

Our ref: P22-672 Noke Solar Farm - planning response

06 March 2023

James Kirkham
 Case Officer
 Cherwell District Council

Dear James

Re: Response to Consultee responses – Land North of Manor Farm, Noke – Planning application ref: 22/01682/F

We have been commissioned by our client to provide a response to potential concerns raised by consultees with regard to the Planning Application for a ground mounted solar farm and associated infrastructure at the above site. We have provided clarification and additional information where that is appropriate.

Consultation responses that include matters relating to ecological features were received (in alphabetical order) from:

- BBOWT (08 August 2022)
- Cherwell District Council (CDC) Ecology Officer (08 August 2022)
- Natural England (14 July 2022; Ref 398177)
- NatureSpace (20 July 2022 [supersedes the response of 24 June 2022])
- Noke Parish Meeting (undated)
- RSPB (22 July 2022 and 29 July 2022)

The sections in the table below address each of the potential concerns raised, with reference to the consultee. Where consultees raise the same or a similar issue, then the response addresses that issue for the combined set of consultees.

Topic: Sites; Issue: Impact on Otmoor SSSI	BBOWT	impact from a large solar farm being placed in close proximity
	CDC	This site is directly adjacent to Otmoor
	Applicant Response by BSG Ecology	The closest any solar panel comes to the boundary of the Otmoor SSSI is 1.8 km. That is not adjacent to the Otmoor SSSI. The impacts to the SSSI are fully assessed in the Ecological Appraisal Report submitted

<p>Topic: Sites; Issue: Impact on Otmoor Local Wildlife Site / RSPB reserve</p>	<p>BBOWT</p>	<p>impact from a large solar farm being placed in close proximity</p>
	<p>CDC</p>	<p>This site is directly adjacent to Otmoor</p>
	<p>Applicant Response by BSG Ecology</p>	<p>The closest any solar panel comes to the boundary of the Otmoor RSPB nature reserve is 350 m. That is not directly adjacent to the Otmoor RSPB nature reserve.</p> <p>It is also noted that the RSPB does not object to the solar farm, rather, it requests that conditions are applied.</p>
<p>Topic: Sites; Issue: Impacts on interest features of nature reserve</p>	<p>CDC</p>	<p>no precedent for a solar farm sited adjacent to a nature reserve with wading and wetland interest.</p>
	<p>Applicant Response by BSG Ecology</p>	<p>BSG Ecology has not carried out a systematic review of the location of solar farms in relation to protected sites and nature reserves but is aware of the following consented solar farms close to designated wetland sites:</p> <ul style="list-style-type: none"> • Cleve Hill, Kent, is adjacent to The Swale SPA, The Swale Ramsar and The Swale SSSI. • Ebbsfleet Farm, Kent, is located within 125 m of the Thanet Coast & Sandwich Bay SPA and the Thanet Coast & Sandwich Bay Ramsar; within 350 m of the Sandwich Bay SAC; within 125 m of the Sandwich Bay to Hacklinge Marshes SSSI; within 125 m of the Sandwich & Pegwell Bay NNR; and within 125 m of the Sandwich & Pegwell Bay Kent Wildlife Trust NR [this solar farm is the subject of post construction monitoring studies on insects and birds that are referred to elsewhere in this document]. • Thorne Farm, South Yorkshire, is located within 400 m of the Thorne Moor SAC, the Thorne & Hatfield Moors SPA and the Thorne, Crowle and Goole Moors SSSI; is within 200 m of the Humberhead Peatlands NNR; and is adjacent to the Thorne Colliery LWS [this solar farm is the subject of post construction monitoring studies on insects in relation to mitigating polarised light effects that are referred to elsewhere in this document].
<p>Topic: Sites; Issue: Impacts on interest features of protected sites</p>	<p>CDC</p>	<p>impact on adjacent protected sites and the species using them - has not been assessed by the applicant and I would have expected it to be considered further.</p>
	<p>Applicant Response by BSG Ecology</p>	<p>The Ecological Appraisal considers the impacts to adjacent sites in so far as typical impacts from solar farms have been considered and no direct impact pathway has been identified. Wintering bird surveys were carried out to establish whether birds from the Otmoor RSPB reserve use the Site regularly, including nocturnal surveys and the results presented in the Ecological Appraisal.</p>

<p>Topic: Species;</p>	<p>Noke Parish</p>	<p>We understand there is no definitive independent UK research on the impact of these types of solar array on bird life</p>
<p>Issue: Impact on birds</p>	<p>Applicant Response by BSG Ecology</p>	<p>BSG Ecology is aware of the following UK based studies on the relationship between birds and solar farms:</p> <ul style="list-style-type: none"> • Clarkson & Woods (2019, 2020 & 2021) Annual reports on a multi-site (100+) study of wildlife on solar farms including observations of birds in the breeding season. 105 bird species recorded including lapwing and skylark observed within the arrays but not nesting there. Indicates that solar farms can support a diverse community of birds. • Feltwell (2013) A study of the Ebbsfleet Farm Solar Farm in Kent examining incidences of mortality and bird flight behaviour over this solar farm that is adjacent to wetland habitat and protected sites. No significant adverse effects identified. • Montag <i>et al.</i> (2016) A study of 11 solar farms and paired control fields nearby that found that solar farms held a higher diversity of birds than their paired control fields. Skylarks held territories over the arrays but none nested within the arrays. • Shotton (2020) studied 9 solar farms over 2 years across central England (including in Oxfordshire) and found that farmland bird abundance on solar farms was similar to arable, meadow and pasture land (i.e. farmland birds were not deterred from using solar farms). Bird abundance was higher within the arrays than the margins with birds observed foraging between and beneath the arrays. Optimum sward height for bird usage is 7-20 cm. • West Oxfordshire Farmland Bird Project (2020) Monitor an unspecified number of solar farms and have recorded corn bunting nesting between the arrays.

<p>Topic: Species; Issue: Impact on wildlife and its mitigation</p>	BBOWT	reducing polarised light from the solar panels
	CDC	measures necessary for reducing the risk to wildlife from polarised light
	RSPB	measures to further reduce polarised light pollution as part of a planning condition
	Applicant Response by BSG Ecology	<p>A review of the effects of polarised light on wildlife is presented in Horvath <i>et al.</i> (2009) – one of the publications referred to the by the RSPB – in which water surfaces are identified as the most widespread natural source of polarised light and hence potential effects on wildlife of man-made structures that polarise light relate to this association with water. Horvath <i>et al.</i> (2009) identify egg laying by aquatic insects and predation on insects attracted to such surfaces as negative consequences. The second publication referred to by the RSPB – Horvath <i>et al.</i> (2010) identified a very significant reduction in the attraction of insect species when the solar panels had white borders and white grids. A field scale investigation of the degree of attractiveness to egg laying aquatic insects of commercial solar panels that have such a grid division is underway at the Thorpe Farm Solar Farm, South Yorkshire. Results are not yet published but the interim results indicate that the aquatic insects characteristic of the wetland habitats of the Thorne, Crowle and Goole Moors SSSI are not attracted to the solar panels.</p> <p>The solar panels that are to be installed at Manor Farm Solar will have such pale or silver borders forming grids and anti-reflective films. For these reasons it can be confirmed that the measures sought by BBOWT, CDC and RSPB will be applied.</p>
<p>Topic: Species; Issue: Impact on Otmoor Local Wildlife Site / RSPB reserve</p>	BBOWT	the “lake effect” whereby birds mistake a large area of solar panels to be a lake and attempt to land on them low-flying birds colliding with the panels or being confused by reflections and colliding with the panels
	CDC	wetland and migrating birds which may mistake them for water
	RSPB	The ecological assessment does not currently consider the impact of reflected light on resident / migratory bird species
	Applicant Response by BSG Ecology	<p>Evidence for birds landing on, or colliding with, solar panels is limited and not directly applicable to the UK. The detailed study of the Ebbsfleet Farm Solar Farm in Kent (Feltwell, 2013) concluded that of the 17 mortalities recorded, one was to power lines and 16 to predators. The studies from the US (e.g. Kagan <i>et al.</i>, 2014; Kosciuch <i>et al.</i>, 2020) are based on a very different context (very large arrays in a desert) and this has to be accounted for in attempting to translate observed mortalities from the US to the UK (Taylor <i>et al.</i>, 2019).</p> <p>The submitted Ecological Appraisal will be revised and resubmitted with an assessment of reflected light on bird species.</p>

<p>Topic: Species;</p> <p>Issue: Impact on Otmoor Local Wildlife Site / RSPB reserve</p>	<p>BBOWT</p>	<p>birds and bats that feed on the wing mistakenly attempting to feed from the panels, with possible collisions</p>
	<p>Applicant Response by BSG Ecology</p>	<p>The risk in relation to birds and collision has been addressed above with reference to the study of Feltwell (2013).</p> <p>The studies cited above entail regular presence by ecologists on solar farm, and no evidence of bat mortality has been recorded. Bat foraging generally occurs though echolocation therefore it is unlikely that the appearance of the solar panels in daylight (i.e. resembling water) is unlikely to result in attraction to bats.</p>
<p>Topic: Species;</p> <p>Issue: Impact on Otmoor Local Wildlife Site / RSPB reserve</p>	<p>BBOWT</p>	<p>attraction of aquatic insects to the panels</p>
	<p>CDC</p> <p>Applicant Response by BSG Ecology</p>	<p>aquatic invertebrates which may mistake them for water</p> <p>Horvath <i>et al.</i> (2009) identified that polarised light reflected off solar panels has the potential to attract insects to lay eggs and their concentration on a surface makes them vulnerable to predation. Horvath <i>et al.</i> (2010) identified a very significant reduction in the attraction of insect species when the solar panels had white borders and white grids. A field scale investigation of the degree of attractiveness to egg laying aquatic insects of commercial solar panels that have such a grid division is underway at the Thorpe Farm Solar Farm, South Yorkshire. Results are not yet published but the interim results indicate that the aquatic insects characteristic of the wetland habitats of the Thorne, Crowle and Goole Moors SSSI are not attracted to the solar panels.</p> <p>The solar panels that are to be installed at Noke Farm will have such pale or silver borders forming grids and also have anti-reflective films. For these reasons it is considered that a high degree of attraction of aquatic insects will not occur.</p>
<p>Topic: Species;</p> <p>Issue: Impact on Otmoor Local Wildlife Site / RSPB reserve</p>	<p>BBOWT</p>	<p>potential noise or pollution impacts during construction</p>
	<p>Applicant Response by BSG Ecology</p>	<p>The construction of a solar farm of this size will be very short in duration and will be comparable in terms of noise to current farming activity and is unlikely to constitute a measurable impact at any scale.</p> <p>In terms of pollution, the proposals for the Site do not include construction activities that are likely to result in significant pollution events or run off effects. The standard measures to prevent issues pollution and run off will be set out in the Construction Environmental Management Plan (CEMP) or similar document.</p>

Topic: Species; Issue: Impact on Otmoor Local Wildlife Site / RSPB reserve	BBOWT	collision of birds with security fencing
	CDC	The 2.1m fence proposed ... may impact low flying wildfowl
	Applicant Response by BSG Ecology	Given the absence of permanent bodies of water within the area enclosed by security fences then low flying wildfowl are highly unlikely to occur – to be at 2.1 m high they would have either to have just taken off from the water surface or be landing on it.
Topic: Species; Issue: Impact of lighting	BBOWT	The removal of any proposals for lighting
	CDC	The ecological report suggests lighting will be used on site this should be clarified and omitted wherever possible
	Applicant Response by BSG Ecology	The proposed development does not include any permanent installation of visible lighting. There is security lighting that operates in the infra-red wavelength, beyond the range of detection by birds and mammals. The Applicant is willing to accept a condition that provides assurance that permanent visible lighting will not be installed.
Topic: Species; Issue: Impact on skylark	BBOWT	Measures are taken to compensate for the impact on skylark
	CDC	The site currently supports a number of farmland birds including red list species (skylark) for which no particular mitigation is proposed
	Applicant Response by BSG Ecology	It is recognised that there is a high probability that six pairs of skylarks will be displaced by the construction of the solar farm and it is proposed to mitigate for this by the provision of skylark plots within the Breach field, which measures 16 ha and is within the control of the Applicant, and is currently in arable use. This will result in a significant localised uplift in breeding territories in this field, and pairs nesting around the proposed solar array will also benefit from a more diverse range of foraging habitat and continue to forage between arrays and in the ecological enhancement areas, as demonstrated by studies carried out by Clarkson Woods. It is accepted that this should be secured by a condition on the consent and the future management of the mitigation measures described in a management plan submitted for approval post-consent.

<p>Topic: Species; Issue: Licence for GCN</p>	<p>CDC</p>	<p>district licence route need to be accepted onto the scheme prior to permission being granted</p> <p>traditional licensing route they should make clear the steps they will take and any mitigation that will be proposed</p>
	<p>NatureSpace</p>	<p>[either licencing route is available] licence from Natural England potential population assessments may need to be undertaken Surveys would need to be undertaken in Spring 2023</p>
	<p>Applicant Response by BSG Ecology</p>	<p>In terms of a licence, the Applicant will likely carry out update population estimate surveys in the breeding season of 2023 to inform a licence application with Natural England in this coming year, once planning has been secured. This licence will set out the appropriate mitigation, which may include for the track resurfacing via destructive search between March and October. The resurfacing of the track is the only likely impact to this species, given the distances to the solar array itself.</p>
<p>Topic: Habitats. species; Issue: Long term management</p>	<p>CDC</p>	<p>[third party overview of] decisions on the design and management options for the site for the lifetime of the solar farm</p>
	<p>Applicant Response by BSG Ecology</p>	<p>The management plans for the Site will be compiled following best practice management principles for the habitats proposed. The overarching principles are set out in the Ecological Appraisal and will be refined in a Landscape and Ecology Management Plan (LEMP) or similar document.</p>
<p>Topic: Habitat; Issue: Net gain calculation and grassland condition</p>	<p>BBOWT</p>	<p>condition scoring of the grassland proposed in and around the solar panels</p>
	<p>CDC</p>	<p>areas under solar panels these areas are likely to remain in poor condition due to lack of light</p>
	<p>Applicant Response by BSG Ecology</p>	<p>BSG Ecology has noted that in the issue of updated guidance on the operation of the BNG metric, that criteria on the justification for condition scoring of grassland is now only provided for 'Poor', 'Moderate' and 'Good'. However in order to ensure a significant net gain, and in order to uplift the value of the proposed development further, a revision will be made to the proposed grassland creation within the array areas. This proposal will be to seed the areas with a wildflower rich grass seed mix, such as Emorsgate EM4 specific for clay soils. This would then be managed via grazing at a lower intensity than initially envisaged and in line with Natural England's grassland management recommendations (Natural England, 2007). The revised habitat and condition will therefore be Modified grassland in Moderate condition, likely to deliver an overall net gain for habitats of 68%.</p> <p>This management measures for this grassland will be set out in the LEMP, as well as the proposed methods of preparation, seeding and monitoring of establishment.</p>

Topic: Habitat; Issue: Sown grassland mix	BBOWT	species mix for the main area of grassland so that it provides species-rich wildflower habitat, with the grazing by sheep being managed to maximise wildlife outcomes
	CDC	a more species rich grassland should be used to maximise ecological benefit on site
	RSPB	grassland around the solar panels managed as species rich grassland with conservation grazing
	Applicant Response by BSG Ecology	As set out above, in order to ensure a significant net gain, and in order to uplift the value of the proposed development further, a revision will be made to the proposed grassland creation within the array areas. This proposal will be to seed the areas with a wildflower rich grass seed mix, such as Emorsgate EM4 specific for clay soils. This would then be managed with grazing at a lower intensity than initially envisaged and in line with Natural England’s grassland management recommendations (Natural England, 2007). The revised habitat and condition will therefore be Modified grassland in Moderate condition, likely to deliver an overall net gain for habitats of 68%.
Topic: Habitat; Issue: Grazing of grassland	RSPB	grazing within the security fence stocking is limited, especially during the bird breeding season to prevent any trampling of nests, especially for species such as Skylark
	Applicant Response by BSG Ecology	As set out above, the grassland within the array will be managed by grazing at a lower intensity than initially envisaged and in line with Natural England’s grassland management recommendations (Natural England, 2007).

In addition to the above topics / issues that relate to impacts on sites and species, the BBOWT response makes a series of requests in relation to providing mitigation measures. These requests are addressed in the order that they are listed in the BBOWT response under the heading ‘Mitigation measures’. Note that some of the topics have already been addressed above as an impact and are not repeated here (e.g. skylark).

Topic: Mitigation; Issue: Sites, habitats, species	BBOWT	Provision of a detailed report on mitigating impact
	Applicant Response by BSG Ecology	The responses above will be integrated into a revision of the Ecological Appraisal, including a detailed list of proposed mitigation for species such as skylark.

Topic: Mitigation; Issue: density of solar pannels	BBOWT	reducing the density of the solar panels
	Applicant Response by BSG Ecology	It is BSG’s opinion that the ecological impact identified and mitigated for would not be greatly reduced by reducing solar panel density. It is for instance unlikely that they could be reduced sufficiently to preclude loss of skylark nest sites. The proposals overall will deliver a significant net gain and the need for producing as much clean energy in a site such as this needs to be considered, so reducing density will not be explored further.
Topic: Mitigation; Issue: management of the proposed site	BBOWT	provision of a detailed ecological management plan for all the habitats, both retained and created
	Applicant Response by BSG Ecology	The Applicant will submit a LEMP or similar document setting out detailed management and habitat creation measures.
Topic: Mitigation; Issue: nature of grassland creation.	BBOWT	grassland in the north-eastern corner changing the intended outcome from a mix of grasses to a wildflower meadow habitat of much greater species diversity
	Applicant Response by BSG Ecology	The solar array area is to be seeded with EM 4 to increase the diversity from the previous proposals. This area will however be regularly inundated and enriched by nearby waterbodies, therefore a high diversity of wildflower and forbs will be difficult to achieve.
Topic: Mitigation; Issue: management of habitats	BBOWT	ecological management plan includes hedgerow management.
	Applicant Response by BSG Ecology	The Applicant will submit a LEMP or similar document setting out detailed management and habitat creation measures.

In summary, clarification has been provided, including additional evidence on a number of concerns raised by consultees, such as potential impacts to invertebrate communities and collision risks with birds and bats.

The Applicant will provide a revised Ecological Appraisal and Biodiversity Impact Assessment metric to reflect the changes to the proposals, including the nature of the seeding of the ground within the Solar Array itself which will now aim to create a high diversity grassland sward, as well as the location and nature of the mitigation measures being provided for skylark. This will also clarify the approached taken to assessing the impacts to off site designated sites.

The Applicant will also (likely to discharge a relevant condition) provide a detailed LEMP and CEMP.

I trust the above is clear and we will provide you with the updated documents in short order.

Yours sincerely



John Baker
Principal Ecologist
For and on behalf of BSG Ecology



References

- Clarkson & Woods (2019). *Solarview - Ecological monitoring of solar sites: Overview of 2018 surveys*. Clarkson & Woods, Somerset.
- Clarkson & Woods (2020). *Solarview - Ecological monitoring of solar sites: Overview of 2019 surveys*. Clarkson & Woods, Somerset.
- Clarkson & Woods (2021). *Solarview - Ecological monitoring of solar sites: Overview of 2020 surveys*. Clarkson & Woods, Somerset.
- Feltwell, J. (2013). Are photovoltaic solar arrays an influencing factor in avian mortality? *The Newsletter of The Kent Field Club* 77: 18-27.
- Feltwell, J. (2014). Observations on the effects of photovoltaic solar panels on invertebrates at Ebbsfleet Farm, Sandwich, Kent 2010-2012.. *The Newsletter of The Kent Field Club* 79: 4-17.
- Harrison, C., Lloyd, H. and Field, C. (2016). *Evidence review of the impact of solar farms on birds, bats and general ecology*. Natural England Report NEER012.
- Horvath, G., Kriska, G, Malik, P. and Robertson, B. (2009). Polarized light pollution: a new kind of ecological photopollution. *Frontiers in Ecology and the Environment* 7: 317-325.
- Horvath, G., Blaho, M., Egri, A., Kriska, G., Seres, I. and Robertson, B. (2010). Reducing the Maladaptive Attractiveness of Solar Panels to Polarotactic Insects. *Conservation Biology* 24: 1644-1653.
- Kagan, R.A., Viner, T.C., Trail, P.W. and Espinoza E.O. (2014). *Avian mortality at solar energy facilities in southern California: a preliminary analysis*. National Fish and Wildlife Forensics Laboratory, Oregon, USA.
- Kosciuch, K., Riser-Espinoza, D., Gerringer, M. and Erickson, W. (2020). A summary of bird mortality at photovoltaic utility scale solar facilities in the Southwestern U.S.. *PLoS ONE* 15: e0232034. <https://doi.org/10.1371/journal.pone.0232034>
- Montag, H., Parker, G. and Clarkson, T. (2016). *The Effects of Solar Farms on Local Biodiversity: A Comparative Study*. Clarkson and Woods and Wychwood Biodiversity.
- Natural England (2007). *Lowland Grassland Management Handbook (Second edition) (GRASSLAND) Ch5*
- Shotton, R. (2020). *Bird use on solar farms, final results*. Published on the RSPB website - <https://community.rspb.org.uk/ourwork/b/science/posts/bird-use-on-solar-farms-final-results>
- Taylor, R., Conway, J., Gabb, O. & Gillespie, J. (2019). *Potential ecological impacts of ground-mounted photovoltaic solar panels*. BSG Ecology, Newport. <https://www.bsg-ecology.com/wp-content/uploads/2019/04/Solar-Panels-and-Wildlife-Review-2019.pdf>
- West Oxfordshire Farmland Bird Project (2020) Tweet of 29 June 2020 <https://twitter.com/WOXFarmBirds/status/1277632799017664519>

