Statement of Case – Dr Christopher J Betts BSc(Hons) PhD FBNA CBiol MRSB MCIEEM MIEnvSc

PROPOSAL FOR BIRCHALL GREEN SOLAR POWER STATION
GRIMLEY WORCESTERSHIRE

21 September 2023

Ref. 7141 210923

CONTENTS

PREFACE

I have been asked by Grimley Parish Council (GPC) to support Ms Carly Tinkler on matters of ecology and biodiversity in this Appeal and thereby to assist the Inspector. I feel privileged to do so and I have done what I can in the very limited time that was available to produce this Statement.

By way of introduction, I am Chairman and Director of Science of Betts Ecology Ltd. and Betts Estates Ltd. I have a first class combined honours degree in ecosystems, rural settlement & land use and human biology, and a doctorate in plant community science. I am a member of various professional institutes and am a Founder Member of the Chartered Institute of Ecology and Environmental Management as well as being a Royal Society of Biology Charted Biologist. I grew up in Wyre Forest, have twenty hears' experience in heavy industry in the UK, and the continental EU until the catastrophe of Brexit. I have been a keen naturalist all my life and set up our ecological consultancy practice in 1981. I have been a member of the Worcestershire Wildlife Trust (WWT) since its formation and I am Editor of the *Transactions* of the Worcestershire Naturalists' Club. I was heavily involved with Monkwood and Little Monkwood SSSI and its management when it was acquired by WWT and Butterfly Conservation, and I wrote the Management Plan for Monkwood Green SSSI with Natural England. Having lived in Monkwood Green since the 1980s, I am familiar with the ecology and natural history of the area and have undertaken various studies of local botany, entomology and biodiversity. My publications and much other information can be found on our web site at www.bettsecology.com.

Francesca Beamish BEng (Hons) MSc AMRSB, our Science Officer, has assisted in the specialist area of reviewing and calculating Biodiversity Net Gain. Francesca holds a first class honours degree in mathematical engineering and a Master of Science degree with distinction in Biological Recording and Ecological Monitoring. She specialises in botanical identification (FISC level 4), recording and statistical analysis to assess biodiversity and changes due to management practice and environmental dynamics. She has a life-long interest in botany and phytosociology, habitat creation, restoration and management as well as extensive experience of working with plants at horticultural nurseries and from many years' managing a Soil Association certified smallholding and forest garden.

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Because of its proximity to my residence and our offices, I have followed this case closely since the original solar power application and its consequent refusal by Malvern Hills District Council (MHDC) which then led to the present Appeal.

PRINCIPAL ECOLOGICAL CONCERNS

There were multiple substantial ecological objections from Grimley Parish Council (GPC) and others to the original planning application, to which the Appellants have produced a range of responses and updated documentation. My Statement of Case addresses the significant concerns that remain as far as time has allowed. In summary, these concerns are set out below, in seventeen broad groups. Greater detail on areas of particular concern or complexity are provided in the two Appendices.

1. A fundamental and overarching conclusion of GPC, and shared by all those so worried by this application, which overshadows the whole case is that greenfield sites such as Birchall Green are no place for these solar cell arrays which should be sited on roofs, hard standings and similar unvegetated locations in urban areas and developments where the power is most needed and where thousands of hectares of suitable substrata are available nationwide. All of us are strongly in favour of solar power but not at the price of our dwindling greenspace and increasingly nature-depleted environment.

2. The Preliminary Ecological Appraisal (PEA) has been revised seven times which does reflect attention to the responses to the application by various parties, but perhaps also indicates how difficult it is to mitigate adverse ecological impacts on this site. The botanical data, arguably the most important aspect of any field survey, leave much to be desired, even after seven updates of the PEA. Although the report states (2.15) that it is not a full botanical survey, it is barely even a cursory one. There are many more species on site than listed in Appendix D which has copious taxonomic errors/shortfalls. The vernacular names do not follow the BSBI list as stated, species which are readily differentiated are aggregated (for example, red and white clovers are readily recognised as red has a hairy leaf edge where white has marginal teeth) and scientific names are not all correct: *Ruscus* is not a rush but a dioecious evergreen shrub of the lily family (butcher's-broom) and unlikely on this site, presumably written in error for *Juncus* but even so, why no identification to species level? Bryophytes, lichens and fungi are not mentioned at all, yet we observed mosses such as *Brachythecium velutinum* in the grass sward and the trees and other substrata host many mosses, liverworts, lichens and fungi. Again, I stress the importance of undertaking a pre-planning decision, full Ecological Impact Assessment (EcIA) rather than only a PEA.

3. Other reports. There are more specialised reports on badgers, bats, great crested newts and skylarks — please see Appendix II for more detailed important comments on these taxa. However, as above, we would have liked to have seen a full EcIA to cover comprehensively the status of, and effects relating to, mammalogy, ornithology, herpetology, ichthyology (Grimley Brook), entomology, botany, dendrology, phytosociology, mycology, ecological hydrology and soil science, only some of which are considered by the Appellants and then often only superficially. After all, this is a major project

covering 36ha involving 46,170 solar panels in a much-loved and very environmentally sensitive area of beautiful English countryside. We should not forget that the adverse ecological impacts are cumulative and are compounded by the current parlous global state of species loss and climate change.

4. Biodiversity Net Gain (BNG). This considers area and linear habitats separately. There is a substantial concern that the calculations by Phlorum for the grassland area, *i.e.* the great part of the site, are incorrect and the open habitat change is not a gain but a loss. Following the public footpaths, which enabled us to walk a full transect from south-east to north-west, the modified grassland condition was observed as "good" as opposed to "moderate" throughout. I should like to see this confirmed by whole-site resurvey as would be done in EcIA. However, it certainly appears that the repeated assertion in the Appellants' reports of a net gain in biodiversity over all the open site where the solar panels would be located, following the stated interventions, is wrong and there would be a biodiversity net loss. The linear habitats show a gain in the calculations because of extra hedge and screen planting , and I do not disagree with that, although these will take many years to mature which is accounted for within the BNG calculations. Please see Appendix I.

5. Security fencing. We have heard that high-specification security fencing may be required because of greatly increased vandalism on solar sites with consequent concerns of the police and insurers. Such fencing would not be able to accommodate mammal and other terrestrial animal passage and so would become a significant adverse ecological impact. It is also an order of magnitude more expensive. This matter should be carefully reviewed and specifications confirmed prior to any Appeal decision.

6. Noise. It is unclear whether panels will be secured by steel posts or ground screws. The former would be pile-driven and thus produce a significant ecological (and human) noise impact. (Please see below under "Badgers" in Appendix II.)

7. Lighting. Although lights will be shielded, cowled and prevented from shining directly on sensitive areas such as roosting/nesting sites or burrows, and it is recognised by the Appellants that best practice is to be followed to avoid light disturbance of bats before dusk and after dawn, we are concerned about excessive vehicle lights on site, especially from construction/maintenance operations during winter when there is low ambient light for many mornings and afternoons. This may be difficult to control.

8. Licences. There is mention in the documentation that licences may be required for work impacting great crested newts, bats and perhaps badgers. I simply note that there is no guarantee that such licences would be granted and that significantly more detailed studies will, in any case, be required in

order to complete licence applications. The element of doubt here is extended by the potential that the relatively few surveys done to date on legally protected species may not have revealed the population data fully. For example, we were surprised that bat surveys referred to in the PEA indicated low use of the fields across the site (although roost potential in trees was high) and that more data were not gathered. Please see under "Bats" in Appendix II. Regarding the badger population of the area, there are some matters requiring further information — please also see Appendix II.

9. It is stated that a precautionary approach regarding reptiles, breeding birds, foraging and commuting otters, water vole, and dormice will be needed to safeguard these protected species, to be outlined within a Method Statement to support the Ecological Clerk of Works prior to works commencing at the site. It would be helpful, indeed essential in my view, for all concerned to see that approach fully explained and circulated before the Appeal decision is made. Please see Appendix II below for some of the species known in this area and likely to use the site, only a few of which have been mentioned by Appellants' reports or granted survey time. Synecological and autecological aspects of impacts on taxa are not distinguished anywhere in the Appellants' reports as far as I can see in the limited time I have been given[1].

10. A rope bridge is to be installed over the southern access road to allow any hazel dormice in the area to commute. Dormice like to have overhead vegetative cover so we would appreciate seeing the full specifications of such a bridge, as inappropriate design would be a concern.

11. There is a large population of Reeves' muntjac in the area. There are likely to be many interactive problems with these cervids. For example, accidents on the adjacent road, some fatal to the deer, are already an issue and a consequent danger to motorists. This topic requires further study to mitigate serious risks to these (and other) animals, vehicles and their drivers and the many pedestrians along this road which has no associated footway and many marginal gaps.

12. The Appellants say they don't think invertebrates from Monkwood would use the solar application area adjacent, but without a full invertebrate survey (please see Appendix II, how do they know? They also indicate that grids will be fitted to the arrays to discourage negative impacts of reflective surfaces and confusion of aquatic invertebrates. Do they have evidence this will work? What about birds and bats? Then there is the interruption of insolation on photosynthesis and consequently on above-ground biomass[2], hydrological

[1] Autecology is the study of individual organisms and their relationship with their environment. It concerns the behaviour, physiology, and other characteristics of individual organisms. Synecology is the study of groups of organisms and their interactions with each other and their environment. It concerns the relationships between different species and the ways in which they interact with each other.

[2] Farming acquaintances tell me the quality of grass under solar panels would be poor because of shading, and sheep need good pasture. I am not a farmer but the reduced insolation effect on photosynthesis would support that view. Farmers would also need free access over the site throughout the year for shepherding work.

ecology/sustainable drainage or of the heat island effect of solar arrays which may raise local temperatures by three or four degrees Celsius[3], worrying in our present climate of heatwaves that already stress plants and wildlife. Other than possible benefits of resting the soil, there is also an absence of consideration of:

- edaphic impacts of compaction and erosion on soil mycology and sub-surface micro-organisms from cable trenching throughout the site;
- impacts from the significant electromagnetic radiation that I assume will emanate from high tension cabling and electrical equipment (although this is not my field of expertise but has been raised by others);
- impacts from traffic generally, servicing, parking and eventual decommissioning[4], and
- impacts from access tracks (6m wide with a total combined length of 1.4km, 0.5m deep), backfilled with imported material which could contain invasive species' propagules, and surfaced with stone/hardcore only to be removed in decommissioning.

13. Sustainable Drainage is sought to be conditioned rather than planned now. The notes in the Flood Risk Assessment suggest the land is well-drained and permeable so will not require surface water flow attenuation. The Soil Survey of England and Wales maps, however, show the soils north of Monkwood to be of the BROCKHURST (slowly-permeable, seasonally waterlogged) and WHIMPLE (slowly-permeable subsoils) series. For such land, I would say that an above-ground Sustainable Drainage System (SuDS) will be necessary to mitigate the high surface water flows that are inevitable from so much introduced hard surfacing of the arrays. Above-ground SuDS attenuation ponds present great concomitant benefits for ecology and biodiversity in provision of mesic and aquatic habitat. I note there is to be a wet scrape and that the existing pond will be managed to optimise it for nature, but SuDS would be significantly incremental for biodiversity, too.

14. The papers I have received indicate that a full Landscape and Ecological Management Plan will be conditioned if the Appeal is upheld. An Ecological

[3] See *e.g.* https://www.nature.com/articles/srep35070.

[4] The Institute Environmental Management & Assessment (IEMA) guide "*A New Perspective on Land and Soil in Environmental Impact Assessment*" (February 2022) defines impacts for Environmental Impact Assessment purposes as "**permanent, irreversible loss of one or more soil functions or soil volumes (including permanent sealing or land quality downgrading)** …" (Table 3, page 49). It also notes that this can include "**effects from temporary developments**", which is defined as follows: "**temporary developments can result in a permanent impact if resulting disturbance or land use change causes permanent damage to soils**".

Enhancement, Mitigation and Management Plan has been submitted as a result of consultation, though. In its Timetable of Works, it is stated that, for ecological monitoring, there will be "one visit annually for the first five years and subsequent visits once every five years (visit May—July each year)" up to decommissioning. For a site with the significant ecological interest that this one has, ecological Management Plans should prescribe monitoring permanently, including post-decommissioning which will be an ecologically disruptive process. Monitoring inspections and reporting should preferably be once in each season but not less than twice per year. This is to ensure adequate formal records are kept and problems are revealed and rectified in a timely manner before they become difficult or impossible to overcome.

15. Regarding loss of trees, whilst this has been minimised, we know from recent (2023) tree survey of Monkwood Green that there are rich and diverse populations of bryophytes and lichens on the local trees. These epiphytes have not been surveyed and will need to be in order to predict impacts adequately and assess significance of any losses and any mitigation. For example, there are exceptional oak trees on or near the solar site such as along the Sinton Green Road, one of which is a veteran, which appear to be under threat from the plans. Under no circumstances should these trees be removed or damaged. I also note that the arboricultural appraisal classed Category C and U trees as of low and very low quality. In fact, ecologically, these classes of trees are of the highest quality and value for the sapro-xylophagous community and their predators, and should always be preserved where they are not independently proven to be dangerous or subject to a notifiable pathogen. Even then, judicious pruning should always be a first option that leaves the maximum standing wood to continue its significant contribution to biodiversity.

16. Because of the late arrival of reports and very tight deadline to submit this Statement, it has not been possible to read all the texts as thoroughly as I would have liked. As an overview, however, and taking account of the points above, I recognise that the Appellants have responded to some of the earlier submissions about ecological weaknesses and amended project parameters to mitigate some adverse ecological impacts, and in a few cases potentially to enhance biodiversity. There are likely elephant traps, though, such as the lacunae in surveys, the security fencing issue and perhaps the heat island and edaphic impact concerns. Moreover, a trawl through the literature on solar photovoltaic installations reveals general concerns that they may adversely impact a broad range of taxa, including not just mammals, birds, bats, herpetofauna, invertebrates and tracheophytes (vascular plants), but also non-vascular plants, fungi and other micro-organisms which have not been examined by the Appellants.

17. Whilst it might be argued that some of the extant adverse ecological impacts could be individually avoided, mitigated or compensated following fuller expert and objective assessment of all the data, the negative effects are

cumulative and synergistic. Using this rural greenspace for what is effectively major industrial development in disposition and scale is entirely misguided in a rural land use context, and that is the *coup de grâce* for the Appeal in my view.

I hope the explanation of concerns in my Statement are helpful to the Inspector which is the primary purpose of the exercise.

APPENDIX I

BIODIVERSITY NET GAIN (BNG)

Date: 19 September 2023
Our ref: S:7141
Site: Birchall Green solar power station

Commentary on the Biodiversity Net Gain assessment by Francesca Beamish, Science Officer.

The Biodiversity Net Gain (BNG) assessment (Phlorum 2022) was based on Phase 1 habitats reported in the Preliminary Ecological Appraisal (Phlorum 2022) and whilst the translation of Phase 1 semi-improved grassland habitat into UKHab modified grassland (g4) is perfectly reasonable, the assessment of the condition of the grassland requires more detailed knowledge.

The condition assessment sums the number of criteria passed and assigns a condition grade:

1. 6–8 species m^{-2} (an essential criterion for achieving moderate condition)
2. Sward height is varied (at least 20% is <7cm and at least 20% >7cm)
3. Scrub accounts for less than 20%
4. Physical damage evident in less than 5%
5. Cover of bare ground is 1–10%
6. Cover of bracken is <20%
7. There is an absence of invasive non-native species.

Score of 6 or 7 implies “good”; 4 or 5 implies “moderate”; 3 or less (or failing criterion 1) implies “poor”.

Following a view of the fields from the public footpath passing through the centre of the site, there are more than six species per square metre (essential for achieving at least “moderate” for modified grassland). The grassland species list collected from this transect walk at all points examined along it, was greater than the grassland species listed in the PEA. Since the rest of the grassland, albeit viewed from a distance, does not appear to be significantly different, I therefore submit that, subject to the level of botanical survey that EcIA would involve, the grassland should be categorised as good: the above criteria appeared to be satisfied apart from 2 which could not be judged as the fields have been mown, but given the species assemblage, it is probable that areas of a very short sward are rare.

This disparity in assessment of the modified grassland represents a significant factor in the outcome of the calculation as the majority (98.7%) of the area being considered within the metric is modified grassland (33.78ha of a total 34.23ha). BM3.1 results are shown below.

Comparison of the BM3.1 results considering all modified grassland to be of moderate or good condition.

Condition of modified grassland prior to intervention	On-site baseline habitat units	Post-intervention habitat units	BNG of habitat units
moderate	146.23	182.33	24.69%
good	217.63	191.72	-11.91%

The BNG assessment includes an area of "lowland meadow" as it is listed in the Worcestershire Habitat Inventory; however, the PEA found all areas of grass to be of similar modified grassland, with which we agree. It is essential to note that categorising this area as "good" condition modified grassland would result in an even lower BNG.

The BNG assessment recognises that only a poor condition neutral grassland is likely to be created beneath the photovoltaic panels. This is a realistic target considering the shade levels, potential disturbance, compaction and water run-off and is a common target habitat used for similar BNG assessments.

In summary, for the BNG result to be applicable, it is essential to conduct a survey at the appropriate level of detail and thoroughly examine the condition assessment criteria, as variations can have a substantial impact on the outcome. From our examination at points across the site from the footpaths, in my and Dr Betts' view the Appellants' ecologists should have classified the modified grassland as "good" *sensu* the BNG metric. As such, the evaluation would show a loss of net biodiversity, not a gain.

APPENDIX II

WILDLIFE OBSERVATIONS OF MONKWOOD & SURROUNDS

All observations listed during the past five years were made personally by Dr C J Betts or verified by him. This list is certainly not exhaustive. Many of those listed occur on the Appeal Site habitats, inhabiting it, foraging on or over it, sheltering on it or in passage, often habitually, using established routes through or over it. Many species on the list have legal protection. I have only red-starred the red-listed birds known definitely to have been on the Appeal site.

Mammals

Badger
Bank vole
Barbastelle
Brown hare
Brown long-eared bat
Brown rat
Common pipistrelle
Common shrew
Fallow deer
Field mouse
Field vole
Fox
Grey squirrel
Hazel dormouse
Hedgehog
Mole
Muntjac
Rabbit
Roe deer
Soprano pipistrelle
Stoat
Weasel
Wood mouse
Yellow-necked mouse

Birds

* = Red listed and seen on Appeal site

Barn owl
Barn swallow
Blackbird
Blackcap
Blue tit
Bullfinch
Buzzard
Carrion crow
Chaffinch
Chiffchaff
Coal tit
Collared dove
Common pheasant
Coot
*Cuckoo (red-listed)
*Fieldfare
Golden oriole (single rare sighting)
Goldfinch
Goshawk
Grasshopper warbler (red-list, rare obs.)
Great spotted woodpecker
Great tit
Green woodpecker
*Greenfinch
Grey partridge (red-listed)
Grey phalarope (single rare sighting)
Grey wagtail
Hedge sparrow
House martin (red-listed)
*House sparrow
Jackdaw
Jay
Kestrel
Kingfisher
*Lesser spotted woodpecker
Long-tailed tit
Magpie
Mallard
Marsh tit (red-listed)
Meadow pipit
Merlin
*Mistle thrush
Moorhen
Mute swan
Nuthatch
Pied wagtail

Red kite
Red-legged partridge
Redwing
Reed bunting
Robin
*Skylark
Song thrush
Sparrowhawk
*Starling
Tawny owl
Tree sparrow
Treecreeper
Willow tit
Wood pigeon
Woodcock (red-listed)
Wren
*Yellowhammer (but not seen recently)

Herpetofauna
Adder
Barred grass snake
Common frog
Common toad
Great crested newt
Slow-worm
Smooth newt
Viviparous lizard

Rare/notable invertebrates include glow-worm *Lampyris noctiluca*, wood white *Leptidea sinapis*, white admiral *Limenitis camilla*, purple hairstreak *Favonius quercus*, Clifden nonpareil *Catocala fraxini*, hummingbird hawk-moth *Macroglossum stellatarum*, drab looper *Minoa murinata*, oakbark pygmy moth *Ectoedemia atrifrontella*, large alder sawfly *Cimbex connatus* and others. It would have been useful if the site survey report had at least included a rapid general macro-invertebrate appraisal such as that devised by Dobson & Fairclough[5]. Historically, macro-invertebrates have received relatively sparse attention in habitat surveys. Recent alarming declines in insect and other invertebrate populations coupled with the realisation of the great ecological importance of these taxa mean more detailed appraisal is required. Several species enjoy legal protection.

I (Dr Betts) also have general lists of flowering plants, ferns, mosses, lichens and fungi as well as moths, butterflies and some other macro-invertebrates of the locality. The area is one of the best sites in the Midlands for butterflies and moths. Detailed survey will be required through the seasons to produce lists of site-specific species records if these have not been produced by the applicants. The desired full Ecological Impact Assessment will greatly assist but time in different seasons should be allowed to conduct it effectively (ideally all four seasons). It may be regarded as precipitate to make definitive planning decisions before it is.

Appellants' ecological surveys by Phlorum

The surveys by Phlorum make frequent references to how the construction of the Solar Power Station will enhance the site ecology and biodiversity.

Preliminary Ecological Appraisal (Phlorum June 2020)
Skylark Survey Report (Phlorum Nov 2020)
Great Crested Newt Report (Phlorum June 2021/Addendum October 2022, eDNA July & November 2020)
Bat Survey Report (Phlorum June 2021, revised October 2022)
Badger Survey Report (Phlorum, June 2021, revised October 2022).

[5] **Dobson, J. & Fairclough, J. (2021).** Rapid Assessments of the Potential Value of Invertebrate Habitats. *In Practice*, **112**, pp 44–48.

The Ecological Enhancement, Mitigation and Management Plan (Phlorum June 2021)
… and updates of these.

This biodiversity enhancement argument might be acceptable if the ecology and biodiversity needed to be enhanced but the present evidence speaks for itself: nature is currently doing an excellent job on its own and doesn't need the installation of a Solar Power Station to enhance the ecology and biodiversity of the site.

3.9 of The Preliminary Ecological Assessment (Phlorum, 2020 updated 2021) identified the site has potential to support bats, badgers, birds, hazel dormice, great crested newts, otters, reptiles and water voles. Please see above for our fauna list.

Phlorum propose enhancements such as the creation of a new native wildflower grassland, native hedges, native trees, skylark plots, bird and bat boxes, bug hotels and log piles. I am certainly not against these but all such habitats currently exist naturally as part of the current site environment and its margins; new ones will take many years to establish.

Great Crested Newts

It is recognised that a European Protected Species Licence will be required because these amphibians use the site (migration/foraging/hibernation).

The site will have to be cleared of any newts (and common reptiles) so the translocation process will include the installation of pitfall traps and refuge mats, and then daily inspections of the site. To speed up the translocation process two-phase vegetation clearance work may be carried out towards the end.

The newt fence would need to be in place for the duration of the construction process. As a result, it is important that the site engineer mark out on site the line of the newt fence and allow several metres of work area around the proposed solar arrays to enable them to be built, plus site compound, and storage of materials. The newt fence should not impede other animals such as hedgehogs, toads and common reptiles.

Bats

I have comments on the Phlorum Bat Activity Report (2021, updated 2022) from our chiropterists as follows:

- A total of four bat species were recorded foraging and commuting at the site which included common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), brown long-eared (*Plecotus auritus*) and barbastelle (*Barbastella barbastellus*). The barbastelle is a priority species and an uncommon one whose presence is further indicative of the general high quality habitat of the Monkwood area. Its confirmed presence should raise a red flag, and alert surveyors to the need for more thorough (transect) surveys in peak season to

obtain a clearer idea of their numbers and activity across the site in view of the sheer scale of this solar proposal.

- 2.4 An activity survey was carried out on 26th May 2021. Four surveyors were used but it is now out of date of course.
- 2.6 The evening surveys commenced at least 15 minutes before sunset and lasted for at least two hours after sunset. Prior to sunset, bat detectors were tuned to below 30 kHz to listen for any potential pre-emergence social calls and noctules, which occasionally leave their roosts before sunset, tuning the detectors up to 45 kHz to pick up on general pipistrelle activity. Bat surveys should start 30 minutes before sunset.
- 2.10 Bats are mobile mammals which can move roost sites both within and between years. It is possible that surveys carried out in May might miss roosts occupied earlier or later in the year. A single survey in May of a transect has a risk of missing bat activity. Surveys through the optimal survey period (April to October) would be more appropriate.
- 4.11 It is recommended that any solar equipment which is located near hedgerows or trees should be placed in appropriate locations to ensure that there will be no impacts to bats. This is an important recommendation.
- 4.17 The current site is not well lit at night and therefore the development should serve to maintain the site's value for foraging bats and to minimise indirect impacts from any new lighting. This can be achieved by following accepted best practice (Institute of Ecology and Environmental Management 2006, Institute of Lighting Professionals 2018, Bat Conservation Trust, 2014). We agree with this.
- It is assumed the authors believed that the grasslands below and between the panels would be retained and thus there would be limited impact on the invertebrates on which the bats currently forage. However, it can reasonably be suggested that shaded grassland is likely to be less species-rich and not as attractive to pollinating or herbivorous insects. This may eventually by compensated by created species-rich grassland around the arrays but that will take years to establish in our experience.
- Appendix A — Bat Survey Map. It seems as if the surveyors were static. In our view, this survey really should be a transect survey to cover the whole site.

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Roosting, foraging and flight corridor impacts

This is from Bristol University recently:

Notes on bat activity and impacts of solar arrays by University of Bristol 8th August 2023

The activity level of six bat species was significantly reduced at solar photovoltaic panel sites, researchers have observed.
Their findings, published in *Journal of Applied Ecology*, have the potential to impact and inform planning legislation and policy so that the benefits of solar power are reaped without impacting wildlife.
Renewable technologies are important in meeting energy demands sustainably. This is of vital importance given the roles of fossil fuels in producing carbon dioxide, a

key driver of climate change. Renewable energy is growing at a rapid pace globally, with solar photovoltaic power providing about 30% of global renewable power, and having increased in amount by 25% in 2021.

Lead author Lizy Tinsley from the University of Bristol's School of Biological Sciences explained, "Renewable energies can have negative impacts on biodiversity and mitigation is essential to provide win-win solutions for energy suppliers and for wildlife."

To carry out their experiment, the team set up bat static monitoring equipment in a solar voltaic panel field, and a matched field without solar panels (control site).

Fields were matched in size, land use, and boundary feature (*e.g.* hedge, fence, stream), and a bat detector was placed in the middle and edge of both fields, totalling four recording locations, repeated across 19 separate sites. Field boundaries were selected as they are important navigation features for bats.

The data from the different echolocation calls at recording points were then analysed to identify the bat species and number of bat passes. They found that the activity level of common pipistrelle, noctule, myotis species, serotine, soprano pipistrelle and long-eared species was substantially lower at solar sites, compared to the paired control sites.

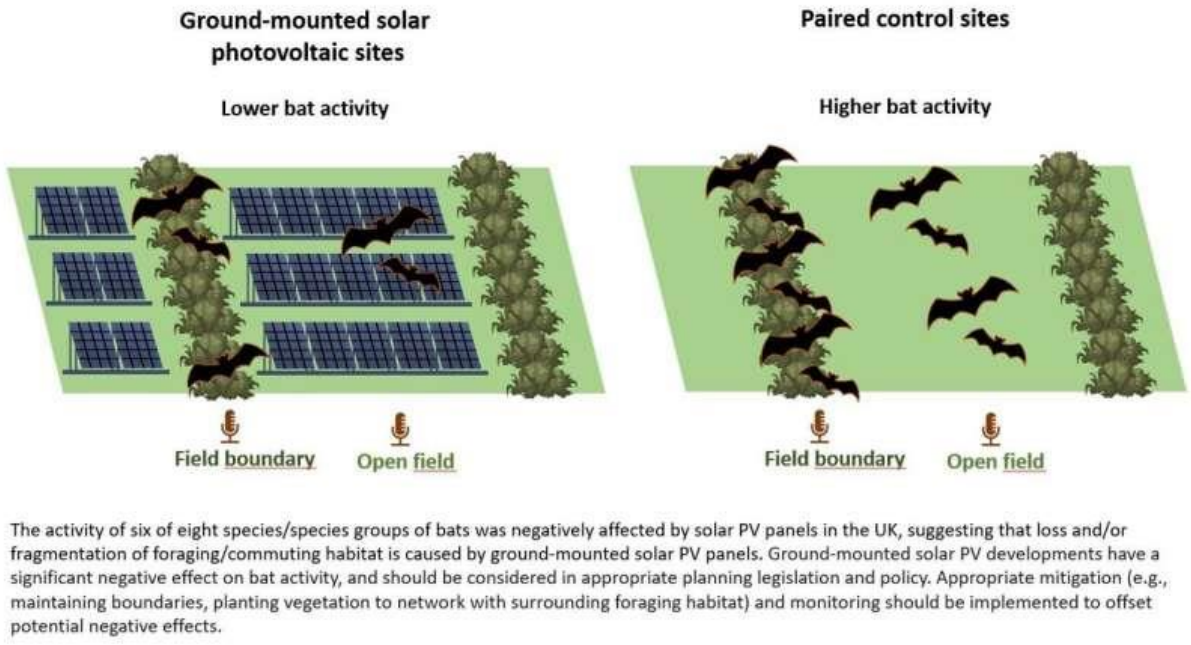

Illustration showing effect of solar panel installation on bat activity. Credit: Lizy Tinsley

Lizy said, "Due to the significant negative impact identified, solar [photovoltaic] developments should be screened in an Environmental Impact Assessment for ecological impacts so that appropriate mitigation be designed against the impacts, and monitoring undertaken. This has already been done with wind farms — where mortality of bats has been reduced by changing the wind speeds at which turbines become operational and by using acoustic deterrents, at minimal cost.

"Further research is required to assess bat behaviour at solar panel installations, and why it is causing the significant decrease of certain species at the site. Is it the loss

of suitable habitat that reduces activity? Are they fewer insect prey available, and are bats at risk of collisions with panels?

"It will be important to identify mitigation strategies that can benefit bats at solar panel installations, such as planting insect-friendly plants, providing corridors to insect-rich habitats, or providing suitable alternative foraging habitats such as trees. Mitigation strategies can potentially mean that renewable energy can be provided while simultaneously having no detriment to wildlife. Such mitigation will be critical in reaping the undoubted benefits for climate change that can be provided by renewable energy."

Co-author Professor Gareth Jones added, "This is novel research, as the impacts of solar panel installations on wildlife are currently little understood, with no evidence regarding their effects on bats, which can provide valuable ecosystem services such as the suppression of pest insect populations.
"The situation is potentially of concern as solar arrays are occupying increasing areas of suitable foraging area for bats, and we already know that bats can collide with vertical flat surfaces, and can mistake flat surfaces for water, and attempt to drink from them. Very little is known on the impacts of solar arrays on bat, particularly in the UK."

The team now plan to look at the differences in invertebrate species richness and abundance between the paired sites.

More information: Renewable energies and biodiversity: impact of ground-mounted solar photovoltaic sites on bat activity, *Journal of Applied Ecology* (2023)[6].

https://phys.org/news/2023-08-solar-farm-sites.html?fbclid=IwAR0Ap2ORVitFIXgFPFDmpk_-7T-7_fV7C6SYEPUFl8Sy-cJoTHoreHgPxYk

Further comment on the the Ecological Enhancement, Mitigation and Management Plan (Phlorum October 2022)

Otters

Please note that a local resident has video footage of otters living on/in a nearby pond for over a year. They use the streams as a highway to connect to their main thoroughfare, the rivers of Worcestershire. The statement in 3.30 that "Overall, it was considered that the site offered negligible potential to support breeding otters and low potential to support commuting otters." Can reasonably be questioned.

Badgers

There is a significant population in the area as the report suggests. It is a little surprising that only one sett was found, albeit a large main sett, as we would expect there to be subsidiary and outlier setts. That all the abutting area of north-eastern Monkwood could not be searched is not surprising, though. I (Dr Betts) was also

[6] Tinsley, E. *et alii* (2023). Renewable energies and biodiversity: Impact of ground-mounted solar photovoltaic sites on bat activity. *Journal of Applied Ecology* DOI: 10.1111/1365-2664.14474.

aware of a sett in that area years ago which may be the one referred to in the report's paragraph 3.7. I explored the wood on September 18th, but as the author suggested, it is now extremely dense, overgrown and largely impenetrable away from the main bridleway and the few paths there still are. There are dozens of mammal tracks but I could not locate any sett or confirm any badger signs. It can be easier after a fresh snowfall as the paw prints are then obvious but my search in the current season did not reveal prints, scratching posts or latrines.

Whilst a 30m distance between a sett and disturbance may be a rule of thumb regarding the need for a licence, the law says that a badger or badgers must not be disturbed in their sett. Some heavy, vibration-generating ground works such as piling could well disturb badgers more than 30m away and such sources should be considered when assessing licence needs.

We note the remarks about fencing and its proposed badger gates but if high security fence is prescribed (Point 5 of main text), these remarks will not hold.

Skylarks

Local residents have said the site is ideal for skylarks. Two skylark plots would be created as part of the Solar Power Station scheme at appropriate locations. It should be noted that there may be other ground-nesting birds using, or which would use, the site, although the Appellants state (in 3.17 of the Ecological Enhancement, Mitigation and Management Plan) that "*…although it was considered the grazed semi-improved fields only offers* [sic] *low potential for farmland ground nesting birds such as skylarks*." It has not been possible to research this independently in the time available for this Statement or any impact a solar power station would have on them. That is another candidate area for further investigation in a more comprehensive Ecological Impact Assessment that is so necessary for a project of this scale.