

Notes on Ecology aspects of Green Hill Solar plans

Main points are taken from the following sources –

- 1) Comments made by [REDACTED], Conservation Officer, Wildlife Trusts Bedfordshire, Cambridgeshire and Northamptonshire – see **APPENDIX A**
- 2) Letter from Gwent Wildlife Trust CEO and Friends of Gwent Levels Chairmen to the Minister for Climate Change in the Welsh Government, including post-construction monitoring results for Llanwern Solar Farm, Gwent Levels – see extract in **APPENDIX B**
- 3) Relevant GHS DCO documentation
- 4) North Northamptonshire Council – Local Nature Recovery Strategy
- 5) E. Tinsley et al, Renewable energies and biodiversity: Impact of ground-mounted solar photovoltaic sites on bat activity. Journal of Applied Ecology 2023; 60

Upper Nene Valley Gravel Pits

Some of the gravel pits along the Nene Valley have been classified as a Special Protection Area and RAMSAR site of international importance for overwintering wetland birds. The designated gravel pits form a chain in the Nene valley and are just downstream of the proposed BESS site for Green Hill Solar. It hosts major overwintering bird assemblages with over 20,000 wildfowl and wading birds including bittern, gadwall, golden plover and lapwing. These species do not just use the Special Protection Area, and therefore land within 10km of it can be functionally linked to it. This Functionally Linked Land (FLL) is used for feeding and foraging, most notably by golden plover and lapwing. Nearly all the Green Hill Solar sites are within this 10 km radius, except A and A2.

Apparently, which fields are used by these overwintering birds will vary from year to year, according to conditions. Two winters of surveys have now been conducted by GHS at most sites. GHS notes in their Ecology and Biodiversity document, paragraph 9.9.7, **that loss of fields identified as**

FLL could have a significant adverse effect on the populations of golden plover and lapwing associated with the SPA, and that this would be significant at INTERNATIONAL level given the designation.

GHS identified fields BF3 and EF25 as used by significant numbers of golden plover. They also identified other fields as likely FFL; these were FF1, FF11, FF13 and FF15. However, they only intend to retain EF25 (managed as grassland) and FF13 (flower meadow) out of these 6 identified fields; the others will be used for PV panels. They state they will substitute field BF1 for BF3 and that they are almost identical in size, but offer no rationale for the swap. **However, if the golden plover had conditions they wanted in BF1, wouldn't they already be using it?** Their sightlines for predators, and lack of disturbance are important – these may not be so satisfactory for them. Green Hill Solar also say that they are putting aside a total of 75 hectares for precautionary mitigation across the sites, against the 44 hectares they are covering with PV panels in the possibly linked fields.

Evidence from post-construction monitoring at the Gwent Levels showed that areas designated for mitigation for lapwing, one of them off-site, but still adjacent to solar panels, were not used by the birds for breeding by Years 2 and 3 post-construction. Overall numbers had reduced from 8 breeding pairs to 2. So there is some evidence that so-called mitigation cannot be presumed to be a satisfactory replacement. We should presume the precautionary principle, so that when it is not certain if the mitigation will achieve it's aim, there should not be use of FLL. Also, in any habitats created, the measures used to mitigate for the loss will take time to establish, and therefore cannot provide continuity locally.

North Northamptonshire Council published it's Local Nature Recovery Strategy in 2025. It's Practical Actions include:

009A Increase area of land managed for priority birds, including Lapwing and Golden Plover across suitable habitat within 10km of the Upper Nene Valley Gravel Pits

009B Within those already identified and mapped areas of suitable habitat for Lapwing and Golden Plover, the land will be principally managed to support these qualifying species. (identified and mapped areas based on evidence of bird record locations and habitat types, this does not preclude other areas that may need to be surveyed further).

Significant other risks to the Upper Nene Gravel Pits wildlife are the potential for contamination from the proposed BESS installation, and the fact that the water drainage from Sites C, D, E, F and G, on either side of the Nene Valley, will enter the River Nene into or upstream from the internationally important wildlife site. This could also carry waterborne pollutants, and although it is acknowledged that the Gwent Levels are a different area physically and ecologically, being created by man-made drainage of marshland with ditches and reens, the evidence from the Gwent Levels post-construction monitoring is very pertinent and disturbing. For example, very high levels of petroleum hydrocarbons were recorded inside the solar farm site, up to 230 micrograms per litre from 10 mcg/l pre-construction. These are very damaging pollutants affecting aquatic invertebrates and plants.

Effects on flora

Gwent levels findings post-construction include that of **severe damage to the flora by the construction process. The ground appeared compacted and the panels have large areas of bare earth under and around them**, with brambles taking over (previously grazing marsh habitat). In the GHS Outline Landscape and Ecological Management Plan, diverse meadow creation is proposed beneath panels. In Chapter 4.6.20, management during the first year is stated to be critical to tackle annual or agricultural plants and injurious weeds. Use of herbicides may be necessary, and late season haycuts or grazing by sheep is proposed. This seems at odds with the proposed PV panel size and probable tracking, 4.5 metres, as this would create vast areas where very little light is likely to penetrate, leading to bare earth. At the Llanwern Solar Farm, the panels are stated to be 2 – 3 metres tall and non-tracking, yet have proven bare earth underneath.

Effects on bat populations

It is not known or understood how populations of bat species are affected by the presence of large areas of PV panels, whether echolocation is impaired, whether the presence of insects is decreased around PV arrays, whether electromagnetic fields produced by inverters and other equipment is a problem, or whether the noise emitted by the

transformers, substations, BESS and tracking panels has an impact. It is known that bats can collide with vertical flat surfaces and can mistake flat surfaces for water. However, there is increasing evidence that bat populations are severely compromised by solar installations.

A recent study (2023) from the University of Bristol in the Journal of Applied Ecology studied 19 solar farm sites and compared them to control sites and found that bat activity was significantly affected by solar installations. They found “The activity of six of eight species/species groups analysed was negatively affected by solar PV panels, suggesting that loss and/or fragmentation of foraging/commuting habitat is caused by ground mounted solar PV panels”. Bat activity in the centre of the solar arrays was reduced by up to 87%. They conclude: “Ground-mounted solar photovoltaic developments have a significant negative effect on bat activity, and should be considered in appropriate planning legislation and policy”.

Post-construction monitoring on the Gwent Levels found that **the diversity of bat species decreased markedly, and for the majority of locations, abundance of species has dropped dramatically (95 – 100%).**

Green Hill Solar Environmental Statement Chapter 9, Ecology and Biodiversity, shows that information relating to bats has been obtained by desk surveys and static detectors. At least 9 species have been identified across the sites. These include the Barbastelle, which was recorded across the proposed development land, but particularly Sites F and G, and they state that the **‘barbastelle is a rare species, for which notable levels of activity was recorded’**. In their Environmental Statement Appendix 9.6, Table 6 indicates that the Barbastelle bat has an estimated UK population of only approximately 5000, with a declining population trend, and is classified as Vulnerable by the International Union for the Conservation of Nature. This is defined as **‘a species at a high risk of extinction in the wild due to factors like habitat loss and human threats’**. All bat species are European Protected Species, with the barbastelle bat being listed as one of Principal importance.

Other findings include that ‘The higher activity levels observed at Green Hill BESS and Green Hill F may be associated with habitat suitability at these locations. Green Hill BESS is situated near ponds and lakes associated

with the Upper Nene Valley Gravel Pits, which likely provide abundant foraging opportunities for a variety of bat species.'

The Bat Survey summary of Appendix 9.6, states that **'The overall bat assemblage score for the Survey Area falls between 17 and 26, indicating an assemblage of between Regional to National importance.'**

It should then be clear that there are confirmed to be rich populations of diverse bat species on all the GHS Sites and BESS, and that the only evidence available at present is that bats can be severely affected by solar farm installations. Therefore the required precautionary principle should be applied, and development not permitted where these protected bat species have been identified, with particular concern for the rare Barbastelle.

Bats are protected in law by the Wildlife and Conservation Act 1971 (amended) and the Conservation of Habitats and Species Regulations 2017:

"It is an offence under the Conservation of Habitats and Species Regulations 2017 (para 43 2a) to affect significantly the local distribution or abundance of bat species, and to cause any disturbance which affects a bats ability to survive, breed, rear young, hibernate or migrate. A bat's ability to survive is heavily dependent on reaching and feeding at foraging areas in safety and free from predation, and also on an abundant food supply."

Skylarks, other ground-nesting birds and Red listed birds of Conservation Concern

Ground-nesting birds such as skylarks, lapwing and quail, need long sightlines to enable them to protect their nests from predators. It is acknowledged by GHS that they will be significantly adversely affected by the development. The breeding bird assemblage associated with open arable fields found across all the sites is noted to be of County importance because of the diversity and abundance. Green Hill Site A supports the densest number of skylark territories, and they state that quail are possibly breeding within Site A too. However, the mitigation offered is only 2 fields out of > 20. Despite the fact that Skylark are on the Red List of

Conservation Concern because of their marked decline, reduction of about 50% in 40 years, GHS state that this is only of local importance.

The DCO documentation shows that there are **many other birds on the Red List of Conservation Concern within the GHS proposed development sites**. These include (but not limited to): linnet, redpoll, yellowhammer, grey partridge, dunnoek, song thrush, barn owl, redwing and fieldfare.

The decline of these protected Species of Principal Importance will be exacerbated by this development contrary to the Natural Environment and Rural Communities Act 2006 (section 40), updated to Environment Act 2021 which states:

“Development which would have an adverse impact on species protected by legislation, or subsequent legislation, will not be permitted unless there is no alternative”.

Extensive linear habitats along cabling routes have not been surveyed

GHS state in their documentation that they assume that the ecology of the cabling routes will be similar to the surveyed sites A – G, and so have not commissioned any ecological studies of what amounts to a considerable land area. **This is a very large assumption that should be challenged by the Planning Inspectors**. They will likely differ because of their potential to be joining up areas and forming wildlife corridors, for example alongside the A43. These habitats are of considerable importance ecologically because they cross or run across/near hedgerows, verges, paths, wildlife corridors, ditches/water courses, trees and their root zones, and will therefore be likely to have substantial potential adverse ecological impacts. So it is essential that all ecological surveys necessary for any secure planning decision are commissioned and carried out.

Other points

Schedule 1 birds of the Wildlife and Countryside Act 1981 (amended) require additional protection from disturbance when nesting. These include many species found across the GHS sites, including barn owl, Cetti's warbler, fieldfare, hobby, kingfisher, osprey, peregrine, redwing

and red kite. As the whereabouts of nests cannot be always known, how can protection be given from noise as well as disturbance from March to August, across many areas of all the sites? It is understood that there is an osprey nest on one site, but details are redacted so specific comment cannot be made.

Concerns have been raised about the **timing of areas of hedgerow removal and possible hedgerow translocation.** Apparently there are contradictory remarks due to prevention of harm to nesting birds from March to August, as opposed to protection for hibernating reptiles and amphibians during the winter months.

There is no apparent consideration of the **‘heat island’ effect of solar arrays** – which may raise local temperatures by 3 – 4 degrees Celsius, which would stress plants and wildlife, and lead to unintended and unwanted effects.

There is no apparent consideration of the impact on wildlife of the Noise and Vibration of Construction, Operation, Maintenance and Decommissioning in the GHS documentation. The Environmental Statement Ch.14, Noise and Vibration refers to sensitive receptors as human only. The effect of construction noise (especially pile driving) and operational noise (especially battery unit cooling fans) have not been studied but are likely to influence a wide range of wildlife.

It is unclear in the Outline Landscape and Ecological Management Plan, where the responsibilities will lie for the ongoing management of the all the associated works required, for example, cutting under panels, hedgerow cutting, management of new wild flower meadows, grasslands etc, replacing any dead planting for screening. At the public consultation, it was stated that this would be by the landowners, but if so, who would performance manage and monitor that it was conducted as planned and required? And as Island Green Power are planning to have rights of compulsory purchase over all the land within the sites (not cabling routes), if these are exercised, who will then manage this aspect?

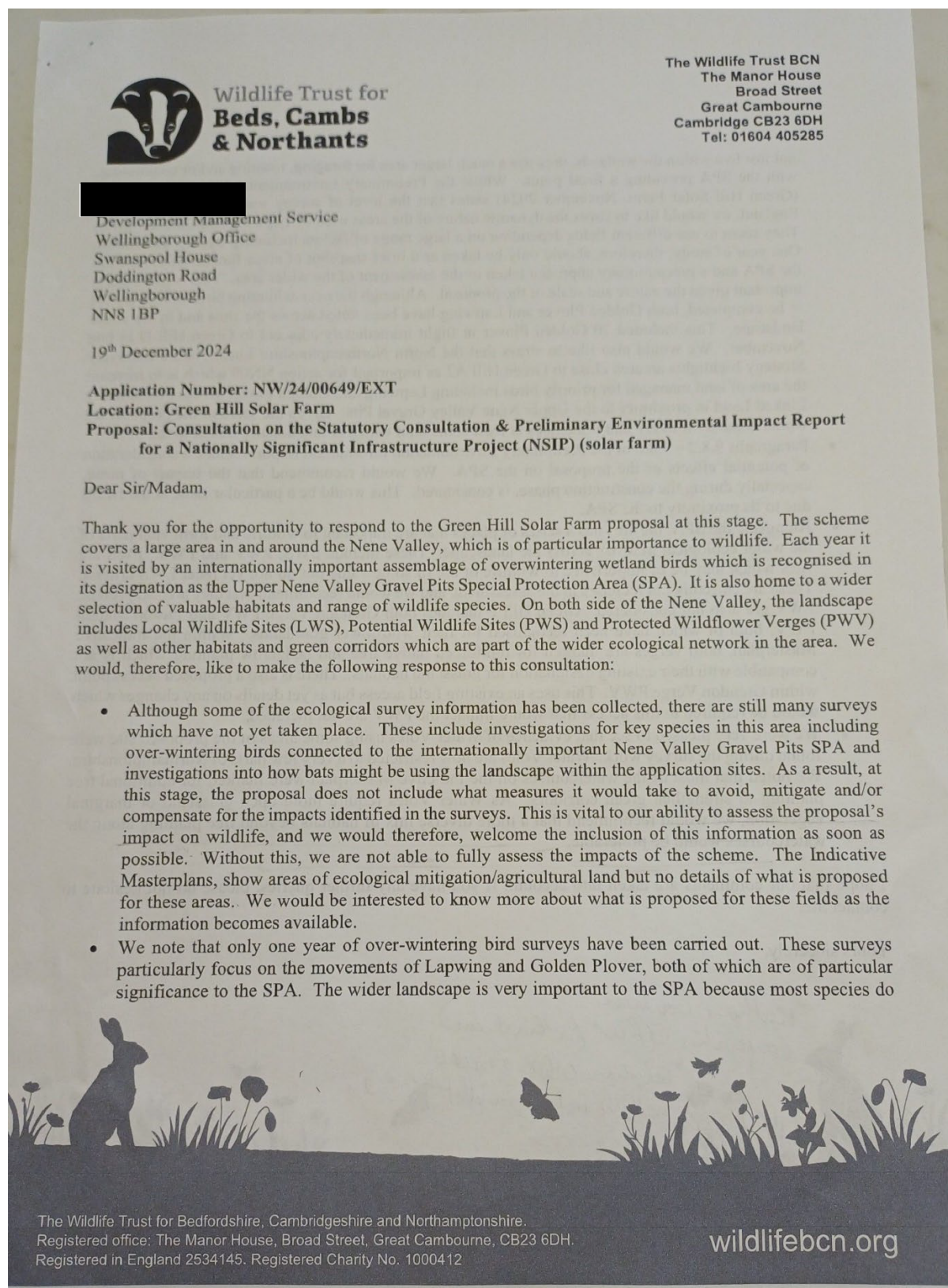
Report prepared by Dr. Linda Twohey, MA MB BS FRCA FFICM, October 2025.

I am not an ecologist. I am retired medical doctor, with a lifelong interest in wildlife, concerned to try to ensure that Ecological matters in the Green Hill Solar proposed development are addressed thoroughly.

APPENDIX A – Comments from Katharine Banham, Wildlife Trusts BCN

With reference to the PEIR during Statutory Consultation:

Photographs of letter to North Northamptonshire Council, December 2024

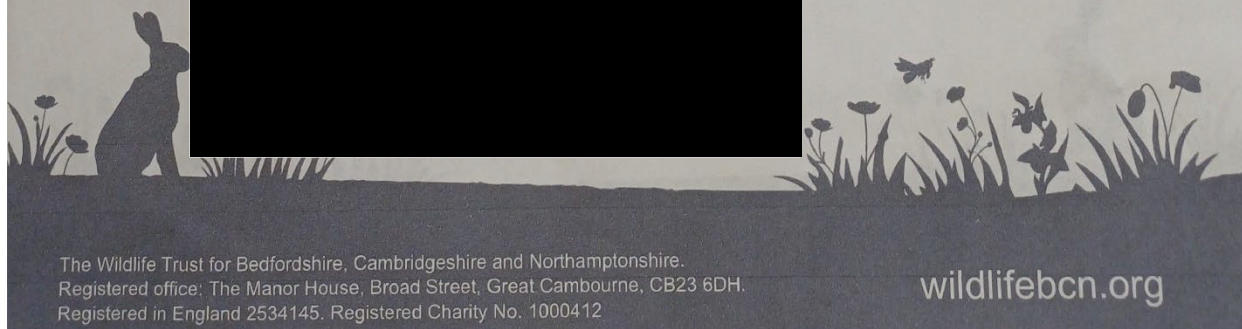
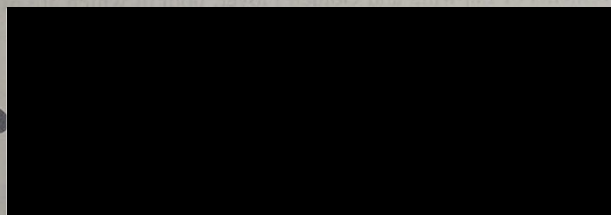


not just live within the wetlands, they use a much larger area for foraging, roosting and/or commuting, with the SPA providing a focal point. Whilst the Preliminary Environmental Information Report (Green Hill Solar Farm, November 2024) states that the level of survey was agreed with Natural England, we would like to stress the dynamic nature of the areas used by Lapwing and Golden Plover. They seem to use different fields depending on a large range of factors including weather conditions. One year of study, therefore, should only be taken as a brief snapshot of areas functionally linked to the SPA and a precautionary approach taken to the assessment of the wider area. This is particularly important given the nature and scale of the proposal. Although the over-wintering bird surveys are yet to be completed, both Golden Plover and Lapwing have been noted across the sites and in the wider landscape. This included 70 Golden Plover in flight immediately adjacent to Green Hill D in late November. We would also like to stress that the North Northamptonshire Local Nature Recovery Strategy highlights an area close to Green Hill A2 as important for action NN09 which is to increase the area of land managed for priority birds including Lapwing and Golden Plover across Functionally Linked Land in proximity to the Upper Nene Valley Gravel Pits. Given the scale of the proposal we would consider it likely that it includes at least some land which is functionally linked to the SPA.

- Paragraphs 9.8.2 – 9.8.8 of the Preliminary Environmental Information Report include a consideration of potential effects of the proposal on the SPA. We would recommend that the impact of noise, especially during the construction phase, is considered. This would be a particular issue at the BESS due to its proximity to the SPA.
- Alongside the SPA, the area has a series of places that are important to wildlife and form vital parts of the wider ecological network across the landscape. These include LWS, PWV and PWS. PWS are sites which may be of importance to wildlife or are of some value but do not yet meet LWS criteria. These are currently not included in the assessment, and we would recommend that they are. At present, PWV are also not considered. Green Hill F includes both Grendon Verge PWV and Easton Maudit PWV, both of which have been recognised for their wildflower grasslands. Within the Indicative Masterplan, both verges are marked for reinforced native tree and hedgerow planting which is not compatible with their existing designation for grassland habitats. There is also a proposed access point within Grendon Verge PWV. This uses an existing field access but as yet details on any changes which would be required to this access that would impact the PWV are not included.
- We were very pleased to see that evidence of Water Voles using some areas of the proposed site were found during the survey work. Water Voles are now restricted to a very few parts of Northamptonshire. We noted that most of the watercourses on the Indicative Masterplan were marked for additional tree planting to strengthen green corridors. As Water Voles require more open grassland or marginal vegetation, we would recommend that a more diverse mix of habitats beyond tree planting along the watercourses would be preferable.

I hope that our comments are taken into account. If you have any further queries, please do not hesitate to contact me.

Yours sincerely,



With reference to the DCO Ecology documentation, August 2025

- *Land which is Functionally Linked to the Upper Nene Valley Gravel Pits Special Protection Area (SPA).* A series of lakes along the Nene Valley is classified as an SPA in recognition of their international

importance to over-wintering water birds. Some of these, particularly Lapwing and Golden Plover, spend significant time on land around the SPA which is described as ‘functionally linked’ to it. That means the birds need these areas for the SPA to support their populations. The application does now include two winters of over-wintering bird surveys on most (but not all) of the sites. This is an improvement as we’ve repeatedly flagged up that one winter was not enough as the bird’s behaviour is very dynamic. As a result, areas of functionally linked land have been identified and areas of mitigation proposed. At Greenhill G, however, only three survey visits have been completed (less than one year), and I’m concerned that they may have been conducted at a similar time to archaeological investigations which could have created disturbance making it less likely the birds would use those fields than normal. Archaeological surveys are listed as a limitation in the report. This is important as Greenhill G has quite dense areas of solar panels. Both Lapwing and Golden Plover like open landscapes so they are unlikely to use areas around solar arrays. In Greenhill G no Golden Plover were recorded and Lapwing were only seen flying over. Similar impacts of archaeological investigations may be present in areas of Greenhill F and Greenhill C, although it is more difficult to tell. As none of Greenhill G was noted as functionally linked to the SPA it has no mitigation for over-wintering birds. In my opinion, more survey effort (without the archaeological work going on) is required here.

- *Local Wildlife Sites.* These are places that are recognised for their importance to wildlife locally when assessed against a set of criteria by a panel of local experts. They are not legally protected (unfortunately) but do receive some recognition in the planning system. In response to previous submissions the area of Grendon Lakes Local Wildlife Site (LWS) which was included within the proposal at Greenhill BESS has been removed, however, part of Earls Barton Meadow LWS is on the cable route. The application states that it will be avoided if possible and if not, then horizontal direct drilling will be used to cross it and not trenching. LWS not only contain important habitats and species, they also form a vital part of wider ecological networks across the county. We, therefore, would be very concerned about any habitat loss within the LWS.

With reference to DCO 7.5 Outline Ecological Protection Mitigation Strategy, September 2025:

In general, most of the measures seem fairly standard, for example, the use of toolbox talks, fencing etc. There were some measures, like checking for flocks of overwintering birds when works moved to a new field, that I don't see very often and seem sensible. I was also pleased to see the use of an Ecological Clerk of Works and updated badger surveys before works commenced as their behaviour can be quite dynamic, especially in a changing landscape. Having said that, as with all these things, writing about it is different from doing it and it is such a big project but the details do matter, most of which would come at a later stage after permission was granted. There does seem to be an issue with the timing of proposed hedgerow removal. Paragraph 6.2.2 advises that habitat removal including hedgerows should take place from March to October to avoid harm to reptiles and amphibians in hibernation but then paragraph 6.4.1 states there would be no hedgerow removal between March and August inclusive to prevent harm to nesting birds. I also thought that the idea of translocating hedgerows was an interesting one, but it would be agreed by the Ecological Clerk of Works and only at appropriate times so may never happen! It's likely that any translocated plants would also need some aftercare e.g. watering if it's dry, until they re-establish.

In terms of mitigation in general, it is such a big scheme that it is tricky to drill down to the details which would make any mitigation plan successful or not. Quite a bit of the mitigation land is linked together along water courses or other existing features. Where I'm more concerned is where ecological features may have been missed. The overwintering bird surveys at areas C, F and particularly G may not have picked up the presence of functionally linked land (as explained further in my email on 22nd September) so there isn't mitigation. Also, in any habitats where mitigation is required the measures used to mitigate for the loss nearly also take time to establish, in some cases many years.

APPENDIX B - Extract from Letter re: Gwent Levels

Results of Post-Construction Monitoring at Llanwern Solar Farm show pollution and biodiversity loss

Pollution:

The post-construction monitoring report for the Llanwern solar farm shows that levels of several waterborne pollutants arising from the constructed solar farm have risen hugely since construction. For example, the pre construction levels of suspended solids (silt) inside the development site were up to 7.4 million µg / litre respectively, compared with pre-construction sample levels of a maximum of 0.53 million µg / litre. Thus, the levels of this damaging pollutant produced by the solar farm were over 14 times higher than pre-construction levels.

Very high levels of total petroleum hydrocarbons TPHCWG (a very damaging pollutant adversely affecting the aquatic invertebrate and plant citation interest of the SSSI) were recorded inside the solar farm site, at 230 µg / litre, compared with a pre-construction level on the site of less than 10 µg / litre.

Even these very high levels of pollutants caused by the solar farm may be underestimates, because other pollutants, for example Nitrite as N and Nitrite as N02, were recorded at very much higher levels post construction compared with pre-construction, but no NRW concern trigger level exists. It is important to stress that the wildlife interest of the SSSI is wholly dependent on a very high quality of water in the reens and ditches.

Biodiversity Loss:

No breeding lapwings used the “Lapwing Mitigation (really compensation) Area”. Numbers of breeding lapwings fell from eight pairs pre-construction to two pairs post-construction, with only one nest found on site. Lapwing are a red list species with numbers dropping by 80% in Wales in the last fifty years.

A breeding pair of cranes was lost from the site. This is a species which had not bred in Wales for over 400 years. The return of these cranes a few years ago was marked as a success story for the Levels. Cranes as a species are making a slight recovery but the Llanwern development appears to have done the very opposite of assisting their recovery.

The diversity of bat species decreased markedly, and for the majority of locations, abundance of species has dropped dramatically (95- 100%).

The flora on the site has been severely damaged by the construction process and there is no evidence of any attempts to mitigate against this. The ground appears compacted and the panels have large areas of bare earth under and around them, with brambles starting to take over the area, in stark contrast to the grazing marsh habitat of the site before construction.

It should be stressed that this is merely a snapshot of the damage caused to the SSSI, and that further damage is likely to manifest itself as the years go by.

Please also see separate document entitled **Gwent Levels Post Construction Monitoring – part of the evidence base required for the Gwent Levels Future Wales: Policy 9 Project**, conducted by ARUP on behalf of the Welsh Government.