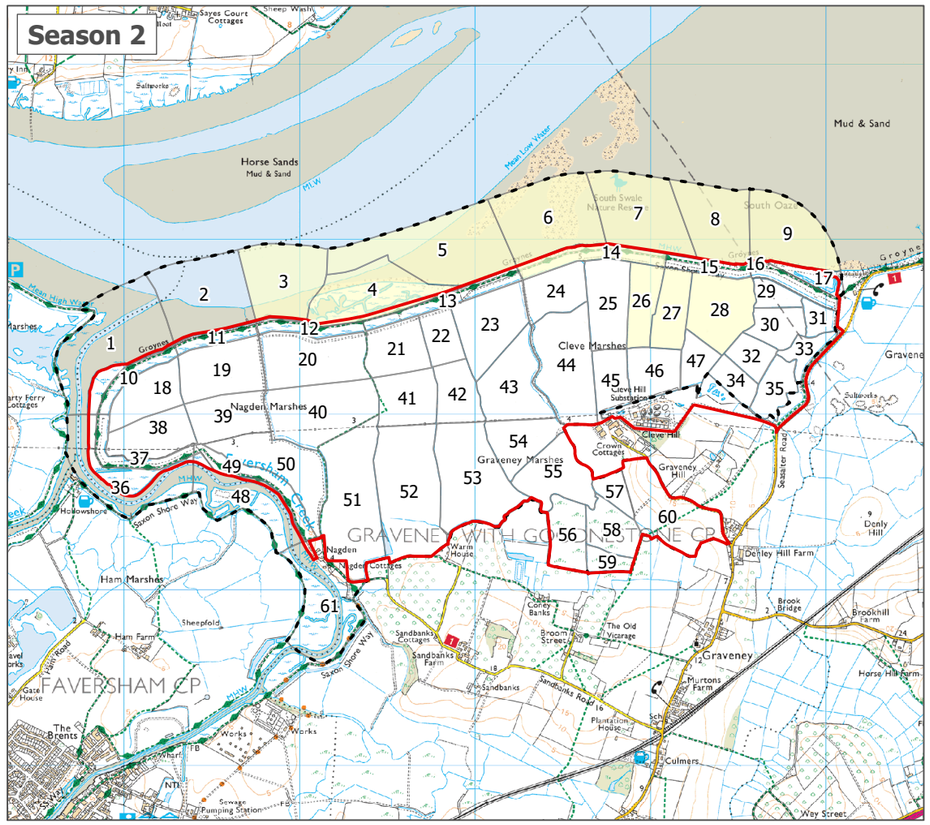
Passage/Winter Bird Survey Results: Golden Plover
Figure A9.16

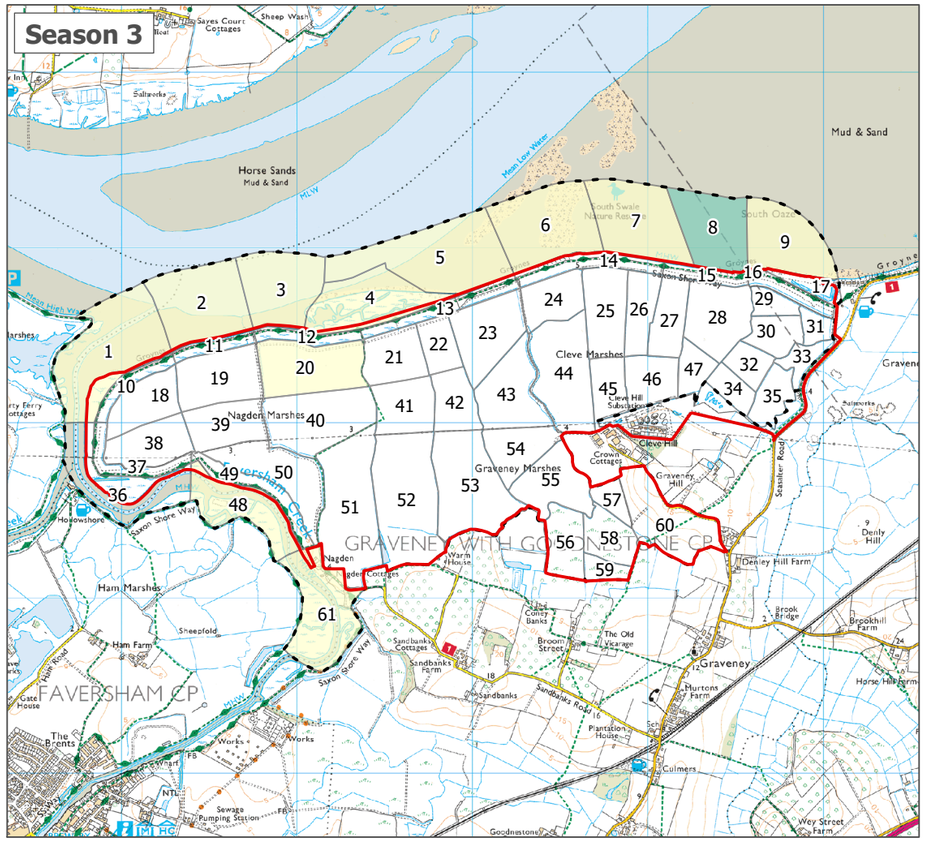
Cleve Hill Solar Park Environmental Statement

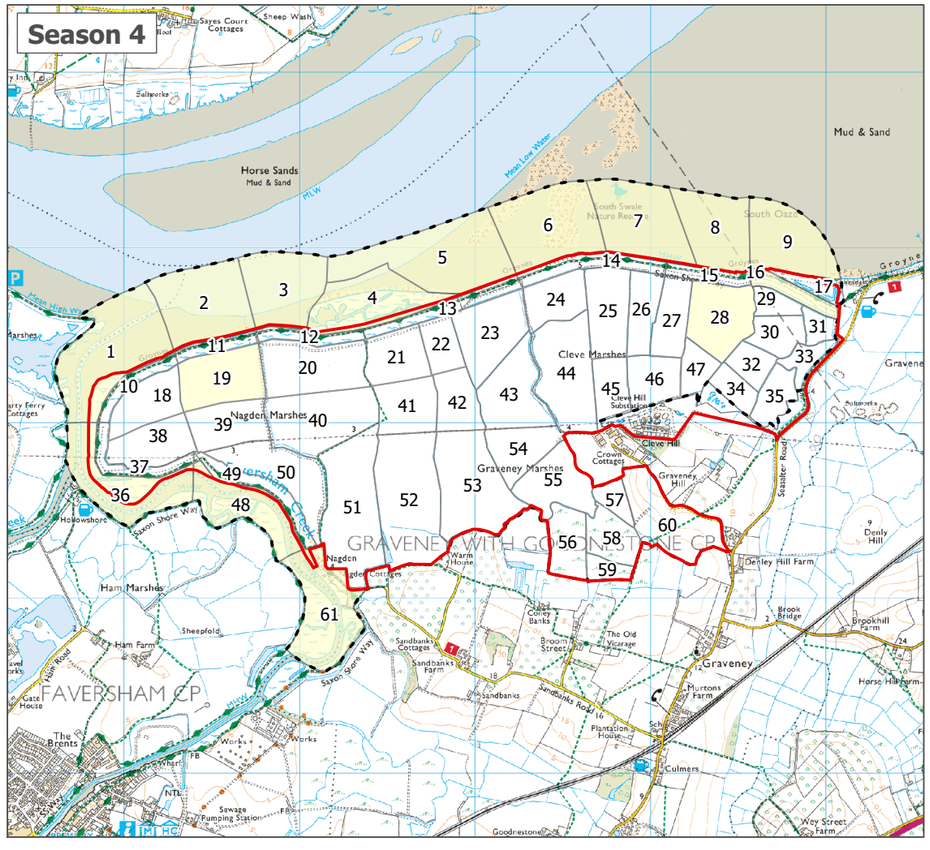
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CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- Winter Bird Survey Area 2016/17 and 2017/18

Grey Plover mean bird days

- 0
- 1 - 2,000
- 2,000 - 4,000
- 4,000 - 6,000
- 6,000 - 8,000
- 8,000 - 10,000

1:35,000 Scale @ A3

0 0.75 1.5 km

NORTH

Produced By: SC	Ref: 2238-REP-268
Checked By: MA	Date: 14/11/2018

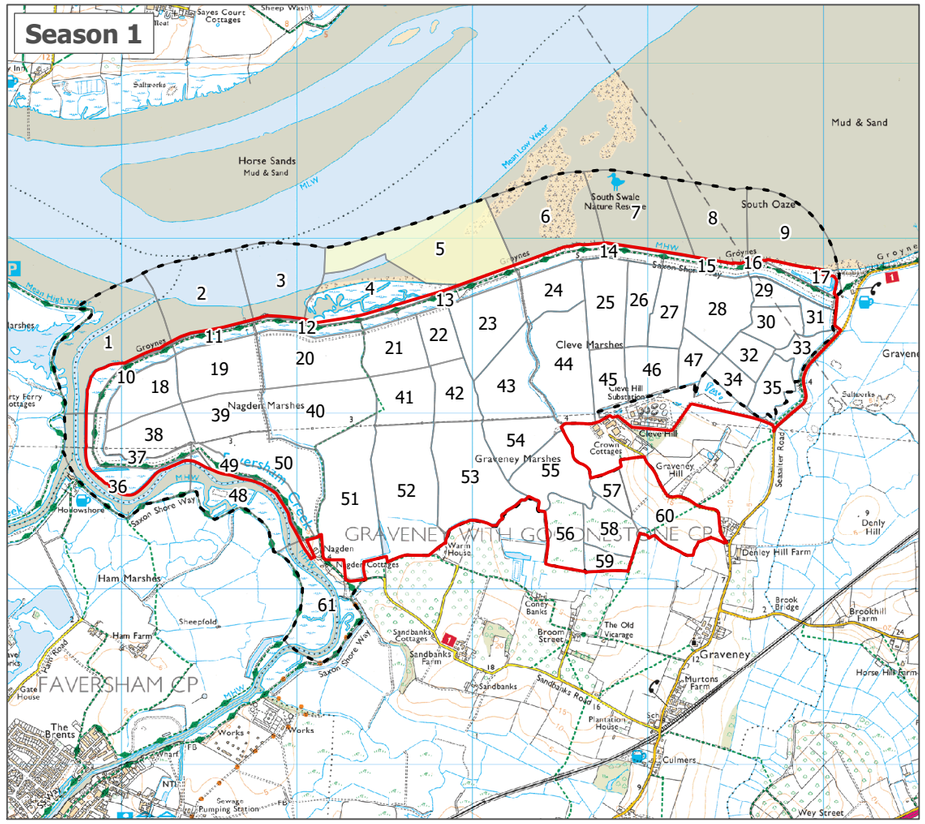
Passage/Winter Bird Survey Results: Grey Plover

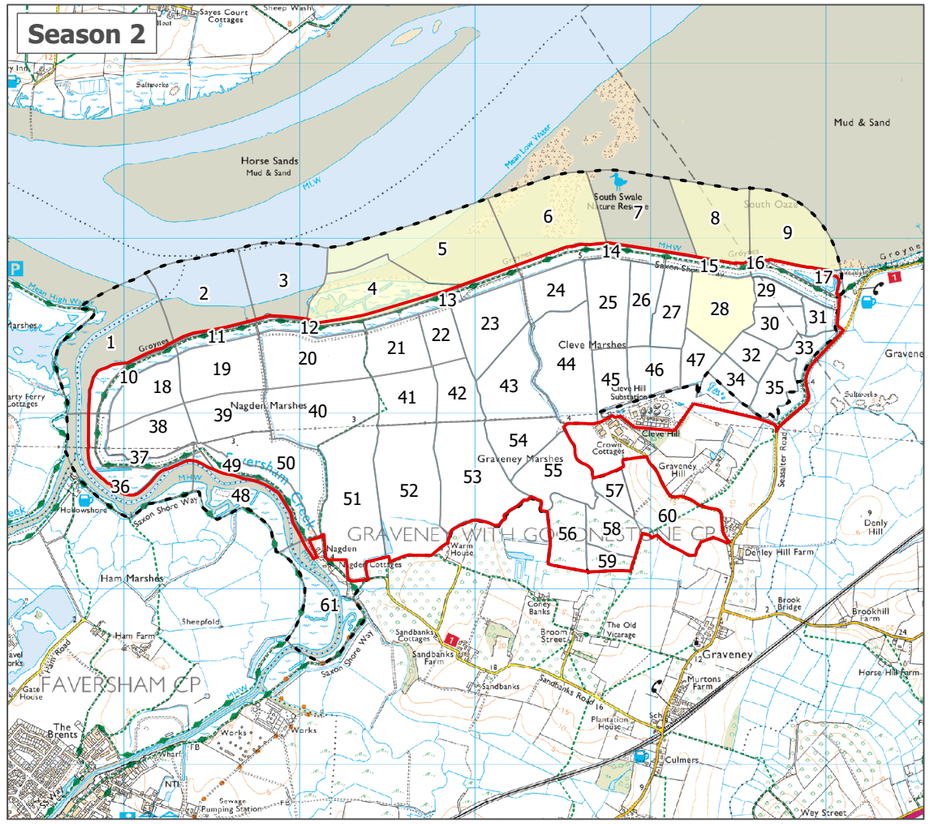
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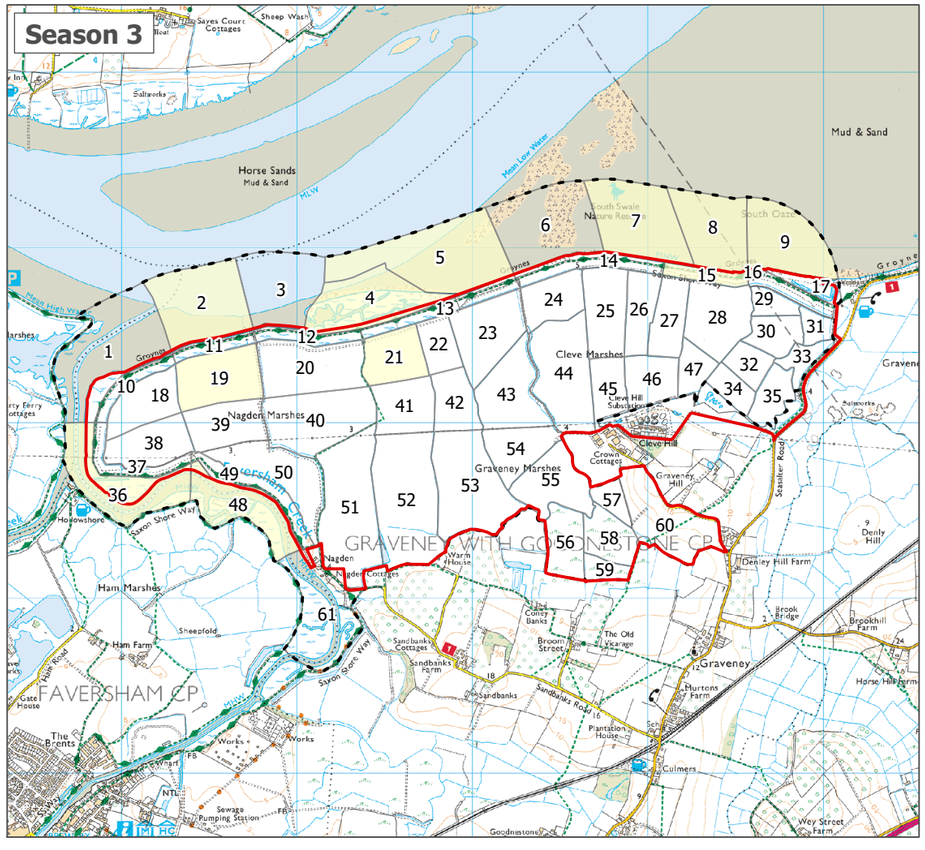
Cleve Hill Solar Park Environmental Statement

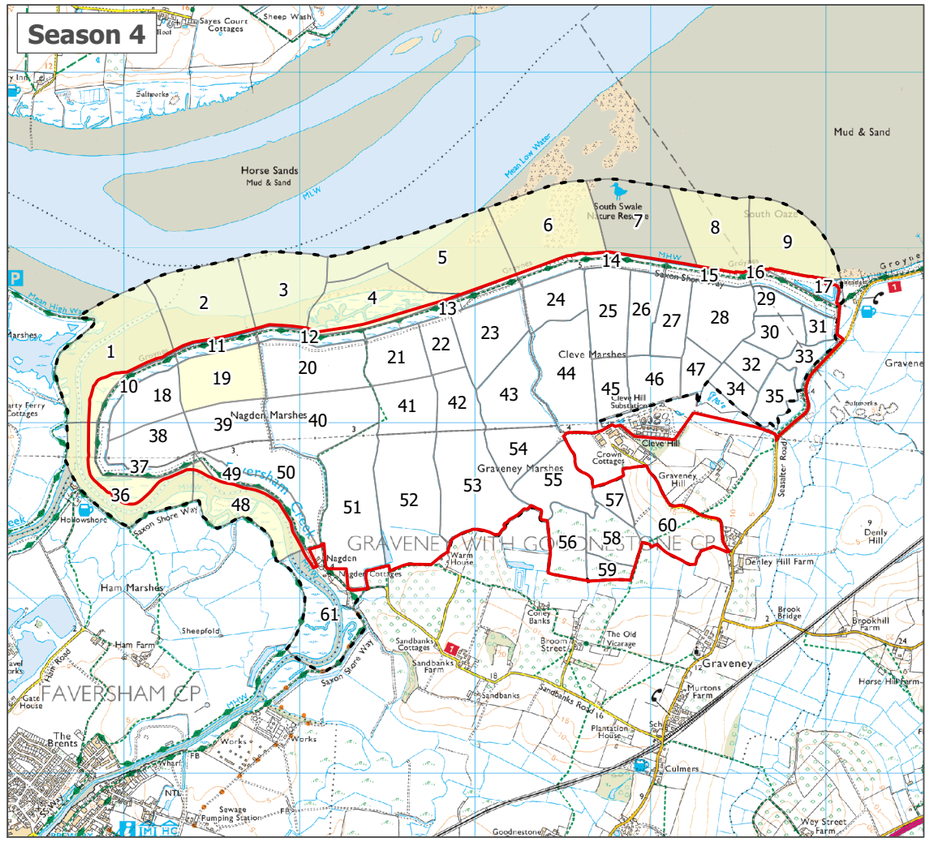
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CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- Winter Bird Survey Area 2016/17 and 2017/18

Ringed Plover mean bird days

- 0
- 1 - 2,000
- 2,000 - 4,000
- 4,000 - 6,000
- 6,000 - 8,000
- 8,000 - 10,000

1:35,000 Scale @ A3

0 0.75 1.5 km

NORTH

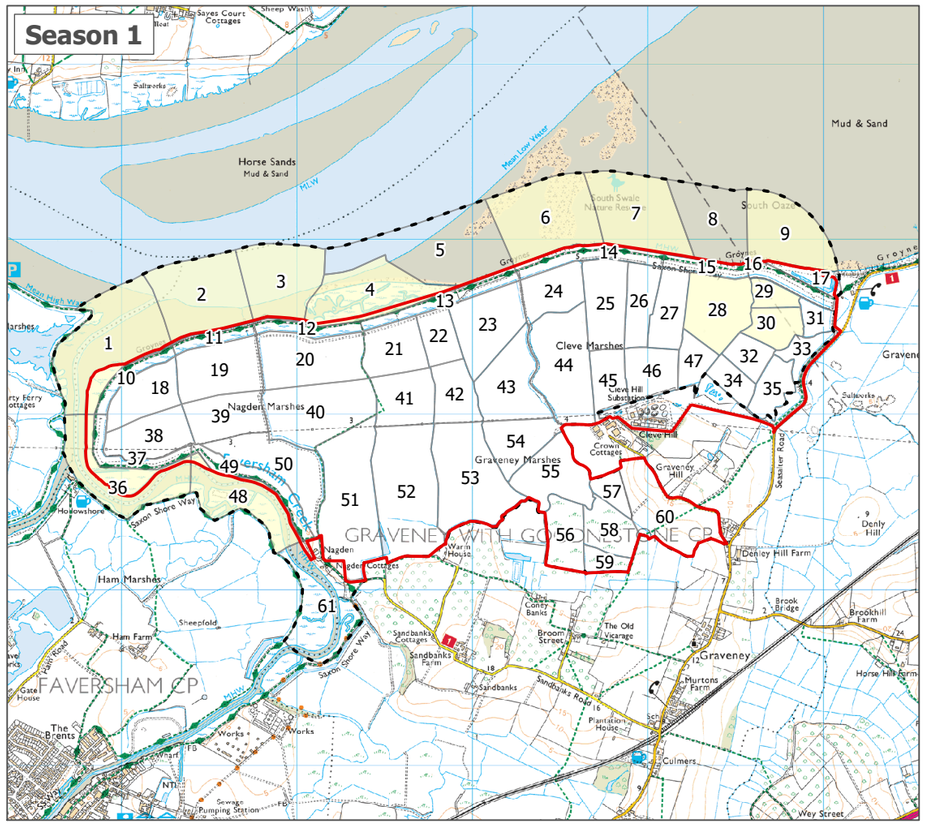
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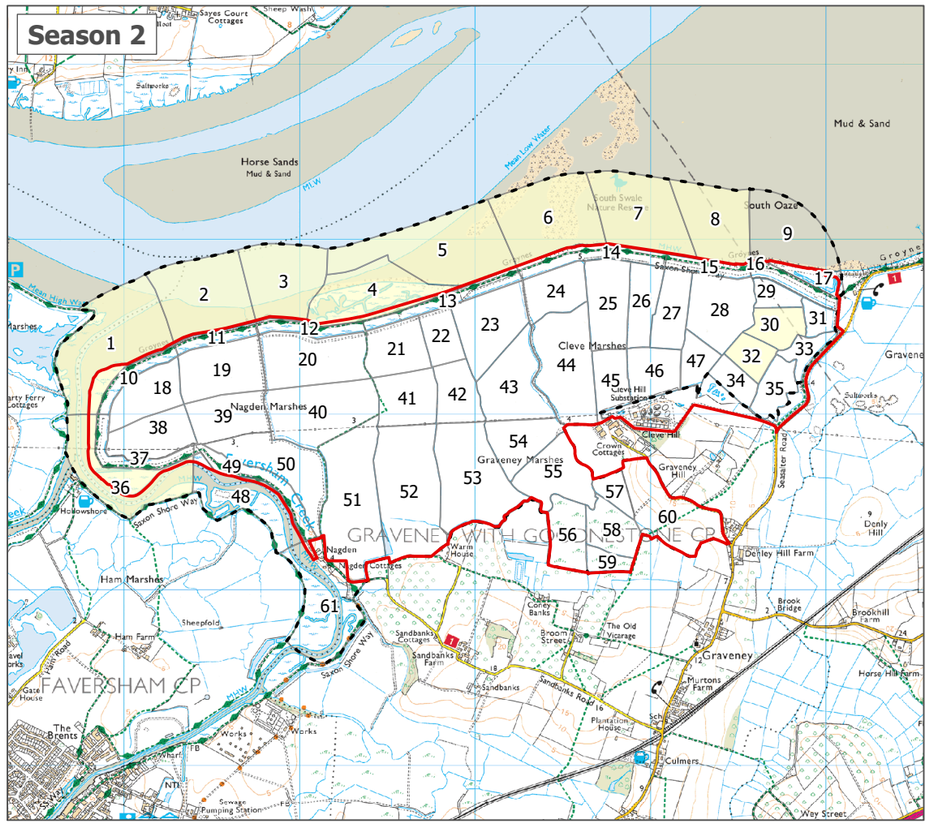
Passage/Winter Bird Survey Results: Ringed Plover
Figure A9.18

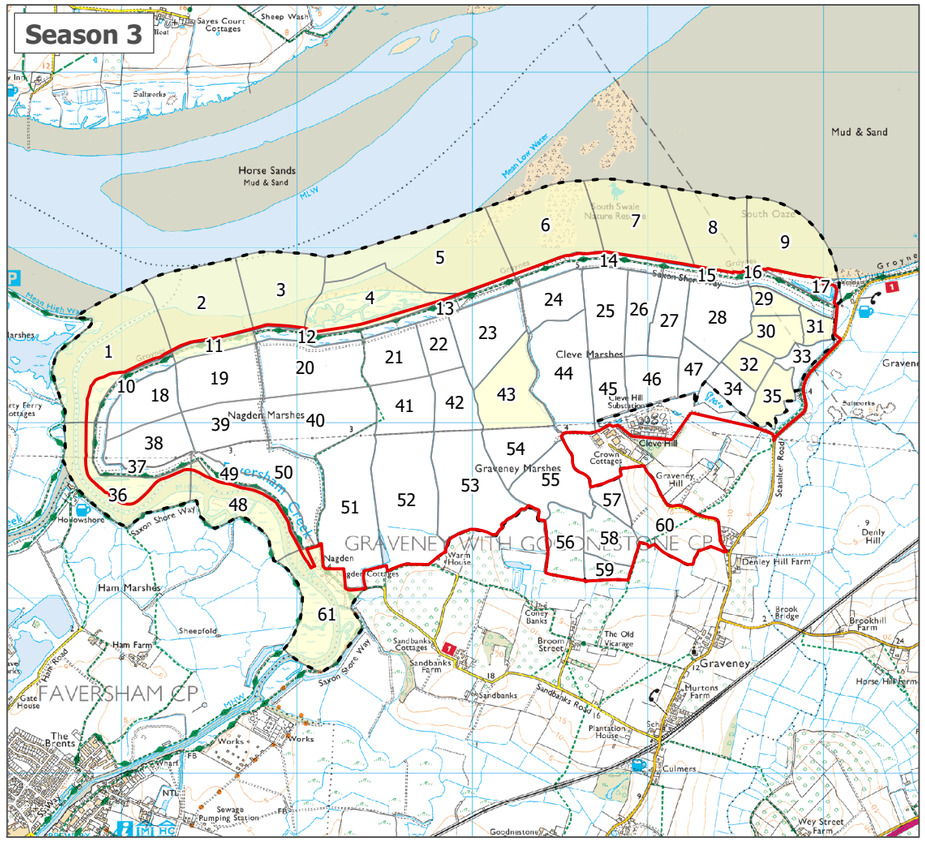
Cleve Hill Solar Park Environmental Statement

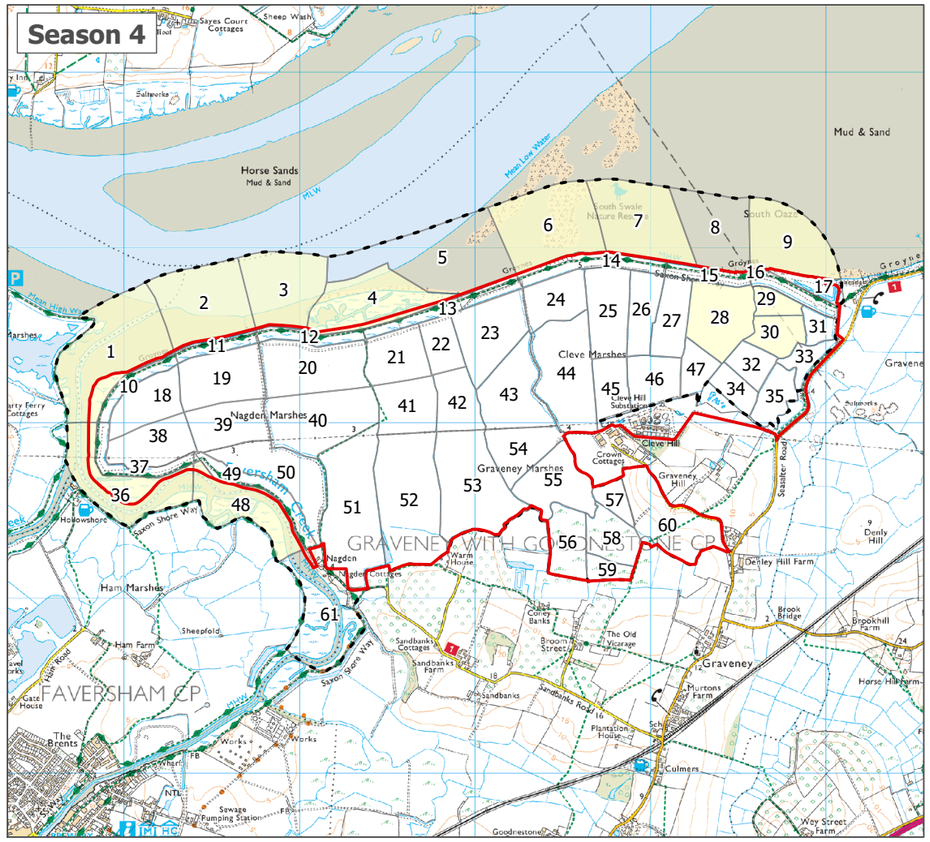
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CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- Winter Bird Survey Area 2016/17 and 2017/18

Curlew mean bird days

- 0
- 1 - 2,000
- 2,000 - 4,000
- 4,000 - 6,000
- 6,000 - 8,000
- 8,000 - 10,000

1:35,000 Scale @ A3

0 0.75 1.5 km

NORTH

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Checked By: MA	Date: 14/11/2018

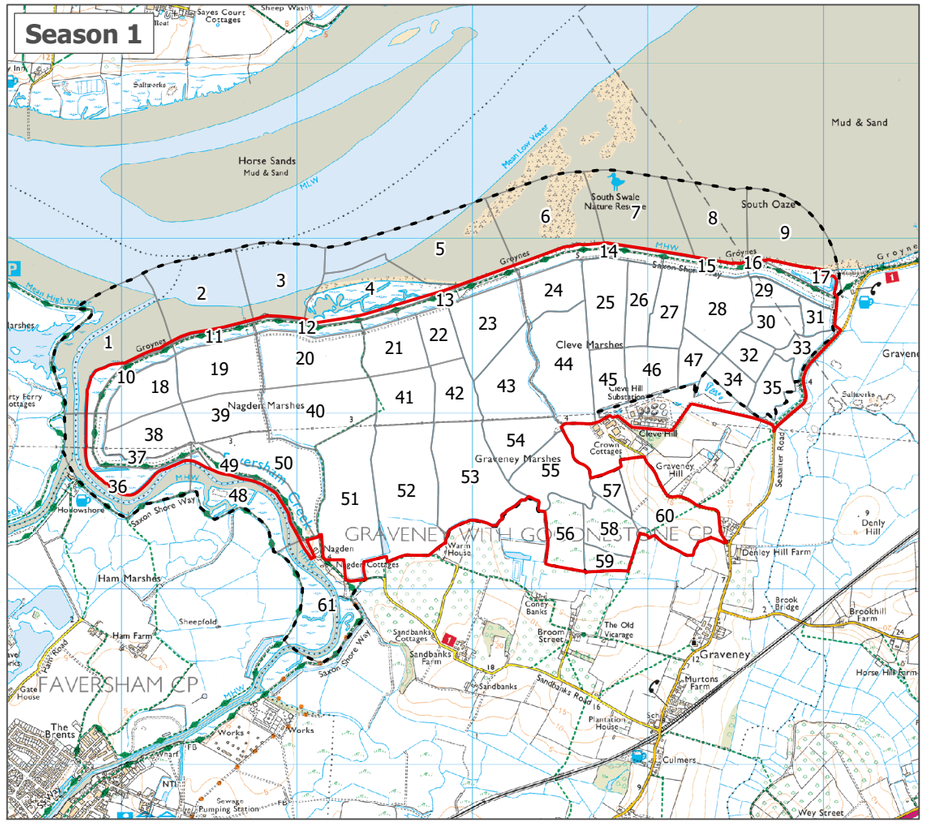
Passage/Winter Bird Survey Results: Curlew

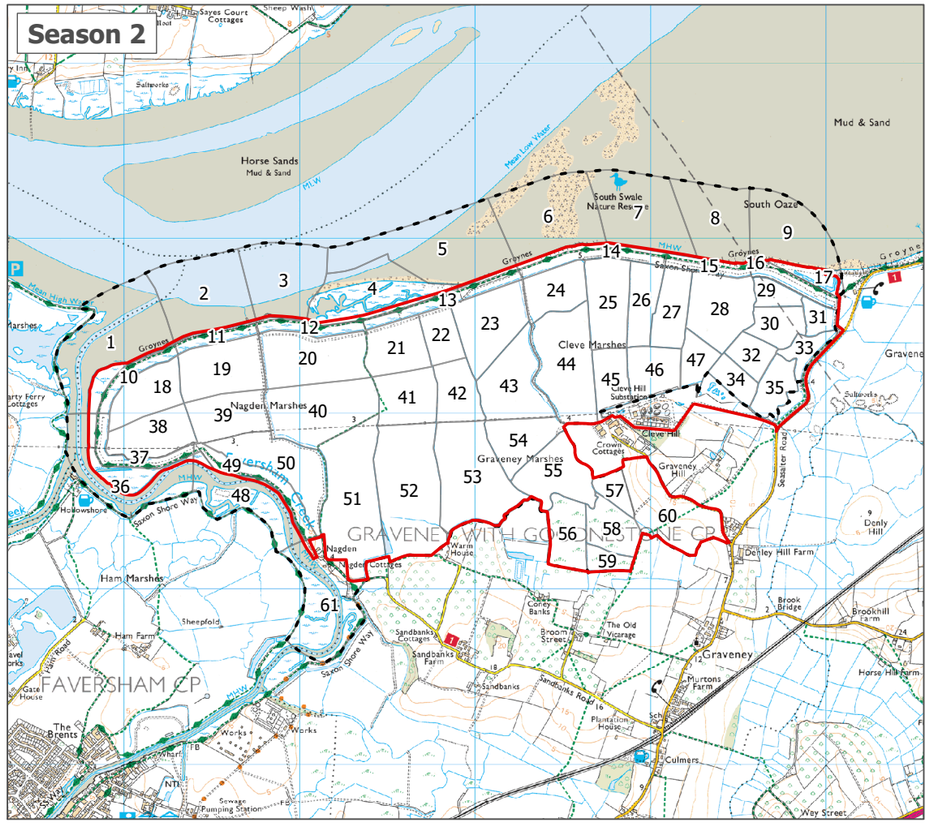
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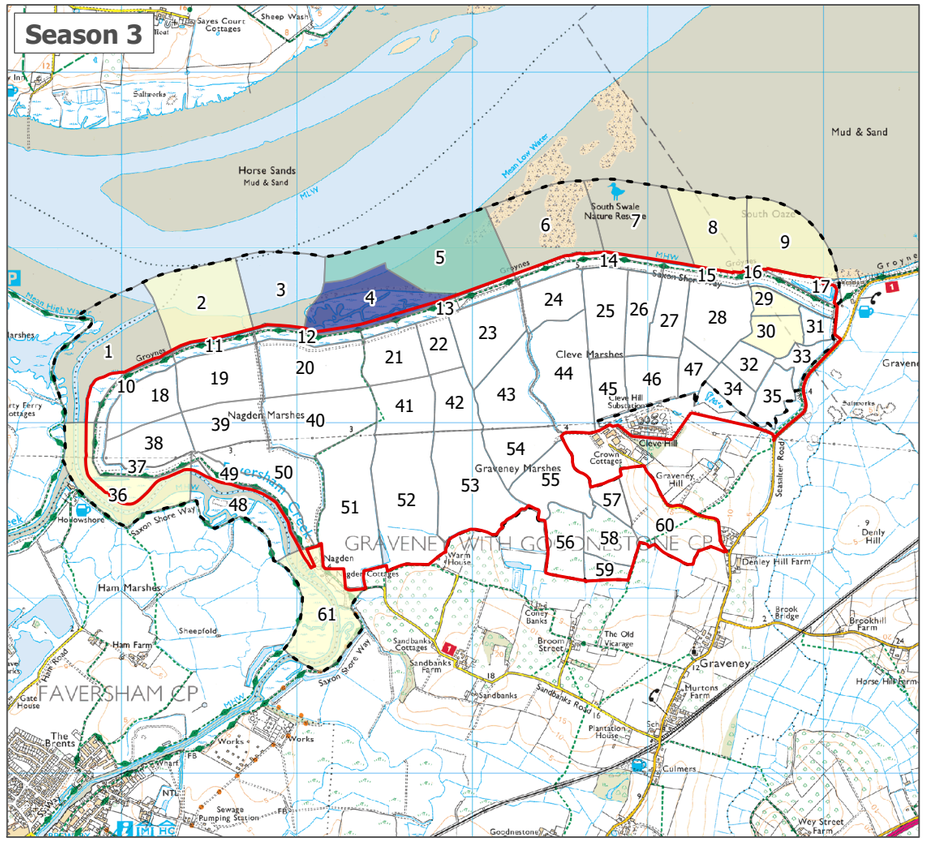
Cleve Hill Solar Park Environmental Statement

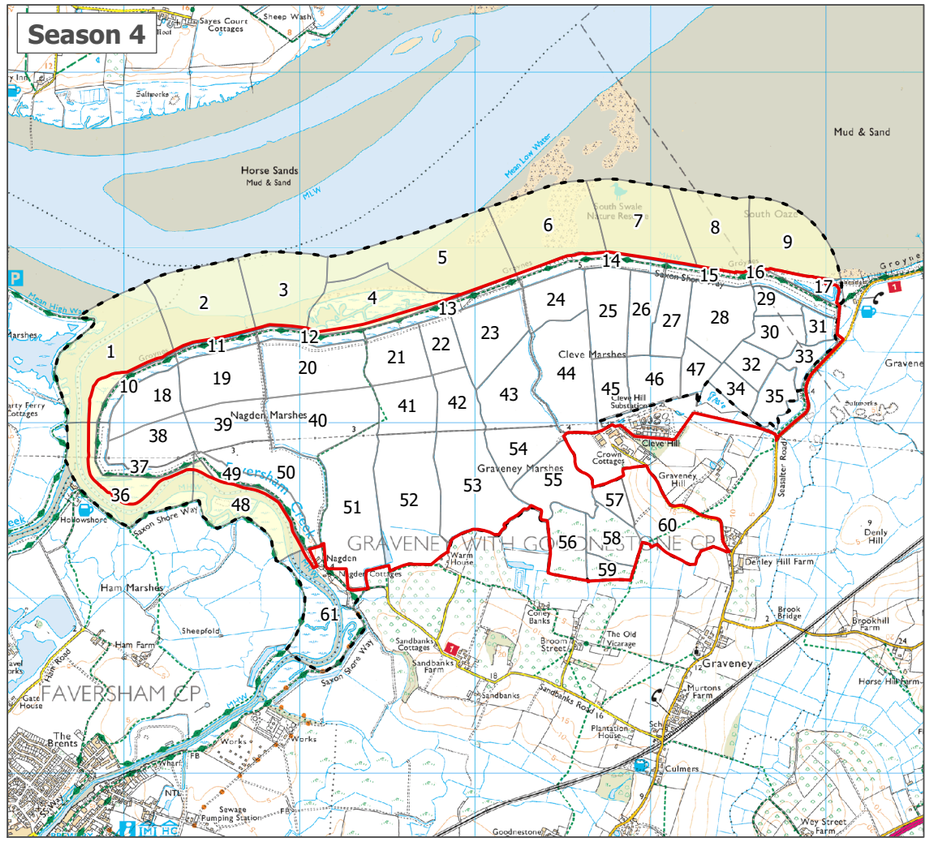
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CLEVE HILL SOLAR PARK

ARCUS

Site Boundary

Winter Bird Survey Area 2016/17 and 2017/18

Bar-tailed Godwit mean bird days

- 0
- 1 - 6,000
- 6,000 - 12,000
- 12,000 - 18,000
- 18,000 - 24,000
- 24,000 - 30,000

1:35,000 Scale @ A3

0 0.75 1.5 km

NORTH

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Checked By: MA	Date: 14/11/2018

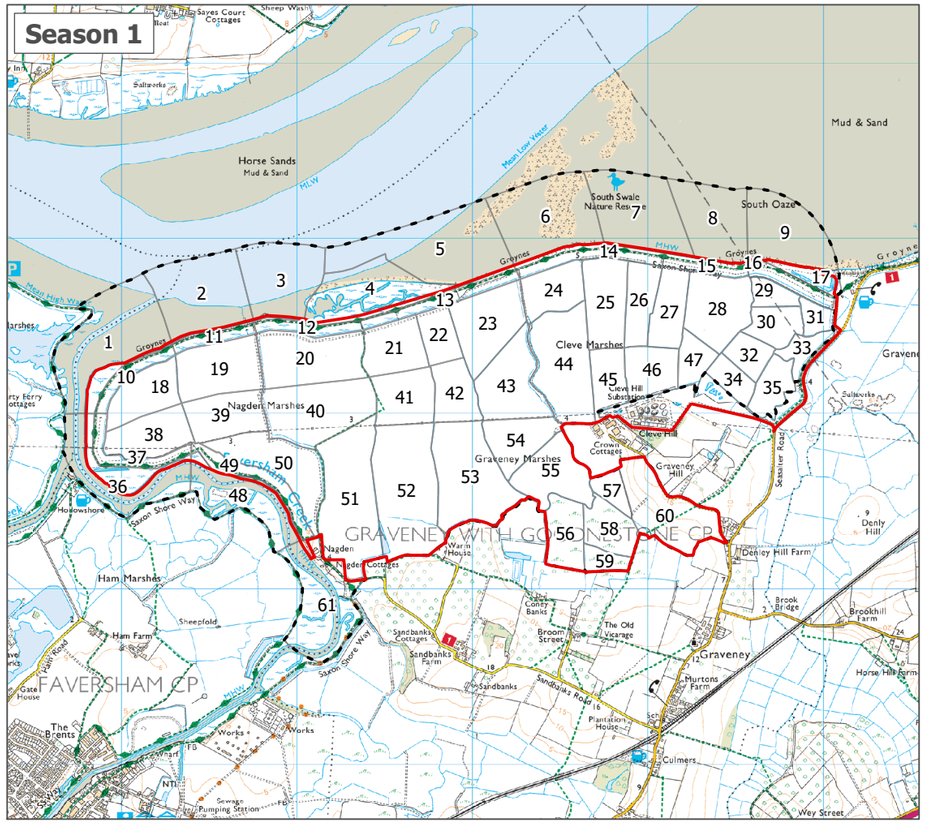
Passage/Winter Bird Survey Results: Bar-tailed Godwit

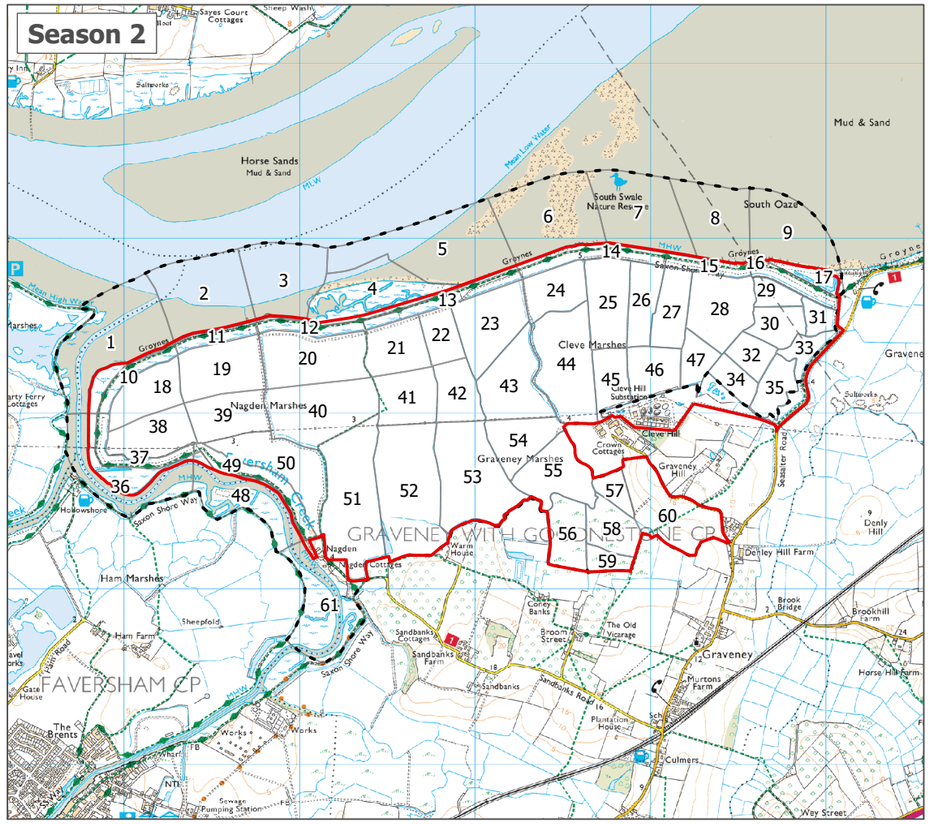
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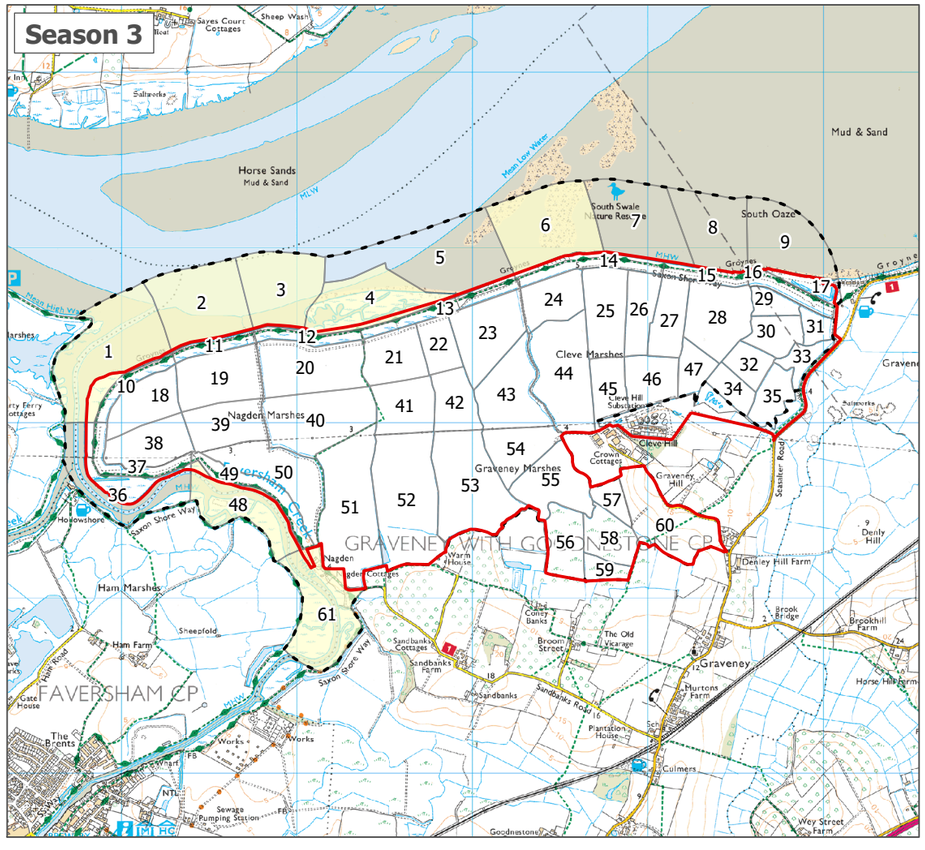
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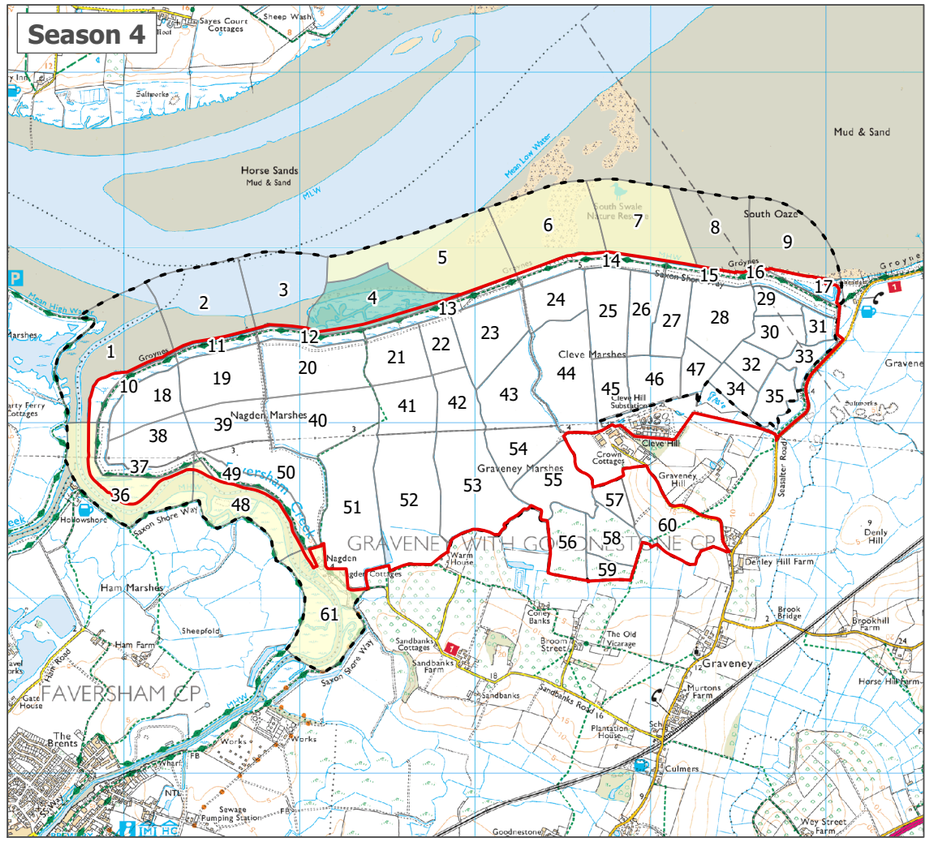
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CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- Winter Bird Survey Area 2016/17 and 2017/18

Black-tailed Godwit

- 0
- 1 - 2,000
- 2,000 - 4,000
- 4,000 - 6,000
- 6,000 - 8,000
- 8,000 - 10,000

1:35,000 Scale @ A3

0 0.75 1.5 km

NORTH

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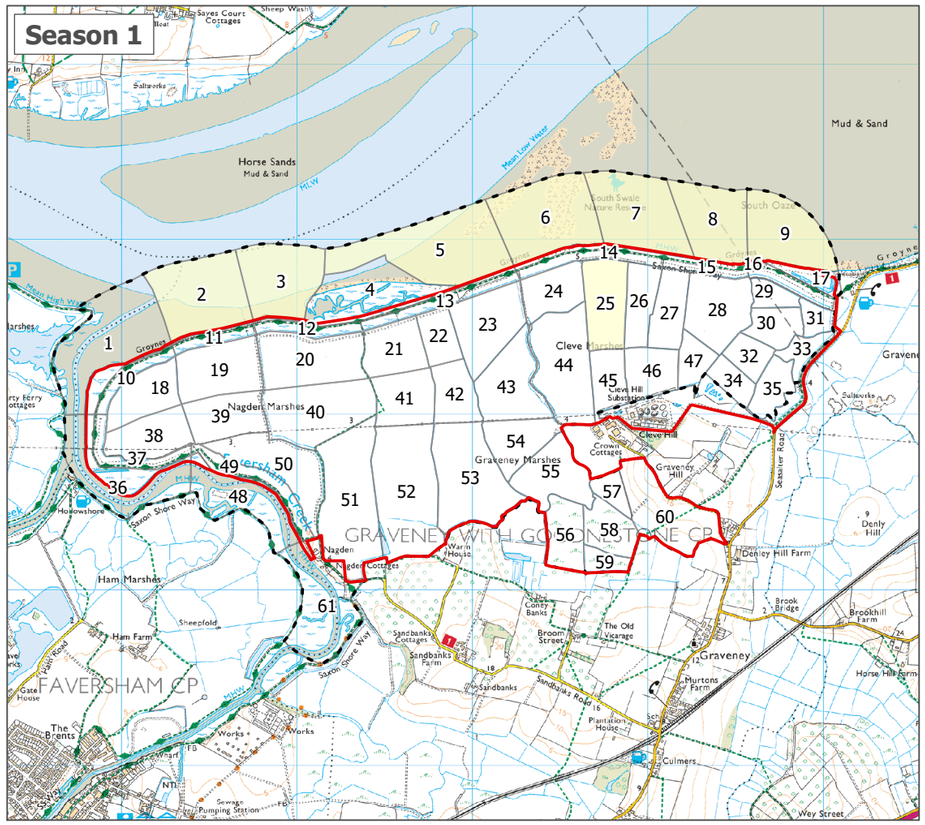
Passage/Winter Bird Survey Results: Black-tailed Godwit

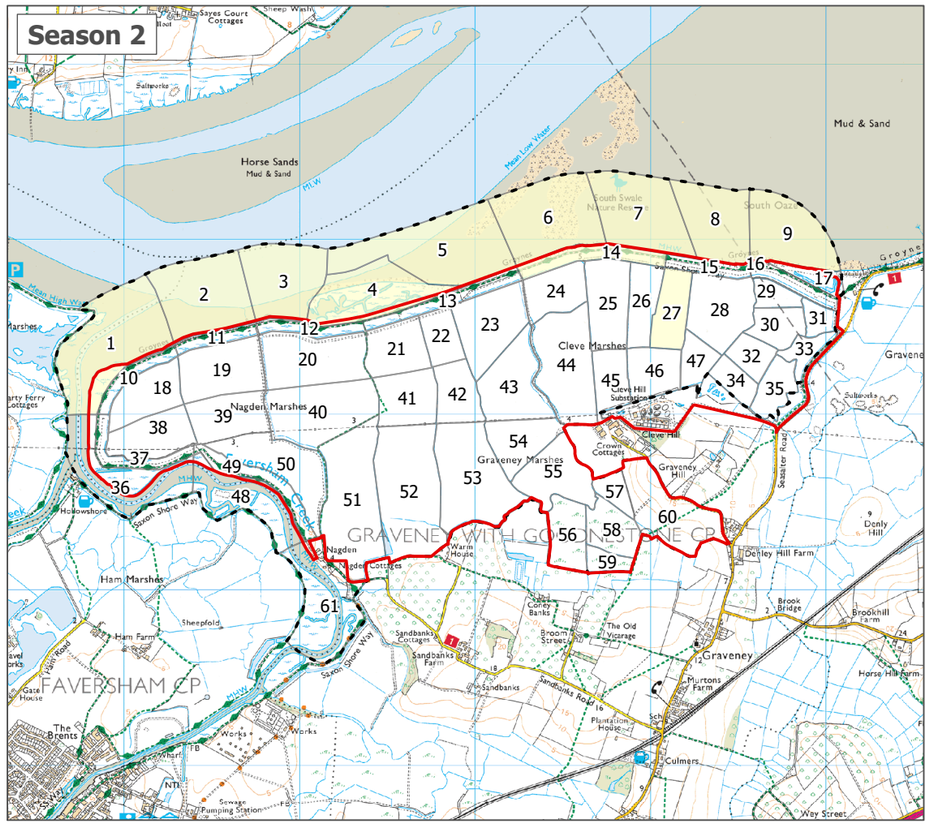
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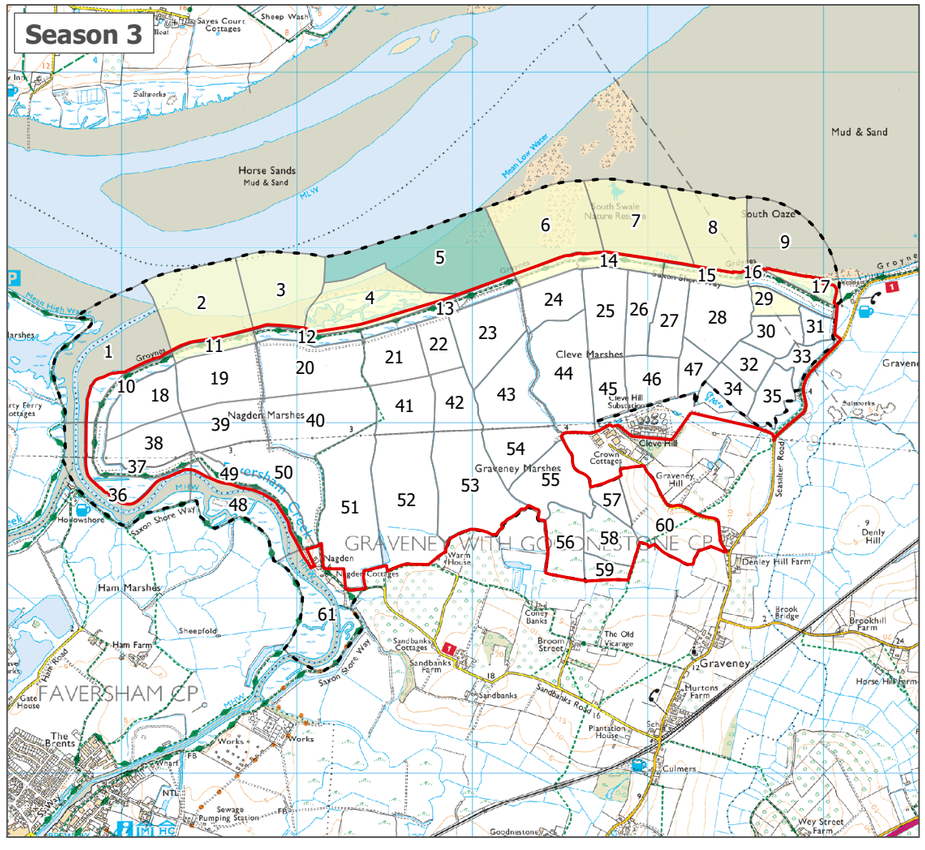
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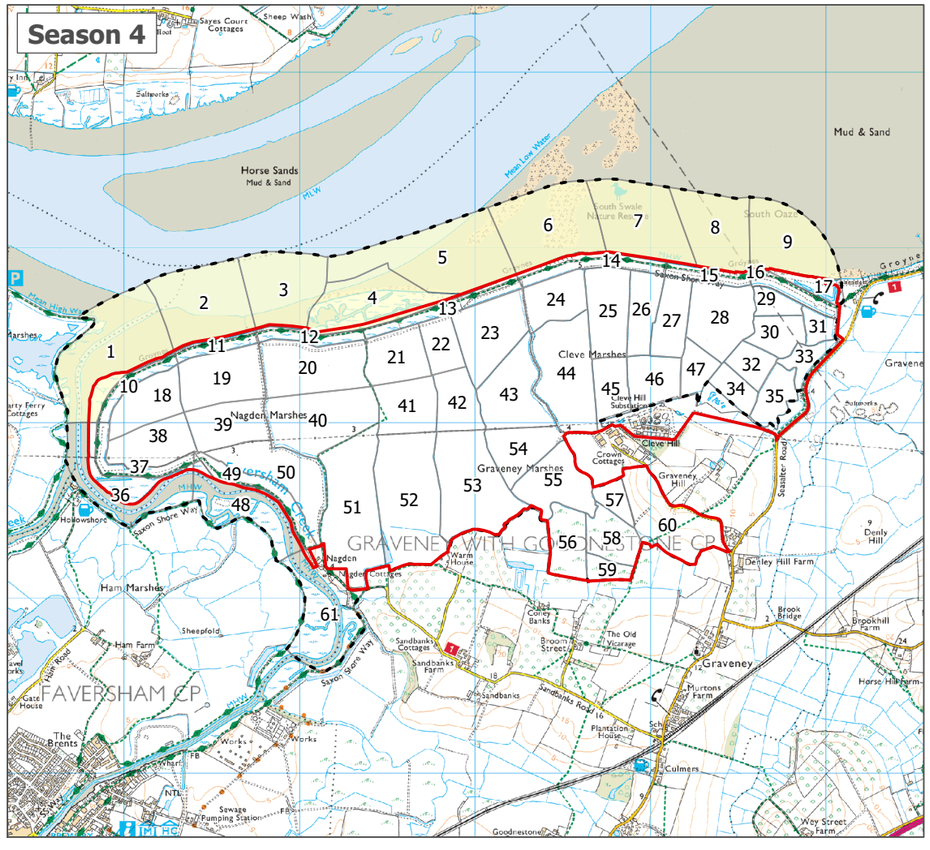
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CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- Winter Bird Survey Area 2016/17 and 2017/18

Turnstone mean bird days

- 0
- 1 - 2,000
- 2,000 - 4,000
- 4,000 - 6,000
- 6,000 - 8,000
- 8,000 - 10,000

1:35,000 Scale @ A3

0 0.75 1.5 km

NORTH

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Checked By: MA	Date: 14/11/2018

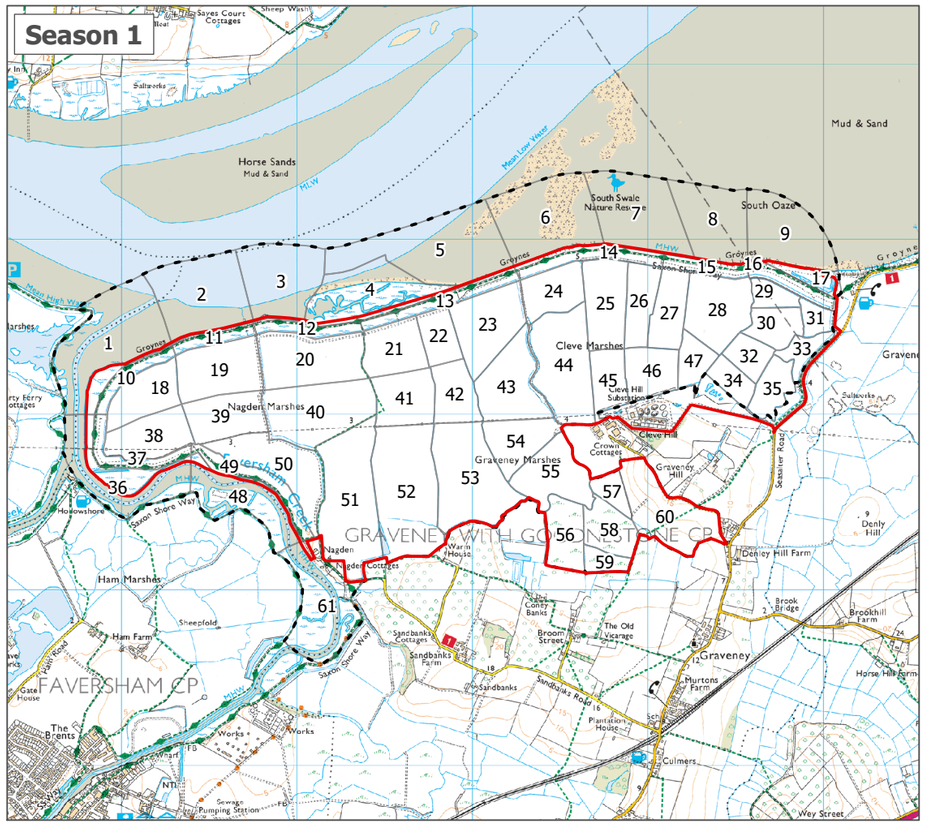
Passage/Winter Bird Survey Results: Turnstone

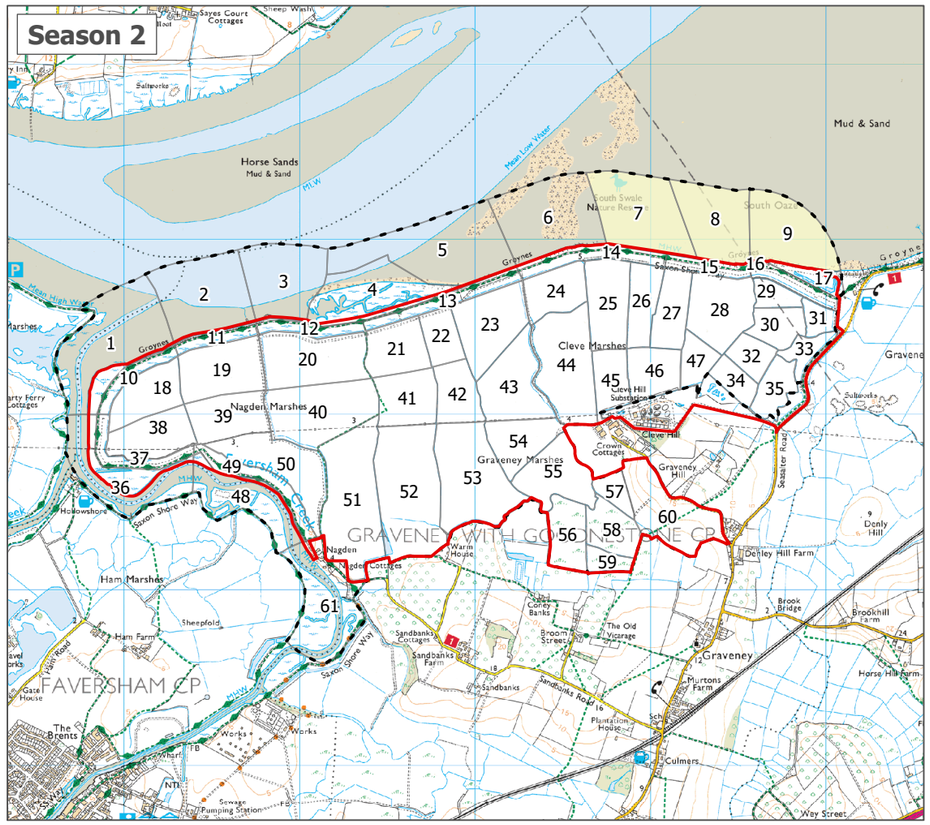
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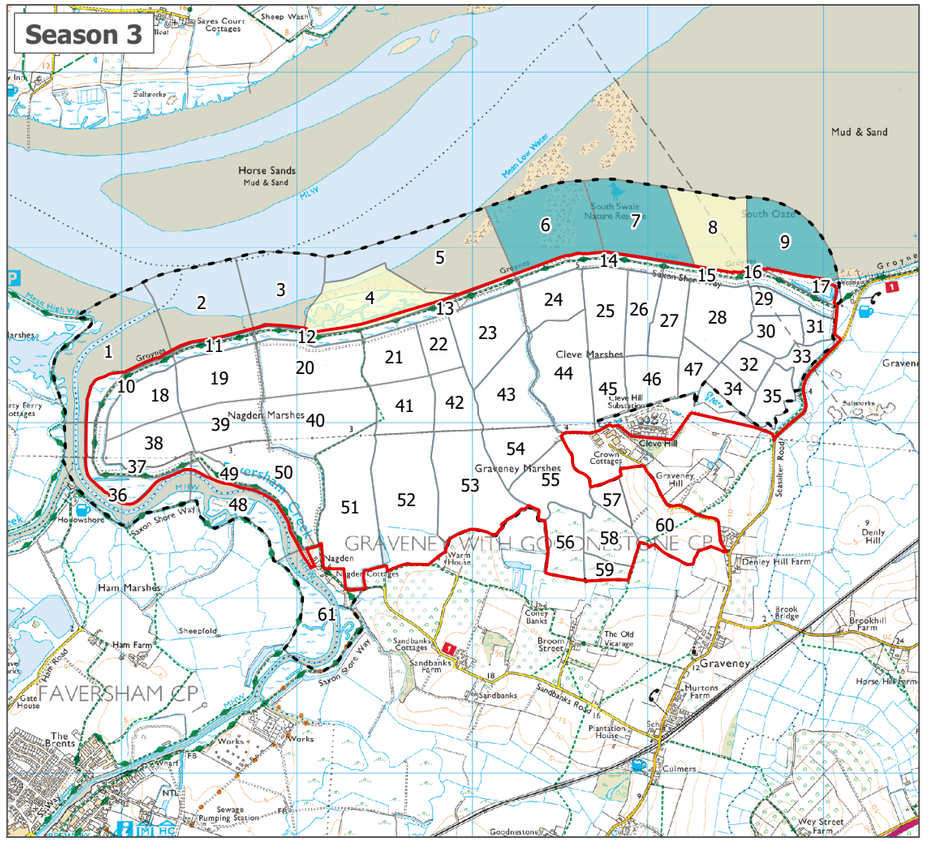
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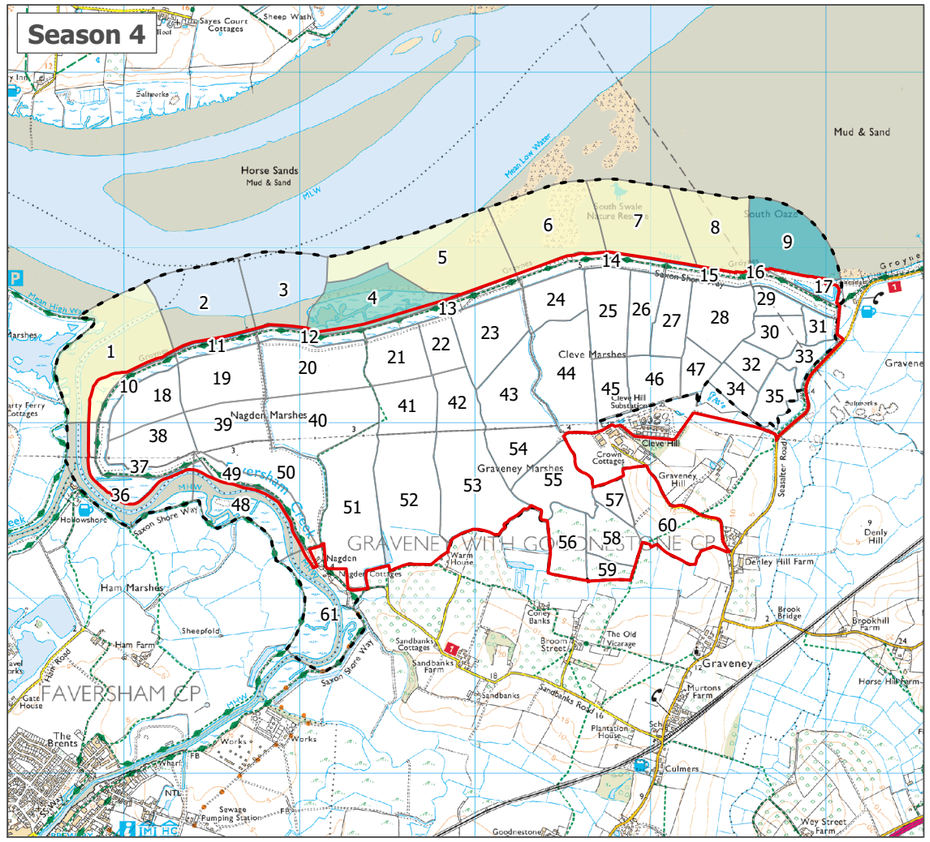
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CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- Winter Bird Survey Area 2016/17 and 2017/18

Knot mean bird days

- 0
- 1 - 6,000
- 6,000 - 12,000
- 12,000 - 18,000
- 18,000 - 24,000
- 24,000 - 30,000

1:35,000 Scale @ A3

0 0.75 1.5 km

NORTH

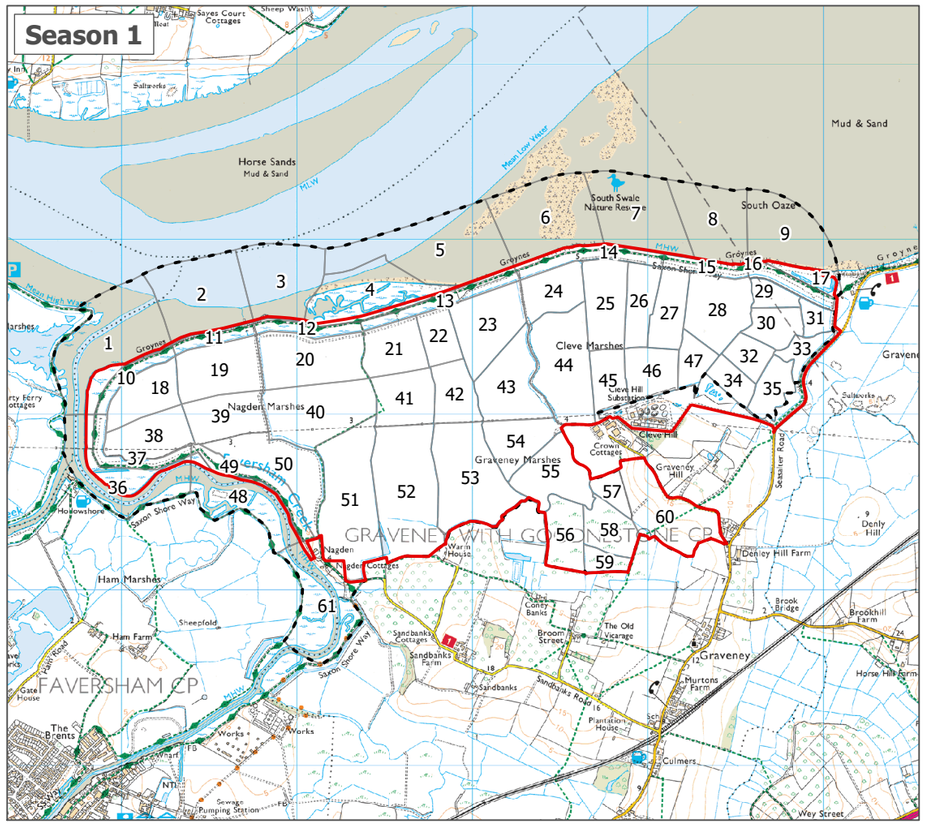
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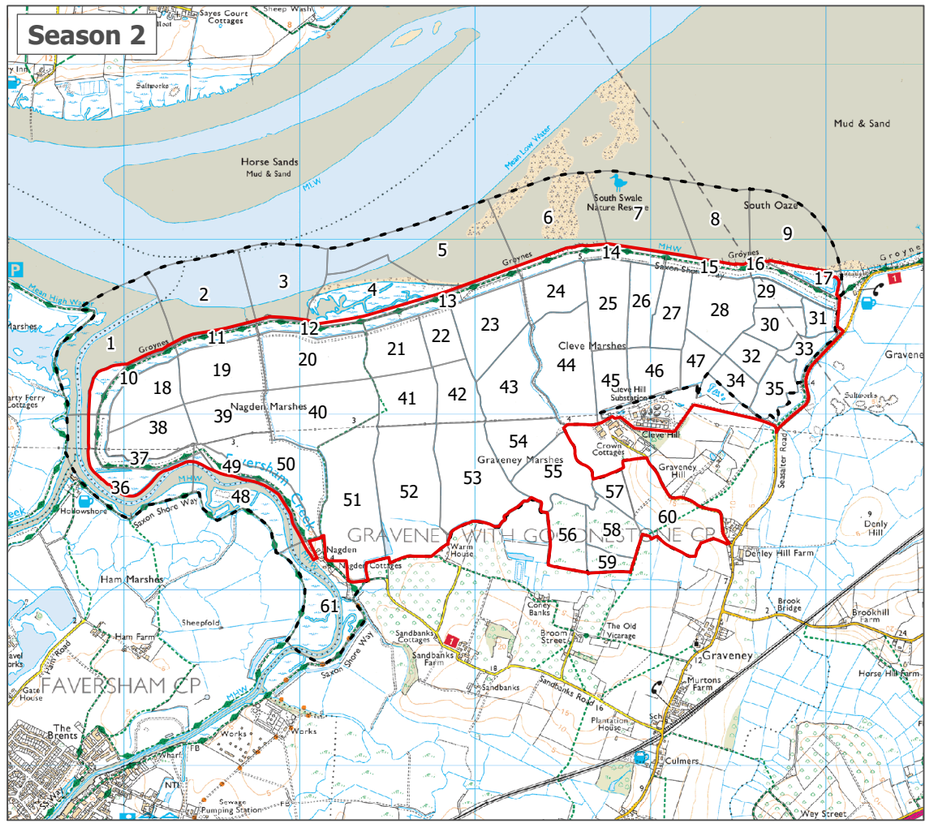
Passage/Winter Bird Survey Results: Dark-bellied Brent Goose
Figure A9.23

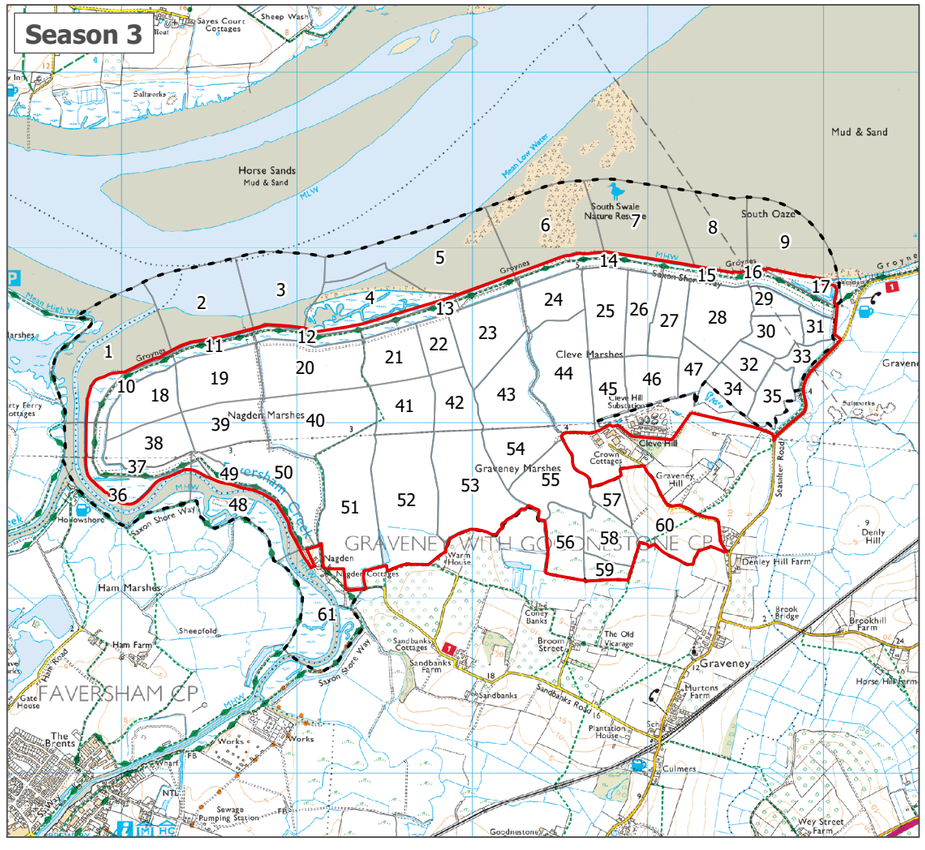
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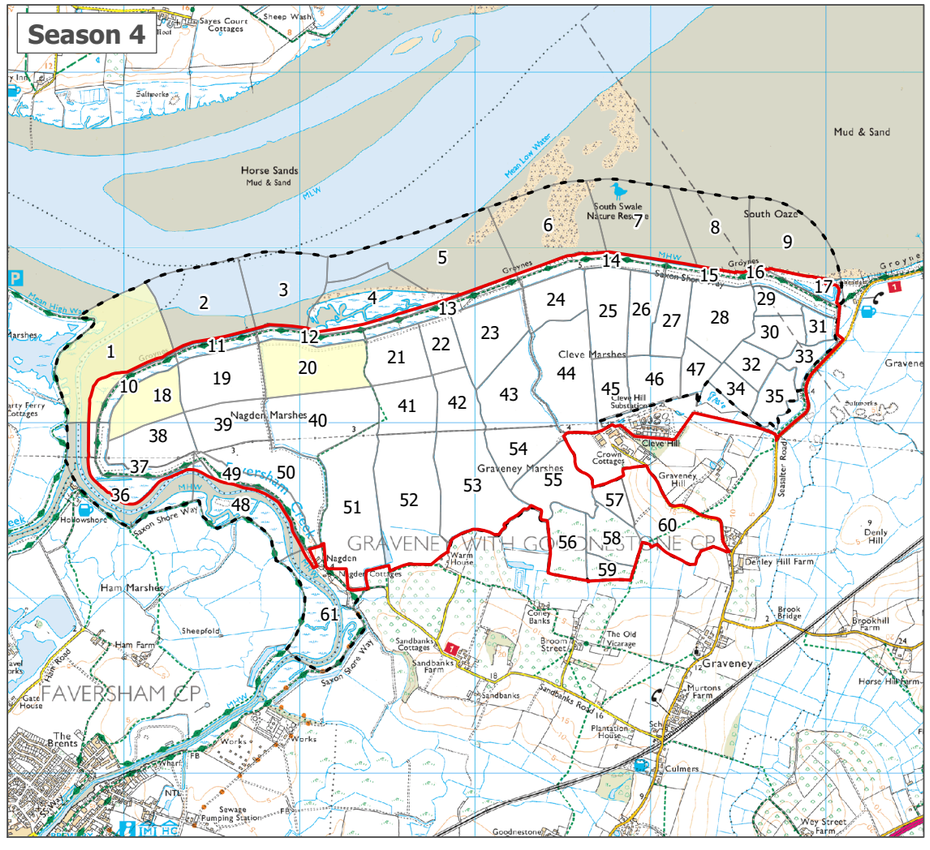
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CLEVE HILL SOLAR PARK

ARCUS

Site Boundary

Winter Bird Survey Area 2016/17 and 2017/18

Ruff mean bird days

- 0
- 1 - 200
- 200 - 400
- 400 - 600
- 600 - 800
- 800 - 1,000

1:35,000 Scale @ A3

0 0.75 1.5 km

NORTH

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Checked By: MA	Date: 14/11/2018

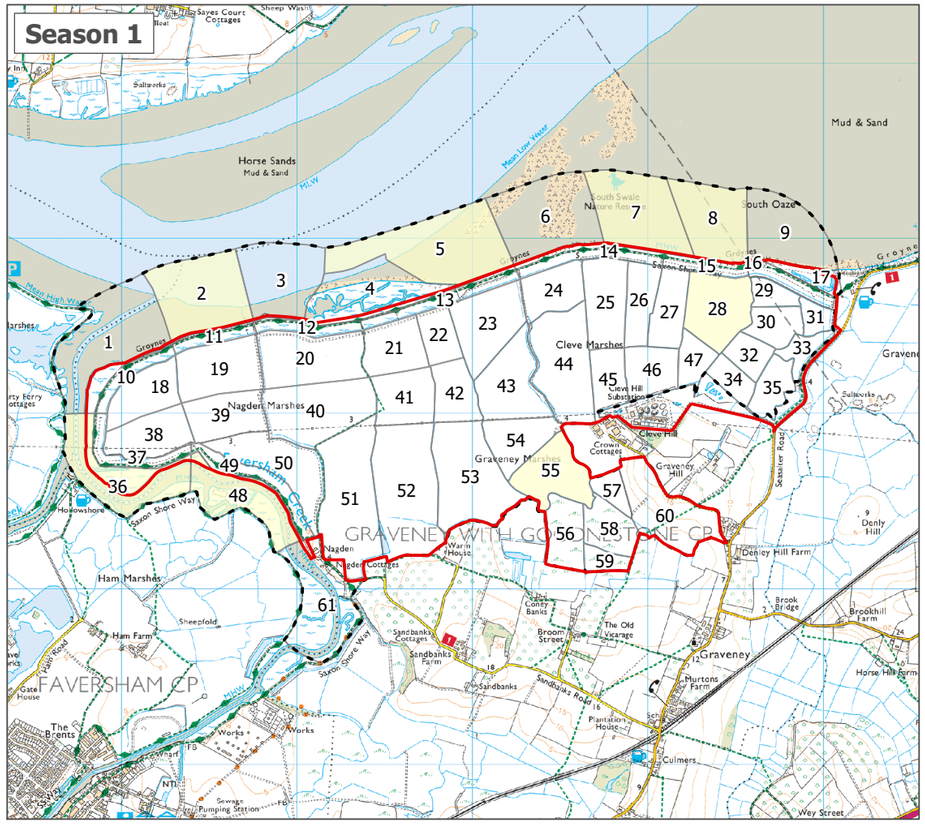
Passage/Winter Bird Survey Results: Ruff

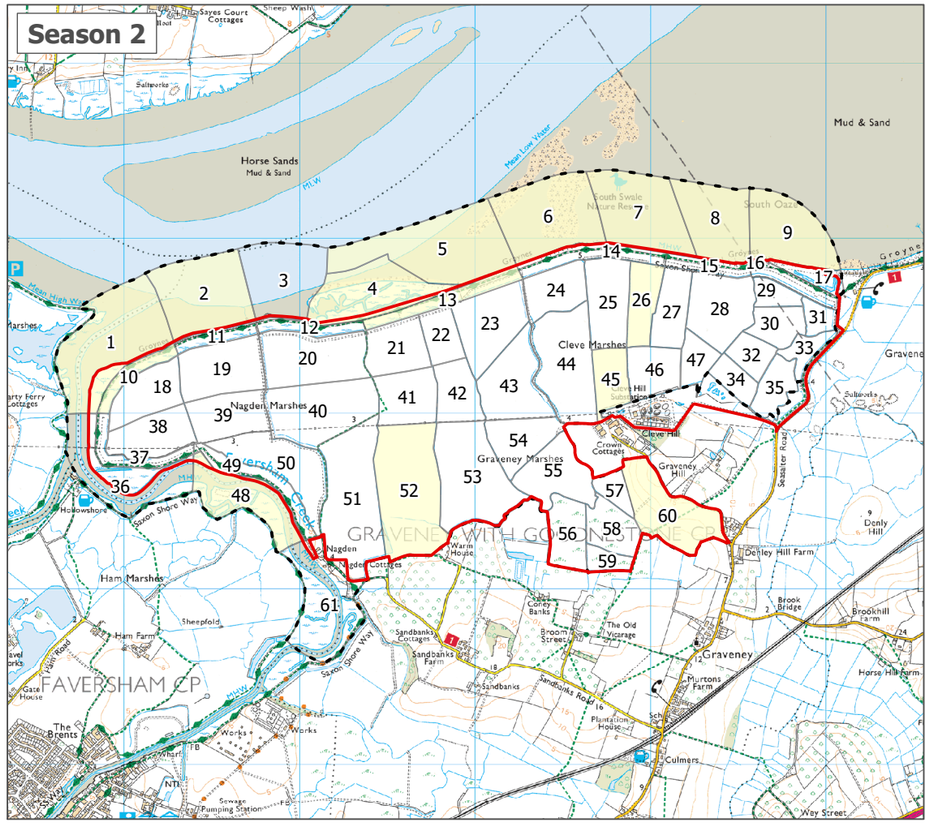
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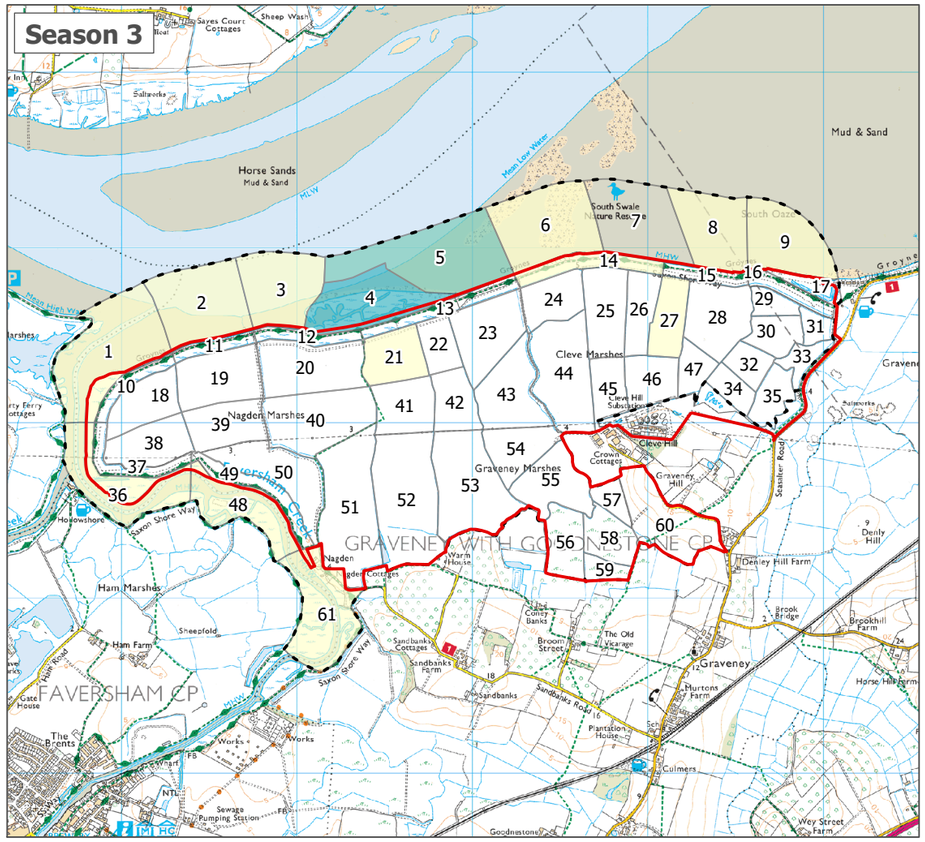
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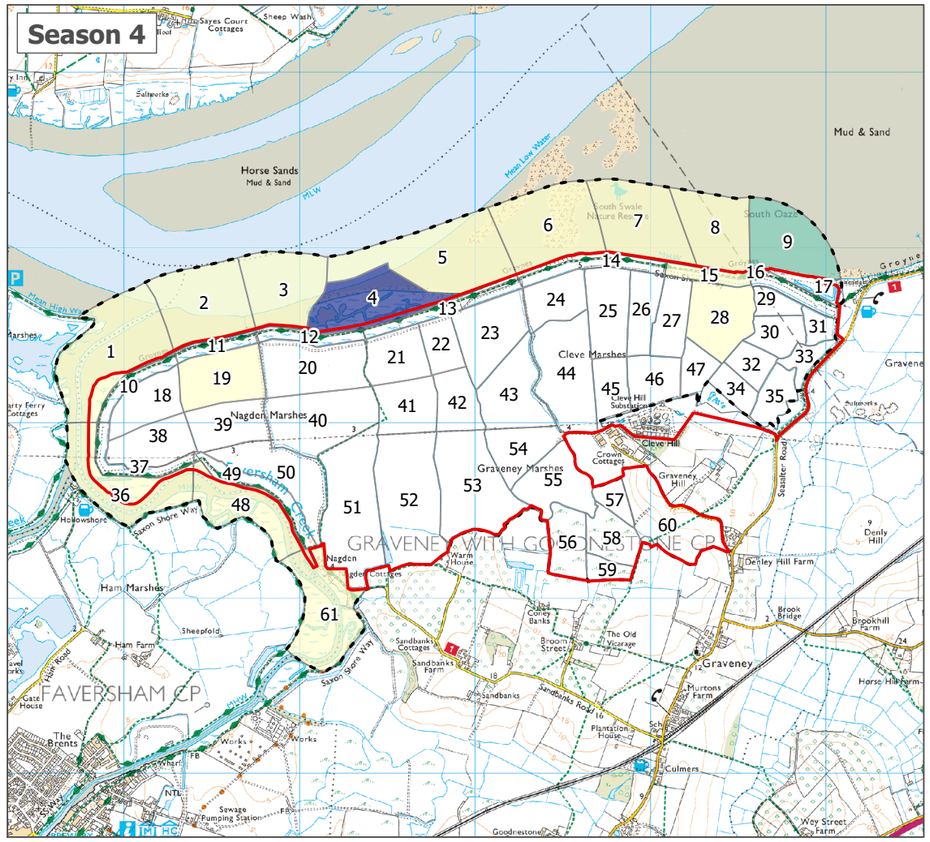
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CLEVE HILL SOLAR PARK

ARCUS

Site Boundary

Winter Bird Survey Area 2016/17 and 2017/18

Dunlin mean bird days

- 0
- 1 - 13,000
- 13,000 - 26,000
- 26,000 - 39,000
- 39,000 - 52,000
- 52,000 - 65,000

1:35,000 Scale @ A3

0 0.75 1.5 km

NORTH

Produced By: SC	Ref: 2238-REP-276
Checked By: MA	Date: 14/11/2018

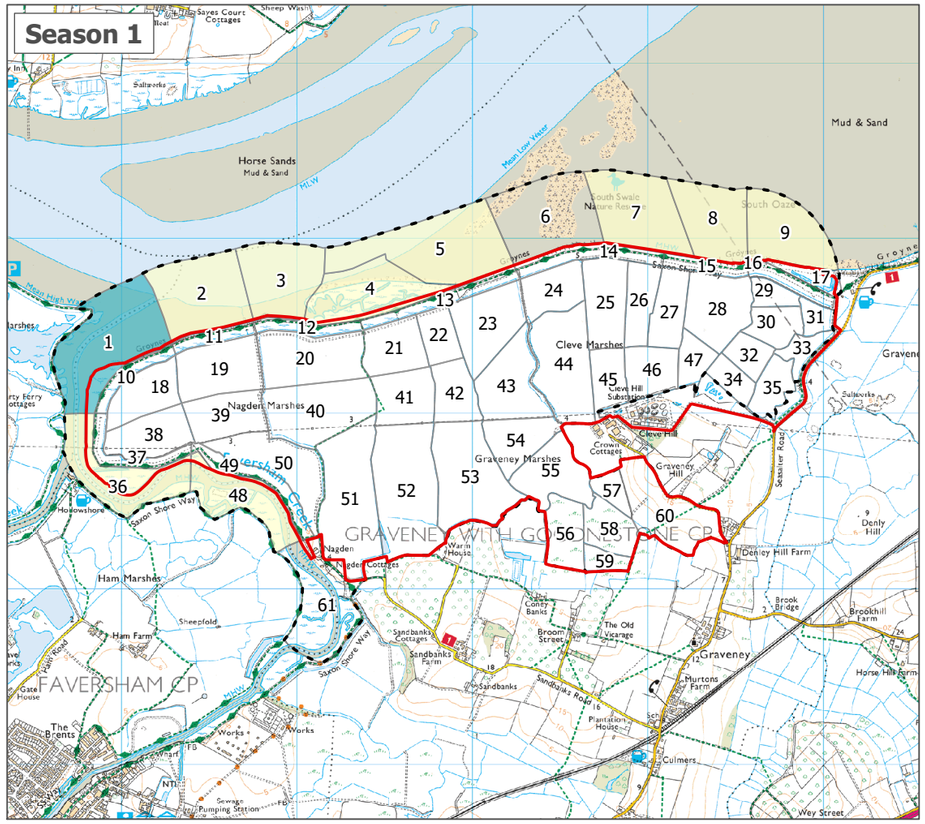
Passage/Winter Bird Survey Results: Dunlin

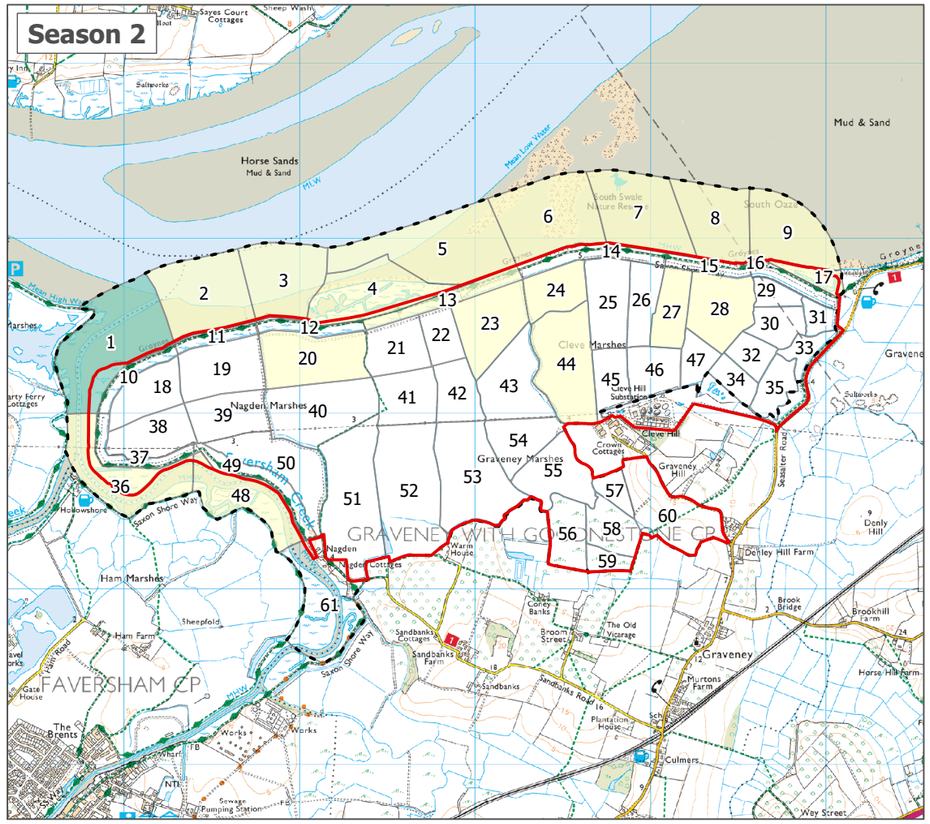
Figure A9.25

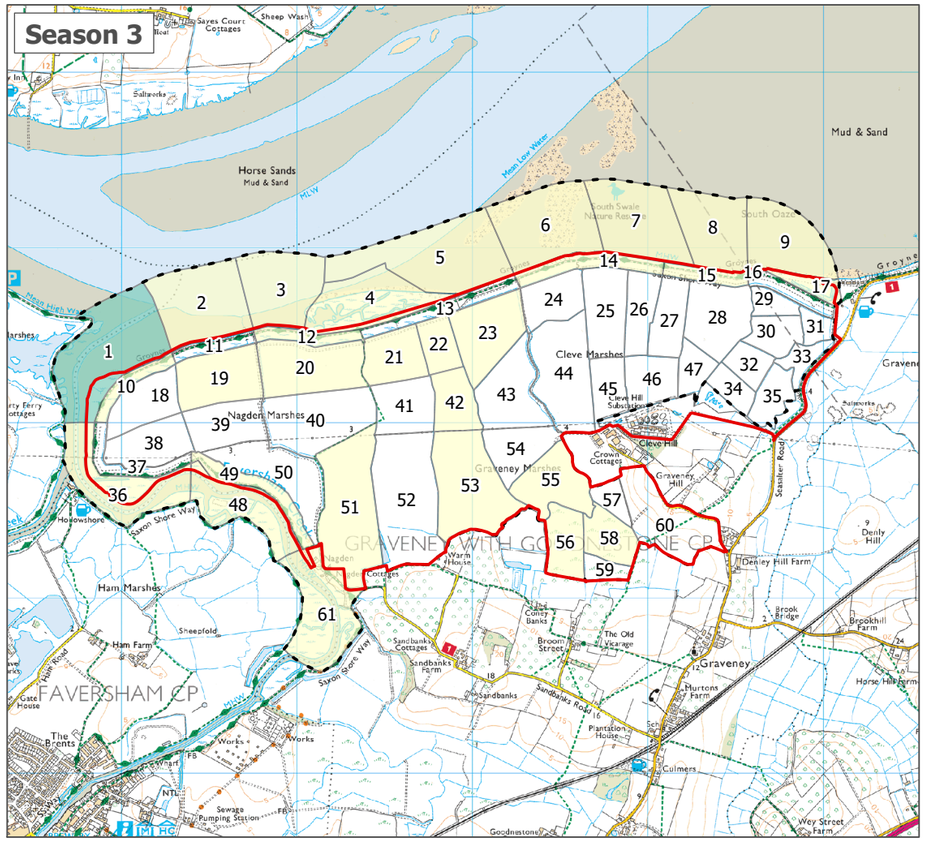
Cleve Hill Solar Park Environmental Statement

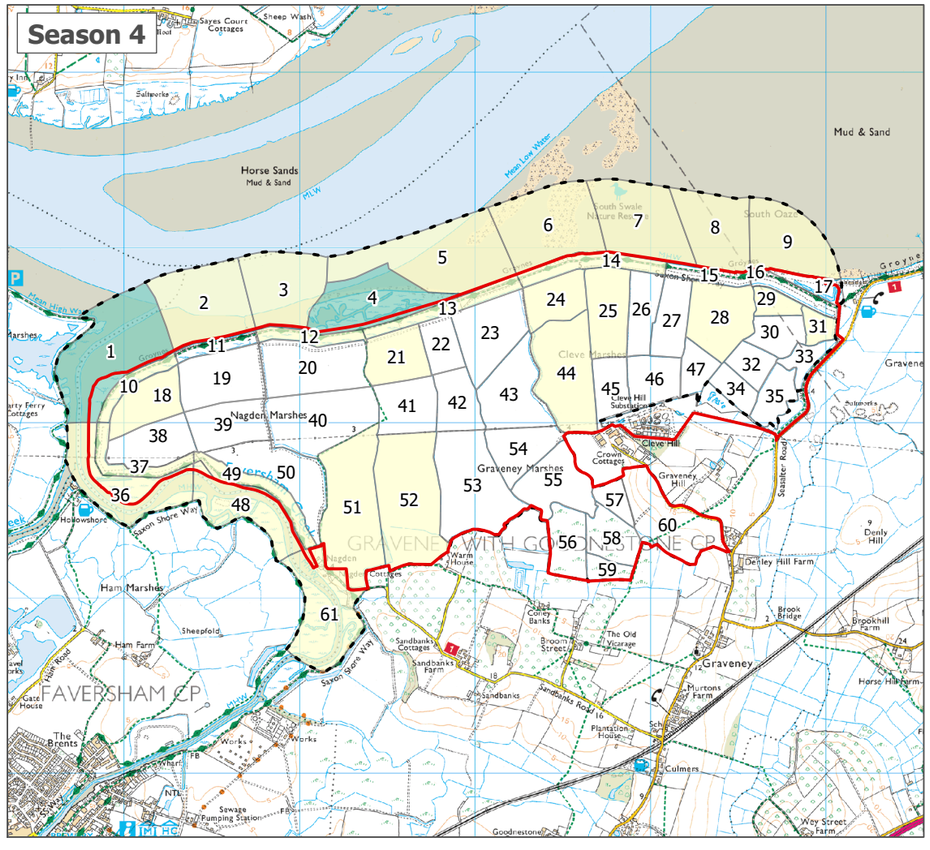
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CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- Winter Bird Survey Area 2016/17 and 2017/18

Redshank mean bird days

- 0
- 1 - 6,000
- 6,000 - 12,000
- 12,000 - 18,000
- 18,000 - 24,000
- 24,000 - 30,000

1:35,000 Scale @ A3

0 0.75 1.5 km

NORTH

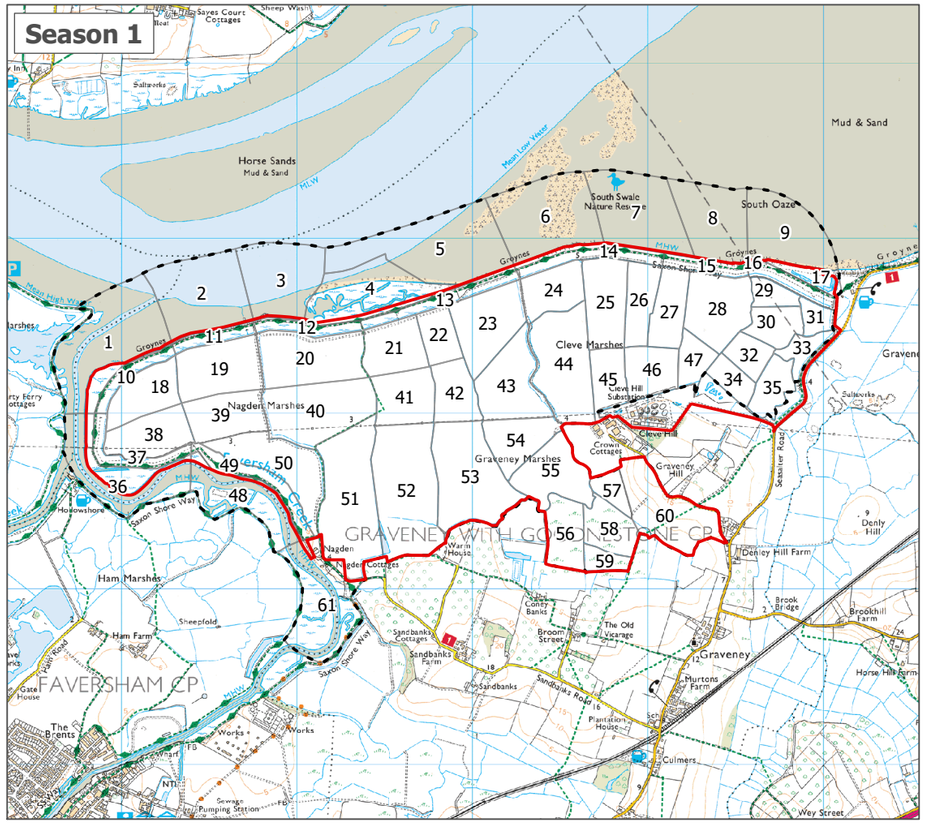
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Checked By: MA	Date: 14/11/2018

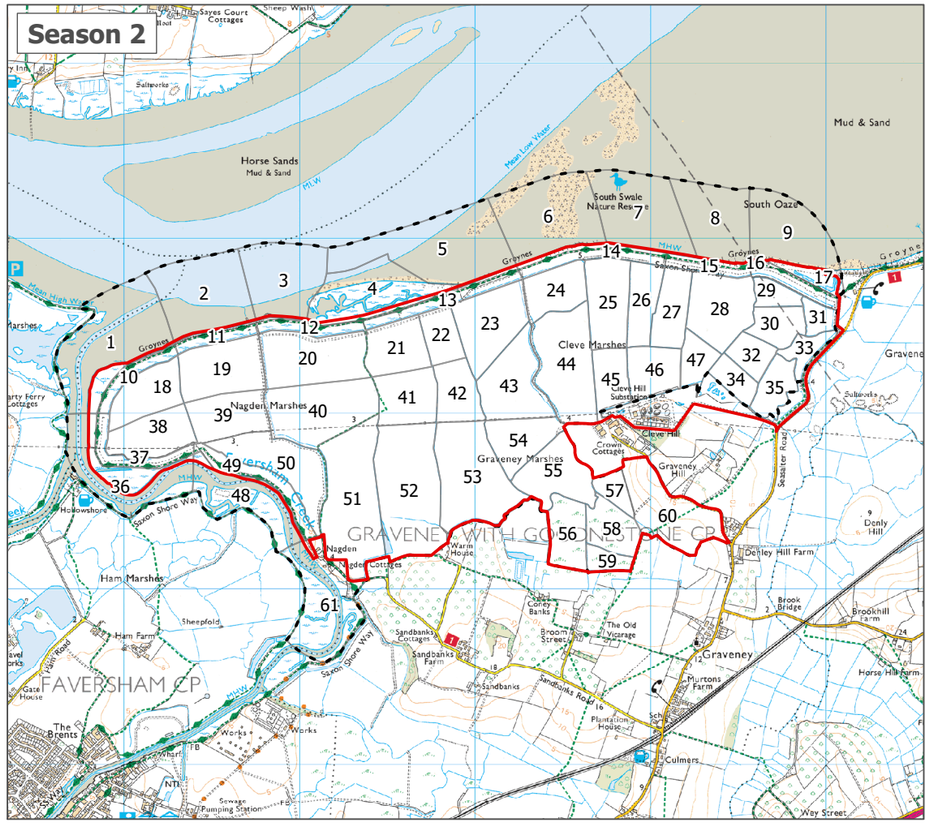
Passage/Winter Bird Survey Results: Redshank
Figure A9.26

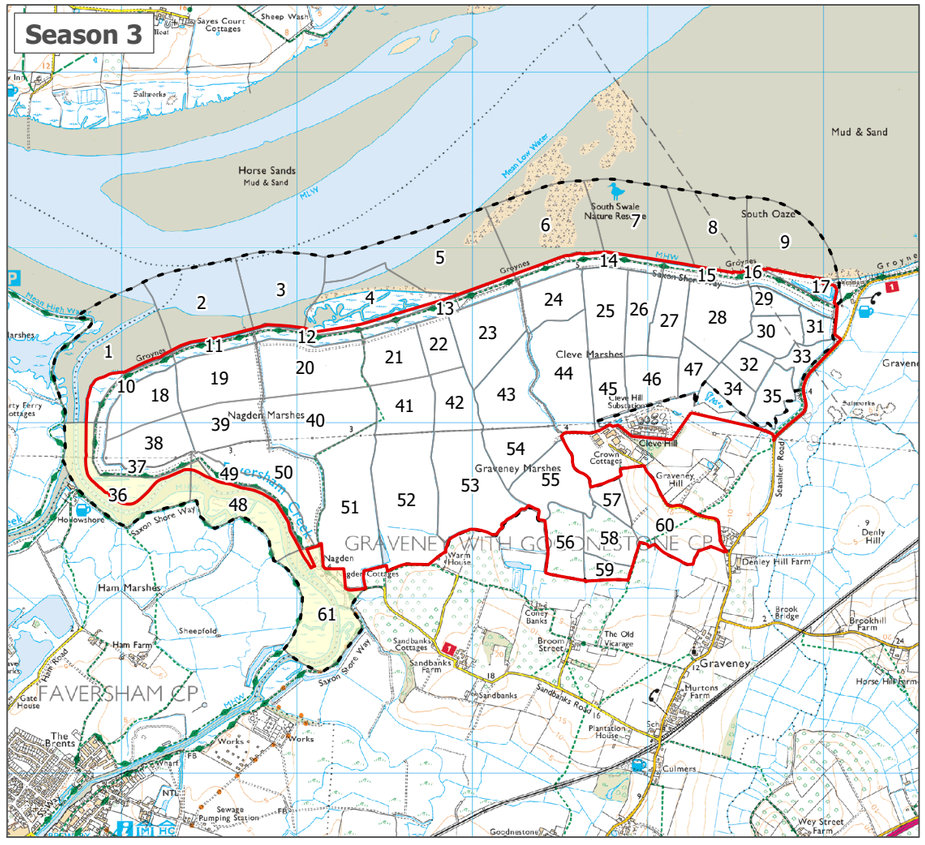
Cleve Hill Solar Park Environmental Statement

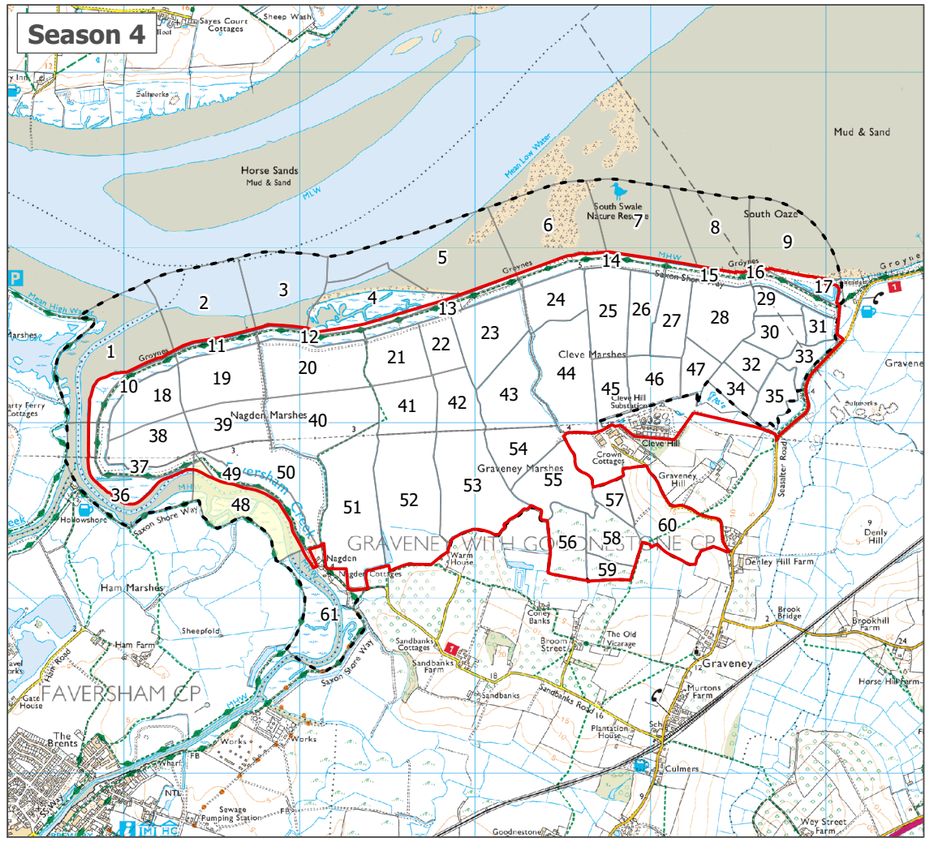
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CLEVE HILL SOLAR PARK

ARCUS

Site Boundary

Winter Bird Survey Area 2016/17 and 2017/18

Greenshank mean bird days

- 0
- 1 - 200
- 200 - 400
- 400 - 600
- 600 - 800
- 800 - 1000

1:35,000 Scale @ A3

0 0.75 1.5 km

NORTH

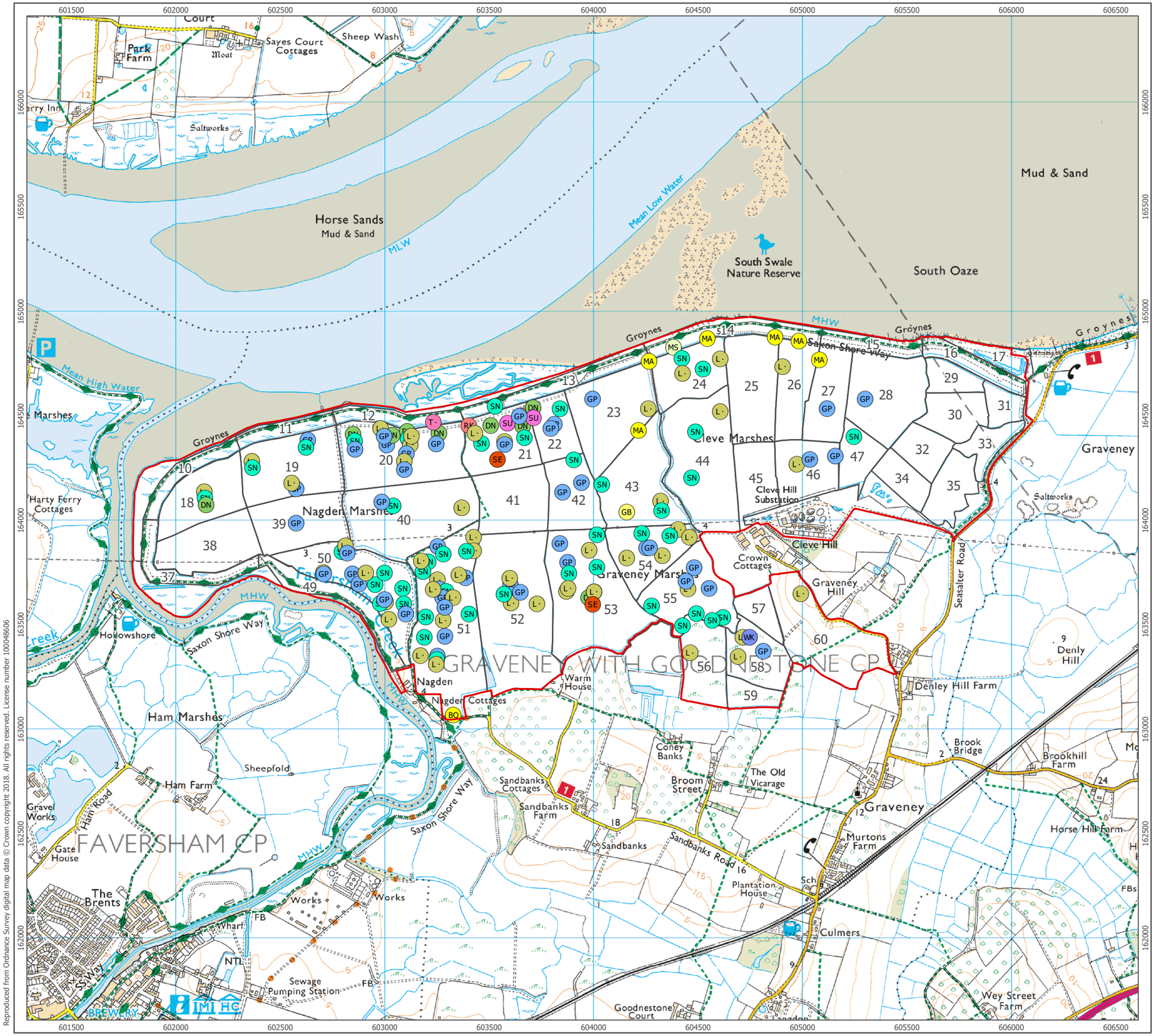
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Checked By: MA	Date: 14/11/2018

Passage/Winter Bird Survey Results: Greenshank
Figure A9.7

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CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- Count Sectors

Species

- BO Barn Owl
- DN Dunlin
- GB Great Black-backed Gull
- GP Golden Plover
- L Lapwing
- MA Mallard
- MS Mute Swan
- RK Redshank
- SE Short-eared Owl
- SN Snipe
- SU Shelduck
- T Teal
- WK Woodcock

1:17,500 Scale @ A3

0 400 800 m

NORTH

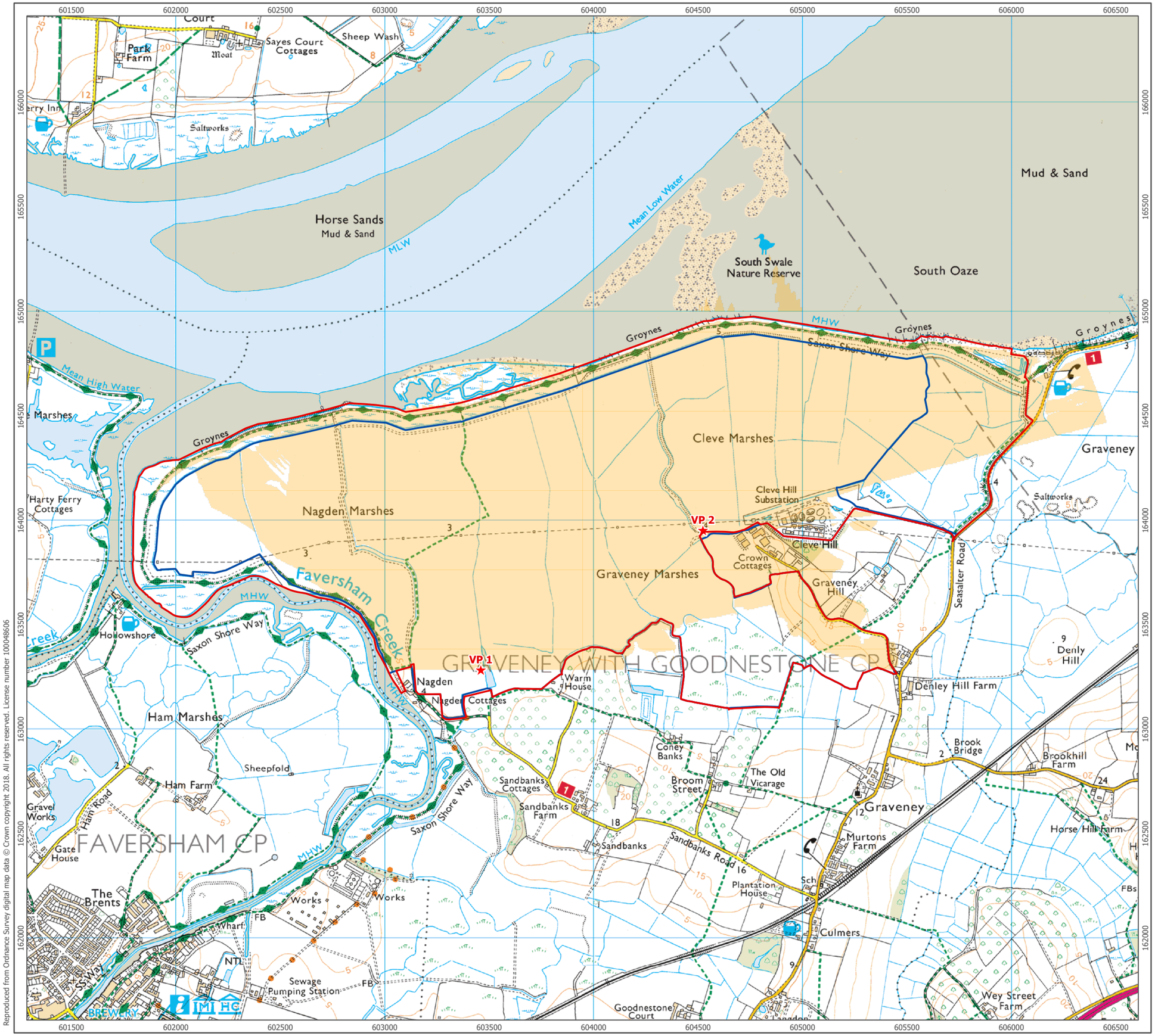
Produced By: SC	Ref: 2238-REP-279
Checked By: MA	Date: 01/11/2018

Nocturnal Winter Bird Survey Results 2015-16

Figure A9.28

Cleve Hill Solar Park Environmental Statement

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CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- Core Survey Area
- ★ Vantage Points
- Visible Area from Vantage Point

1:17,500 Scale @ A3

0 400 800 m

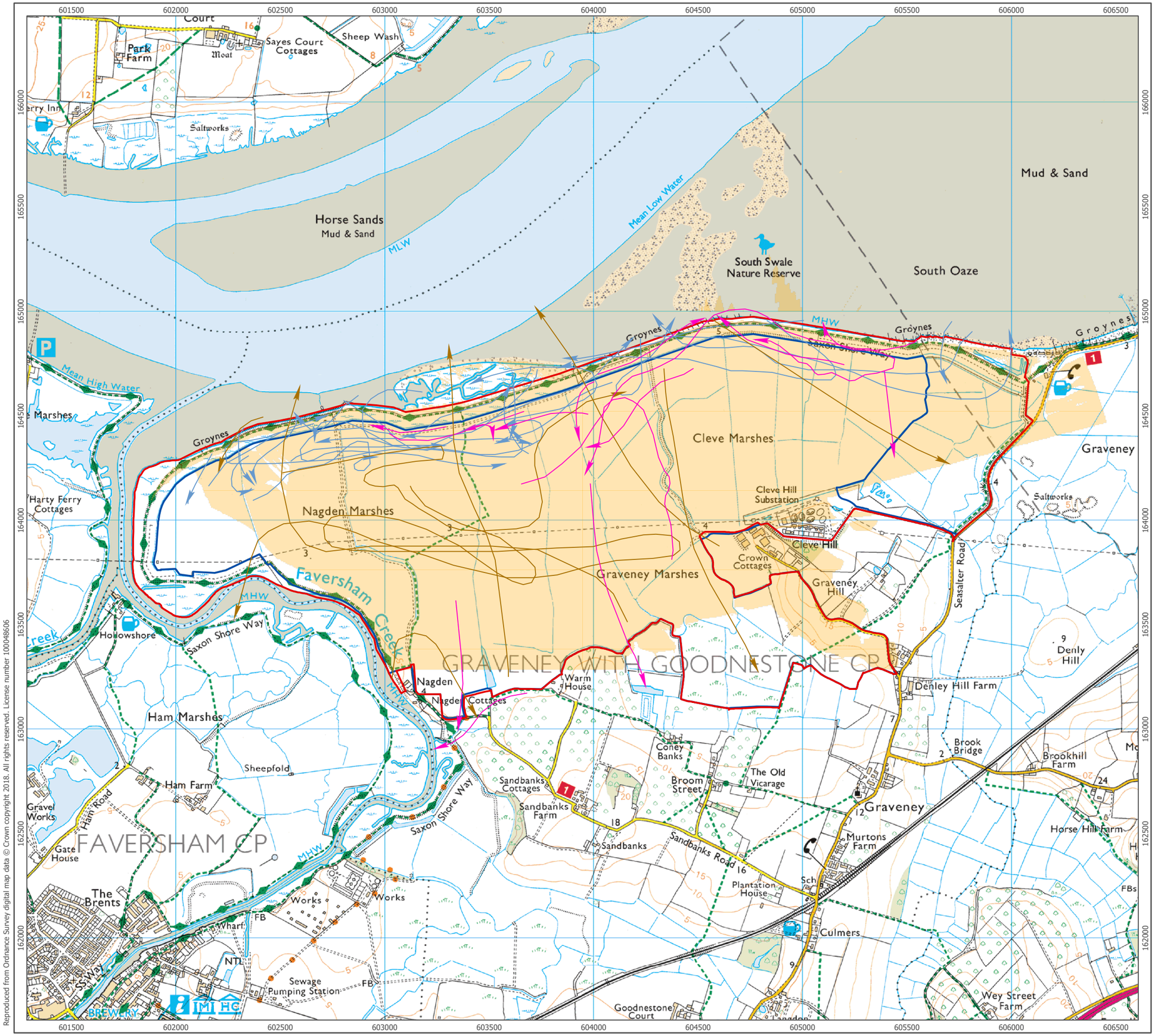
NORTH

Produced By: SC	Ref: 2238-REP-280
Checked By: MA	Date: 07/11/2018

Flight Activity Survey Area
Figure A9.29

Cleve Hill Solar Park
Environmental Statement

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CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- Core Survey Area
- Visible Area from Vantage Point
- Brent Goose
- Greylag Goose
- Mute Swan

1:17,500 Scale @ A3

0 400 800 m

NORTH

Produced By: SC	Ref: 2238-REP-281
Checked By: MA	Date: 01/11/2018

FAS Results: MS, GJ and DB
Figure A9.30

Cleve Hill Solar Park
Environmental Statement

CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- Core Survey Area
- Visible Area from Vantage Point
- Gadwall
- Mallard
- Shelduck
- Shoveler
- Teal
- Wigeon

1:17,500 Scale @ A3

0 400 800 m

NORTH

Produced By: SC	Ref: 2238-REP-282
Checked By: MA	Date: 01/11/2018

FAS Results: SU, WN, GA and T

Figure A9.31

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CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- Core Survey Area
- Visible Area from Vantage Point
- Grey Heron
- Little Egret

1:17,500 Scale @ A3

0 400 800 m

NORTH

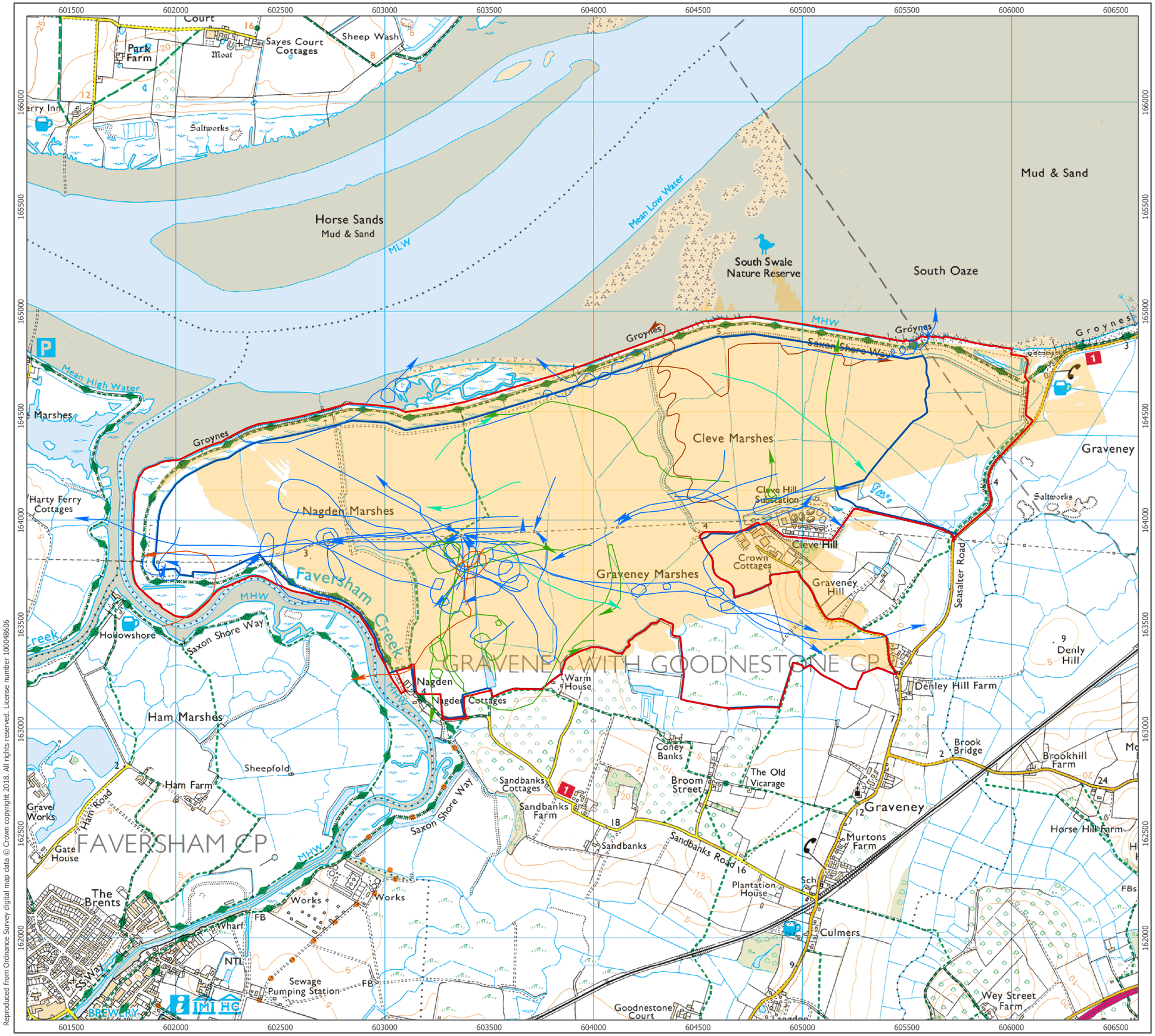
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Checked By: MA	Date: 01/11/2018

FAS Results: ET and H.
Figure A9.32

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CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- Core Survey Area
- Visible Area from Vantage Point
- Hen Harrier
- Hobby
- Merlin
- Peregrine
- Red Kite

1:17,500 Scale @ A3

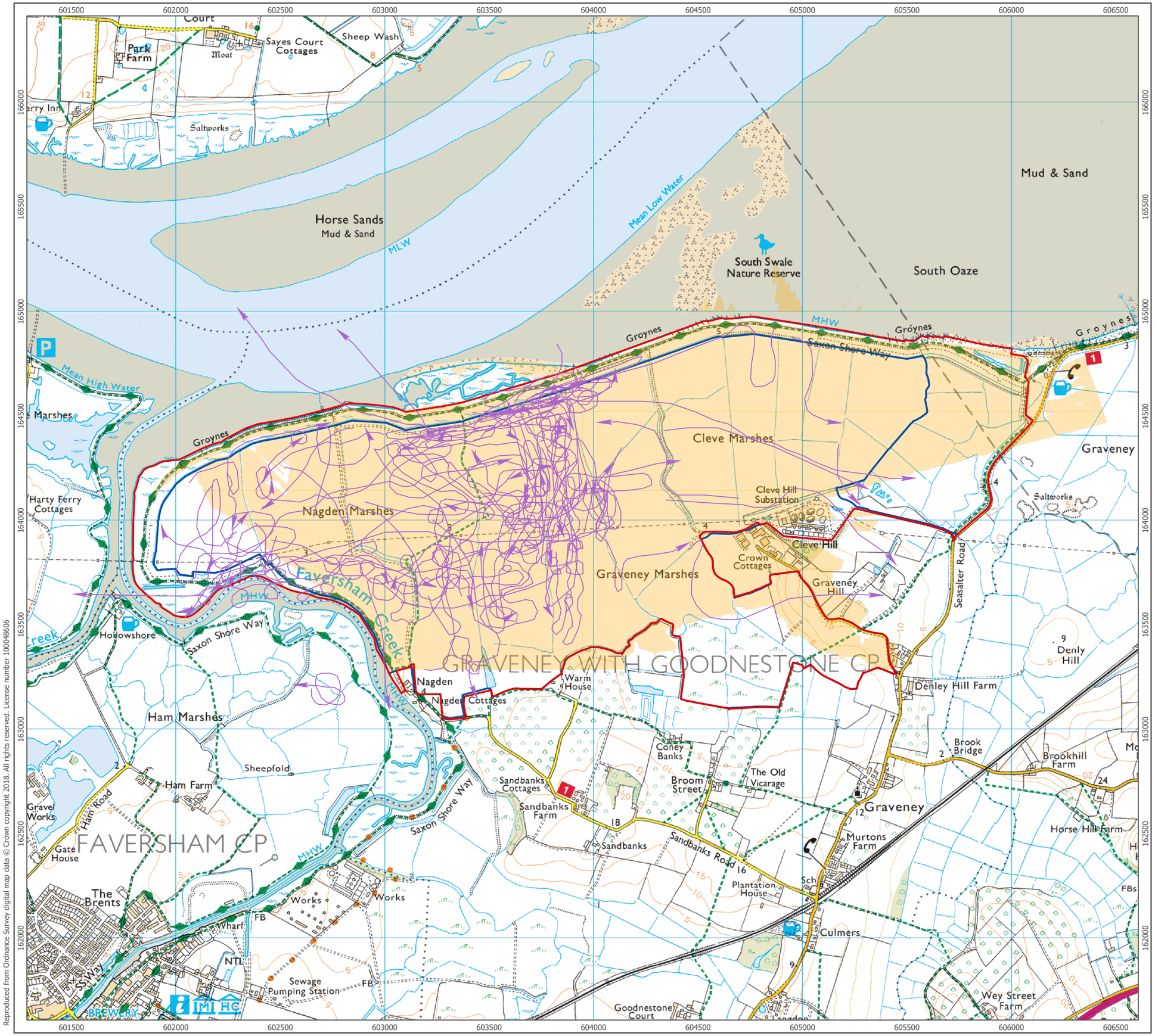
0 400 800 m

NORTH

Produced By: SC	Ref: 2238-REP-284
Checked By: MA	Date: 01/11/2018

FAS Results: KT, HH, ML, HY and PE
Figure A9.33

Cleve Hill Solar Park
Environmental Statement



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CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- Core Survey Area
- Visible Area from Vantage Point
- Marsh Harrier

1:17,500 Scale @ A3

0 400 800 m

NORTH

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Checked By: MA	Date: 07/11/2018

FAS Results: Marsh Harrier - Breeding Season

Figure A9.34

Cleve Hill Solar Park Environmental Statement

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CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- Core Survey Area
- Visible Area from Vantage Point
- Marsh Harrier

1:17,500 Scale @ A3

0 400 800 m

NORTH

Produced By: SC	Ref: 2238-REP-286
Checked By: MA	Date: 07/11/2018

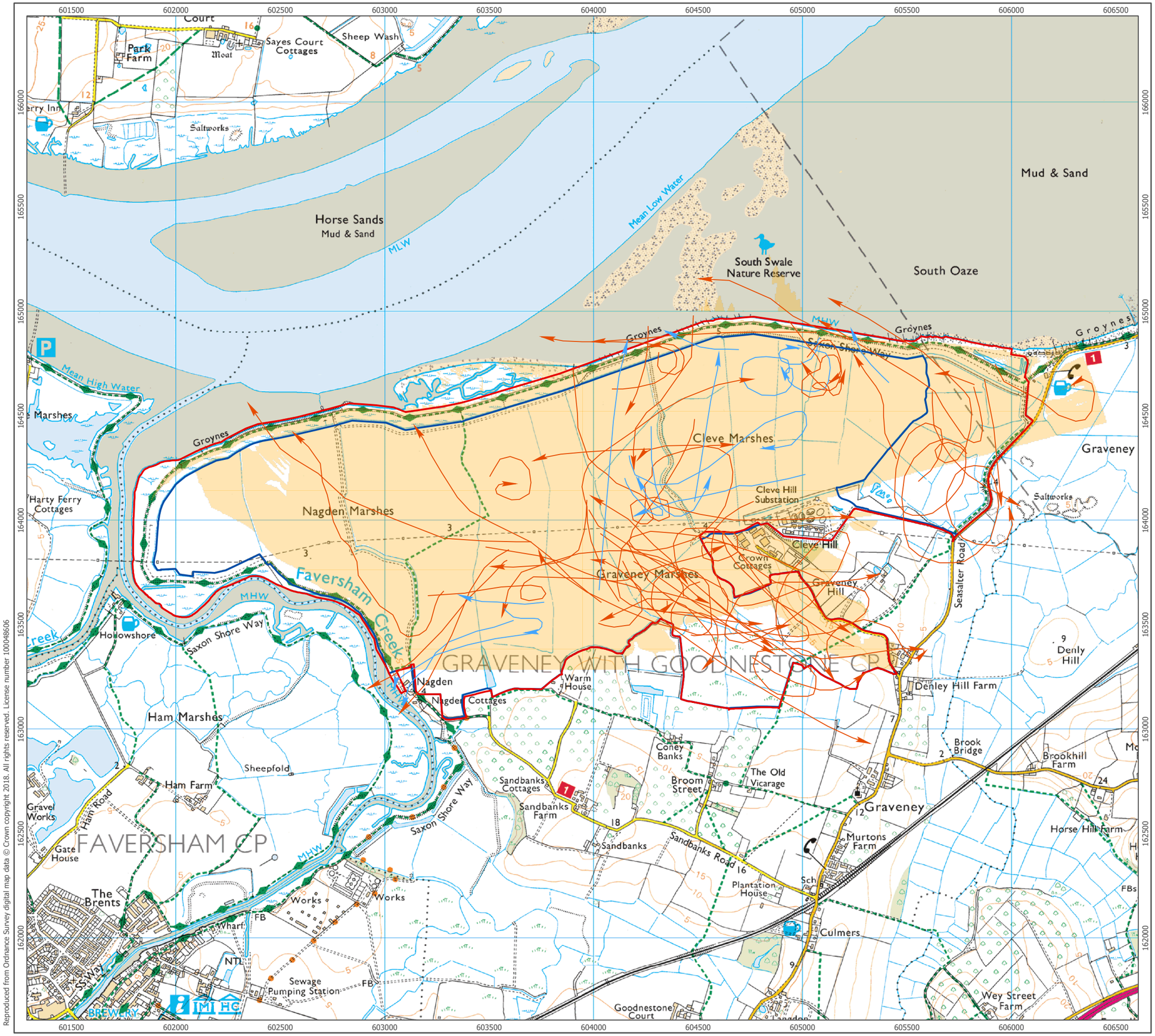
FAS Results: Marsh Harrier - Non-breeding Season

Figure A9.35

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P:\Projects\Ornithology\Projects\2238 Cleve Hill\ES Technical Appendix.aprx\2238-REP-286 FigA9.35 FAS Results Marsh Harrier - Non-breeding Season



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CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- Core Survey Area
- Visible Area from Vantage Point
- Golden Plover
- Oystercatcher

1:17,500 Scale @ A3

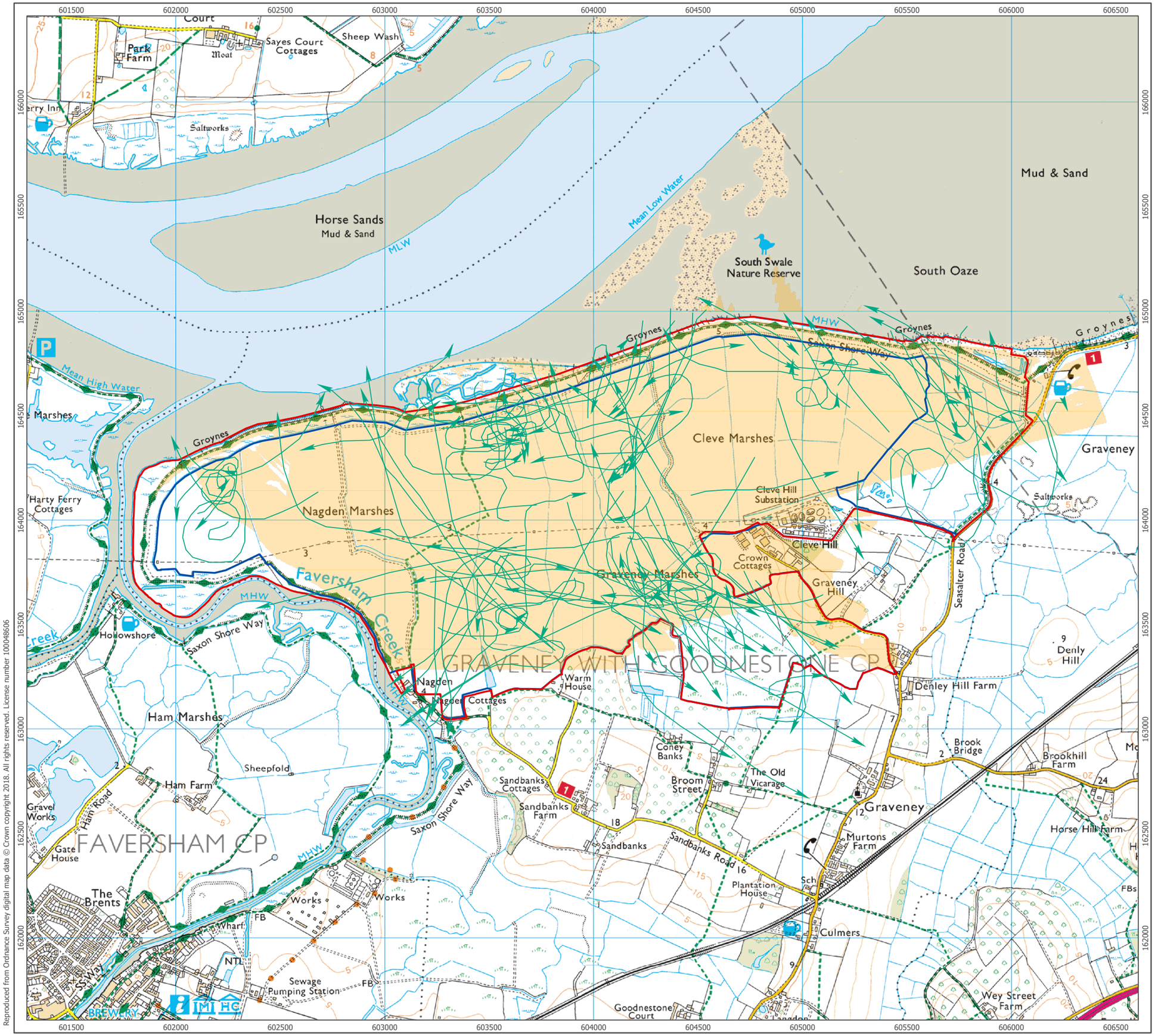
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NORTH

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Checked By: MA	Date: 01/11/2018

FAS Results: OC and GP
Figure A9.36

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CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- Core Survey Area
- Visible Area from Vantage Point
- Lapwing

1:17,500 Scale @ A3

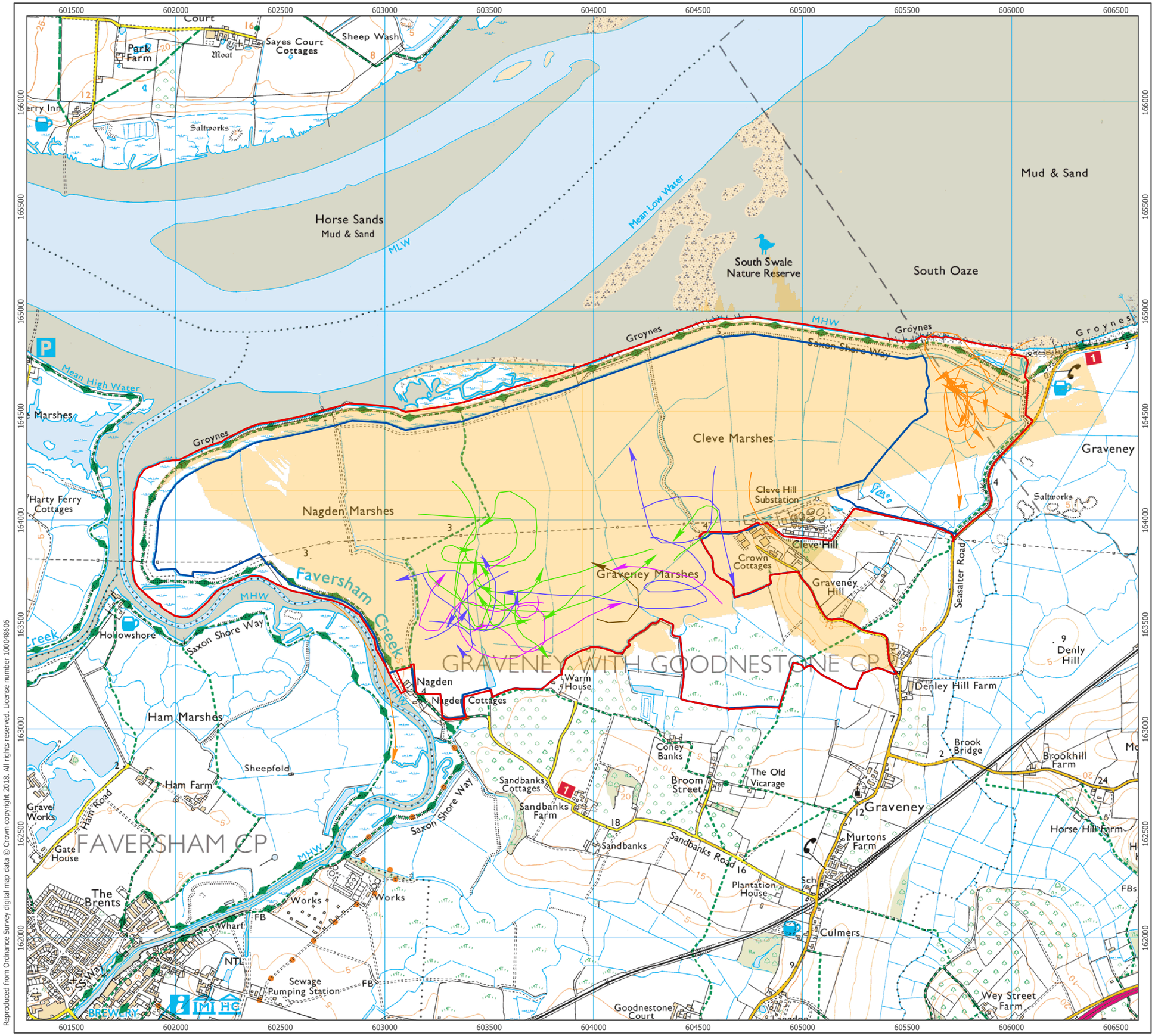
0 400 800 m

NORTH

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Checked By: MA	Date: 01/11/2018

FAS Results: L.
Figure A9.37

Cleve Hill Solar Park
Environmental Statement



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CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- Core Survey Area
- Visible Area from Vantage Point
- Curlew
- Dunlin
- Green Sandpiper
- Redshank
- Snipe

1:17,500 Scale @ A3

0 400 800 m

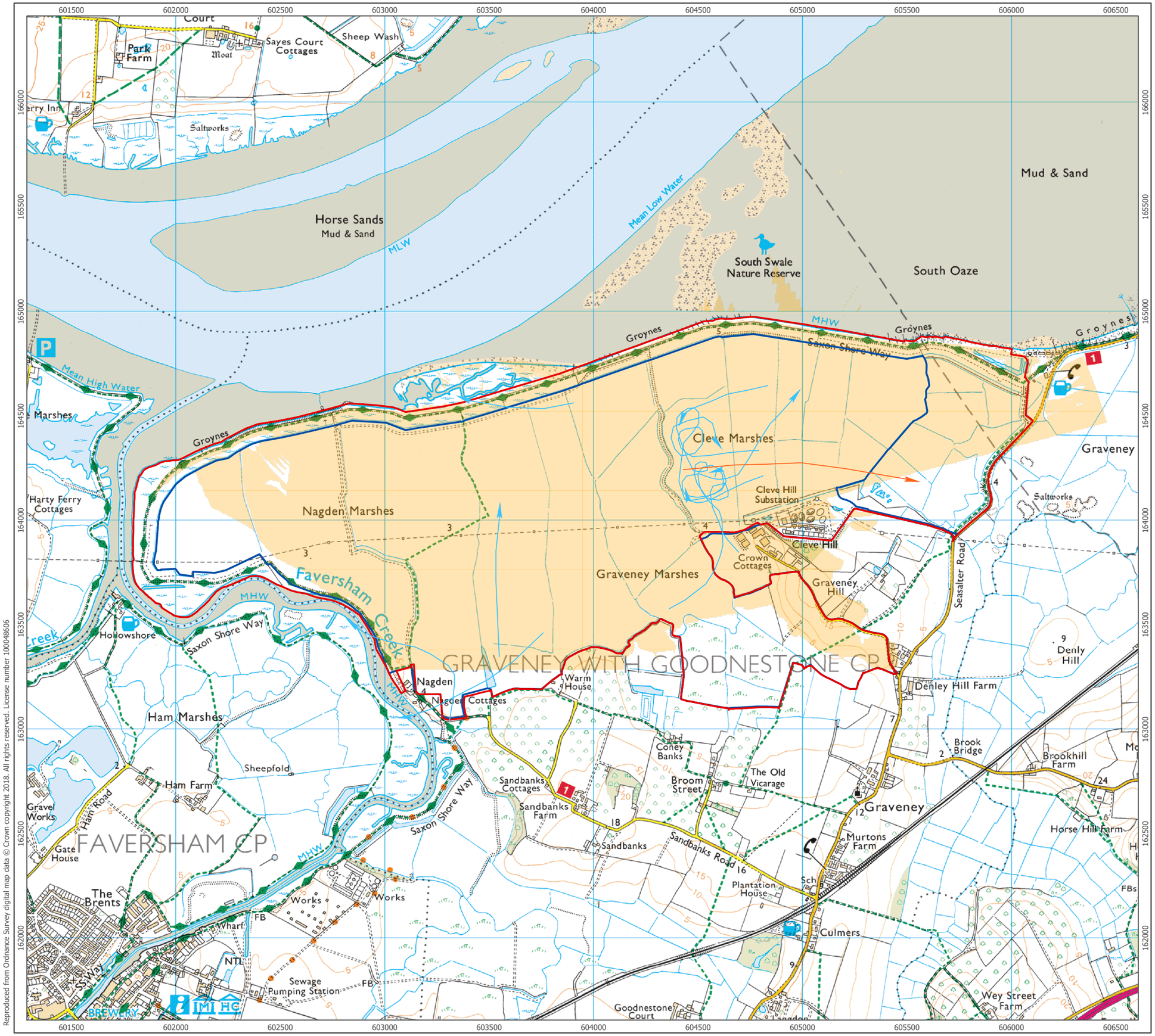
NORTH

Produced By: SC	Ref: 2238-REP-287
Checked By: MA	Date: 01/11/2018

FAS Results: DN, SN, CU, GE and RK
Figure A9.38

Cleve Hill Solar Park Environmental Statement

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CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- Core Survey Area
- Visible Area from Vantage Point
- Common Tern
- Mediterranean Gull

1:17,500 Scale @ A3

0 400 800 m

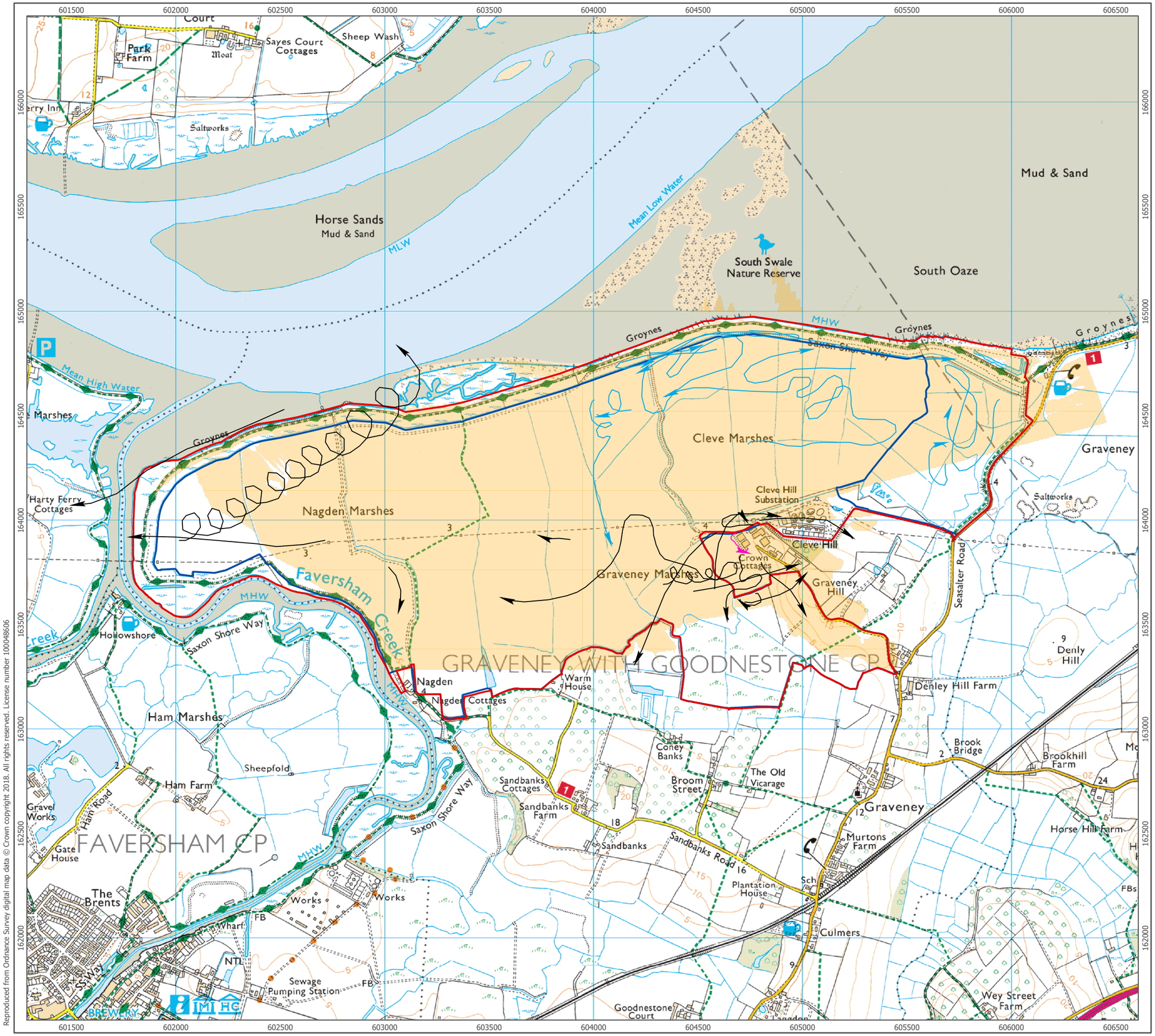
NORTH

Produced By: SC	Ref: 2238-REP-288
Checked By: MA	Date: 01/11/2018

FAS Results: MU and CN
Figure A9.39

Cleve Hill Solar Park
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CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- Core Survey Area
- Visible Area from Vantage Point
- Barn Owl
- Raven
- Short-eared Owl

1:17,500 Scale @ A3

0 400 800 m

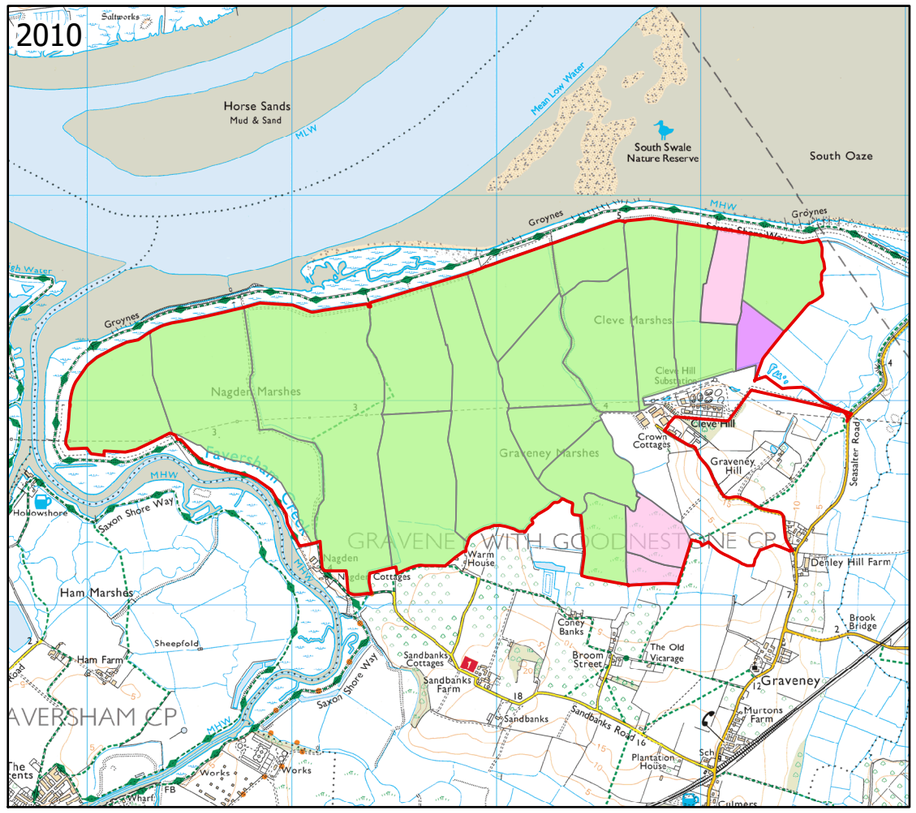
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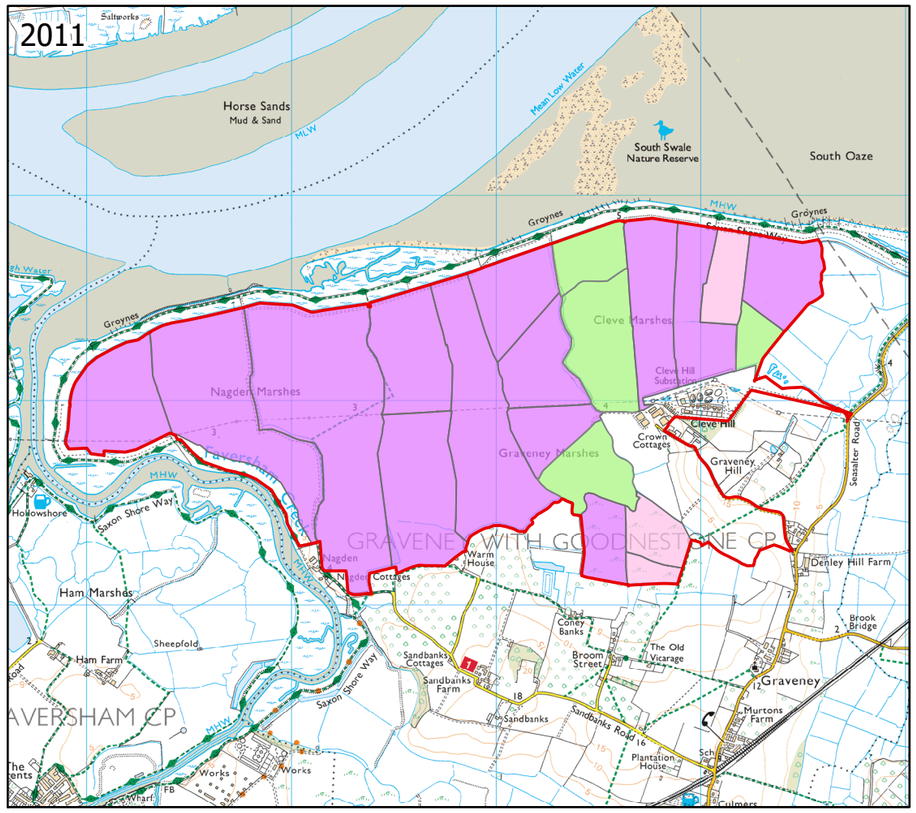
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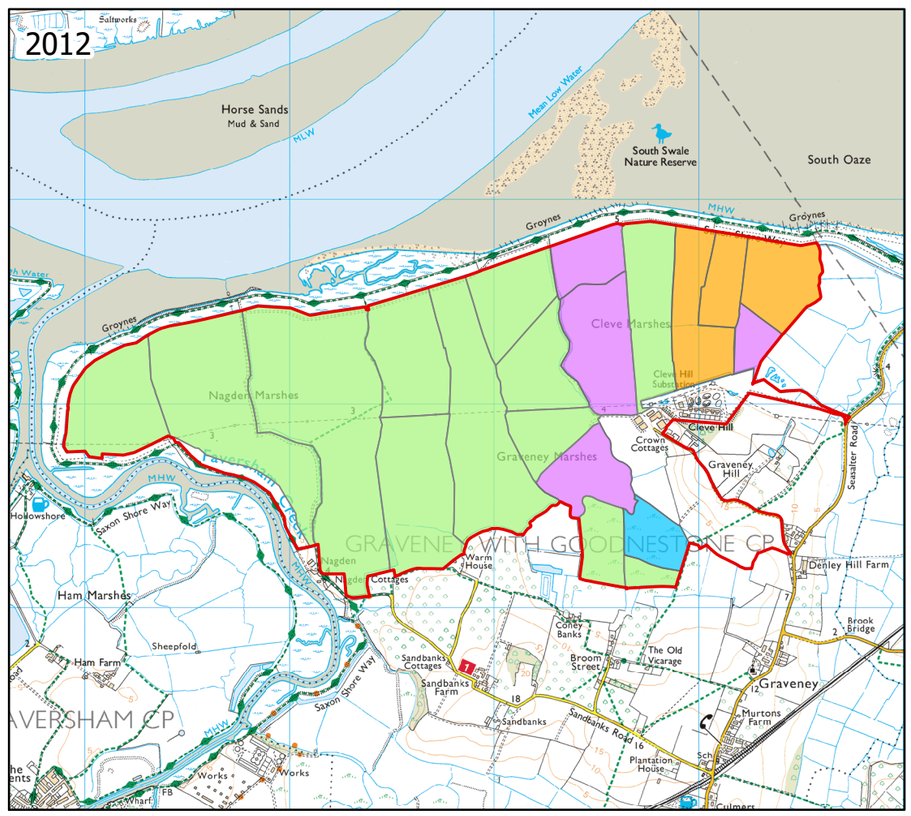
FAS Results: BO, SE and RN
Figure A9.38

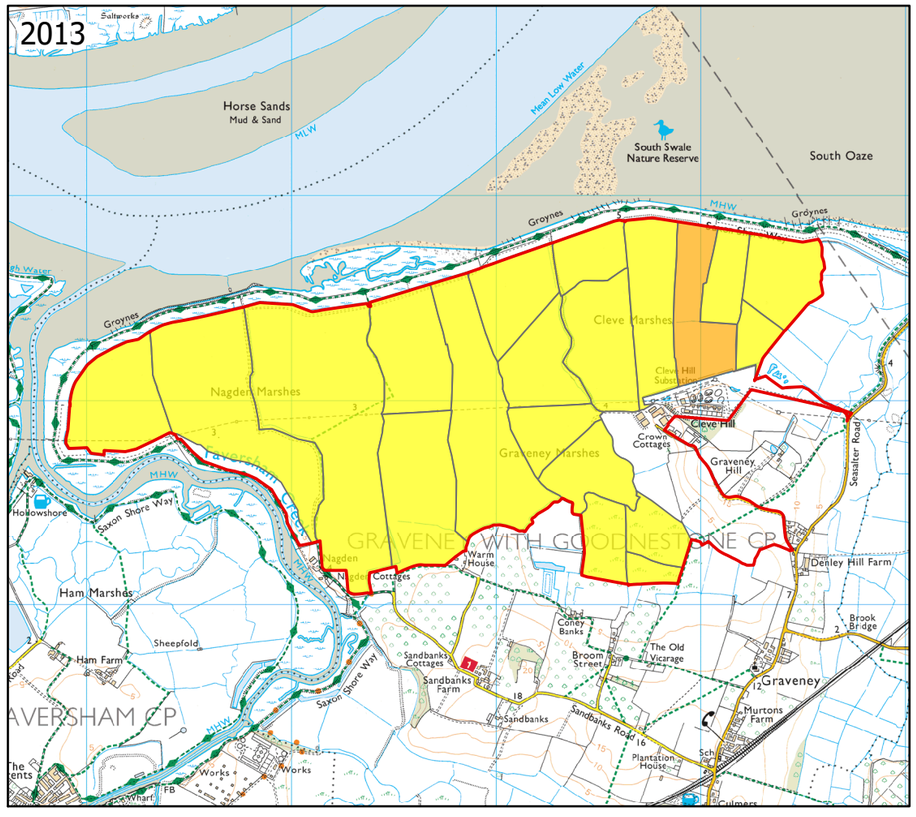
Cleve Hill Solar Park
Environmental Statement

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CLEVE HILL SOLAR PARK

ARCUS

- Core Survey Area

Crop Type

- Fallow
- Oats/Fallow
- Pasture
- Spring Crop
- Uncropped
- Wheat/Fallow
- Winter Beans
- Winter Cereal
- Winter OSR

1:30,000 Scale @ A3

0 5 10 km

NORTH

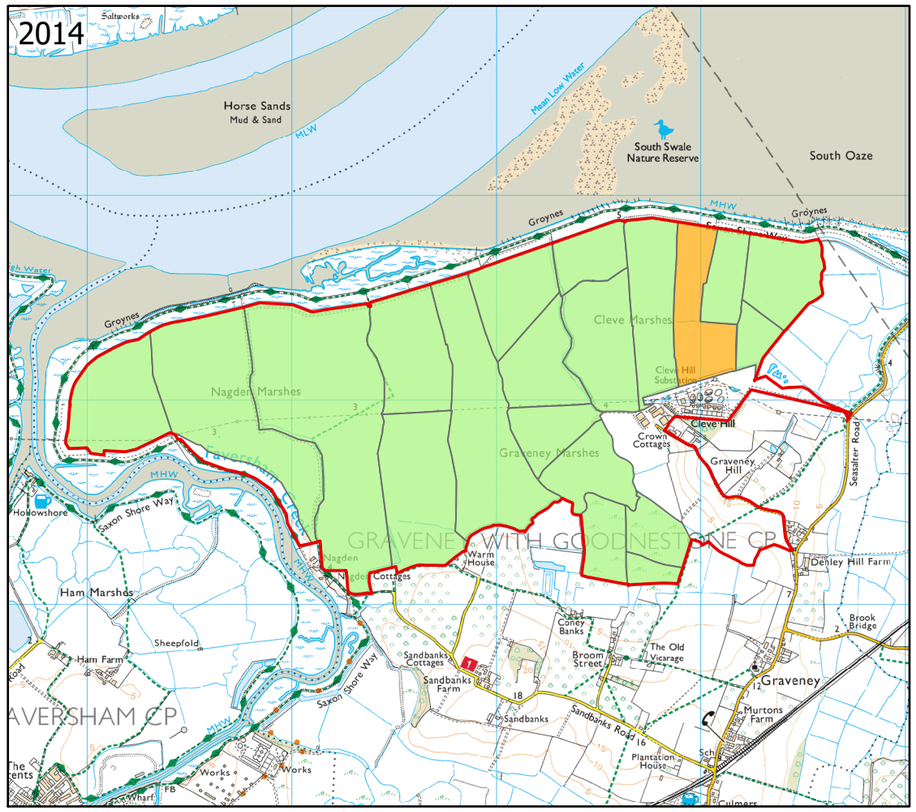
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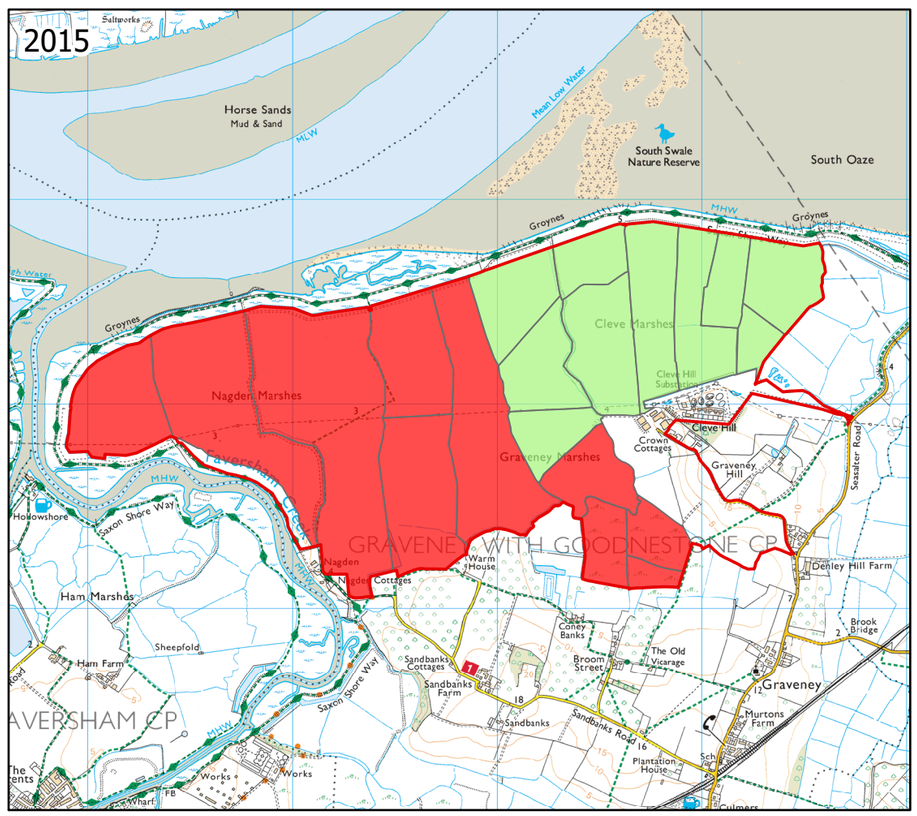
Cropping Plan 1
Figure A9.41

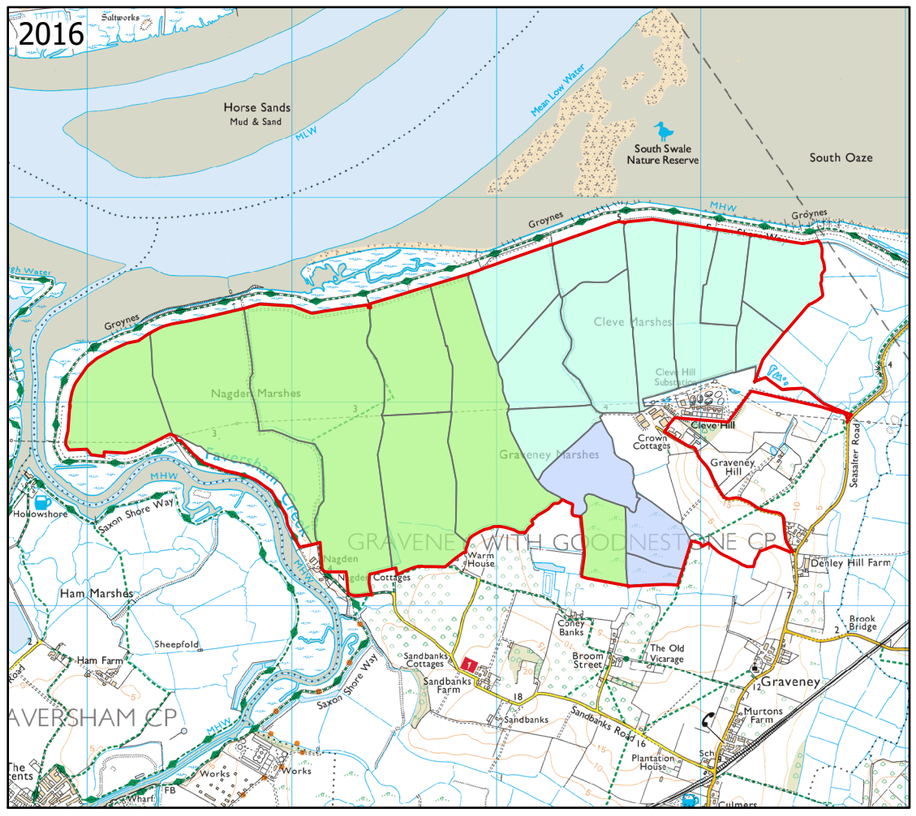
Cleve Hill Solar Park
Environmental Statement

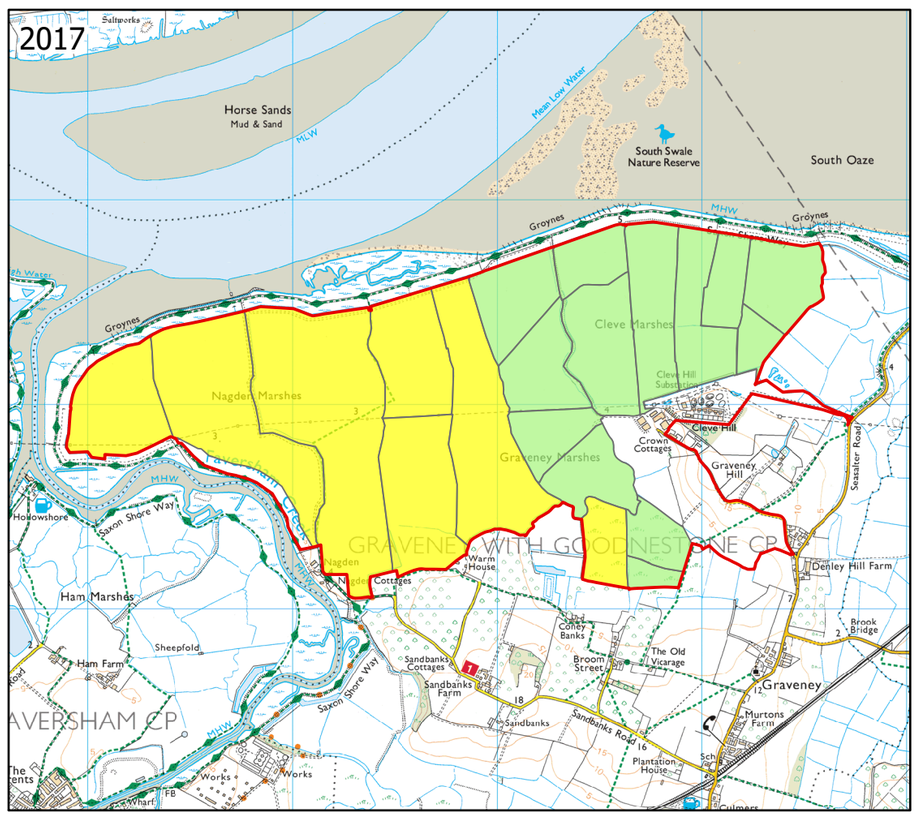
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CLEVE HILL SOLAR PARK

ARCUS

Core Survey Area

CropType

- Fallow
- Oats/Fallow
- Pasture
- Spring Crop
- Uncropped
- Wheat/Fallow
- Winter Beans
- Winter Cereal
- Winter OSR

1:30,000 Scale @ A3

0 5 10 km

NORTH

Produced By: KE	Ref: 2238-REP-309
Checked By: MB	Date: 06/11/2018

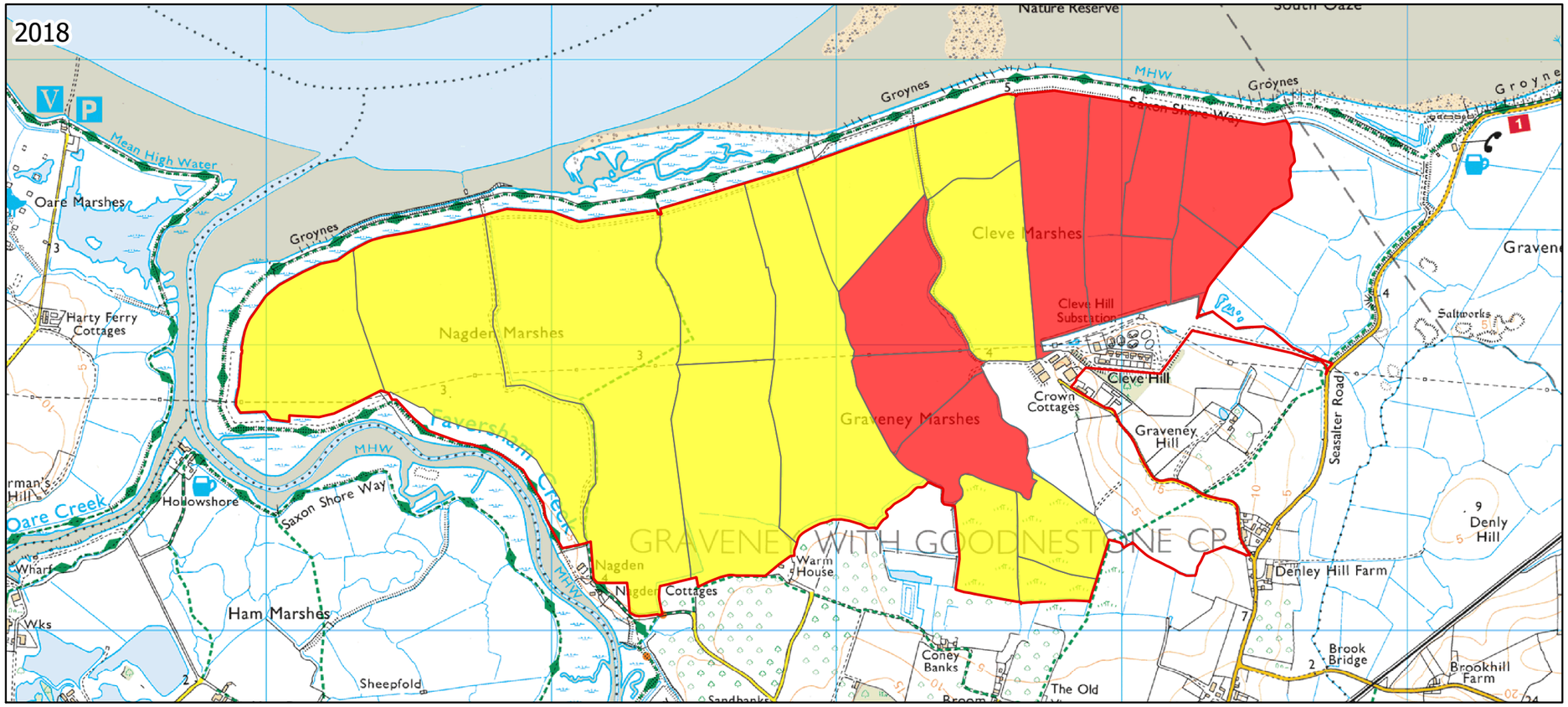
Cropping Plan 2
Figure A9.42

Cleve Hill Solar Park
Environmental Statement

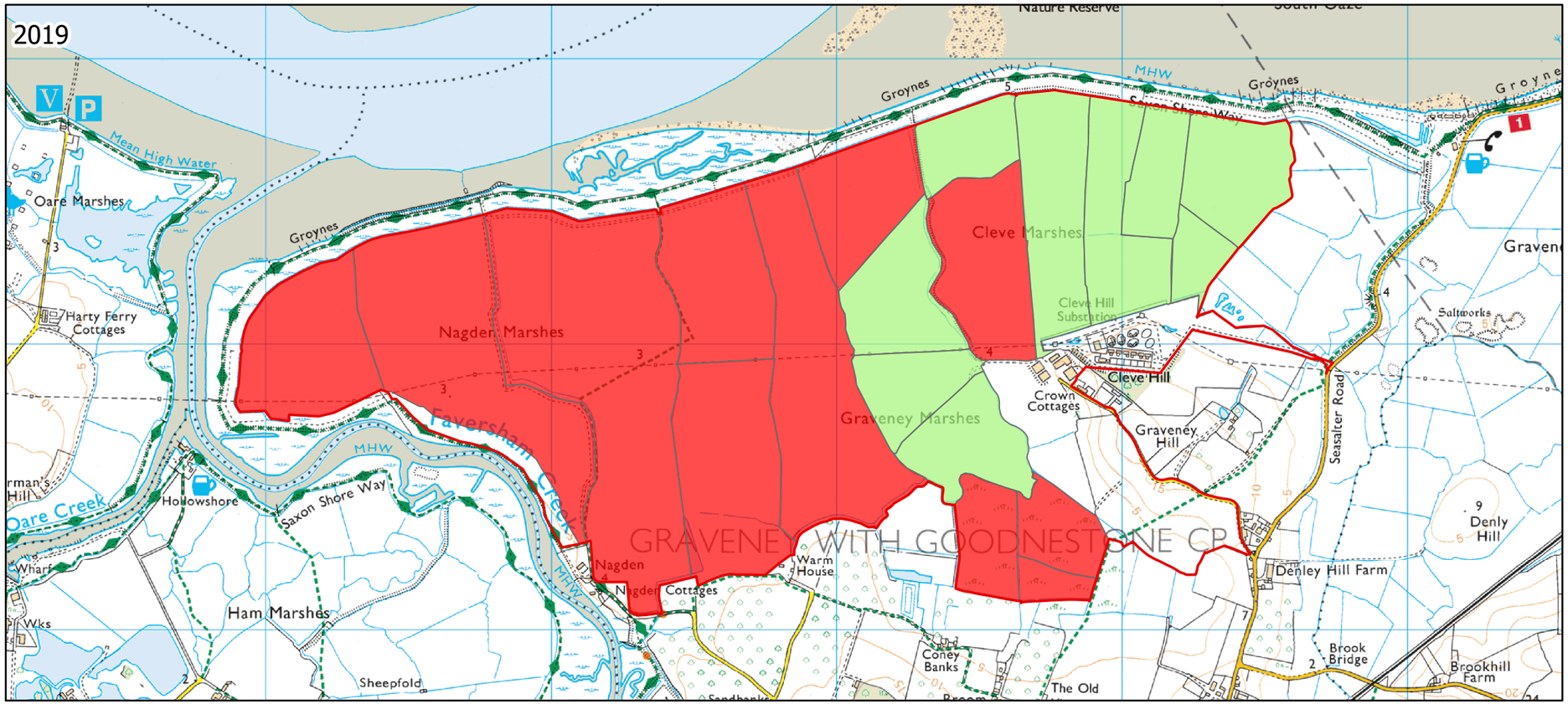
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2018



2019



CLEVE HILL SOLAR PARK

ARCUS

Core Survey Area

Crop Type

- Fallow
- Oats/Fallow
- Pasture
- Spring Crop
- Uncropped
- Wheat/Fallow
- Winter Beans
- Winter Cereal
- Winter OSR

1:18,000 Scale @ A3

0 5 10 km

NORTH

Produced By: KE	Ref: 2238-REP-310
Checked By: MB	Date: 06/11/2018

Cropping Plan 3
Figure A9.43

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13th July 2018

Cleve Hill Solar Park Ltd
Woodington House
East Wellow
Hants
SO51 6DQ

This correspondence sent via email only

Dear [redacted],

RE: Cleve Hill Solar Park Phase 2 Consultation

This letter constitutes Kent Wildlife Trust's formal response to the Phase 2 consultation on the Cleve Hill Solar Park (CHSP). We acknowledge and applaud the level of engagement the CHSP team has undertaken with the Trust prior to this stage through the Habitat Management Steering Group, and expect it to continue to enable the issues below to be discussed in more detail.

Summary

We are generally supportive of initiatives to reduce human reliance on fossil fuel energy generation, and renewable energy no doubt has a role to play in this. However, this should not be at the expense of the natural environment. **The proposals set out in this consultation will result in significant impacts on wildlife and are unacceptable.**

We are unconvinced the mitigation proposed, most notably in the form of a 41 hectare Habitat Management Area, will be sufficient to offset the impacts on a number of species, and this shortfall is confirmed for Dark-bellied Brent Geese within the documents. Marsh Harrier is also of particular concern, as a possible outcome of the proposals is the loss of this site and adjacent nature reserve as a breeding and foraging area. The proposals will adversely affect the integrity of the Special Protection Area (SPA).

Further detail on these and other issues is appended to this letter.

Yours sincerely,

[redacted]

Thames Gateway Officer
[redacted]

Basic and Precautionary Principles

Throughout our consideration of the proposals we have had regard to the core principle of ensuring no net loss of biodiversity *as a minimum*. While we appreciate the need to attempt to quantify the scale of the impacts, a disregard of any impact, even if considered 'of low magnitude' would be an erosion of the principles of sustainable development.

We have also had regard to the principles of mitigation to offset the impacts not just in scale but in kind. An enhancement in the outcome for a one ecological receptor does not mitigate for a negative impact on another.

The proposals in front of us are of a scale and design not previous seen in the UK, still relatively novel internationally, and thus not fully understood with regard to their impacts upon flora and fauna. Owing to the sensitivity and importance of the nearby designated habitats, as well as the species therein and on the development site, it is necessary to adopt the precautionary principle. In the absence of evidence, and in the presence of uncertainty, it is prudent to consider the worst case scenario with regard to the impacts and efficacy of mitigation when presented with a range of possible outcomes.

Alternatives

While it can be argued there is a need for additional renewable energy generation, it does not necessarily follow that there is a need for a development of the scale, and at the location, proposed.

In Section 4 it is stated that "*A large number of sites had been identified by a team of project developers via direct approaches and a network of land agents across the country*" though these do not appear to be provided in the supporting appendices.

While we understand that the spare capacity at the Cleve Hill substation presents an opportunity, and is a principle driver in the selection of the development site (Section 4.2), this does not negate the need for full and proper consideration of alternatives. In the context of national renewable energy generation, we would expect a full and proper consideration of alternatives to include not just alternative locations, but alternative patterns of generation, i.e. multiple, smaller, decentralised generation.

While it may not be in your interests to undertake this work, we will be pushing the Planning Inspector(s) and Secretary of State to have regard to this. Indeed, we consider it essential to meeting the requirements of the Habitats Regulations to rule out alternatives to meeting the need.

Kent Wildlife Trust believes that the best use of the development site would be to accommodate managed realignment. This would benefit both the environment through habitat creation and local communities through the provision of recreation and ecotourism opportunities, and potentially reduction in local flood risk. It is the best location within The Swale SPA for such an undertaking, and this is reflected in proposals within the Environment Agency's Medway Estuary and Swale Strategy. The solar park proposals are incompatible with this.

Wintering Birds

Overwintering birds, particularly those associated with The Swale Special Protection Area (SPA), are a key issue with regard to the impacts of the proposals. It is essential that the proposals are able to demonstrate that there will not be an adverse impact on the SPA. The proposals in front of us have not done that.

The key principle proposed with regard to mitigating the loss of habitat is the provision of a smaller but 'higher quality' area of equivalent 'carrying capacity' to that being lost (expressed as 'bird days' in the documents). The calculations presented are insufficiently robust, and the predicted outcomes overly optimistic.

In seeking to shrink 387 hectares of 'extensive' habitat into 41 hectares of 'intensive' habitat differing requirements of species are likely to come into conflict. It is important that this is taken into account when considering the area required and its management.

Dark-bellied Brent Goose

It is clear from the survey results that the percentage of the SPA's Dark-bellied Brent Geese population that the development site supports varies from year to year. Anecdotally it has been suggested that this is a result of changes in crop and crop development, and this would be consistent with what we know of this species, though site crop information to compare to the results to verify this would be welcome. There are no doubt other factors involved that influence the day-today differences in survey results, though these may be less well understood.

However, what is of little doubt is that at times the site supports a significant proportion of the SPA's population, occasionally over 100%[1]. There remains a question over how we attempt to quantify this in order to put in place adequate mitigation to ensure the integrity of the SPA is not adversely affected. At present, the Preliminary Environmental Impact Report (PEIR) appears to use the Wetland Bird Survey (WeBS) 5-year Mean of the Peak counts for the Swale Estuary as a proxy for the SPA population to calculate the percentage provision provided by the Habitat Management Area (HMA). If we use an equivalent figure (or as close as possible) from the development site survey results (mean of the peak counts) to calculate the provision the development site provides we get 64%. The PEIR also uses a 'mean of seasonal monthly peak means' and 'mean of seasonal means' of the development site survey results to quantify the value of the development site. Using the former figure we get 32%. While the true figure arguably falls somewhere between the lower and higher of these three figures, the validity of the approach taken, and other possible approaches, is clearly a subject that needs further discussion. This is of course as valid for other species as it is for brent geese. To enable further comment on the issues, we have worked with the approach taken in the PEIR and the figures provided therein.

Key to the calculations of the required area of mitigation for Dark-bellied Brent Geese is the paper by Vikery *et al.* (1994) '*The management of grass pastures for brent geese*'. Presented are two potential carrying capacities based upon management prescriptions studied in this paper (1,562 and 2,097 bird-days/ha). However, we note that the study cited (and therefore the figures in question) was of grassland that had been established for several years prior to the study being undertaken – as the title suggests, it was of management of grass pastures, not arable reversion as is the case at Cleve Hill.

[1] Further discussions around the issue raised in this paragraph will necessarily include the accuracy of SPA population figures and movements of birds between SPAs in the area.

The higher bird-day figure stated depends upon the inputs of fertilizers. However, many times in Chapter 8 (Ecology) the cessation of the input of fertilizers is stated as an outcome of the change from arable, leading to improvements in the water quality and habitats of the ditches, and indirect benefits for designated sites. The application of fertilizer to achieve more bird-days would contradict the assessments made for other ecological receptors.

For the reasons set out above, we consider even the lower figure of 1,562 bird-days/ha for brent geese to be overly optimistic. The actual figure, taking into account both the less intensive management prescriptions consistent with ecological assessments in Chapter 8, and the fact the site is arable reversion that is likely to take a while to 'reach condition' under these prescriptions, the actual figure is likely to be lower than this.

However, even using these figures (or rather a mid-point between the two) by admission "*The HMA may not be able to replace entirely the loss of foraging provision for brent geese*…" (Chapter 9, Paragraph 158). Based on the assumptions made (notwithstanding we consider these unsafe), it is stated that the HMA would have the capacity to support 22.7% of the foraging requirement of the SPA population (Chapter 9, Paragraph 157).

While it is not stated, based upon the figures provided for development site bird-days and SPA bird-days, the development site has supported ~32% of the foraging requirements of the SPA's brent geese. Paragraph 158 of this Chapter seeks to argue that the consistency of the HMA will offset this shortfall, compared to the present situation where the arable habitat does not provide the same foraging resource every season. However, this has already been taken into account in using mean, rather than maximum, figures. I.E. the fact that the site does not always provide foraging for brent geese, as evidenced by the survey results, has been taken into account by the use of those survey results in the calculations of development site bird-days. The Ornithology Technical Appendix states that 66.3 hectares are required for Dark-bellied brent geese, based on these metrics (Table A9.24).

Comparing the stated HMA provision (22.7%) to the current provision (~32%) we are left with a reduction of approximately 10% of the foraging availability for the SPA (comparing peak-means for the site and the SPA). As stated earlier, we consider the calculations for the HMA to be overly optimistic, so this shortfall is likely to be higher, at least in the short term.

In addition, there will be impacts from disturbance during the construction phase. This is to be offset by the establishment of grassland across the site prior to construction works commencing, providing areas of forage away from the development site. The phasing of construction across the seasons will need to take this into account. Even with this reduction, it is predicted that brent geese will be displaced from the site for a season (with the loss of forage availability that this entails).

Considering the complete loss of forage ('on average') that the site provides for an entire season as a result of construction disturbance, followed by the shortfall in provision of what is likely to be >10% minimum in perpetuity, we are surprised that the assessment concludes that the impact on this feature of The Swale SPA is not significant. We **disagree** with this assessment.

Lapwing and Golden Plover

The calculation of bird-days for Lapwing and Golden Plover is based upon a related and relevant study that looked at the carrying capacity of mixed arable farmland. However, we consider that the assessment of what can be achieved is overly optimistic, and has not taken sufficient account of the constraints and context of the HMA.

Lapwing and Golden Plover feed on invertebrates in a range of open habitats. At present, it is fair to assume that they feed on invertebrates associated with the crops present at the time (phytophagous and saprophagous inverts and their predators). As stated in Paragraph 129 of the Ornithology technical Appendix, "…*abundance and availability of potential prey items present in different habitats is likely to be an important factor shaping the distribution of plovers*...". We do not contest that switching from an arable habitat to permanent pasture will increase the forage available to plovers per hectare, but (1) this may take some time (particularly with regard to soil fauna) and (2) is likely to be constrained, both with regard to rate of increase and maximum, by management for brent geese and grazing pressure from brent geese (which will be in competition with phytophagous insects plovers feed on). While we acknowledge that a more conservative metric has been applied for years 1-5 compared to after this period, without further evidence we consider this overly optimistic.

We remain unconvinced that the HMA will provide adequate mitigation for Lapwing and Golden Plover for the reasons stated above. We therefore **disagree** that the impacts are not significant.

Breeding Birds

Marsh Harrier

As stated in Paragraph 307 of the Ornithology chapter, the "…*core survey area and adjacent terrestrial habitats form an important foraging area for marsh harriers throughout the year*." We also note that "*Even with this mitigation however, the effect of construction activities might displace marsh harrier from nesting in the KWT South Swale reserve that borders the Development area*" (paragraph 313).

Regarding the statement "*In the longer term, the effect is reversible as they may be expected to nest again if they are not displaced by the presence of the operational Development.*" (paragraph 314), the *may* and *if* express the considerable uncertainty regarding the impact the solar farm may have on Marsh Harrier. This is reinforced by the statement within the assessment of habitat loss: "*...the effect on nesting birds is uncertain as there is no evidence either way in the literature regarding the effects of the presence of solar panels on the proximity of nesting marsh harriers.*"

It is clear from this that, while the outcomes are uncertain, a possible impact is the loss of this "important foraging area" and nesting areas, even with the proposed mitigation. The area in question is not inconsiderable, and is a significant part of The Swale SPA. We **disagree** that this impact is not significant. More needs to be done to avoiding these potential impacts with regard to the proximity of solar panels to nesting habitat and width of potential foraging corridors, which is of particular concern.

Skylark and Yellow wagtail

As species that nest within the arable (and other open) habitats, the Skylark and Yellow Wagtail populations of the development site will lose the majority of their nesting habitat.

The proposed mitigation for this is the HMA plus enhancements to the designated area to the east of this. However, given skylarks' preference for ungrazed grassland, set-aside and winter cereal (Browne *et al.*, 2010[2]) we are unconvinced that sufficient enhancement can be achieved to offset the

[2] S. Browne, J. Vickery & D. Chamberlain (2000) Densities and population estimates of breeding Skylarks *Alauda arvensis* in Britain in 1997, Bird Study, 47:1, 52-65, DOI: 10.1080/00063650009461160

impact on this species. While in theory the changes are more likely to benefit Yellow Wagtail than Skylark given slightly different habitat preferences, as mentioined earlier with regard to lapwing and Golden Plover, we are concerned that the requirements on the HMA to support so many species at a high density will result in compromises in management that may result in failure.

We note the uncertainties regarding the overall impact on these species: "*There is some uncertainty with regards to the breeding opportunities in the areas between the solar arrays, as these species prefer more open habitats than the grassland between the arrays might provide.*" (Chapter 9 Paragraph 327).

Impacts from Noise

Paragraph 105 of Chapter 9 states "*In line with the recommendations of the IECS study, the noise assessment for the Development suggests that a level of 70 dB LAeq (at the bird receptor location) is a suitable threshold for significant effects on ecological designations.*" In Paragraph 19 of Chapter 12 more detail is given, stating that the study in question suggested a classification of noise levels of 70-85 dB(A) as a 'moderate – high effect level', that resulted in *"Headturning, scanning behaviour, reduced feeding, movement to other areas close by.*" It is also reported that noise levels of 50 – 70 dB(A), a 'moderate effect level' resulted in "*…headturning, scanning, behaviour, reduced feeding, movement to other areas close by*" We note that the recommendations within this report were developed specifically for the Humber.

While the IECS study does state "*Ambient construction noise levels should be restricted to below 70dB*" nowhere can we find it this report that it concludes 70dB is a suitable threshold for significant effects on ecological designations. On the contrary, the IECS report states "…*regular construction noise between 50 and 70 dB (A) are categorised as moderate as these activities can have significant effects on avifauna*…" While useful as a starting point, the IECS study classified the significance of different disturbance events on birds and sought to classify the sensitivity of receptors within the area of study, it did not set universal thresholds.

It is clear from the above that noise levels below 70dB can induce a behavioural change, and therefore have the potential to cause an impact. The assessment of the impacts of noise should not be based solely on what may be considered a 'moderate – high level effect' (70dB) from a single noise event. What also needs to be taken into account is the frequency of disturbance and the significance of the birds involved (species and number). Habituation is also mentioned a few times. In the absence of alternative evidence it would seem wise to assume that the SPA birds are largely unhabituated to the potential noise events, and the proximity of sources, in question. While some may become habituated, the process itself requires exposure to disturbance.

We remain unconvinced that birds will not be disturbed by construction noise and would like to see further assessment and more information on this issue.

Ecology

Determining Importance of Local Wildlife Sites

Table 8.2 of section 8.4.5 includes "*Sites designated as…LWS's, or equivalents that may be designated according to criteria at the local authority level*" for sites of 'local' importance. Table

8.7 of Section 8.7 states for Abbey Fields Local Wildlife Site that "*The site is designated as a LWS according to criteria at the local authority level*." Despite the name, all Local Wildlife Sites in Kent are designated by the Kent Nature Partnership based upon criteria developed at a County level. There are no 'local authority level' criteria so all qualify as Regionally important.

Designation Boundary Issue

Paragraph 104 of Chapter 8 states "…*there is a network of ditches that flow from south to north into the South Bank of the Swale LNR and beyond that through a non-return valve into The Swale SSSI/SPA, MCZ and Ramsar designated sites.*" This implies an incorrect understanding of the boundaries of the designated sites. The SSSI/SPA/Ramsar boundary with the development site is the same as the LNR, I.E. it includes the sea wall and borrowdyke/reedbed on the landward side of the sea wall. This has implications for the assessment of impacts, as it states in Paragraph 107 that "*Direct disturbance to designated sites from dust arising from construction activities is not anticipated to be higher than the baseline, with sea defences and wall providing a physical barrier to impacts from this source on the Swale SSSI/SPA/MCZ and Ramsar.*" The assessments need to be revised where this error has been made.

Water Vole

The ditch network of the site would qualify as Local Wildlife Site under Criteria MA2 "…*any waterway or connected waterway complex where in total more than 2,000 linear metres of habitat is known to hold water voles during summer. Justification – these areas are core habitats in the county and provide local source populations.*" The wider area is also identified as a key area for Water Voles nationally[3]. As such, the Importance/Sensitivity of the feature should be considered at least Regional.

Culverts have the potential to fragment the ditch network, and therefore should be (1) minimised in number and size and (2) designed so as to reduce fragmentation as much as possible.
We remain to be convinced that all the planned new ditch crossing points are necessary. We would like to see justification for the need for multiple access points into each 'compartment' as well as justification that these need to be permanent (for the construction and operational life of the development) rather than temporary.

Bats

We note that "…the site offers foraging and commuting habitat used by at least nine species of bat'. That's 50% of UK species and easily qualifies it for Local Wildlife Site status (BA4 "*Regular feeding and foraging sites for an assemblage of 4 species or more*"). As such the Importance/Sensitivity of this feature should be considered Regional.

Reptiles

The Reptile Mitigation Strategy set out in Paragraph 211 of Chapter 8 does not represent best practice. Given that the survey followed a presence/absence (rather than a Relative Population Assessment) methodology trapping should proceed on a 'Minimum days plus number of searches with no captures' approach before trapping is completed. Additionally, it is not stated what the basis is for the belief that "…*sufficient carrying capacity is available for reptiles without the need to provide additional habitat improvements*." It is generally believed that populations expand to fill, and are then limited by, the carrying capacity of their habitats. Unless there is reason to believe the situation is different in this case, some degree of habitat enhancement will be required before reptiles are translocated.

[3] Strachan, R., Moorhouse, T. and Gelling, M. 3rd Edition (2011) Water vole Conservation Handbook. The Wildlife Conservation Research Unit, University of Oxford.

Inclusion of Grazing Marsh

We support the inclusion of the area of grazing marsh at to the east of the development site within the wider plans, in the interests of consistent and complementary management for wildlife, and to potentially provide enhancement measures that would be consistent with UK environmental policy. However, we reiterate our previous communication that as there exists a statutory requirement to maintain this designated site in favourable condition, it cannot meaningfully contribute to mitigation for the impacts of the solar park. We note that this is effectively stated in Paragraph 139 of Chapter 9, but in other Chapters this area is sometimes referred to separately from the HMA, and sometimes as part of the HMA. This causes ambiguity when discussing mitigation and the final submission documents should avoid this.

Permissive Accessways

Proposed permissive accessways create a number of new circular routes. These have the potential to increase or decrease disturbance to wildlife occurring at the SPA depending upon a number of factors, not least of which is potential users' reaction to the solar panels. They will also increase disturbance to the ditch network, compromising its capacity to support species like Water Vole and Marsh Harrier. We are also concerned by the potential for additional 'permissions' (E.G. cycling) along these permissive accessways that may increase disturbance on the SPA sections of the circular routes.

As the outcome with regard to disturbance at the SPA is uncertain, but the increased disturbance to the ditch network is likely, we are, at present, opposed to the proposed permissive accessways. We are open to further discussion regarding these and how access may be managed to reduce disturbance, however.

A Note

Owing to the number and size of the documents and limited resources we have not been able to scrutinise them all to the level we would have liked. We may have missed further issues we would have raised here, or missed sections that addressed some of our concerns. The issues raised here are necessarily 'headline' issues.

We are aware that the responses to this stage of public consultation will be used to further refine the plans prior to submission of the application, and we intend to maintain a dialog during this period to discuss the concerns raised in this response and any further issues identified, with an aim to get the best possible outcome for wildlife should the application be approved.

[redacted]
Kent Wildlife Trust
13th July 2018

Local Wildlife Site Selection Criteria for the Cheshire region.

Covering the districts of Cheshire West and Chester, Cheshire East, Wirral, Halton and Warrington

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For more information contact:

Local Wildlife Sites Officer
Cheshire Wildlife Trust,
Bickley Hall Farm,
Bickley,
Malpas,
SY14 8EF
01948 820728
info@cheshirewt.org.uk

Contents

1. The Cheshire region LWS system 4

1.1 Introduction 4

1.2 Background and context 5

1.3 Legislation and policy 6

1.4 The LWS system – Key interests and the role of the partnership 7

1.5 Evaluation and selection of LWS 8

1.5.1 Key functions of partnership in site selection and de-selection 8

1.5.2 Key principles and priorities in site selection 9

1.5.3 Procedures 11

1.5.4 Data storage 13

1.5.5 Access to information 13

2. Habitat criteria 14

3. Species criteria 50

4. References 83

5. Appendices 85

5.1 LWS survey form 85

5.2 Checklist for Single Data List SDL ref 160 (previously NI 197) 87

1. The Cheshire region LWS system

1.1 Introduction

Local Wildlife Sites are sites with 'substantive nature conservation value'. They are defined areas identified and selected locally for their nature conservation value, based on important, distinctive and threatened habitats and species with a national, regional and (**importantly**) a local context. The purpose of selection is to provide recognition of the substantive nature conservation value and to help conserve those features for which the site was selected. Together with the statutory sites (such as National Nature Reserves and Sites of Special Scientific Importance), they form the essential building blocks of an ecological network.

Found on both public and private land, Local Wildlife Sites vary in size and shape from small ponds and copses and linear features such as hedgerows, road verges and water courses to much larger areas of habitat such as ancient woodlands, heaths, wetlands and grassland.

Collectively they play a critical role in the conservation of the UK's natural heritage by providing essential wildlife refuges in their own right[21] and by acting as stepping stones, corridors and buffer zones to link and protect other site networks and the open spaces of our towns and countryside.

The Cheshire Region LWS system ensures a consistent approach for identifying, selecting, assessing, monitoring and protecting Local Wildlife Sites. Administration of the system requires enabling access to the most up to date information for approximately one thousand sites across the region. It operates as a partnership organisation across five local authorities, Halton, Warrington, Wirral, Cheshire East and Cheshire West and Chester. In addition to the local authorities the key partners include the Cheshire Wildlife Trust, Record, Natural England and the Environment Agency. Private landowners and other stakeholders are encouraged to participate in the partnership by attending annual site selection meetings. Typically stakeholders include organisations such as the Forestry Commission, the Woodland Trust and 'Friends of' groups.

This document outlines the role and purpose of the Cheshire Region LWS system and provides details of the management of the system including the site selection criteria and procedures. It is based upon the 2006 Defra publication 'Local Sites – Guidance on their identification, selection and management'.

1.2 Background and context

1. Non-statutory Local Sites include both Local Geological Sites (previously known as RIGGS) and Local Wildlife Sites (previously known as SBIs, SINCs or SNCVs). Statutory designations such as Sites of Special Scientific Interest provide a representative rather than a comprehensive suite of sites. Not all sites which meet the criteria for statutory designation can be designated and instead are selected under the Local Sites system. Consequently such Local Sites may be amongst the best sites in the region for the habitats, species or geology they support. It is essential, therefore, that the different status assigned to Local Sites compared to SSSIs should not lessen the perception of their importance and the vital role they play in conserving our natural heritage.

2. Local Wildlife Sites should be distinguished from the Local Green Space designation which was introduced in the 2011 Localism Act. Local Green Spaces may be selected for wildlife value, but unlike Local Wildlife Sites selection they could also be selected solely on their local community significance for beauty, historic importance, recreational value and tranquillity.

3. In the Cheshire region prior to 2012 each local authority had its own guidance and site selection criteria for Local Sites. In Halton and Warrington such sites were known as Sites of Importance for Nature Conservation (SINCs) and in Wirral, Cheshire East[1] and Cheshire West and Chester the sites were known as Sites of Biological Importance[4] (SBIs). A smaller number of sites in Cheshire West and Chester were previously known as Sites of Nature Conservation Value (SNCVs).

4. In 2006 Defra issued comprehensive guidance on Local Sites[11]. The Cheshire Region Local Wildlife Site system for site identification, selection and management is based upon this guidance and is set out in this document.

According to this guidance:

- Local Sites networks provide a comprehensive rather than representative suite of sites.
- Local Sites provide wildlife refuges for most of the UK's fauna and flora and through their connecting and buffering qualities, they complement other site networks.
- Local Sites have a significant role to play in meeting overall national biodiversity targets.
- Local Sites represent local character and distinctiveness.
- Local Sites contribute to the quality of life and the well-being of the community, with many sites providing opportunities for research and education.

[1]Cheshire East LA refer to sites which have not been reviewed under the new criteria as SBIs. The CCC 2000 criteria remain valid for these sites until they are re-assessed under the new criteria.

1.3 Legislation and policy

Local sites are afforded a level of protection via the following policies and guidance:

- **NPPF – Sustainable development**. Local wildlife sites may provide building blocks and linkages of networks of biodiversity and as such the NPPF guidance advises that sustainable development requires such networks should be protected, enhanced and managed.

- **NERC act 2006. Biodiversity duty.** This places a duty on local authorities to conserve biodiversity in exercising its functions. This duty includes restoring or enhancing populations or habitats of principal importance which appear on the S41 list (UK BAP).

- **The conservation of habitats and species regulations 2010.** Part 2, section 39. This regulation provides guidance on nature conservation policy in planning contexts. Paragraph (3) encourages the management of features of the landscape which are linear/continuous or act as stepping stones essential for the migration, dispersal and genetic exchange of wild species. The regulations in part 3 refer to EU protected species and Local Wildlife Sites which support these species may be protected from disturbance and/or activities which destroy breeding sites or resting places.

- In addition to the legislation for European protected species referred to above other UK specific legislation may apply including: **Protection of Badgers act 1992, Wildlife and Countryside Act 1981 (schedules 1, 5 and 8), Countryside and Rights of Way Act 2000 (section 74) and the Hedgerows Regulations 1997**.

- **Good agricultural and environmental conditions for habitats and wildlife (GAECs).** Semi-natural habitat in the farmed environment is afforded some protection through the GAECs. These standards provide a baseline of environmental protection for habitats and wildlife in order to maintain biodiversity and sustainable farming and are linked to Cross Compliance requirements and the Single Payment Scheme.

By identifying sites which host priority and protected species and habitats the LWS system provides a robust evidence base. This enables the development of well-informed special planning policies and facilitates objective planning decisions so that local authorities can fulfil their biodiversity duty. Furthermore reporting on the management of Local Sites contributes to the Single Data List, specifically *Local nature conservation/biodiversity* (reference 160-00)

1.4 The LWS system – Key interests and the role of the partnership

1. With their statutory roles and responsibilities relating to nature conservation and biodiversity the lead partners for the Cheshire Region LWS system are the local authorities, with the Cheshire Wildlife Trust and Record taking responsibility for overseeing site surveys, administration and data storage.

2. Other stakeholders include statutory agencies and bodies (such as Natural England and the Environment Agency), landowners and the voluntary and community sector. Due to the large number of sites included within the system the success of the partnership is dependent on the input from volunteers with nature conservation expertise.

3. The role[11] of the LWS partnership is to
    - Agree the basis for site selection.
    - Co-ordinate site selection procedures including survey and identification of candidate sites.
    - Actively promote and support site management.
    - Co-ordinate funding provision and/or identify and promote the taking up of funding opportunities.
    - Promote educational use where appropriate.
    - Establish a process for monitoring the condition of the selected sites.
    - Review the operation of the Local Sites system at suitable intervals.
    - Promote the role and importance of Local Sites at a strategic level (for example in delivering BAP targets, targeting of agri-environment schemes).
    - Promote the enhancement of sites through buffering and increasing connectivity.

4. All sites which are selected or de-selected by the partnership are submitted to the relevant local authority for inclusion in, or deletion from, their Local Development Plan.

1.5 Evaluation and selection of LWS

1.5.1 Key functions of partnership in site selection and de-selection

1. The evaluation and selection of Local Wildlife Sites is a central responsibility of the LWS partnership. The partnership is the final arbiter for the evaluation and selection process.

2. The partnership is responsible for developing and periodically reviewing the site selection criteria in line with published guidance.

3. The partnership is responsible for ensuring all site surveys are undertaken by suitably trained staff or volunteers. The selection process must also be undertaken by suitably qualified personnel representing the LWS partnership.

4. The partnership is responsible for maintaining a list of candidate/alert LWSs and periodically assessing these sites against the LWS criteria. Candidate/alert sites may hold habitat or species of local/national importance but have not been assessed against the LWS criteria. Such sites may be proposed by members of the partnership or other stakeholders including the general public. The list should act as an alert for the planning process and may indicate that an ecological survey is required before determination of any application affecting the site.

5. Existing/candidate/alert sites should be assessed against the criteria by the LWS partnership. The objective of site selection is to select *all*[11] sites that meet the criteria and to review all sites against these criteria at least once every 10 years.

6. The partnership should decide whether sites are in positive management by completing the questionnaire in appendix 5.2. Reporting this figure contributes to the single data list, specifically *Local nature conservation/biodiversity (reference 160-00).* The questionnaire has been compiled following the guidance set out in *Defra guidance on the improved Local Biodiversity indicator (NI197). Revised guidance note December 2008.*

7. Site owners should, whenever possible, be contacted by the partnership and asked for access permission to survey and monitor sites. Where access is denied those wishes should be respected and no change should be made to the site's status. However where there is a threat to a LWS (existing or proposed) section 324 of the 1990 Town and Country Planning Act indicates that any person duly authorised in writing by the Secretary of State or by a local planning authority may at any reasonable time enter land for the purpose of surveying it in connection with preparation of development plans or submission of a planning application. Although in the case of land which is 'occupied' 24 hours' notice of the intended entry has to be given to the occupier.

8. Prior to formal endorsement of sites by the LWS partnership, site owners should be given the opportunity to make observations, for example, on whether or not the site continues to host the listed features, provides the functions as stated and accords with the assessment

made against the selection criteria. This liaison with the landowner relates to the partnership's precise function of identifying appropriate sites and should, therefore be confined to factors relating directly to the application of the site selection criteria.

9. In the information sent to owners of a proposed site, the partnership should set out the process it will follow in considering any observations received from site owners and how the partnership will respond.

10. The criteria have been devised so that sites with restoration potential should not be de-selected, however careful consideration must be given to such sites. If a site no longer meets the criteria and has low restoration potential then it should be de-selected. Site owners and other interested parties should be notified and given the opportunity to make observations. Formal de-selection, once agreed by the partnership, should be notified to owners and other interested parties where appropriate.

1.5.2 Key principles and priorities in site selection

1. Sites with a substantive nature conservation interest will be selected. What constitutes substantive nature conservation interest is set out in the site selection criteria (sections 2 and 3) and reflects the local context as well as national priorities. Sites where the social/aesthetic/educational interest of the site derives from the wildlife features present may also be selected. Only one criterion needs to be met in order for a site to qualify as a LWS.

2. The criteria have been developed in wide consultation with various naturalist organisations and their representatives. Criteria H1 – H26 are generally habitat based, whereas criteria S1-S13 are species specific. The criteria represent a set of clear guidelines with measurable thresholds and provide a structured and systematic approach to site selection. The set of criteria has been devised to reflect local and national priorities as set out above and takes into consideration the following attributes[2]:

    - Size or extent
    - Diversity
    - Naturalness
    - Rare or exceptional value
    - Fragility
    - Typicalness
    - Recorded history and cultural associations
    - Connectivity with the landscape
    - Value for appreciation of nature
    - Value for learning

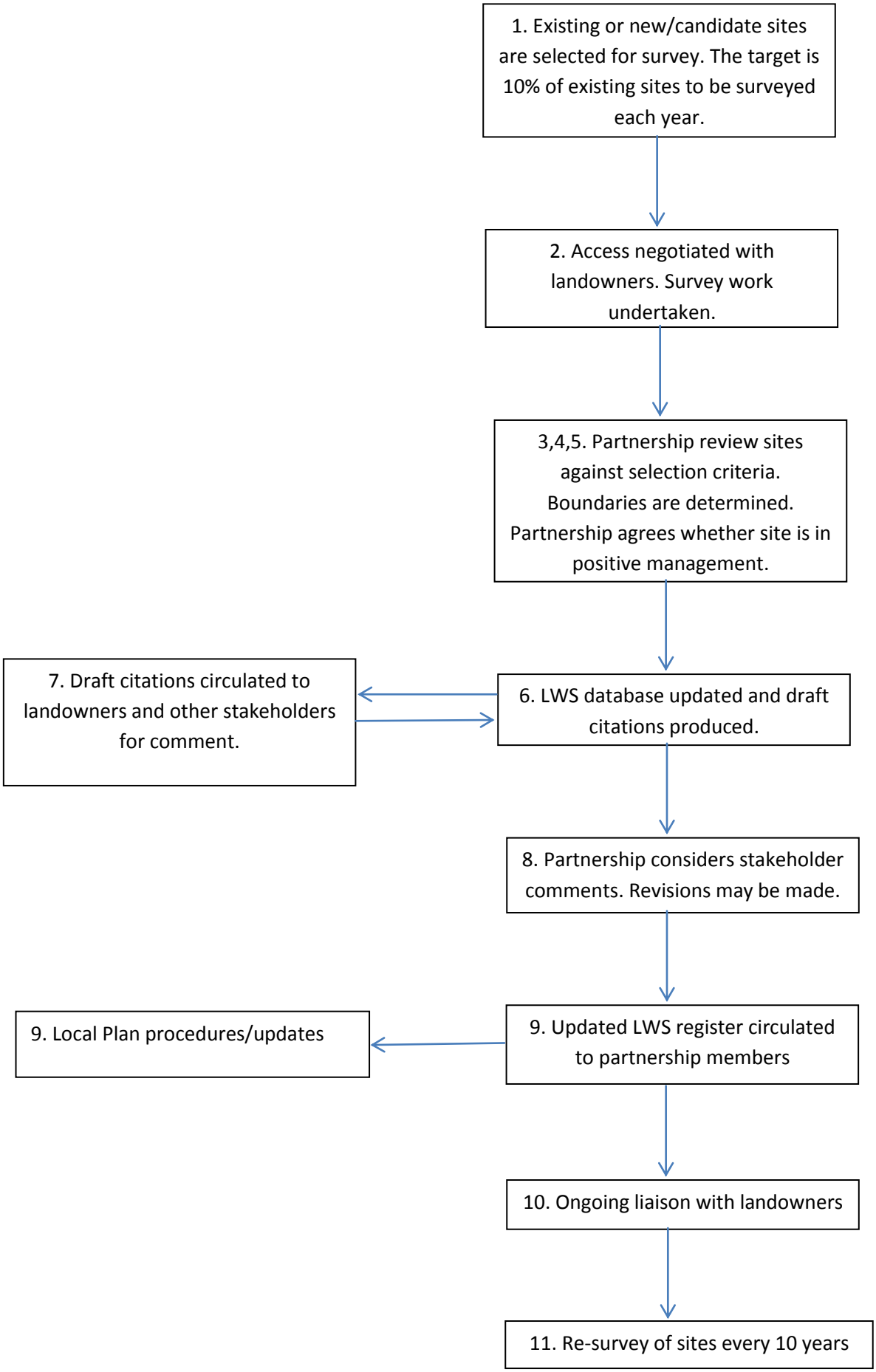
[2] Based upon the Ratcliffe approach set out in the Nature Conservation Review 1977

3. Criteria are weighted relative to each other and geographically so that the suite of LWSs (together with other networks such as SSSIs) can maintain the nature conservation interest of the Cheshire region by supporting viable populations and functioning ecological communities.

4. The habitat criteria in section 2 closely follow the definitions of UK BAP habitats[8]. Several of these UK BAP habitats are also listed as European Annex 1 habitats as they are important in a European context as well as nationally. For a small number of sites the habitat may be excluded from the UK BAP but will appear on the Local BAP (lime-beds and some waxcap grasslands for example). Under the site selection criteria provision is also made for sites that provide important wildlife corridors or perform a buffering function for other important sites.

5. Sites may be selected for the species they support where these are of local or national conservation status, or if the site supports important species assemblages or a significantly large population. Detailed guidance is provided in section 3.

1.5.3 Procedures



1. Each year a number of existing or new sites are put forward for assessment. The target number for each local authority area is 10% existing sites to be surveyed each year. Where this rate is achieved sites are reviewed on a ten year rolling basis in line with Defra guidance. New candidate/alert sites can be put forward for survey by the partnership or other stakeholders including private individuals. Both new and existing sites are surveyed using the same methodology. Further guidance is given in 1.5.1.4.

2. Site surveys should be undertaken once site access has been negotiated. The survey process is similar to extended phase 1 methodology and requires the production of a phase 1 habitat map, and a completed LWS survey form (appendix 1). The form must include a concise description of the site and a list of indicator species (ideally with DAFOR score). In most cases the survey form will include brief management recommendations and a condition assessment of the site (based upon Higher Level Stewardship condition assessment methodology[5]).

3. The review process decides whether a site meets any of LWS criteria. Only one criterion needs to be met in order for a site to qualify. All criteria that are met should be recorded. If a site no longer meets the criteria it should be deleted.

4. The boundary of the site should be determined. This may include deletions or additions to existing sites. Further guidance is provided in the site selection criteria (sections 2 and 3).

5. The partnership will determine if sites are in positive management according to the methodology set out in appendix 2. Site owners/managers must be sent management recommendations, or possess a similar document if a site is to be assessed as being in positive management. Sites that are in schemes such as Higher Level Stewardship would be deemed to be in positive management unless evidence suggests otherwise. Entry Level Stewardship participation does not qualify a site as being in positive management.

6. The database is updated and draft citations are produced.

7. Draft citations are circulated to landowners and other interested parties for comment on how the criteria were applied. Additionally the standard survey form should be given to landowners/managers. The form would normally include brief management recommendations which if implemented would maintain the features for which a site was selected.

8. Partnership considers stakeholder comments and revisions may be made. A final decision on the status of each site is made.

9. Updated LWS registers are finalised for each local authority to incorporate into their Local Plans. The register will include the data on whether newly surveyed sites are considered to be in positive management.

10. Ongoing liaison with landowners which may include further site visits

11. Re-survey of site at least once every ten years.

1.5.4 Data storage

1. Following the review and selection procedure the boundaries of Local Wildlife Sites are transferred to GIS. Responsibility for this is agreed locally with individual local authorities. In some instances (and where funding allows) the habitat data may be included in the GIS layer.

2. Electronic databases of the suite of Local Wildlife Sites are held by all partners. For sites which have been survey from 2012 onwards the database will also hold a list of each site's qualifying criteria.

3. Electronic copies of citations are held by partnership members and electronic copies of site survey reports (post 2010) and phase 1 habitat maps are held by the Cheshire Wildlife Trust. Paper copies of reports pre 2010 are held by the Cheshire Wildlife Trust.

4. A list of alert/candidate sites should be maintained alongside the database for existing sites.

1.5.5 Access to information

The partnership operates a general presumption in favour of making the information relating to LWSs available for public inspection, unless:

- The disclosure of such information could harm or pollute the environment, for example in the case of threatened or protected species.

- The person who has supplied the data has refused permission for disclosure.

- The site owner(s) specifically requested confidentiality

- Requests are unreasonable

There is a charge for supplying this information. This has been levied to cover the costs of administration and to provide support for the running of the LWS system

2. Habitat criteria

H1 –H3 Woodland - UK BAP priority habitat

H1 **Lowland mixed deciduous woodland -** UK BAP priority habitat (contains European Annex 1 habitats)

H2 **Wet woodland -** UK BAP priority habitat (contains European Annex 1 habitats)

H3 **Upland oakwood** - UK BAP priority habitat

Areas of locally native semi-natural lowland mixed deciduous woodland and/or wet woodland greater than 0.25ha should be selected as LWS. All areas of woodland listed on the Ancient Woodland Inventory should be selected. Plantation on ancient woodland sites (PAWS) should be selected where there is survival of significant elements of the original woodland ecosystem[26]. All areas of woodland on peat should be selected. Any site supporting species/species assemblages which qualify under the species selection criteria S1 - 13 should be selected.

Guidance

Sites may meet multiple woodland criteria where mosaics of different habitat types occur (such as dry and wet woodland together).

Criteria **H1-H3** cover the following locally native deciduous NVC communities and community mosaics[1], all of which are BAP priority habitat:

H1 dry woodland : W8, W9, W10, W14, W15, W16 (canopy may have oak sp., birch sp., ash, elm, wych elm, sweet chestnut, lime, hornbeam, field maple, sycamore*, beech*)

H2 wet woodland : W2, W4, W5, W6, W7 (alder, willow sp. or downy birch dominant)

H3 upland oakwood : W11 (with sessile and/or pedunculate oak and birch sp.)

Although beech woodland (W14 and W15) is non-native to Cheshire[2], long established beech plantations that have acquired a high conservation value will be selected as LWS (see below). Upland oakwood is rare in Cheshire however areas may be found on the Pennine fringe and the Peckforton Ridge.

***Excluded are:**

- Small impoverished woodlands <1ha in size[26] with low species diversity (for their likely NVC community) or frequent non-native/invasive species; unless they act as wildlife corridors/ stepping stones between areas of high wildlife value.
- Beech dominated woodland unless the canopy/ground flora has 2 or more of oak, birch, yew, bilberry, heather(s), great wood rush, bluebell, enchanter's nightshade, lords and ladies, honeysuckle, wood sorrel[3] or a Cheshire class 1 AW indicator species[4] from Table 1.

The above must be present **throughout** and not obviously planted and there must be few invasive/non native species.

- Conifer dominated woodland, including Scot's pine or other none locally native species, unless a Cheshire class 1 AW indicator[4] species from Table 1 is present **throughout** and not obviously planted. There must be few invasive/non native species.
  Deciduous woodland with small patches of conifer should be considered as restorable native woodland[26] (BAP habitat) and not excluded. Coniferous woodland may have rich ride fauna or significant bird interest and where this is the case it should be selected under the species selection criteria[26].
- Sycamore dominated woodland, unless the canopy/ground flora has:
  - Either both wood sorrel **and** creeping soft grass, **plus** at least one of ash, native bluebell or hazel (may suggest NVC community W10e). All must be at least occasional **throughout** and there must be few invasive/non native species.
  - Or has occasional sessile oak and supports a rich bryophyte community (such woodlands may be a European Annex 1 habitat).
  - Or a Cheshire class 1 AW indicator species[4] from Table 1 rare/occasional **throughout** and not obviously planted. There must be few invasive/non native species.
  - Or there is a rich (typical NVC community) woodland ground flora (which may suggest invasion of sycamore into established woodland). There must be few invasive/non native species.
- Immature plantation woodland (usually less than 30 years old). Mature plantation woodland should broadly conform to one or more of the above NVC communities and have few invasive/non-native species in order to qualify.

Woodland containing **extensive** areas of native bluebells (LBAP species) and which do not otherwise meet criteria H1-H3 may be selected using criterion S13.

A woodland is dominated by a particular tree species if that tree occurs more frequently in the canopy than any other tree species.

Justification

Britain is one of the least well wooded countries in Europe and with around 5% woodland cover Cheshire is a particularly poorly wooded county. Much of Cheshire's semi-natural woodland is thought to be ancient in origin and often survives in steep sided valleys which have afforded it a degree of protection. Many sites have been felled in the past but still retain much of the original ground flora. Larger woods are generally more valuable than similar smaller woods and the fewer exotics and the greater the range of typical flora, the more valuable the site is. This should be taken into consideration during the selection process.

Several of Cheshire's woodland habitats are also EU Annex 1 habitats and therefore important on an international scale. These include areas of long established alluvial alder woodland which are periodically inundated (though not riparian trees or secondary woodland) and areas of sessile oak woodland (typically NVC communities W10e and W16b). Cheshire also has important areas of secondary woodland which have developed on heathlands, grasslands and wetlands following

changes in traditional management practices. Peatlands are a finite resource and may have restoration potential; therefore any woodland on peat would qualify under the woodland criteria.

The semi-natural woodlands in Cheshire are highly fragmented which compromises the long term survival of specialised woodland species and communities. Therefore woodland that provides a stepping stone between other important woodlands, or links areas of wildlife value, should be selected. This may be done using criterion **H24** if the woodland criteria are not met.

H4 Wood pasture and parkland – UK BAP priority habitat

Wood pasture and parkland with occasional veteran or ancient trees and an open grassland or heathland ground flora should be selected as LWS. Where the parkland/pasture has been changed to arable there must be significant remaining nature conservation interest in the veteran or ancient trees and their associated flora and fauna. Any site supporting species or species assemblages which qualify under the species selection criteria S1-13 should be selected.

Guidance

The parkland or wood pasture may show some correspondence to the following NVC communities: W10, W14, W15, W16[2]. The ground flora may host important communities which may also qualify under grassland, heathland or waxcap grassland criteria **H7-H16**.

Veteran trees may be native or non-native and display attributes associated with late maturity; whereas the term ancient refers to a developmental stage beyond late maturity[26] (refer to criterion **H5**).

Excluded are:

- Sites originating from the 19th century or later which do not have veteran/ancient trees or were not derived from earlier parklands or forests.
- Upland sheep grazed closed-canopy woodland (refer to woodland criteria **H1/H3**).

Justification

Wood-pasture and parkland are mosaic habitats valued for their trees, especially veteran and ancient trees, and the plants and animals that they support. Grazing animals are fundamental to the existence of this habitat. The varied habitats within wood-pasture and parkland provide a home for a wide range of species (many of which occur only in these habitats) such as invertebrates, lichens, bryophytes and fungi which depend on dead and decaying wood. Individual trees, some of which may be of great size and age, are key elements of the habitat and many sites are also of national historic, cultural and landscape importance.

H5 Veteran and Ancient trees

Veteran trees are trees which are in late maturity and should be selected as LWS where they display one or more of the following:

- **The tree has a large girth relative to other mature trees of the same species (see table 2 for guidance)**
- **The tree displays characteristic age related features such as hollowing or crown die back.**
- **The tree supports important populations of invertebrates, lichens, fungi or bryophytes.**
- **Historical records of the individual tree exist.**

The land lying directly under the canopy should also be selected.

Ancient refers to a developmental stage beyond late maturity and such trees are likely to meet more than one of the above.

Guidance and Justification

Veteran and ancient trees may have a cultural and/or landscape value but they are also important for the species they support, particularly invertebrates, lichens, bryophytes and fungi. All qualifying species criteria should be recorded.

Veteran and ancient trees usually have a girth measurement which is larger than other trees of the same species[5]; however other characteristic features should also be taken into consideration. Such features may include trunk cavities, a large quantity of dead wood in the canopy or physical damage including bark loss.

H6 Traditional orchards – UK BAP priority habitat

Traditional orchards should be selected as LWS when all of the following apply:

- **The orchard consists of at least 5 fruit or nut trees planted at low density (3-20m apart).**
- **At least 50% of the trees in the orchard are traditional varieties of fruit or nut (not dwarf varieties).**
- **The ground flora consists of permanent grassland.**
- **The orchard is managed in a low intensity way without the wide use of pesticides, herbicides or inorganic fertilisers.**

Orchards listed on the national orchard inventory should be selected as Local Wildlife Sites providing they meet all the above.

Any site supporting species or species assemblages which qualify under the species selection criteria S 1-13 should be selected.

Guidance and Justification:

Most Cheshire farms and larger houses historically had an orchard. Although many orchards have been removed there are still areas of the county, such as Vale Royal, where numerous orchards still survive. A recent survey by PTES recorded 455 traditional orchards in the county covering an area of 90.2 hectares.

Traditional varieties of fruit trees (not modern dwarf varieties) may be unusual or highly localised cultivars[2] of species such as apple, damson, plum and pear. Traditional orchards are normally managed at low intensity, without the use of pesticides and inorganic fertilisers. Such orchards usually contain numerous micro habitats and are hotspots for biodiversity often supporting rare and declining species. The orchard may consist of several habitat features such as scrub, ponds, walls, hedgerows and hedgerow trees.

Windfall fruit is an important food source for populations of over wintering birds such as fieldfare and redwing. The presence of dead wood is particularly important as it may support rare species of saproxylic invertebrates, fungi, bryophytes and lichens[6]. The flowering trees provide an important source of pollen and nectar for numerous species of declining pollinators including bees, hoverflies and moths.

H7 – H15 Grassland and Heathland – UK BAP priority habitats

H7 Neutral grassland – Lowland meadows UK BAP (contains an EU Annex 1 habitat)

H8 Marshy grassland – Purple moor grass and rush pasture UK BAP habitat

H9 Acid grassland – Lowland dry acid grassland UK BAP habitat

H10 Calcareous grassland – Lowland calcareous grassland UK BAP habitat (contains LBAP limebed communities)

H11 Restorable grassland – good semi-improved (restorable to BAP grassland)

H12 Undetermined grassland – species rich (UK BAP habitat)

H13 Lowland heathland (dry) – Lowland heathland UK BAP habitat, EU Annex 1 habitat

H14 Lowland heathland (wet) - Lowland heathland UK BAP habitat, EU Annex 1 habitat

H15 Upland heathland – Upland heathland UK BAP habitat

Areas of semi-natural grassland which support 4 or more indicator species* (from table 3) should be selected as LWS. Areas of upland heath (above 300m) > 5ha should be selected as LWS. Any site supporting species or species assemblages which qualify under the species selection criteria S1-13 should be selected.

*Refer to guidance. Thresholds lower for acid grassland/heathland.

Guidance

Apart from semi-improved indicator species, all indicators (in table 3) can be used interchangeably and a judgement made as to which grassland type best describes the site[5]; however where clear mosaics of different habitat types occur all relevant criteria codes should apply. If a judgement on grassland type is not possible (for example on post-industrial sites) the criterion **H12** may be used. Sites with >25% dwarf shrub should be recorded as heathland **H13/H14**, above approximately 300m this should be recorded as Upland heathland **H15**.

Minimum thresholds for BAP priority grassland habitats (and LWS criteria) are listed below together with the corresponding NVC communities and community mosaics[2,7]. **Indicator species must not be confined to the field edges.** DAFOR score is referred to (details in table 3).

H7 Neutral grassland, NVC MG4, MG5, MG8.Threshold to qualify as Lowland meadow BAP priority habitat[5] (and LWS status) requires a minimum of:

Four 'occasional' indicator species (from table 3), at least 3 of which are listed as neutral grassland indicators.

OR

Four 'rare' neutral grassland indicators (from table 3).

Where the above minimum thresholds are just met the habitat is classified as 'good quality semi-improved neutral grassland' and corresponds to code B2.2 in phase 1 terminology. Where the above thresholds are clearly exceeded the habitat is likely to correspond to code B2.1 in phase 1 (unimproved neutral grassland).

H8 Marshy grassland, NVC M22, M23, M23. Threshold to qualify as Purple moor grass and rush pasture BAP priority habitat[5] (and LWS status) requires a minimum of:

- *Four 'occasional' indicator species (from table 3), at least 3 of which are listed as marshy grassland indicators.*

  OR

- *Four 'rare' marshy grassland indicators (from table 3).*

There may be some overlap with NVC M27 but where dominated by meadowsweet, yellow iris or tussocky sedges the area should be selected under criterion **H18** Fens, swamps, bogs and reedbeds.

Marshy grassland corresponds to code B5 in phase 1 terminology.

H9 Acid grassland, NVC U1, U2, U4. Threshold to qualify as Lowland acid grassland BAP priority habitat[5] (and LWS status) requires a minimum of:

- *Three 'occasional' acid grassland/heathland indicator species (from table 3).*

  OR

- *Four 'rare' acid grassland/heathland indicators (from table 3).*

Where the above minimum thresholds are just met the habitat is classified as 'good quality semi-improved acid grassland' and corresponds to code B1.2 in phase 1 terminology. Where the above thresholds are clearly exceeded the habitat is likely to correspond to code B1.1 in phase 1 (unimproved acid grassland). Lowland acid grassland is often present in mosaics with Lowland heath. It occurs on enclosed land below approximately 300m (although particularly good examples may be considered if they lie above 300m and are enclosed). Above 300m unenclosed acid grassland is likely to be either degraded upland heath (<0.5m peat) or degraded blanket bog (>0.5m peat) and should be assessed against these criteria.

H10 Calcareous grassland, Examples of calcareous grassland in Cheshire (post industrial sites) do not generally conform to existing NVC communities. Threshold to qualify as Lowland calcareous grassland BAP priority habitat[5] (and LWS status) requires a minimum of:

- *Four 'occasional' indicator species (from table 3), at least 3 of which are listed as calcareous grassland indicators.*

OR

- *Four 'rare' calcareous grassland indicators (from table 3).*

Where the above minimum thresholds are just met the habitat is classified as 'good quality semi-improved calcareous grassland' and corresponds to code B3.2 in phase 1 terminology. Where the above thresholds are clearly exceeded the habitat is likely to correspond to code B3.1 in phase 1 (unimproved calcareous grassland).

H11 Restorable grassland[5] – (moderately species rich semi-improved, where there is good potential to restore to BAP quality). Threshold to qualify as restorable grassland habitat[5] (and LWS status) requires a minimum of:

- *Four 4 'occasional' indicator species present from table 3, but 2 or fewer occur from the lists given for neutral/acid/marshy/calcareous grassland.*

Restorable semi-improved grassland should have less than 30% cover of white clover and rye grass and generally host at least 3 of the following grasses: common bent, crested dog's tail, false oat grass, meadow fescue, meadow foxtail, red fescue, sweet vernal grass, tufted hair grass (rarer grasses more typical of unimproved grassland may be counted).

This criterion includes degraded examples of the above NVC communities e.g. more species rich examples of MG1, MG6, MG9, MG10, MG11, MG13. The latter two are typical of coastal or floodplain grazing marsh and may be selected under criterion **H17**.

Where the above minimum threshold of indicator species are present the habitat is classified as 'good quality semi-improved grassland of moderate species richness'[5] and corresponds to either code B1.2, B2.2 or B3.2 in phase 1 terminology.

H12 Undetermined species rich grassland, Threshold to qualify as BAP priority grassland habitat[5] (and LWS status) requires a minimum of:

- *Four 'occasional' indicator species (from table 3), only one of which may be a semi-improved indicator.*

OR

- *Any four 'rare' neutral, marshy, acid or calcareous grassland indicators (from table 3).*

This type of grassland is still considered BAP priority habitat as indicator species are interchangable[5]. Species rich arable field margins may be selected using this criterion providing they are not sown.

Sown wildflower grasslands may qualify under this criterion once they have proved to be sustainable e.g. retaining a species-rich sward approximately 20 years after sowing.

Where the above minimum thresholds are just met the habitat is classified as 'good quality semi-improved grassland'[5] and is likely to best correspond to code B2.2 in phase 1 terminology. Where the above thresholds are clearly exceeded the habitat is likely to correspond to code B2.1 in phase 1.

H13 Lowland heathland – dry, may correspond to NVC H1, H2, H4, H7, H8, H9, H10, H11, H12, H16, H18 (usually present as a mosaic with acid grassland **H9**)

> Lowland heath generally occurs below 300m. There should be at least 25% cover of heathers and other dwarf shrubs with fine grasses, wildflowers and lichens in a complex mosaic. Areas with less than 25% dwarf shrub may qualify under criterion **H9** Acid grassland.

H14 Lowland heathland – wet, may correspond to NVC M15, M16 (wet heath may grade to wetter, sphagnum rich habitat which should be recorded as **H18**)

> Lowland heath generally occurs below 300m. There should be at least 25% cover of heathers and other dwarf shrubs with fine grasses, wildflowers and lichens in a complex mosaic. Areas with less than 25% dwarf shrub may qualify under criterion **H9** Acid grassland.

H15 Upland heathland, may correspond to NVC M3, M15, M17, M18, M19, M20 (where wet upland active bog with bog mosses and cottongrass record as **H18**)

> Upland heath generally occurs above 300m, on <0.5m of peat and above the line of enclosure. Above 600m (tree-line) it is considered to be a montane heath. On peats depths > 0.5m it is considered to be blanket bog (**H18**). There should be at least 25% cover of dwarf shrubs including heathers, bilberry, crowberry and western gorse.

Other grasslands

Roadside verges can be selected as LWS where they qualify under the grassland criteria. The calcareous grasslands on post-industrial sites e.g. those associated with the salt industry in mid-Cheshire, are recognised in the LBAP and may qualify under **H10** or **H12**.

Excluded are:

- Sites sown from a seed mix. However these sites may qualify once they have proved to be sustainable e.g. retaining a species-rich sward approximately 20 years after sowing. (Sown sites may be important habitats for terrestrial invertebrates and should be assessed against the species criteria. Such sites may also qualify under criterion **H26** Accessible natural greenspace.)
- Areas of degraded heath and mire above 300m where dwarf shrubs are less than frequent in **species poor** grassland (typically with bent and fine leaved fescues, mat

grass and purple moor grass). But consider if likely to qualify as waxcap grassland (**H16**).

Condition

The above criteria list the **minimum** thresholds required for a site to be considered as BAP priority habitat (or restorable to BAP priority habitat – **H11**) and to qualify as a LWS. A number of grassland sites exceed these quality thresholds and are therefore considered to be in 'favourable condition', which in phase 1 terminology is likely to be classified as 'unimproved'. For neutral and marshy grassland 'favourable condition' requires the presence of at least two frequent and two occasional indicator species (not including those listed as semi-improved indicators). For acid grassland there should be at least one frequent indicator and three occasional and for calcareous grassland there should be at least two frequent indicators and three occasional. The amount of scrub and undesirable species such as thistle and dock will also affect the condition assessment. Further information is given by Defra[5]

Justification

Semi-natural grassland and heathland can be hundreds or even thousands of years old and many sites have survived due to a long history of traditional management practices. Such habitats often support rich species assemblages, both above and below ground, with complex webs of beneficial associations of flowering plants, soil mycorrhizae and invertebrates. This complexity means that such habitats are difficult or impossible to replace once destroyed, yet semi-natural lowland grassland is being lost faster than any other habitat type in the UK. As a consequence of this rapid loss semi-natural grassland supports more priority species than any other habitat.

Due to the twin pressures of intensification of landuse and neglect Cheshire has lost 99% of its species rich grassland compared to a national average of 97% and there are now less than 60 hectares of lowland heath remaining in the county. For this reason all remaining areas of these important habitats should be considered for site selection.

Dry and wet lowland heaths and *Alopecurus* – *Sanguisorba* meadows (NVC MG4) are internationally important EU Annex 1 habitats.

H16 Waxcap grasslands – Local BAP habitat

Sites should be selected as LWS where[24]:

- they host one or more of the following: *Hygrocybe calptriformis, Hygrocybe punicea, Hygrocybe ovina, Hygrocybe ingrata, Hygrocybe spadicea (BAP and British Red list species)*

OR

- they host at least **8** Waxcap species identified on a single visit
- they host at least **12** Waxcap species (from table 4) identified on multiple visits

Two visits are recommended during the fruiting period, mid-Sept to mid-November

Guidance [24]

"Waxcap grassland" is so called because it is the specific habitat of a distinct assemblage of macrofungi which includes members of the genus *Hygrocybe,* otherwise known as waxcaps. The particular character of this habitat is that it is long-standing, unimproved, nutrient poor, well-drained, semi-natural grassland. It can occur in a variety of situations e.g. as pastures, reservoir embankments, churchyards or old cricket pitches. The sward is usually kept short by grazing or mowing and can be mossy. Given the low nutrient levels, waxcap grasslands often have a rich vascular plant flora. Indeed because of this they may be selected as Local Wildlife Sites even if their mycological importance is unappreciated. However, waxcap grasslands may also be botanically impoverished and thus their conservation value could be overlooked altogether.

To determine whether a grassland site should be selected as a Local Wildlife Site for its mycological importance, and to complement the criteria suggested for the selection of grassland sites as SSSIs based on mycological interest[23] these LWS selection criteria have been based primarily on the *Hygrocybe* (waxcap) species present.

There are several other fungal families whose species are also grassland specialists, and which occur alongside the *Hygrocybe* species in the distinct assemblages of macrofungi found in waxcap grasslands. These are the Clavariaceae (Fairy Clubs), Entolomataceae (Pink Gills) and Geoglossaceae (Earth Tongues). Although threshold figures are not provided for these species here, they should be identified and recorded if possible and will serve to further confirm the importance of a site (see Table 4 for several examples).

Justification

Grassland specialist fungi are vulnerable primarily through loss, fragmentation or changes to management of their grassland habitat. Research suggests that waxcap grasslands would take decades to re-establish. Evidence from surveys indicates that the UK is particularly important for grassland fungi compared with other European countries. Many species relatively common in the UK are on one or more European red lists. The UK therefore has an international responsibility for the conservation of these fungi and their special grassland habitat.

H17 Coastal and Floodplain grazing marsh -UK BAP priority habitat

Areas of coastal and floodplain grazing marsh that are subject to seasonal inundation should be selected. Areas of floodplain hosting a semi-natural, predominantly grassland flora that have the potential to be seasonally inundated should be selected. Any site supporting species or species assemblages which qualify under the species selection criteria S 1-13 should be selected.

Guidance and Justification

Floodplains which retain a high water table for at least part of the year provide important habitat for populations of over wintering wildfowl and breeding waders. Where ditches retain water these can provide important habitat for populations of dragonflies, water voles and specialised wetland flora.

Coastal and floodplain grassland can be species poor (typically NVC communities MG9, MG10, MG11, MG13)[8] with species such as Yorkshire fog, tufted hair grass, soft rush, creeping bent, common fleabane and silverweed. However there may be areas with a richer flora which also meet the criteria for wetlands/grasslands. Where this is the case all criteria that are met should be recorded in addition to **H17**. If the site is predominantly fen it should be selected under criterion **H18** rather than as floodplain grazing marsh.

Many floodplains are no longer seasonally inundated due to changes in water management, however if the site retains a semi-natural, predominantly grassland flora and has the potential to be restored to grazing marsh, then it should be selected as a LWS.

H18 **Fens, swamps, bogs and reedbeds -** Fens UK BAP priority habitat, Lowland raised bog UK BAP priority habitat, Reedbeds UK BAP priority habitat, (contains EU Annex 1 habitat)

Areas of fens, swamps, reedbeds, lowland raised bogs and blanket bogs with sphagnum moss, cotton grasses or abundant tall vegetation such as common reed, tall sedges and grasses or wetland plants from table 5 should be selected as LWS. Any site supporting species or species assemblages which qualify under the species selection criteria S 1-13 should be selected.

Guidance

Wetland communities exist on soil that is waterlogged with the water table close to, or above the surface for most of the year. Fens are wetlands found on flood plains, on the fringes of open water, in valleys and basin-like depressions and around springs and flushes. Fens occur on both peat and mineral soils. Lowland raised bogs are found in similar locations but are only fed by rainwater and always occur on peat. Blanket bog is present in the uplands usually between 250 and 600m above sea level lying on >0.5m of peat (<0.5m it is considered to be upland heath).

Fens encompass a wide range of wetland communities including narrow fringes of tall herb vegetation (e.g. meadowsweet, yellow flag iris) alongside water bodies, sphagnum rich flushes and areas of tall swamp vegetation with common reed or sedges. Upland blanket bog and Lowland raised bogs are peatland communities dominated by bog mosses, cotton grasses and heathers. Schwingmoor is a very rare habitat developed from a raft of peat vegetation sitting on top of open water.

This criterion may correspond with the following NVC communities[2] which often occur in complex mosaics with marshy grasslands, wet heathland, wet woodland and open water.

M18, M17, (also M1, 2, 3, 15, 19, 20, 25) - raised bog communities.

M1-14, M18, 19, 27, S1-28, - fen and swamp communities

M17-20, M25 – upland blanket bog whether it is active or not.

Excluded are:

- Large/significant areas dominated by willowherb, butterbur, nettle or invasives such as Himalyan balsam.
- Areas of upland blanket bog which no longer contain semi-natural bog vegetation unless such areas are important for the protection and/or enhancement of the adjacent bog.
- Areas of degraded heath and mire above 300m where dwarf shrubs are less than frequent in **species poor** grassland (typically with bent and fine leaved fescues, mat grass and purple moor grass).

Justification

The wetlands of the Cheshire plain form part of a unique and internationally important landscape known as the 'Meres and Mosses Natural Area' which formed as glaciers retreated after the last ice age. Several wetlands have their origins in a post industrial landscape following extraction of sand and salt, whilst others sit on river floodplains such as the Mersey and the Dee.

These fragile landscapes with their suite of specialised wetland species, are just a fragment of their former size. Losses have occurred as land has been drained for agriculture and development, or as a result of diffuse pollution. Further losses have occurred as changes in traditional agricultural practices have led to the scrubbing over and drying out of former wetlands. In the uplands of east Cheshire the extent of blanket bog has been reduced through overgrazing, burning and pollution although restoration projects are helping to reverse the decline.

Reedbeds are amongst the most important habitats for birds in the UK. They support a distinctive breeding bird assemblage including nationally rare Red Data Birds such as the bittern, marsh harrier, Cetti`s warbler and bearded tit. They also provide roosting and feeding sites for migratory species and are used as roost sites for several raptor species in winter. Reedbeds are also important havens for invertebrates, particularly moths and beetles.

Upland blanket bog, Lowland raised bogs and closely related 'Transition mires' are all present in Cheshire and are internationally important EU Annex 1 habitats.

H19 **Meres, lakes, reservoirs, canals –** Eutrophic standing water UK BAP priority habitat, Mesotrophic lakes UK BAP priority habitat (contains European Annex 1 habitat)

- **Any mesotrophic or naturally eutrophic lake, mere, reservoir or canal greater than 2ha in size with an abundance of native floating, submerged and emergent plants should be selected. Qualifying emergent species are listed in table 5. Marshy grassland species may also be present.**
- **Any mere or lake which supports species or species assemblages which qualify under the species selection criteria S 1-13 should be selected.**

Guidance

Mesotrophic lakes and meres have relatively low levels of plant nutrients whereas naturally eutrophic standing waters have plentiful nutrients. Mesotrophic water bodies are rare and are now normally confined to the margins of upland areas. In Cheshire much of the open water is highly eutrophic due to artificially increased levels of phosphorous and nitrogen leading to an increase in algae and a loss of other aquatic organisms.

Where the vegetation (or other aquatic species assemblages) suggests the level of nutrient enrichment is lower, the site should be selected as a LWS. Naturally eutrophic waters can be identified by the presence of aquatic species such as pondweeds, spiked watermilfoil, yellow water lily and stoneworts and are often fringed by common reed[8].

Reservoirs and canals may also be considered under this category, so long as they meet the selection criteria by supporting an abundance of native floating, submerged and emergent plants. Where this is not the case such sites may qualify under the species selection criteria or **H26** Accessible natural greenspace or **H24** Wildlife corridors/buffers.

There are various corresponding aquatic, swamp and fen NVC communities[2] including OV28-OV35.

Justification

The meres of the Cheshire plain form part of a unique and internationally important landscape known as the 'Meres and Mosses Natural Area' which formed as glaciers retreated after the last ice age. Many of Cheshire's lakes have their origins in a post industrial landscape following extraction of sand and salt and have since developed into important wildlife habitats.

Naturally eutrophic lakes are internationally important EU Annex 1 habitats.

H20 Ponds and ditches – contains UK BAP priority habitat

All seasonal or permanent ponds or ditches of <2ha should be selected as LWS providing one or more of the following criteria are met:

- ***High value*[5] ponds* or ditches which support species or species assemblages which qualify under the species selection criteria S 1-13 and are *dependent* on the pond.**
- **Ponds or ditches which sit within 250m of a *high value* pond or ditch, which have a strong likelihood of hosting the qualifying species or species assemblages.**
- **All ponds which sit within 250m of a *high value* pond where they form part of 'an exceptional pond density or pond network**'.**
- **Ponds/pond clusters* or ditches with at least 9 species[9] of native floating or submerged aquatic or emergent wetland species and a good physical structure***. Qualifying emergent species are listed in table 5. Marshy grassland species from table 3 may be substituted.**

*Including all ponds within the **immediate** cluster (with connectivity of water bodies at times of high water levels) unless there is a reason to exclude.
**According to Pondlife
***Excludes ponds where the majority of the flora has been introduced unless the pond has a good physical structure/water quality, with conditions suitable for supporting healthy populations of invertebrates or amphibians or breeding wetland birds. Ponds stocked with high numbers of fish are unlikely to meet this requirement.

Guidance

The most valuable ponds/pond clusters have a diverse flora and a good physical structure with areas of open water and a good marginal marsh. The selected area must contain the whole pond (or pond cluster) and sufficient habitat to enable the species or species assemblages to be maintained as a minimum viable population. Where this cannot be estimated a minimum 6 metre riparian zone around the pond should be selected. Where ponds host *good* breeding populations of great crested newts (refer to criterion **S5**), any habitat suitable for foraging which sits within 250m of the pond could be considered for selection.

Ditches can be considered as linear ponds and should be selected as LWS where they meet the above criterion. Ditches which do not meet the above criterion may meet criterion **H24** Wildlife corridors/buffers. Where a pond is part of another habitat (e.g. part of a larger wetland), or was selected using species criteria, all qualifying criteria should be listed on the site citation, including **H20.**

There are various corresponding aquatic, swamp and fen NVC communities[2] including OV28-OV35.

The criteria for selecting ponds have been set following an audit of Local Wildlife Sites in Cheshire West and Chester LA[35] and subsequent review of the quality of ponds present on these sites.

Justification

Cheshire has approximately 16,000[15] ponds which is approximately 10% of the total number for England and Wales[10]. Most are farm ponds many of which originate from flooded marl pits. Today only 40% of those existing in 1870 remain[10] and numbers are continuing to decline through natural succession, deliberate infilling and runoff from agricultural practices.

Ponds often sit within intensively managed grasslands and provide important stepping stones for the movement of wetland species through the landscape. They also provide open water for birds and mammals to drink from and feeding areas for bats. In south Cheshire ponds form an integral part of the internationally important landscape known as the 'Meres and Mosses Natural Area'.

H21 **Rivers –** contains UK BAP priority and European Annex 1 habitat

All *near natural*[2] sections of rivers and larger streams will be selected as LWS where they display one or more of the following features:

- **Display signs of active erosion and /or meandering, such as extensive areas of gravel, pebble and sand beds, eroding cliffs or the presence of ox bow lakes. Many of these features will be unvegetated reflecting their dynamic nature.**
- **Support an abundance of water crowfoots (*Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation – a European Annex 1 habitat)**
- **Support invertebrate species that are strongly indicative of river shingle.**
- **Support species or species assemblages which qualify under the species selection criteria S 1-13.**

Guidance and justification

The LWS should include all areas of the active river system such as floodplains, ox bow lakes and ponds which were formed as part of the natural river evolution process. Consideration should be given to areas of historic floodplain which may be essential to the functioning of the river system[2]. In the absence of adjacent qualifying areas a 6 metre riparian zone from the top of the riverbank should be included.

Sections of the river of >250m away from any qualifying features should be excluded unless there is potential for re-colonisation or restoration, for example when considering the restoration of areas of the river which sit between two qualifying sections.

Sections of several rivers in Cheshire support an abundance of river water crowfoot. These are internationally important Annex 1 habitats and therefore should be selected as LWS.

There are various corresponding aquatic, swamp and fen NVC communities including A2, A8-9, A11-20, S4-9, S11-14, S16-19, S22 and others[2]. Where there is a good marginal vegetation present but the above river criterion is not met, the site should be selected under **H18** Fens, swamps, bogs and reedbeds.

Excluded are:

Canals

Ditches

H22 Rock outcrop and stone structures – contains LBAP habitat and UK BAP priority habitat

Areas of rock, scree and stone structures supporting a rich assemblage of ferns, lichens and bryophytes will be selected as LWS. Any site supporting species or species assemblages which qualify under the species selection criteria S 1-13 should be selected.

Guidance and justification

This type of vegetation can occur in areas of low atmospheric pollution and is associated with acidic rock surfaces (both sedimentary and igneous), usually at moderate altitudes below 600m. Often these surfaces are found on man-made structures such as stone walls and gravestones, but also on glacial erratics which are pieces of rock that differ from the native rock of the area. The vegetation may correspond with the NVC U21 community.

Rock ledges and cliff faces which are inaccessible to grazing animals often develop a specialised flora and support rare species. Such habitats may host numerous terrestrial invertebrates such as beetles, diptera and spiders. Raptors such as the peregrine falcon also favour this particular habitat.

H23 Open mosaics on previously developed land- UK BAP priority habitat

Sites should be selected that fulfil the following criterion (where other habitat criteria are not met):

- **The site supports species or species assemblages which qualify under the species selection criteria S 1-13.**

Where the above is not fulfilled all of the following must apply[2]:

- **The site is an open mosaic habitat of at least 0.25ha.**
- **There is a known history of disturbance or evidence material has been added or removed.**
- **The vegetation comprises early successional communities of mainly stress tolerant species such as annuals, mosses/liverworts, lichens, ruderals, inundation species, open grassland, flower rich grassland, heathland.**
- **The site contains some loose bare substrate (very small areas will qualify).**

Guidance and justification

Open mosaics may include areas of scattered scrub or other communities such as reedbed or open water however early successional communities should comprise the majority of the habitat. Such communities often contain numerous niches within a relatively small area and can be particularly important for invertebrates, reptiles and amphibians with many sites hosting rare or declining species. Open mosaic vegetation sites may also be important for birds such as little ringed plover, skylark and grey partridge. These primary successions are generally rare in the wider landscape and may persist for decades without active management as edaphic conditions can severely limit plant growth. However with appropriate management these sites can persist indefinitely. The plant species of such areas are often declining in the wider countryside but there are also likely to be exotic species which may contribute to the value of the site for invertebrates and birds. Typical sites include disused quarries, former railway sidings and landfill sites. Such sites tend to be concentrated in urban or urban fringes or former industrial landscapes.

All selection criteria that apply should be recorded.

H24 Wildlife corridors/buffers

Areas of land including hedges and ditches may be selected for inclusion within (or extension to) LWS where they fulfil at least one of the following:

- **Provide a physical link between two or more areas of high wildlife value and has favourable conditions for the movement of species between these habitats.**
- **Provide a buffer zone protecting vulnerable sites from disturbance, pollution or development/recreational pressure.**
- **Provide additional buffering habitat for species associated with existing wildlife sites.**
- **Provide a significant physical extension to an area of high wildlife value and has favourable conditions for the movement of species out into the wider countryside.**

Guidance and Justification

The movement of species through the countryside is vital for the sustainability of ecosystems by facilitating the genetic exchange of species and enabling movement in response to climate change[21]. Important wildlife sites should be connected to other wildlife habitats and the wider countryside[11, 21], although it is recognised that some sites may consist of fragments of discontinuous habitat which cannot be linked.

Sites should be selected as LWS using criterion **H24** where they fail to meet other selection criteria but have the potential to act as wildlife corridors. This criterion can also be used to buffer wildlife sites from existing or potential factors that may adversely affect the site, or to provide additional habitat for species associated with an existing wildlife site.

Hedges and ditches of *high value* may meet criteria **H20** Ponds and ditches or **H25** Hedges.

H25 High value hedges – UK BAP priority habitat

***High value*[5] species rich hedges at least 20m in length should be selected as LWS where either of the following apply:**

- If they have a least 4 native woody species in a 30metre section within 2m of the centre of the hedge (excluding bramble and honeysuckle)[2]

Or

- A high biodiversity value within the hedge and surrounding ground flora.

Guidance and Justification

Many hedges are protected by the hedgerow regulations and should not require further protection; however *high value*[5] species rich hedges can be considered for selection. Such hedges are likely to be ancient and may date back to before the enclosures act and are usually associated with historic features such as green lanes, banks, ditches, walls or relic woodland boundaries. They often provide refuges for species such as woodland plants, butterflies, moths, farmland birds, bats, amphibians and dormice and may contain ancient or veteran trees. Adjacent verges, ditches and field margins should also be included within the LWS boundary.

Hedges of lower value may meet criterion **H24** Wildlife corridors/buffers.

H26 Accessible natural greenspace

Sites should be selected as LWS under criterion H26 when the social/aesthetic/educational interest of the site derives from the wildlife features of the site.

Guidance

Where local space provides primarily for social and community benefits *not* related to a site's nature conservation interest, it should *not* be selected as a LWS, but should be recognised for these in relation to local open space policies[11]. The Open Space Strategy should make provision elsewhere for the demand for other functions which would have an adverse effect on Local Sites' biodiversity or geological value[11].

The social/aesthetic/educational values of a site *related to nature* include:

- Recorded biological history (especially valuable as habitats change with climate change).
- Opportunities for public access for appreciation of nature.
- Educational value in relation to nature (both formal and informal and at all ages/levels).

H27 Mosaics

This criterion is only to be used to select mosaic sites which fail to reach the minimum size specified in the habitat criteria (e.g. woodlands which have a size threshold). The total area of the site must be equivalent to the minimum size specified for the component habitat. The majority of the site must meet the LWS criteria. Any site supporting species or species assemblages which qualify under the species selection criteria S 1-13 should be selected.

Guidance

Where a habitat mosaic complements/buffers an adjacent LWS through provision of additional habitat for species associated with the LWS, it should be incorporated into the existing LWS or selected independently using criterion **H24 Wildlife corridors/buffers**.

All selection criteria that apply should be recorded.

H28 Saltmarsh and intertidal mudflats, UK BAP priority habitat, contains European Annex 1 habitat.

All zones of saltmarsh and intertidal mudflats which support characteristic flora shall be selected. All areas of anthropogenic or naturally occurring inland saltmarsh/salt meadows should be selected. Any site supporting species or species assemblages which qualify under the species selection criteria S 1-13 should be selected

Guidance

There is a natural zonation of plant communities from species poor lower saltmarsh at the edge of estuarine mudflats through the mid saltmarsh to the upper tidal limit swamp or transitional communities. Salt tolerant plants of the lower salt marsh are adapted to regular immersion by the tides, whereas upper salt marsh plants may only be inundated occasionally. Mudflats and saltmarsh are particularly important habitats for wading birds and wildfowl but also provide feeding grounds for species such as skylark and meadow pipit.

Sites which support characteristic species of mud flats and saltmarsh should be selected as LWS. Accreting areas should be included as they develop the characteristic flora and fauna. Many sites would additionally qualify on the grounds of species criteria, particularly bird assemblages. Where this is the case the relevant species criteria should also be recorded. Where coastal grassland is present this should be assessed using criterion **H17**.

Justification

The majority of saltmarsh and mudflats of the Dee and Mersey estuaries are internationally important areas and protected through legally designated sites including SPAs, SSSIs and SACs. However some areas remain unprotected and should be considered for LWS selection if they support characteristic species.

Inland salt marsh and salt meadows are post-industrial habitats which have developed following salt extraction. There are a small number in mid-Cheshire. Very rarely such habitats may occur naturally due to brine springs enabling the development of saltmarsh vegetation. Inland salt marsh is a European Annex 1 habitat.

H29 Sand dunes and estuarine rocky habitats UK BAP priority habitat (contains Annex 1 habitat)

All sites that support characteristic species of sand dunes or estuarine rocky habitats shall be selected. Any site supporting species or species assemblages which qualify under the species selection criteria S 1-13 should be selected.

Guidance

Sand dunes depend upon dune building grasses such as marram grass which traps sand above the high water mark. There is a natural zonation of plant communities from species poor lower dunes through to the more stable upper dunes which can be species rich.

The reduced salinity of an estuarine rocky habitat allows specialised communities to develop, often with rare species of algae and lichens. Estuarine rocky habitat is a European Annex 1 habitat.

Sites which support characteristic species of dunes and estuarine rocky habitats should be selected as LWS. Accreting areas should be included as they develop the characteristic flora and fauna. Many sites also would qualify on the grounds of species criteria, particularly bird assemblages. Where this is the case the relevant species criteria should also be recorded.

Justification

The majority of sand dunes and rocky habitats of the Dee and Mersey estuaries are internationally important areas and protected through legally designated sites including SPAs, SSSIs and SACs. However some areas remain unprotected and should be considered for LWS selection if they support characteristic species.

H30 Maritime cliff and slopes UK BAP priority habitat

All sites that support characteristic species of maritime cliff and slopes should be selected as LWS. Any site supporting species or species assemblages which qualify under the species selection criteria S 1-13 should be selected.

Guidance

Maritime cliff and slope comprises sloping to vertical faces on the coastline. This habitat broadly fits into one of two categories:

- Soft cliffs and slopes which can be colonised relatively easily by maritime or inland species particularly grassland, ruderal and scrub vegetation.
- Hard cliffs which may be rich in lichens but have fewer higher plants apart from on ledges.

The vegetation can vary substantially depending upon substrate and prevailing conditions and can extend inland for a considerable distance to the limit of salt spray deposition. The edge of this habitat on the seaward side extends to the limit of the supralittoral zone and includes the splash zone lichens.

Sites which support characteristic species of maritime cliff and slope habitats should be selected as LWS. The boundaries should include all cliff top areas which are influenced by salt deposition. Sites may also qualify on the grounds of species criteria. Where this is the case the relevant species criteria should also be recorded.

Justification

Maritime cliffs and slopes are particularly important for the species they support. Hard cliffs may support populations of breeding seabirds and characteristic species of lichens. Soft cliffs may host populations of sandmartins as well as rare invertebrates including species of solitary bees, wasps, weevils and beetles.

The majority of maritime cliff and slope habitats of the Dee and Mersey estuaries are internationally important areas and protected through legally designated sites including SPAs, SSSIs and SACs. However some areas remain unprotected and should be considered for LWS selection if they support characteristic species.

Table 1 Class 1 Ancient Woodland indicator species for Cheshire[4].

Taxon	Vernacular	Comment
Allium ursinum	Ramsons	May also be found in non-ancient alder woodland (NVC W6d)
Campanula latifolia	Giant bellflower	Blue flowered form only
Campanula trachelium	Nettle-leaved bellflower	
Carex strigosa	Thin-spiked wood sedge	
Carex sylvatica	Wood sedge	
Chrysosplenium alternifolium	Alternate-leaved golden saxifrage	
Crataegus oxyacanthoides	Woodland hawthorn	Beware of plantings
Daphne laureola	Spurge laurel	Beware of plantings
Elymus caninus	Bearded couch	
Euonymus europaeus	Spindle	
Festuca altissima	Wood fescue	
Gagea lutea	Yellow star of Bethlehem	
Galium odoratum	Woodruff	
Hordelymus europaeus	Wood barley	
Lathraea squamaria	Toothwort	
Lathyrus sylvestris	Wild pea	
Luzula pilosa	Hairy woodrush	
Melica uniflora	Wood melick	
Paris quadrifolia	Herb Paris	
Poa nemoralis	Wood meadow grass	
Polygonatum multiflorum	Solomon's seal	Beware 'Solomon's Walrus' *Polygonatum x hybridum* – the garden form
Polystichum aculeatum	Hard shield fern	Also in relict hedges
Polystichum setiferum	Soft shield fern	
Prunus padus	Bird cherry	Also in relict hedges. Beware of plantings.
Rhamnus catharticus	Purging buckthorn	Also in relict hedges
Sanicula europaea	Sanicle	
Sorbus torminalis	Wild service tree	Also in relict hedges
Stellaria neglecta	Greater chickweed	
Stellaria nemorum	Wood stitchwort	
Tilia cordata	Small-leaved lime	Beware of plantings
Viola odorata	Sweet violet	
Viola reichenbachiana	Early dog violet	

Species such as greater stitchwort, barren strawberry, dog's mercury, yellow archangel and wood speedwell (class 2 indicators) are often found in ancient woodlands but may survive long periods after a wood has been felled and subsequently re-invade secondary woodland.

Table 2 Minimum tree girth for trees to be considered 'very large'[5].

Tree girth (minimum)	Species
80 cm	Holly
133cm	Rowan
160cm	Birch spp. hawthorn, field maple
200cm	Alder, white/crack willow
213cm	Goat willow, hornbeam, holm oak
266cm	Scots pine
320cm	Ash, small-leaved lime, beech
373cm	Elm, sycamore
400cm	Oaks, yew, sweet chestnut

These measurements represent a guide and where trees have obviously lost girth due to great age this should be taken into account

Table 3 Indicators and thresholds for grassland and heathland UK BAP priority habitat (Defra[5]).

	Habitat type (indicators are all interchangeable[5])				
Indicator species **Refer to descriptions for H1-H12 for full explanation. In summary DAFOR 'occasional' occurrence of any 4 species from list below denotes LWS status grassland. For acid grassland the threshold is 3 'occasional' acid grassland indicators. Indicators should not be confined to field edges**	**Neutral grassland** **(lowland meadows and other neutral grassland).** At least 4 DAFOR 'rare' neutral indicators (or 3 'occasional' neutral indicators plus one other 'occasional' indicator from the table).	**Marshy grassland** **(purple moor grass and rush pasture)** At least 4 DAFOR 'rare' marshy indicators (or 3 'occasional' marshy indicators plus one other 'occasional' indicator from the table).	**Acid grassland or acid grassland/ heathland mosaics** (dry and wet) At least 4 DAFOR 'rare' or 3 'occasional' acid indicators should be present.	**Lowland Calcareous grassland** At least 4 DAFOR 'rare' calcareous indicators (or 3 'occasional' calcareous indicators plus one other 'occasional' indicator from the table).	**Semi-improved grassland[a]** The presence of at least 4 DAFOR 'occasional' indicators denotes grassland which may be restored to BAP quality. Indicators should not be confined to field edges
Adder's tongue fern	✓				
Agrimony	✓				
Autumn hawkbit	✓				✓
Betony	✓		✓	✓	
Bilberry			✓		
Biting stonecrop			✓		
Bitter vetch	✓		✓		
Black knapweed	✓				
Black medick					✓
Bloody crane's-bill				✓	
Blue fleabane			✓		
Bog asphodel		✓	✓		
Bog pimpernel		✓			
Bristle club rush		✓			
Buck's-horn plantain			✓		
Bugle	✓	✓			
Bulbous buttercup					✓
Burnet saxifrage	✓				
Carline thistle				✓	
Clustered bellflower				✓	
Common bird's-foot trefoil	✓		✓	✓	
Common bistort	✓				
Common catsear					✓
Common centaury			✓	✓	
Common meadow-rue	✓				
Common rock-rose			✓	✓	
Common sorrel					✓
Common stork's-bill			✓		
Common valerian		✓			
Cotton grasses		✓	✓		
Cowberry			✓		

Cowslip	✓			✓	
Cranberry			✓		
Crowberry			✓		
Cuckoo flower					✓
Devilsbit scabious	✓	✓	✓	✓	
Dropwort (s)	✓			✓	
Dyer's greenweed	✓				
Eyebrights	✓		✓	✓	
Fairy flax				✓	
Field scabious	✓			✓	
Field woodrush					✓
Gentians				✓	
Germander speedwell					✓
Globeflower		✓			
Goatsbeard	✓				
Greater bird's-foot trefoil	✓	✓			
Greater burnet	✓	✓			
Greater knapweed				✓	
Hairy violet				✓	
Harebell			✓	✓	
Heath bedstraw			✓		
Heath speedwell			✓		
Heathers[b]		✓	✓		
Hemp-agrimony		✓			
Hoary Plantain				✓	
Hoary Rock-rose				✓	
Horseshoe vetch				✓	
Jointed rushes		✓			
Kidney vetch				✓	
Lady's bedstraw	✓		✓	✓	
Lady's mantle sp.	✓				
Lesser hawkbit			✓	✓	
Lesser spearwort		✓			
Lesser trefoil					✓
Lesser water-parsnip		✓			
Lichens			✓		
Lousewort		✓	✓		
Marjoram				✓	
Marsh cinquefoil		✓			
Marsh hawk's-beard		✓			
Marsh marigold	✓	✓			
Marsh pennywort		✓			
Marsh valerian	✓	✓			
Marsh violet		✓			
Marsh/fen bedstraw	✓	✓			
Meadow buttercup					✓
Meadow rue		✓			
Meadow saxifrage	✓			✓	
Meadow thistle		✓			
Meadow vetchling	✓				

Meadowsweet	✓	✓			
Milkwort sp.	✓		✓	✓	
Mountain pansy			✓		
Mouse-ear hawkweed			✓	✓	
Narrow leaved water dropwort	✓	✓			
Orchids	✓	✓		✓	
Ox-eye daisy	✓			✓	
Parsley-pierts			✓		
Pepper saxifrage	✓				
Pignut	✓				
Purple Milk-vetch			✓	✓	
Ragged robin	✓	✓			
Red clover					✓
Restharrow				✓	
Ribwort plantain					✓
Rough hawkbit	✓	✓	✓	✓	
Salad burnet	✓			✓	
Saw-wort	✓	✓	✓	✓	
Selfheal					✓
Sheep's bit			✓		
Sheep's-sorrel			✓		
Shepherd's cress			✓		
Small sedges[c]	✓	✓	✓	✓	
Small scabious				✓	
Sneezewort	✓	✓			
Spagnum sp.		✓	✓		
Squinancywort				✓	
Stemless/Dwarf thistle				✓	
Sundew			✓		
Thyme-leaved sandwort				✓	
Thymes			✓		
Tormentil (s)		✓	✓		
Violets			✓		
Water avens	✓	✓			
Water mint	✓	✓			
Western gorse			✓		
Whorled caraway		✓			
Wild angelica		✓			
Wild basil				✓	
Wild strawberry				✓	
Wild Thyme			✓	✓	
Wood anemone	✓		✓		
Wood sage			✓		
Yarrow					✓
Yellow rattle	✓				
Yellow-wort				✓	

[a]Restorable semi-improved grassland should generally host at least 3 of the following grasses: common bent, crested dog's tail, false oat grass, meadow fescue, meadow foxtail, red fescue, sweet vernal grass, tufted hair grass (rarer grasses typical of unimproved grassland also count) and should have less than 30% cover of white clover and rye grass.

[b] *Including cross leaved heath Erica tetralix, bell heather Erica cinerea, ling Calluna vulgaris.*

[c] *Excluding hairy sedge Carex hirta .*

Indicators should not be confined to field edges. 'Occasional' on the DAFOR scale of relative abundance equates to a minimum cover of 11% or the occurrence of a species in at least 3 random samples from a total of ten assessments[5]. Cheshire grassland axiophytes[28] not listed above and species listed under S13 can be considered as indicators.

Table 4 Cheshire waxcap grassland species

Species	Vernacular
Hygrocybe colemanniana	Toasted Waxcap
Hygrocybe fornicata	Earthy Waxcap
Hygrocybe russocoriaceae	Cedarwood Waxcap
Hygrocybe flavipes	Yellow Foot Waxcap
Hygrocybe nitrata	Nitrous Waxcap
Hygrocybe reidii	Honey Waxcap
Hygrocybe pratensis[3]	Meadow Waxcap
Hygrocybe quieta	Oily waxcap
Hygrocybe vitellina	
Hygrocybe coccinea	Scarlet Waxcap
Hygrocybe irrigata	Slimy Waxcap
Hygrocybe insipida	Spangle Waxcap
Hygrocybe glutinipes	Glutinous Waxcap
Hygrocybe ceracea	Butter Waxcap
Hygrocybe acutoconica	Persistent Waxcap
Hygrocybe chlorophana	Golden Waxcap
Hygrocybe laeta	Heath Waxcap
Hygrocybe psittacina	Parrot Waxcap
Hygrocybe virginea	Snowy Waxcap
Hygrocybe conica	Blackening waxcap
+ any other *Hygrocybe* species	
Other examples of CHEG species which may be commonly encountered	
Clavulinopsis corniculatus	Meadow Coral
Clavulinopsis helvola	Yellow Club
Clavulinopsis fusiformis	Golden Spindles
Clavaria fragilis	White Spindles
Entoloma conferendum	Star Pinkgill
Entoloma serrulatum	Blue Edge Pinkgill

The table does not contain a complete list of *Hygrocybe* species but includes those which have been recorded in Cheshire. If several varieties of a species have been recorded at a site then these should not be counted separately e.g. *Hygrocybe pratensis* var. *pratensis* and *Hygrocybe pratensis* var. *pallida* should only be counted as one species. Where *Hygrocybe calyptriformis, Hygrocybe punicea, Hygrocybe ovina, Hygrocybe ingrata or Hygrocybe spadicea (BAP and British red list)* are present the site should qualify as a LWS.

Table 5

Indicator species for wetland – Cheshire list[32]

Amphibious bistort	Marsh pennywort
Arrowhead (native only)	Marsh valerian
Bittersweet	Marsh woundwort
Blinks	Marsh/fen bedstraw
Bogbean	Marsh-marigold
Bog-mosses (*Sphagnum*)	Marsh yellow cress
Brooklime	Meadowsweet
Bur marigold (nodding, trifid),	Pondweeds (native – bog, broadleaved, curled, blunt leaved, small, red)
Bur-reeds	Ragged robin
Celery-leaved buttercup	Reed canary-grass
Clubrushes (grey, common, floating)	Reed sweet-grass
Common butterwort	Reedmace (common and lesser)
Common reed	Rushes (excluding soft/hard rush)
Common skullcap	Sedges
Cottongrass	Spearwort sp.
Cowbane	Speedwells (marsh, pink water, water),
Crowfoot sp.	Spiked water milfoil
Duckweeds (common, ivy leaved, fat, greater)	Spike rushes
Figwort (water)	St John's wort sp.
Flowering rush	Water cress
Fools water cress	Water dropworts
Frogbit	Forget-me-not (water and tufted)
Greater bladderwort	Horsetails (water and marsh)
Gypsywort	Valarian (common, marsh)
Hemp-Agrimony	Water mint(s)
Hornworts (soft, rigid),	Water pepper
Iris sp. (native only)	Water plantains (common, lesser water)
Lesser marshwort	Water purslane
Lesser water parsnip	Water violet
Loosestrife (yellow, purple)	Whorl grass
Marsh arrowgrass	Wild angelica
Marsh cinqfoil	Yellow water lily

Other emergent/wetland specialist species not appearing on this list may be considered if native

3. Species criteria

The criteria for species will be based on the following considerations:

Sites should be selected that support or have supported in the past 5 years:

- **Nationally or globally critically endangered, endangered, vulnerable, or near threatened species according to IUCN guidelines. Or nationally rare or scarce according to non-IUCN designation.**
- **All species and habitats listed on the European Birds Directive and European Habitats directive.**
- **Locally rare or scarce plant species[18,20] i.e. those which occur in:**
    - **≤ 6 sites in the county (rare). Approximates to ≤ 1% of tetrads/monads in Cheshire and should be based upon distribution records less than 20 years old.**
    - **≤ 7-16 sites in the county (scarce). Approximates to ≤ 1-3 % of tetrads/monads in Cheshire and should be based upon distribution records less than 20 years old.**
- **Edge of range species[11].**
- **Native species fully protected under the Wildlife and Countryside Act 1981 Schedules 5 and 8 (but refer to relevant species class).**
- **UK BAP or Local LBAP species – (but refer to relevant species class as not all BAP species necessarily qualify).** Note the UK BAP has now been superseded by the S41 list (section 41 of the 2006 NERC act). The S41 list for England has all the species and habitats on the previous UK BAP which are present in England plus one additional species (hen harrier). As the UK BAP terminology is still widely recognised it has been used in this document and should be considered interchangeable with the S41 list.
- **Species assemblages deemed to be important.** (The number of species which constitutes a 'locally outstanding assemblage' will be set for each species criterion).
- **≥ 0.5% of the British breeding population of any species.**

All qualifying population sizes/assemblages are best approximations according to current knowledge, however in many cases the data is poor or out of date. Where there is doubt expert opinion should always be taken into account.

The area of the site must contain sufficient habitat to enable the species to be maintained as a minimum viable population[11] (MVP). For animal species this approximates to a minimum of 50 *breeding* individuals (or a key life stage thereof) for the short term avoidance of inbreeding. A population of 500 is considered the MVP for the long term survival of many groups of species[12]. These figures provide a cautionary guideline only as many other factors may influence survival.

S1 Butterflies

Sites should be selected that regularly support:

- **Probable breeding populations of white letter hairstreak, small pearl bordered fritillary, small heath, wall, grayling or dingy skipper.**

  Or

- **An assemblage of species with a minimum total score of 16 points[22] calculated from table 6.**

Guidance and justification

Sites which qualify for LWS status under criterion **S1** are also likely to qualify under the habitat selection criteria. All qualifying criteria should be recorded on the site citation.

Table 6

List of butterflies in the Cheshire region with their local, national or global significance

Species	Global status IUCN 2011	UK red list status[16] 2010	BAP status 2011	Tetrads in Cheshire (based on 2005-2009)	Points
Speckled Wood				401	1
Green-veined White				384	1
Red Admiral				382	1
Small Tortoiseshell				380	1
Peacock				365	1
Large White				359	1
Meadow Brown				355	1
Small White				332	1
Gatekeeper				332	1
Orange Tip				321	1
Comma				300	1
Holly Blue				205	1
Brimstone				203	2
Small Copper				185	2
Small Skipper				160	2
Large Skipper				156	2
Common Blue				151	2
Wall	Not evaluated	Near threatened	UK BAP	57	20
Purple Hairstreak				57	5
Small Heath	Not	Near	UK BAP	51	20

	evaluated	threatened			
White-letter Hairstreak	Not evaluated	Endangered	UK BAP	43	20
Green Hairstreak				33	5
Ringlet	Not evaluated		LBAP	28	5
Grayling	Least concern	Vulnerable	UK BAP	14	20
Dingy Skipper	Not evaluated	Vulnerable	UK BAP	10	20
Small Pearl-bordered Fritillary	Not evaluated	Near threatened	UK BAP	1	20

S2 Birds

Sites should be selected that support either:

- **Any *regular* probable breeding or over wintering* bird species listed in table 7.**
- **Any *regular* over wintering population as listed in table 8.**
- **Any established colony as listed in table 8.**
- **At least 10 probable breeding species from tables 7 and 9 (these records can be from a single visit). Where a site is exceptional on a county-wide basis it may be selected with a lower number of breeding species.**
- **≥0.5% of the British breeding population of any species.**

* Unless listed as breeding only

Guidance

For birds listed in tables 7 and 8 ***regular*** probable breeding/over wintering records should generally equate to data from any three years out of the preceding five years. However it is recognised that past records are not always available and where missing the presence of at least **five** additional probable breeding or overwintering species/populations (as described in tables 7, 8 and 9) is required for the site to qualify as a LWS.

Probable breeding evidence[33] includes:

Pair observed in suitable nesting habitat in breeding season; Permanent territory presumed through registration of territorial behaviour (song etc.) on at least two different days a week or more apart at the same place or many individuals on one day; Courtship and display (judged to be in or near potential breeding habitat - be cautious with wildfowl); Visiting probable nest site; Agitated behaviour or anxiety calls from adults suggesting probable presence of nest or young nearby; Brood patch on adult examined in the hand suggesting incubation; Nest building or excavating nest-hole.

Table 7 Rare or scarce bird species in the Cheshire region – probable breeding or* over wintering

Species	**Global status IUCN 2011**	**UK Birds of conservation concern[31]**	**Status 2011**	**Rare breeding birds 2004-2006[30]** (<20 confirmed breeding pairs in Cheshire)	**Scarce breeding birds 2004-2006[30]** (20-100 confirmed breeding pairs in Cheshire)
Avocet	Least concern	Amber	Schedule 1		✓
Bearded tit	Least concern	Amber	Schedule 1	✓	
Bittern	Least concern	Red	UK BAP, Schedule 1	✓	
Black necked grebe	Least concern	Amber	LBAP, Schedule 1	✓	
Common Redstart	Least concern	Amber			✓

Corn bunting	Least concern	Red	UK BAP	✓	
Cuckoo	Least concern	Red	UK BAP	✓	
Dunlin*	Least concern	Red		✓	
Eurasian curlew	Near threatened	Amber	UK BAP	✓	
Gadwall	Least concern	Amber		✓	
Garganey*	Least concern	Amber	Schedule 1	✓	
Golden plover	Least concern	Amber		✓	
Goshawk*	Least concern	Green	Schedule 1	✓	
Hen harrier	Least concern	Red	S41 NERC, Schedule 1	✓	
Lesser spotted woodpecker	Least concern	Red	UK BAP		✓
Little ringed plover	Least concern	Green	Schedule 1	✓	
Long-eared owl	Least concern	Green		✓	
Marsh harrier	Least concern	Amber	Schedule 1	✓	
Marsh tit	Least concern	Red	UK BAP		✓
Merlin	Least concern	Amber	Schedule 1	✓	
Nightjar	Least concern	Red	UK BAP	✓	
Peregrine	Least concern	Green	Schedule 1	✓	
Pied flycatcher	Least concern	Amber			✓
Pochard*	Least concern	Amber		✓	
Red grouse	Least concern	Amber	UK BAP		Estimate of 300 pairs in 2006 following reintroduction programme
Redshank	Least concern	Amber		✓	
Ring ouzel	Least concern	Red	UK BAP		✓
Short-eared owl	Least concern	Amber		✓	
Snipe	Least concern	Amber			✓
Tree pipit	Least concern	Red	UK BAP	✓	
Turtle dove	Least concern	Red	UK BAP	✓	
Twite	Least concern	Red	UK BAP	✓	
Warblers*				Assemblages of 6+ probable breeding species	Assemblages of 6+ probable breeding species
Water rail*	Least concern	Green			✓
Whinchat	Least concern	Amber			✓
Willow tit	Least concern	Red	UK BAP	✓	
Wood warbler	Least concern	Red	UK BAP	✓	
Woodcock*	Least concern	Amber		✓	
Woodlark	Least concern	Amber	Schedule 1	✓	
Yellow wagtail	Least concern	Red	UK BAP		✓

* Breeding only

Table 8 Rare, scarce and notable over wintering and colonial bird species in the Cheshire region

Species	Global Status IUCN 2011	UK Red list Birds of conservation concern	Local status Confirmed breeding tetrads[30]	Status 2011	Comment
Bewick's swan	Least concern	Amber	0		Regular over wintering 5+ individuals
Black tailed godwit	Near threatened	Red	0	UK BAP. Schedule 1.	Passage sites and over wintering/ summering 50+ individuals.
Cormorant spp.	Least concern	Green	6		Established colonies only
Duck species					Regular over wintering sites with 5+ species of dabbling* ducks or 3+ species of diving** ducks
Greater white fronted goose	Least concern	Green	0	UK BAP	Regular over wintering 5+ individuals
Green sandpiper	Least concern	Amber	0		Regular over wintering 3+ individuals
Grey heron	Least concern	Green	641 apparently occupied nests		Established colonies only
Gull species (any groups of any species)					Winter roost sites with 1000+ individuals
Jack snipe	Least concern	Amber	0		Regular over wintering 5+ individuals
Light bellied brent goose (race *hrota*)	Least concern	Amber	0		Regular over wintering 7+ individuals
Little egret	Least concern	Amber	2		Established colonies only
Pink footed goose	Least concern	Amber	0		Regular over wintering 100+ individuals
Pintail	Least concern	Amber	0		Regular over wintering 50+ individuals
Rook	Least concern	Green	205		Established colonies only (70+ nests)
Sand martin	Least concern	Amber	42		Established colonies only
Swift	Least concern	Amber	119		Established colonies only (20+ pairs)
Teal	Least concern	Amber	2		Regular over wintering 200+ individuals
Whooper swan	Least concern	Amber	0	Schedule 1	Regular over wintering 5+ individuals.
Wigeon	Least concern	Amber	0		Regular over wintering 200+ individuals

***Dabbling ducks* – shelduck, mandarin, Eurasian wigeon, gadwall, Eurasian teal, mallard, pintail, shoveler. ***Diving ducks* – pochard, goldeneye, red-breasted merganser, goosander, tufted duck.

Table 9 Notable birds in the Cheshire region - probable breeding

Species	Global Status IUCN 2011	UK Red list Birds of conservation concern	Local status Confirmed breeding tetrads[30]	Status 2011	Comment
Barn owl	Least concern	Amber	142	LBAP. Schedule 1	
Black headed gull	Least concern	Amber	13		
Bullfinch	Least concern	Amber	95	UK BAP	
Common sandpiper	Least concern	Amber	1		
Common tern	Least concern	Amber	0		10+ breeding pairs only
Common whitethroat	Least concern	Amber	282		
Dipper	Least concern	Green	13		
Dunnock	Least concern	Amber	428	UK BAP	Spp.occidentalis is endemic to the British Isles
Firecrest	Least concern	Amber	1	Schedule 1	
Grasshopper warbler	Least concern	Red	10	UK BAP	
Green woodpecker	Least concern	Amber	39		
Grey partridge	Least concern	Red	47	UK BAP	
Grey wagtail	Least concern	Amber	114		
House sparrow	Least concern	Red	559	UK BAP	
Kestrel	Least concern	Amber	183		
Kingfisher	Least concern	Amber	38	Schedule 1	
Lapwing	Least concern	Red	263	UK BAP	
Lesser redpoll	Not evaluated	Red	3	UK BAP	
Linnet	Least concern	Red	125	UK BAP	
Little grebe	Least concern	Amber	61		
Mallard	Least concern	Amber	499		
Meadow pipit	Least concern	Amber	70		
Mistle thrush	Least concern	Amber	380		
Oyster catcher	Least concern	Amber	45		
Reed bunting	Least concern	Amber	171	UK BAP	
Ringed plover	Least concern	Amber	10		
Shelduck	Least concern	Amber	29		
Shoveler	Least concern	Amber	3		
Skylark	Least concern	Red	141	UK BAP	
Song thrush	Least concern	Red	461	UK BAP	
Spotted flycatcher	Least concern	Red	101	UK BAP	
Starling	Least concern	Red	573	UK BAP	
Stock dove	Least concern	Amber	150		
Tree sparrow	Least concern	Red	182	UK BAP	
Tufted duck	Least concern	Amber	63		
Wheatear	Least concern	Amber	9		
Willow warbler	Least concern	Amber	163		
Yellowhammer	Least concern	Red	119	UK BAP	

S3 Mammals

Sites should be selected that regularly support:

- **Likely breeding/hibernating populations of hazel dormouse, otter, Nathusius pipistrelle, lesser horseshoe bat, serotine bat.**
- **Likely breeding/hibernating populations of at least 2 species of bat.**
- **Assemblages of mammals from table 10 which score a total of 12 points.**

In Wirral sites should be selected that support a breeding badger sett which has been occupied for any three years out of the preceding five years.
Warrington is a regionally key area for water voles, therefore any Warrington site that supports a likely breeding population should be selected.

Guidance and justification

Domestic gardens or buildings housing mammals will not be considered for LWS selection unless the site is critical to that species' survival in the borough, or supports exceptional populations[9]. Temporary bat night roosts and feeding roosts should not be considered. The boundaries of any site selected for mammals should contain key foraging areas and commuting routes to such areas.

In contrast to the majority of Cheshire, Wirral badgers have a small, stable but not expanding population which struggles with fragmented habitat, development and significant levels of illegal persecution. Therefore in Wirral sites should be selected when they support a regular breeding badger sett.

The presence of water vole latrines indicates that there is a likely breeding population.

Table 10

List of mammals in the Cheshire region with their local, national or global significance

Mammal	Score based on local status (Cheshire mammal group)	Global Status IUCN 2011	UK Red list	BAP status 2011	Other
Common pipistrelle bat	2	Least concern		LBAP	European protected species
Soprano pipistrelle bat	2	Least concern		UKBAP	European protected species
Noctule bat	3	Least concern		UKBAP	European protected species
Brown long eared bat	3	Least concern		UK BAP	European protected species
Whiskered bat	3	Least concern		LBAP	European protected species

Brandts bat	3	Least concern		LBAP	European protected species
Daubentons bat	2	Least concern		LBAP	European protected species
Leislers bat	4	Least concern		LBAP	European protected species
Natterers bat	3	Least concern		LBAP	European protected species
Serotine bat	12	Least concern		LBAP	European protected species
Lesser horseshoe bat	12				
Nathusius pipistrelle	12				
Otter	12	Near threatened		UK BAP	European protected species
Hazel dormouse (native wild populations only)	12	Least concern		UK BAP	European protected species
Harvest mouse	4	Least concern		UK BAP	
Water vole	4	Least concern		UK BAP	Wildlife and Countryside Act
Mountain hare	4				
Red deer (not captive populations)	4				
Roe deer	3				
Polecat	3	Least concern		UK BAP	
European hedgehog	3	Least concern		UK BAP	
Brown hare	3	Least concern		UK BAP	
Badger	2	Least concern			Protection of Badgers act 1992 and protected from persecution under WCA 1981
Water shrew	3				
Bank vole	2				
Pygmy shrew	2				
Stoat	2				
Weasel	2				
Badger	2				
Field vole	1				
Wood mouse	1				
House mouse	1				
Common rat	1				
Rabbit	1				
Mole	1				
Common shrew	1				
Fox	1				

S4 Dragonflies and damselflies (*Odonata*)

Sites should be selected that regularly support either:

- **Probable breeding populations of variable damselfly, common club-tail, downy emerald, golden-ringed dragonfly, white-legged damselfly, beautiful demoiselle, common hawker, black darter, black tailed skimmer, hairy dragonfly, white-faced darter.**

  OR

- **Species assemblages (probable breeding) scoring 8 points or more from table 11.**

Guidance and justification

The variable damselfly is 'near threatened' in the UK and the common club tail has a restricted distribution in Cheshire. Both species are listed on the LBAP and sites where either is probably breeding should be selected as a LWS.

All sites still supporting the endangered white faced darter should be selected as LWS, although this species is now thought to be extinct in Cheshire. Any sites supporting 'edge of range' species (white legged damselfly and golden ringed dragonfly) should be selected as LWS. Other notable species for the region include downy emerald, beautiful demoiselle, common hawker, black darter, black tailed skimmer and hairy dragonfly and where probably breeding sites should be selected as a LWS.

Table 11

List of *Odonata* in the Cheshire region which are of local, national or global significance

Vernacular	Species	Global status IUCN 2011 (where information available)	UK Status[17] 2008	BAP status 2011	Relative distribution and breeding status value for Cheshire (2006-2010)[29]	Score
Azure damselfly (Azure bluet)	*Coenagrion puella*		Least concern		1.6	1
Banded demoiselle	*Calopteryx splendens*		Least concern		3.6	4
Beautiful demoiselle	*Calopteryx virgo*		Least concern		33.3	10
Black darter	*Sympetrum danae*		Least concern		11.1	10
Black tailed skimmer	*Orthetrum cancellatum*		Least concern		7.1	10
Blue tailed	*Ischnura*		Least		1.8	1

damselfly (Common bluetail)	*elegans*		concern			
Broad bodied chaser	*Libellula depressa*		Least concern		3.3	4
Brown hawker	*Aeshna grandis*		Least concern		2.2	1
Common blue damselfly (Common bluet)	*Enallagma cyathigerum*		Least concern		2.5	1
Common club tailed	*Gomphus vulgatissimus*	Not evaluated	Near threatened	LBAP	25	10
Common darter	*Sympetrum striolatum*	Least concern	Least concern		1.7	1
Common hawker	*Aeshna juncea*		Least concern		11.1	10
Downy emerald	*Cordulia aenea*	Not evaluated	Least concern	LBAP	50	10
Emerald damselfly (Common spreadwing)	*Lestes sponsa*		Least concern		5.3	4
Emperor (Blue Emperor)	*Anax imperator*	Least concern	Least concern		2.3	1
Four spotted chaser	*Libellula quadrimaculata*		Least concern		2.4	1
Golden-ringed dragonfly (Common goldenring)	*Cordulegaster boltonii*		Least concern		50	10
Hairy dragonfly (Hairy hawker)	*Brachytron pratense*		Least concern		6.7	10
Large red damselfly (Large red damsel)	*Pyrrhosoma nymphula*		Least concern		2.0	1
Migrant hawker	*Aeshna mixta*		Least concern		3.4	4
Red-eyed damselfly (Large Red-eye)	*Erythromma najas*		Least concern		4.5	4
Ruddy darter	*Sympetrum sanguineum*	Least concern	Least concern		5.3	4
Southern hawker (Blue hawker)	*Aeshna cyanea*		Least concern		2.8	1
Variable damselfly (Variable bluet)	*Coenagrion pulchellum*	Not evaluated	Near threatened	LBAP	20	10

White faced darter	*Leuchorrinia dubia*	Least concern	Endangered	LBAP (archive)	Assumed extinct in Cheshire	10
White legged damselfly (blue featherleg)	*Platycnemis pennipes*	Least concern	Least concern		100	10

S5 Amphibians

Sites should be selected that regularly support any of the following:

- **Populations of Natterjack toad.**
- **Exceptional/good[27] populations of > 100 individuals palmate newts or toads.**
- **Good[27] populations of great crested newts (5+ day time count, 10+ night time count)**
- **Assemblages with four or more (probable breeding) species of amphibian or two or more where palmate newts are present.**

In Wirral sites should be selected that support two or more probable breeding species of amphibian.

Guidance and justification

Great crested newts are common in Cheshire and they are afforded high levels of protection under UK and European legislation. Medium or small populations do not warrant additional protection within the LWS system; however a good population (5+ individuals caught in the day time during 15 minutes netting per 50m water's edge. Or 10+ individuals caught at night)[27] should be selected as a LWS.

The common toad is a UK BAP species and sites with good populations of at least 100[27] individuals should be selected as LWS. The Palmate newt is Cheshire's second rarest[14] amphibian after the Natterjack Toad and sites hosting exceptional populations of at least 100[27] individuals should be selected as LWS. Natterjack toads were present until recently at Red Rocks marsh on the Wirral and any site found to still be supporting this species should be selected as a LWS.

In Wirral the majority of ponds have lost one or more species of amphibian so any site supporting two or more species should be selected.

The boundaries of any site selected for amphibians should contain key foraging areas and commuting routes to such areas.

Table 12 List of amphibians in the Cheshire region which are of local, national or global significance

Species	Global status IUCN 2011	UK red list	Local status	BAP status 2011	Other
Natterjack toad	Least concern			UK BAP	European protected species
Common toad	Least concern			UK BAP	
Common frog	Least concern				
Great crested newt	Least concern			UK BAP	European protected species
Palmate newt	Least concern				
Smooth newt	Least concern				

S6 Reptiles

Sites should be selected that regularly support significant populations of common lizard and provide suitable habitats for breeding, basking and hibernation. All sites supporting populations of grass snakes, adders or slow-worms should be selected as LWS.

Guidance and justification

Grass snakes, adders and slow worms are infrequent in Cheshire therefore sites which support populations should be considered as LWS. Any site which supports a significant population of common lizards should be selected.

Reptiles tend to favour the following habitats: rough grassland, heathland, moorland, hedgerows, woodland edges, coastal dunes, disused quarries and railway embankments. Grass snakes feed almost entirely on amphibians and are normally present close to areas of fresh water.

Table 13

List of reptiles in the Cheshire region which are of local, national or global significance

Species	Global Status (IUCN data 2011)	UK Red list	Local status	BAP status
Common lizard	Least concern			UK BAP
Adder	Least concern			UK BAP
Grass snake	Least concern			UK BAP
Slow-worm	Not evaluated			UK BAP

S7 Fresh water fish

Sites should be selected that regularly support any of the following:

- **The European eel, the Allis shad or the Twaite shad**
- ***Significant populations* of river lamprey or Atlantic salmon.**
- ***Significant naturally sustaining populations* of brown trout/sea trout.**

Guidance and justification

Any site that supports the European eel, Allis shad or the Twaite shad should be selected as LWS. The European eel is critically endangered worldwide making it likely to be Cheshire's most threatened species. Rivers and still waters are frequently stocked with brown trout so only sites with naturally sustaining populations should be selected.

Sites that support UK red list species (excluding 'least concern') should be selected as LWS.

Table 14 Fish species in the Cheshire region listed on the UK BAP.

Species	Global status (IUCN data 2011)	UK Red list	Local status	BAP status
Allis shad	Least concern			UK BAP
Twaite shad	Least concern			UK BAP
European eel	Critically endangered			UK BAP
River lamprey	Least concern			UK BAP
Brown trout/sea trout	Least concern			UK BAP
Atlantic salmon	Least concern			UK BAP

S8 White clawed crayfish

Sites should be selected that regularly support populations of white clawed crayfish.

Guidance and justification

The white clawed crayfish is globally endangered according to the IUCN red data book and it is also a UK BAP species. This rare species was once widespread but has declined rapidly largely due to the introduction of the American Signal crayfish. This alien species carries crayfish disease to which the native crayfish has little immunity. American signal crayfish will also out-compete the native crayfish for food and shelter.

White clawed crayfish are dependent on good quality water and are particularly susceptible to pollution events such as sewage leaks, milk spillages, sheep dip contamination. For this reason in particular sites selected for white clawed crayfish should include a 6 metre riparian zone from the top of the riverbank.

The white clawed crayfish can live in various watercourses including rivers, streams, lakes and canals and survives in small isolated populations mainly in south Cheshire.

S9 Terrestrial/freshwater invertebrates

Sites should be selected that regularly support either:

- **Significant populations of any UK BAP species, or red data book listed species, or national rare/scarce species (present in 1-100 hectads in the UK).**
  OR
- **Significant assemblages* of any terrestrial or freshwater invertebrates. (A locally significant bee assemblage is 8+ species of social bumble bee or 4+ species of cuckoo bee. A locally significant assemblage of macro-moths is 350 species which equates to 65% of the current list for VC58[36])**

*Refer to Lancashire and Cheshire Entomological Society

Guidance and justification

A large number of species have suffered severe declines nationally and these are listed as UK BAP species (table 15). The BAP list is likely to be incomplete as little research has been undertaken on invertebrate populations particularly when compared to other groups of species.

Consideration should also be given to species which are locally or nationally rare/scarce but may currently have stable populations. A list of conservation designations for UK taxa may be found on the JNCC website using the following link http://jncc.defra.gov.uk/page-3408

Expert opinion (e.g. Lancashire and Cheshire Entomological Society) should always be sought when determining what constitutes a significant assemblage of invertebrates.

Butterflies, dragonflies and damselflies have their own selection criteria **S1** and **S4**.

Table 15 Terrestrial invertebrates in the Cheshire region listed on the UK BAP

Vernacular	Species	Global status IUCN	UK Red list	Local status	Status
Belted Beauty	*Lycia zonaria britannica*				UKBAP
Cuckoo bee	*Coelioxys mandibularis*				UK BAP
Depressed river mussel	*Pseudanodonta complanata*				UK BAP
Leaf beetle	*Bromius obscurus*				UK BAP
Lesser silver water beetle	*Hydrochara caraboides*				UK BAP and WCA
Linyphilid spider	*Carolita limnaea*				UK BAP
Longhorn	*Acmaeops collaris*				UK BAP

beetle					
Mining beetle	*Colletes cunicularis*				UK BAP
Mud snail	*Omphiscola glabra*				UK BAP
Rove beetle	*Lathrobium rufipenne*				UK BAP
Sand wasp	*Podalonia affinis*				UK BAP
Sandhill rustic	*Luperina nickerlii gueneei*				UK BAP
Small egger	*Eriogaster lanestris L.*				UK BAP
Ten spot pot beetle	*Cryptochephalus decemmacultus*				UK BAP
Stag beetle	*Lucanus cervus*				UK BAP
Thick-legged flower beetle	Thick-legged flower beetle				UK BAP
Peus's Long-back spider	*Mecopisthes peusi*				UK BAP
Broad Groove-head Spider	*Monocephalus castaneipes*				UK BAP
Swamp Lookout Spider	*Notioscopus sarcinatus*				UK BAP
Argent and sable	*Rheumaptera hastata*				UK BAP
Triangle Hammock Spider	*Saaristoa firma*				UK BAP
Heath Rustic	*Xestia agathina*				UK BAP
Ashworth's Rustic	*Xestia ashworthii*				UK BAP
Neglected Rustic	*Xestia castanea*				UK BAP
Sword-Grass	*Xylena exsoleta*				UK BAP

S10 Bryophytes

Sites supporting significant populations of any notable bryophytes from table 16 should be selected as LWS.

Guidance and justification

Sites should be selected which host populations of nationally or locally rare, or conservation status bryophytes listed in table 16. The table lists all the notable bryophytes identified in VC 58 up to 2012.

Table 16

List of bryophytes in the Cheshire region which are of local or national significance[42]

Species	Vernacular	UK Red list	BAP status
Bryum calophyllum	Matted bryum	Nationally rare	UK BAP
Bryum knowltonii	Knowlton's Thread Moss	Nationally scarce	UK BAP
Bryum uliginosum	Cernuous bryum	Nationally rare	UK BAP
Bryum warneum	Sea bryum	Nationally scarce	UK BAP
Cephaloziella nicholsonii	Greater Copperwort	Nationally scarce	UK BAP
Dicranum bergeri	Waved Fork-moss	?	UK BAP
Orthodontium gracile	Slender Thread Moss	Nationally rare	UK BAP
Rhytidiadelphus subpinnatus	Scarce Turf-moss	Nationally rare	UK BAP
Riccia canaliculata	Channelled Crystalwort	Nationally rare	UK BAP
Sphagnum balticum	Baltic Bog-moss	Nationally rare	UK BAP
Tortula cemua	Flamingo moss	Nationally rare	UK BAP
Tortula freibergii	Freiberg's Screw-moss	Nationally scarce	UK BAP
Tortula wilsonii	Wilson's Pottia	Nationally scarce	UK BAP
Weissia multicapsularis	Moss	Nationally rare	UK BAP
Weissia squarrosa	Spreading-leaved beardless-moss	Nationally scarce	UK BAP
Aloina ambigua		Nationally scarce	
Aloina brevirostris		Nationally scarce	
Aloina rigida		Nationally scarce	
Amblyodon dealbatus		Nationally scarce	
Atrichum tenellum		Nationally	

		scarce	
Brachydontium trichodes		Nationally scarce	
Bryum creberrimum		Nationally scarce	
Bryum intermedium		Nationally scarce	
Buxbaumia aphylla		Nationally scarce	
Calypogeia azurea		Nationally scarce	
Calypogeia integristipula		Nationally scarce	
Campylostelium saxicola		Nationally scarce	
Cephalozia macrostachya var. macrostachya		Nationally scarce	
Cephaloziella elachista		Nationally rare	
Cladopodiella francisci		Nationally scarce	
Dicranella crispa		Nationally scarce	
Dicranum polysetum		Nationally scarce	
Dicranum undulatum		Nationally scarce	
Didymodon acutus		Nationally scarce	
Discelium nudum		Nationally scarce	
Distichium inclinatum		Nationally scarce	
Ditrichum pusillum		Nationally scarce	
Drepanocladus sendtneri		Nationally scarce	
Ephemerum sessile		Nationally scarce	
Fissidens fontanus		Nationally scarce	
Fossombronia caespitiformis		Nationally scarce	
Fossombronia foveolata		Nationally scarce	
Fossombronia incurva		Nationally scarce	
Hamatocaulis vernicosus		Nationally scarce	
Hennediella stanfordensis		Nationally scarce	
Hygroamblystegium humile		Nationally scarce	
Lophozia capitata		Nationally scarce	
Moerckia flotoviana		Nationally	

		scarce	
Nardia geoscyphus		Nationally scarce	
Philonotis arnellii		Nationally scarce	
Philonotis caespitosa		Nationally scarce	
Physcomitrium sphaericum		Nationally scarce	
Plagiothecium laetum		Nationally scarce	
Platyhypnidium lusitanicum		Nationally scarce	
Pohlia lescuriana		Nationally scarce	
Pterygoneurum ovatum		Nationally scarce	
Racomitrium affine		Nationally scarce	
Riccardia incurvata		Nationally scarce	
Riccia cavernosa		Nationally scarce	
Riccia huebeneriana		Nationally scarce	
Riccia rhenana		Nationally rare	
Ricciocarpos natans		Nationally scarce	
Sphagnum pulchrum		Nationally scarce	
Sphagnum riparium		Nationally scarce	
Tomentypnum nitens		Nationally scarce	
Weissia rostellata		Nationally scarce	

S11 Lichens

Sites supporting significant populations of any notable lichens from table 17 should be selected as LWS. Where new species are recorded in Cheshire then the more comprehensive UK list should be consulted.

Guidance and justification

There are several thousand species of lichen recorded in Cheshire however only a small number of these are designated at a national level. Many of the species listed below originate from churchyards including Handley, Acton and Pott Shrigley.

Table 17 List of lichens in the Cheshire region which are of local, national or global significance[40]

Species	**UK Red list** (contains both IUCN and non-IUCN methodology)	**BAP/S.41 status/WCA**
Acarospora nitrophila	Nationally scarce	
Acarospora umbilicata f.congredians	Nationally scarce	
Aspicilia contorta subsp. hoffmanniana	Nationally scarce	
Calicium quercinum	Extinct (tbc)	
Caloplaca crenulatella	Nationally scarce	
Caloplaca ferruginea	Nationally scarce	
Candelariella aurella f. smaragdula	Nationally scarce	
Carbonea vorticosa	Nationally scarce	
Cladonia merochlorophaea	Nationally scarce	
Cladonia uncialis ssp. uncialis	Nationally rare	
Ephebe hispidula	Nationally rare	
Fossombronia foveolata		UK BAP and England NERC S.41
Lecania aipospila	Nationally scarce	
Lecania cuprea	Nationally scarce	

Lecanora fuscescens	Extinct (tbc)	
Lecanora handelii	Near threatened	
Lecanora subaurea	Nationally scarce	
Lecanora subcarnea	Nationally scarce	
Lecidella viridans	Data deficient	
Melanelia subargentifera	Critically endangered	
Peltigera lepidophora		WCA schedule 8
Pyrenula nitida		England NERC S.41
Rhizocarpon furfurosum	Near threatened	
Usnea subscabrosa	Vulnerable	

S12 Fungi

Sites supporting populations of conservation status fungi[34] listed in table 18 should be selected as LWS. Where new species are recorded in Cheshire then the more comprehensive British lists[34] should be consulted.

OR

Sites should be selected where they support 50+ species of woodland fungi recorded on a single visit. Assemblages should contain examples from all the different fungal groups (refer to guidance).

Guidance and justification

Sites should be selected which host populations of conservation status British Fungi[34]. Conservation status fungi which have been recorded in Cheshire (VC58) are listed in table 18.

Table 18 Conservation status fungi recorded in Cheshire 1980 - 2012[41]

Species	Vernacular	British red list	BAP status 2011	Other
Boletopsis perplexa	Black Falsebolete		UK BAP	
Caloscypha fulgens	Golden Cup	Vulnerable/D2		
Cantharellus friesii	Orange/velvet Chanterelle		UK BAP	NERC 2006
Cortinarius violaceus	Violet Webcap	Near threatened		
Geastrum campestre	Field Earthstar	Endangered/B		
Gloeoporus dichrous	*Gloeoporus dichrous*	Near threatened		
Gyrodon lividus	Alder Bolete	Near threatened		
Hericium erinaceus	Bearded Tooth		UK BAP	NERC 2006
Leucoagaricus barssii	*Leucoagaricus barssii*	Near threatened		
Lycoperdon ericaeum	Heath Puffball	Extinct (tbc)		
Onygena equina	Horn Stalkball	Near threatened		
Phylloporus pelletieri	Golden-gilled Bolete	Annex	UK BAP	NERC 2006
Polyporus umbellatus	Umbrella Polypore	Near threatened		
Pycnoporus cinnabarinus	Cinnabar Polypore	Extinct (tbc)		

Good assemblages of woodland fungi[41]

An assemblage of woodland fungi regarded as having conservation value will usually have four groups of fungi represented. These groups are indicative of the execution of important beneficial ecological activities/processes and thus of the self-sustainability of the woodland:

Ectomycorrhizal fungi are associated with particular tree species. Their mycelium grows over the surface of a tree's roots enabling an exchange of minerals and carbohydrates with the tree, and providing protection from attack by pathogens. Not all mycorrhizal species produce visible fruitbodies.

Living wood decay fungi[38] establish themselves within living trees and help to create crevices and exposed wood which may then host a variety of fauna including invertebrates. They are often visible as brackets on the outside of tree trunks or branches. Affected trees may ultimately die, but this can increase structural diversity in a woodland.

Dead wood rotting fungi[38] are found on dead wood, usually lying on the woodland floor. They are able to break down the wood structure enabling other taxa to establish themselves and also facilitating the recycling of nutrients. There is some evidence that these species occur in succession as wood becomes more decayed.

Ground fungi (soil humus/leaf litter fungi) are found on the woodland floor breaking down leaf litter and soil humus and facilitating the recycling of nutrients.

The particular fungal species composition will depend to an extent on the vascular plant species composition of the woodland but generally species richness and composition will be greater where:

- there is a greater diversity of trees and shrubs
- there is abundant dead wood of varying dimensions from small twigs to large tree trunks
- there is older woodland, particularly ancient woodland
- there is greater diversity of habitat providing more niches for colonisation by fungi e.g. in larger woodland

There are a number of undesirable fungi which can have a serious and rapid deleterious effect on a woodland e.g. ash dieback *Chalara fraxinea* which, if identified, should be reported to the appropriate authority.

Table 19 Examples[37,39] of ectomycorrhizal, living wood decay, dead wood decay and ground fungi:

Vernacular	Species name	Comment
Ectomycorrhizal fungi*		
Under Oak		
Oakbug Milkcap	*Lactarius quietus*	
Scarletina Bolete	*Boletus luridiformis*	Can occur with Pine
Death Cap	*Amanita phalloides*	Can also occur with Beech
Under Birch		
Brown Birch Bolete	*Leccinum scabrum*	
Fly Agaric	*Amanita muscaria*	Can also occur with Pine
The Blusher	*Amanita rubescens*	Can also occur with other species
Birch Mikcap	*Lactarius tabidus*	Especially with Birch
Woolly Milkcap	*Lactarius torminosus*	
Tawny Grisette	*Amanita fulva*	Can also occur with other species
Brown Rollrim	*Paxillus involutus*	Can also occur with other species
Common Earthball	*Scleroderma citrinum*	Also Oak and Beech
Under Alder		
Ochre Aldercap	*Naucoria escharioides*	
Alder Milkcap	*Lactarius obscuratus*	
(Alder) Rollrim	*Paxillus rubicundulus*	
Under Beech		
Lilac Bonnet	*Mycena pura*	Especially with Beech
Beech Milkcap	*Lactarius blennius*	
Beechwood Sickener	*Russula nobilis*	
Under Pine/Larch		
Slippery Jack	*Suillus luteus*	Pine
Larch Bolete	*Suillus grevillei*	

Sickener	*Russula emetica*	
Under both Deciduous and Coniferous species		
Ochre Brittlegill	*Russula ochroleuca*	
Penny Bun or Cep	*Boletus edulis*	
Purple Brittlegill	*Russula atropurpurea*	
Poisonpie	*Hebeloma crustuliniforme*	
Butter Cap	*Collybia butyracea*	
The Deceiver	*Laccaria laccata*	
Amethyst Deceiver	*Laccaria amethystina*	
Chanterelle	*Cantharellus cibarius*	
Living wood decay fungi		
Birch Polypore	*Piptoporous betulinus*	Can be seen on dead wood too
	Peniophora quercina	On Oak
Alder bracket	*Mensularia radiata*	
Oyster Mushroom	*Pleurotus ostreatus*	Can be seen on dead wood too
Bleeding Broadleaf Crust	*Stereum rugosum*	Particularly Hazel, Beech, Birch. Can be seen on dead wood too
Hoof Fungus	*Fomes fomentarius*	Especially on Birch
Honey Fungus	*Armillaria sp*	Can also be found on or near dead wood
Root Rot	*Heterobasidion annosum*	Usually on conifers but can also occur on dead broadleaved trees
Southern Bracket	*Ganoderma australe*	Usually on Beech
Beeswax Bracket	*Ganoderma pfeifferi*	Usually on Beech but can occur on dead wood too
Shaggy Scalycap	*Pholiota squarrosa*	Can occur on dead wood too
Dead wood decay fungi		
Hairy Curtain Crust	*Stereum hirsutum*	
Sulphur Tuft	*Hypholoma fasciculare*	
Split Porecrust	*Schizopora paradoxa*	
Elder Whitewash	*Hyphodontia sambuci*	On dead Elder wood
Candlesnuff Fungus	*Xylaria hypoxylon*	
Jelly Ear	*Auricula auricularia-judae*	
King Alfred's Cakes	*Daldinia concentrica*	On dead Ash wood
Blushing Bracket	*Daedaleopsis confragosa*	
Turkeytail	*Trametes versicolor*	Can occur on living wood too
Oak Mazegill	*Daedalea quercina*	
Smoky Bracket	*Bjerkandera adusta*	
Stump Puffball	*Lycoperdon pyriforme*	
Deer Shield	*Pluteus cervinus*	
Velvet Shank	*Flammulina velutipes*	
Common Bonnet	*Mycena galericulata*	
Glistening Inkcap	*Coprinellus micaceus*	
Oysterling sp.	*Crepidotus variabilis/cesatii*	
Bleeding Oak Crust	*Stereum gausapatum*	
Scarlet Elf Cup	*Sarcoscypha austriaca*	
Coral Spot	*Nectria cinnabarina*	

Yellow Brain	*Tremella mesenterica*	
Orange spot	*Dacrymyces stillatus*	
Birch/Beech/Hazel Woodwart	*(Annulo)Hypoxylon sp.*	
Lumpy Bracket	*Trametes gibbosa*	
Waxy Crust	*Vuilleminia comedens*	
Common Rustgill	*Gymnopilus penetrans*	
Ground fungi (Soil humus/leaf litter fungi)		
Stinkhorn	*Phallus impudicus*	
Collared Earthstar	*Geastrum triplex*	
Horsehair Parachute	*Marasmius androsaceus*	
Collared Parachute	*Marasmius rotula*	
Milking Bonnet	*Mycena galopus*	
Clouded Funnel	*Clitocybe nebularis*	
Slender club	*Macrotyphula juncea*	

* Ash, Sycamore, Yew and Elm tend not to form visible mycorrhizal relationships with fungal species

S13 Vascular plants

Sites should be selected that regularly support:

- **Populations of any species listed in table 20[18].**
- **Significant or viable populations of any species listed in table 21[18].**

Guidance and justification

Many sites that host rare or scarce vascular plants will also qualify for LWS selection under the habitat criteria. This is particularly true when considering assemblages of vascular plants.

Sites should be selected which host populations of nationally or locally rare, or conservation status plants listed in table 20. Any site which hosts significant or viable populations of plants which are scarce in Cheshire (table 21) should be considered for selection as a LWS. A significant or viable population is one that could be considered self-sustaining in the medium term (this will require a subjective judgement to be made taking into consideration the population size and the likely future management of the site).

Table 20 Rare and conservation status plants in the Cheshire region[18]

Species	Global status IUCN	UK Red list[19] 2005	Kay's classification[18]	BAP status	1 km Squares
Luronium natans			Internationally rare	UK BAP	1
Asplenium trichomanes ssp *pachyrachis*		Near threatened	Nationally rare		4
Baldellia ranunculoides		Near threatened	Nationally rare		4
Calamagrostis stricta		Vulnerable	Nationally rare		1
Mentha pulegium		Endangered	Nationally rare	UK BAP	3
Rubus wolley-dodii		Threatened	Nationally rare		1
Adiantum capillus-veneris			Nationally scarce		1
Carex elongata			Nationally scarce		1
Cicuta virosa			Nationally scarce		37
Coincya monensis			Nationally scarce	LBAP	2
Elatine hexandra			Nationally scarce		1
Equisetum variegatum			Nationally scarce		2
Equisetum x meridionale			Nationally scarce	LBAP	3
Euphorbia portlandica			Nationally scarce		3
Fritillaria meleagris		Vulnerable	Nationally scarce		?
Fumaria purpurea			Nationally scarce		Rare casual
Gentiana pneumonanthe			Nationally scarce		1
Hieracium vagense			Nationally scarce		1
Hippophae rhamnoides			Nationally scarce		1 (but widely planted –

					native population probably confined to one site)
Hordelymus europaeus			Nationally scarce		2-3
Impatiens noli-tangere			Nationally scarce		2
Lepidium latifolium			Nationally scarce		2
Limonium celticum ssp *britannicum*			Nationally scarce	BAP	1
Limosella aquatica			Nationally scarce		5
Medicago sativa ssp *falcata*			Nationally scarce		1
Puccinellia rupestris			Nationally scarce		1
Ribes alpinum			Nationally scarce		1
Silene gallica		Endangered	Nationally scarce		Casual
Thelypteris palustris			Nationally scarce		5
Vaccinium x intermedium			Nationally scarce		2
Verbascum lychnitis			Nationally scarce (possibly not native in Cheshire)		1
Verbascum virgatum			Nationally scarce		Casual
Vicia lutea		Near threatened	Nationally scarce (possibly not native in Cheshire)		2
Allium oleraceum		Vulnerable	Locally rare		3
Allium scorodoprasum			Locally rare		2
Anacamptis pyramidalis			Locally rare		5
Andromeda polifolia			Locally rare		6
Arabis hirsuta			Locally rare		2
Asplenium marinum			Locally rare		2
Atriplex laciniata			Locally rare		2
Brachypodium pinnatum			Locally rare		2
Bromopsis erecta			Locally rare		2
Bromus commutatus			Locally rare		14
Bromus hordeaceus ssp thominei			Locally rare		1
Bromus racemosus			Locally rare		3
Bromus secalinus			Locally rare		16
Calystegia sepium ssp. Roseata			Locally rare		5
Carex acuta			Locally rare		4
Carex hostiana			Locally rare		¾
Carex lasiocarpa			Locally rare		1
Carex limosa			Locally rare		1
Carex muricata ssp *pairae*			Locally rare		1
Carex muricata ssp *lamprocarpa*			Locally rare		?
Carex viridula ssp *viridula*			Locally rare		1
Carlina vulgaris			Locally rare		Extinct?
Centaurium pulchellum			Locally rare		1
Cerastium arvense			Locally rare		3
Chenopodium bonus-henricus		Vulnerable	Locally rare		1

Circaea x intermedia			Locally rare		3
Cirsium dissectum			Locally rare		1
Cirsium heterophyllum			Locally rare		1
Clinopodium ascendens			Locally rare		3
Crambe maritima			Locally rare		1
Crithmum maritimum			Locally rare		2
Cynoglossum officinale			Locally rare		½
Dactylorhiza incarnata			Locally rare		?
Daphne laureola			Locally rare		3
Dipsacus pilosus			Locally rare		5
Drosera intermedia			Locally rare		1
Eleocharis multicaulis			Locally rare		2
Eleocharis quinqueflora			Locally rare		2
Eleocharis uniglumis			Locally rare		1
Eleogeton fluitans			Locally rare		6
Epipactis palustris			Locally rare		3
Equisetum hyemale			Locally rare		1
Erodium lebelii			Locally rare		2
Eryngium maritimum			Locally rare		3
Euphorbia exigua		Near threatened	Locally rare		1
Festuca altissma			Locally rare		1
Festuca rubra ssp juncea			Locally rare		2
Filago minima			Locally rare		2
Filago vulgaris		Near threatened	Locally rare		3
Gagea lutea			Locally rare		1
Glaucium flavum			Locally rare		1
Hippuris vulgaris			Locally rare		2
Huperzia selago			Locally rare		1
Hyoscyamus niger		Vulnerable	Locally rare		casual
Hypericum elodes			Locally rare		2
Hypopitys monotropa		Endangered	Locally rare		1
Juncus compressus		Near threatened	Locally rare		2?
Lathyrus nissolia			Locally rare		4
Limonium vulgare			Locally rare		1
Linum bienne			Locally rare		3
Lycopodium clavatum			Locally rare		1
Meum athamanticum		Near threatened	Locally rare		1
Myosurus minimus		Vulnerable	Locally rare		3
Myrica gale			Locally rare		5
Myriophyllum alterniflorum			Locally rare		4
Nuphar pumila/x spenneriana			Locally rare		1
Oenanthe fistulosa		Vulnerable	Locally rare	UK BAP	Many
Orobanche hederae			Locally rare		1
Paris quadrifolia			Locally rare		1
Persicaria minor		Vulnerable	Locally rare		3
Phegopteris connectilis			Locally rare		3
Pilosella x stolonifera			Locally rare		1
Platanthera chlorantha		Near threatened	Locally rare		2
Polygonum oxyspermum ssp *raii*			Locally rare		?

Polygonum rurivagum			Locally rare		3
Populus nigra ssp betulifolia			Locally rare	LBAP	?
Potamogeton alpinus			Locally rare		2
Potamogeton compressus			Locally rare	UK BAP	?
Potamogeton lucens			Locally rare		2
Potamogeton pusillus			Locally rare		4
Potamogeton trichoides			Locally rare		?
Pyrola minor			Locally rare		1
Pyrola rotundifolia ssp maritima			Locally rare		1
Ranunculus baudotii			Locally rare		1
Ranunculus circinatus			Locally rare		3
Ranunculus fluitans			Locally rare (EU Annex 1 habitat)	UK BAP	?
Ranunculus hederaceus			Locally rare	LBAP	?
Rhynchospora alba			Locally rare		2
Rosa agrestis		Near threatened	Locally rare		1
Rosa micrantha			Locally rare		4
Rosa mollis			Locally rare		3
Rosa x hibernica			Locally rare		2
Rosa x margerisonii			Locally rare		1
Rubus chamaemorus			Locally rare		1
Rumex longifolius			Locally rare		1
Rumex alpinus		Near threatened	Locally rare (possibly not native in Cheshire)		3
Ruppia maritima			Locally rare		?
Sagina nodosa			Locally rare		4
Salix triandra			Locally rare		4
Salsola kali		Vulnerable	Locally rare	UK BAP	3
Salvia verbenaca			Locally rare		1
Saxifraga tridactylites			Locally rare		3
Schoenoplectus triqueter			Locally rare	UK BAP	?
Scleranthus annuus		Endangered	Locally rare		4
Scutellaria minor			Locally rare		5
Sedum anglicum			Locally rare		1
Serratula tinctoria			Locally rare		4
Silene uniflora			Locally rare		3
Sorbus torminalis			Locally rare		4
Spergula arvensis		Vulnerable	Locally rare		Many
Spergularia rupicola			Locally rare		2
Stachys arvensis		Near threatened	Locally rare		Many
Teesdalia nudicaulis		Near threatened	Locally rare		3
Thalictrum minus			Locally rare		2
Thymus polytrichus ssp *britannicus*			Locally rare		3
Trifolium ornithopodioides			Locally rare		1
Utricularia minor			Locally rare		2
Utricularia vulgaris			Locally rare		3
Vicia lathyroides			Locally rare		4
Vicia sylvatica			Locally rare		3
Viola canina ssp *canina*		Near threatened	Locally rare		2

Vulpia fasciculata			Locally rare		3
Wahlenbergia hederacea		Near threatened	Locally rare		4
xAgropogon littoralis			Locally rare		1
xFestulpia hubbardii			Locally rare		1

Table 21 Locally scarce plant species in Cheshire (present in 4-16 x 1 km^2 sites)[18]

Alchemilla glabra	*Carex extensa*	*Erigeron acer*	*Narcissus pseudonarcissus* ssp	*Sagina maritima*
Alopecurus aequalis	*Carex laevigata*	*Erophila glabrescens*	*pseudonarcissus*	*Samolus valerandii*
Allium vineale	*Carex lasiocarpa*	*Erophila majuscula*	*Narthecium ossifragum*	*Sanicula europaea*
Ammophila arenaria	*Carex pallescens*	*Euonymus europaeus*	*Neottia ovata*	*Saxifraga granulata*
Anagallis tenella	*Carex pulicaris*	*Fumaria bastardii*	*Oenanthe lachenalii*	*Schoenoplectus lacustris*
Anthriscus caucalis	*Carex spicata*	*Fumaria capreolata*	*Ononis repens*	*Schoenoplectus tabernaemontani*
Apium graveolens	*Carex strigosa*	*Galium mollugo ssp erectum*	*Ononis spinosa*	*Scirpus sylvaticus*
Apium inundatum	*Carex vesicaria*	*Galium uliginosum*	*Ophrys apifera*	*Sison amomum*
Arctium lappa	*Catabrosa aquatica*	*Gentianella amarella*	*Orchis mascula*	*Spartina anglica*
Armeria maritima	*Catapodium marinum*	*Geranium sanguineum*	*Orobanche minor*	*Spergularia media*
Artemisia absinthium	*Catapodium rigidum*	*Geum rivale*	*Osmunda regalis*	*Spergularia rubra*
Asplenium ceterach	*Centaurea scabiosa*	*Gymnadenia conopsea*	*Parapholis strigosa*	*Spirodella polyrhiza*
Atriplex glabriuscula	*Ceratophyllum demersum*	*Helichtotrichon pubescens*	*Phleum arenarium*	*Stellaria nemorum*
Atriplex littoralis	*Ceratophyllum submersum*	*Hordeum secalinum*	*Picris echioides*	*Stellaria pallida*
Berberis vulgaris	*Chaenorhinum minus*	*Hottonia palustris*	*Poa angustifolia*	*Suaeda maritima*
Botrychium lunaria	*Chenopodium ficifolium*	*Hydrocharis morsus-ranae*	*Polygonatum multiflorum*	*Thalictrum flavum*
Beta vulgaris ssp *maritima*	*Chenopodium polyspermum*	*Hypericum hirsutum*	*Polypodium interjectum*	*Tilia cordata*
Brassica nigra	*Chrysosplenium alternifolium*	*Inula conyzae*	*Polypodium x mantoniae*	*Trifolium fragiferum*
Cakile maritima	*Cladium mariscus*	*Iris foetidissima*	*Polystichum aculeatum*	*Trifolium micranthum*
Calamagrostis canescens	*Clematis vitalba*	*Juncus ambiguus*	*Polystichum setiferum*	*Trifolium striatum*
Calamagrostis epigejos	*Clinopodium vulgare*	*Juncus gerardii*	*Potamogeton polygonifolius*	*Triglochin maritimum*
Callitriche hermaphroditica	*Cochlearia anglica*	*Juncus maritimus*	*Ranunculus lingua*	*Umbilicus rupestris*
Callitriche obtusangula	*Crepis paludosa*	*Juncus subnodulosus*	*Ranunculus peltatus*	*Vaccinium vitis-idaea*
Callitriche platycarpa	*Cystopteris fragilis*	*Lathraea squamaria*	*Raphanus raphanistrum* ssp *maritimus*	*Valeriana dioica*
Campanula trachelium	*Dactylorhiza maculata*	*Lavatera arborea*	*Rhamnus cathartica*	*Valerianella locusta*
Carduus nutans	*Dactylorhiza purpurella*	*Lepidium campestre*	*Rhinanthus minor* ssp *stenophyllus*	*Veronica polita*
Carduus tenuiflorus	*Drosera rotundifolia*	*Lepidium heterophyllum*	*Rosa caesia ssp caesia*	*Viola lutea*
Carex arenaria	*Dryopteris affinis ssp affinis*	*Leymus arenarius*	*Rosa caesia ssp vosagiaca*	*Viscum album*
Carex binervis	*Dryopteris affinis ssp cambrensis*	*Littorella uniflora*	*Rosa pimpinellifolia*	*Viola reichenbachiana*
Carex distans	*Echium vulgare*	*Lythrum portula*	*Rosa rubiginosa*	*Zannichellia palustris*
Carex disticha	*Eleocharis acicularis*	*Melampyrum pratense*	*Rubus caesius*	*Hyacinthoides non-scriptus* **Extensive areas only**
Carex divulsa ssp *divulsa*	*Elytrigia atherica*	*Myosotis ramosissima*	*Rumex crispus* ssp *littoreus*	
Carex elata	*Elytrigia juncea*	*Myosotis secunda*	*Rumex maritimus*	

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5. Appendices

5.1 LWS survey form

Local Wildlife Site Description and Management Form

Site name:	Site code:	Grid reference:
Date(s) of visit:	**Surveyor(s)**	**Data submitted to rECOrd?**

Land owner/tenant

Include name, address and contact number/email for owner and/or tenant/agent. Where there is more than one owner, indicate ownership boundaries clearly on site map.

Selection Criteria

List all criteria that apply. Give brief justification here or in target notes.	

Site Characteristics

Topography: undulating; irregular; slopes; aspects etc.	*Any public access to site?*
Hydrology/Geomorphology/Soils(if known): wet, flushes, streams, outcrops, mineral, peat, clay etc.	*Surrounding area information: urban, semi-rural, rural, intensively farmed etc.*

Site Summary

Give BRIEF description/summary of the site. Include information on most important habitats, important or dominant species and other important aspects of the site. May update existing citation.

Additional information

e.g. species lists, species diversity, notable or indicator species (approximate NVC communities may be suggested), suggested boundary changes (mark on map), recommendations for future surveys. List any target notes with species information (e.g. indicators, invasives, species lists). All botanical species information should be recorded with DAFOR score where possible.

Condition assessment	
Overall impression of the condition of site. Good, fair or poor? Give reasons.	
Social Issues	
Issue	**Comment where applicable**
Litter/fly tipping/pollution	
Vandalism/anti-social use	
Recreational damage	
Other	
Grassland/Heathland	
Issue	**Comment where applicable. Complex sites may need to be assessed in compartments/fields – annotate map.**
Grazing (animal sp.) - Any suggestion of over/under grazing?	
Poaching	
Scrub encroachment (% cover, include young plants)	
Mowing	
Ridge and furrow/anthills	
Re-seeding/fertiliser application? Record % of white clover/rye grass.	
Undesirables (% cover e.g. bracken, thistles, nettles, docks, ragwort, invasives/ non-natives – list sp.)	
Bilberry/heathers/western gorse (% cover)	
Other	
Woodland	
Issue	**Comment where applicable. Complex sites may need to be assessed in compartments/fields – annotate map.**
Tree cover (estimate % cover where possible)	
Invasives/non-natives (list sp. and approx. frequency)	
Coppicing/felling	
Grazing (livestock and/or deer, give details)	
Pheasant rearing	
Regeneration of locally native tree species?	
Fallen/standing dead wood	
Fencing	
Other	

Wetland	
Issue	**Comment where applicable. Complex sites may need to be assessed in compartments/fields – annotate map.**
Invasives/non-natives (list sp. and estimate % cover)	
Scrub encroachment (% cover, include young plants)	
Any good populations of wetland flora/fauna?	
Suggestion of eutrophication e.g. algal blooms?	
Other	
Management plan / stewardship agreement / any management suggestions?	
Comment where known	

5.2 Checklist for Single Data List SDL ref 160 (previously NI 197)

	Measure	Yes	No	Not known
1.	Have the conservation features for which the site has been selected been clearly documented?			
2.	Is there documented evidence of a management plan/ management scheme/advisory document which is sufficiently targeted to maintain or enhance the above features?			
3.	Are the management requirements set out in the document being met sufficiently in order to maintain the above features? This should be assessed at 5 year intervals (minimum). Record 'not known' if interval is greater than 5 years.			
4.	Has the Local Sites Partnership verified the above evidence?			

For a site to score positive for ref 160 all four measures listed above MUST be YES[43].