argus ecology

Peel Environmental Management (UK) Ltd. / Bilsthorpe Waste Ltd.

Public Inquiry into the proposed development of Bilsthorpe Energy Centre

Appendices to Proof of Evidence on matters relating to ecology and nature conservation

Kevin Honour MSc MCIEEM

Final version 1.0, 01 October 2015

Unit 14 The Greenhouse Greencroft Industrial Park
Annfield Plain County Durham DH9 7XN
T: 01207 524859 F: 01207 524895 www.argusecology.co.uk

Contents

Figures

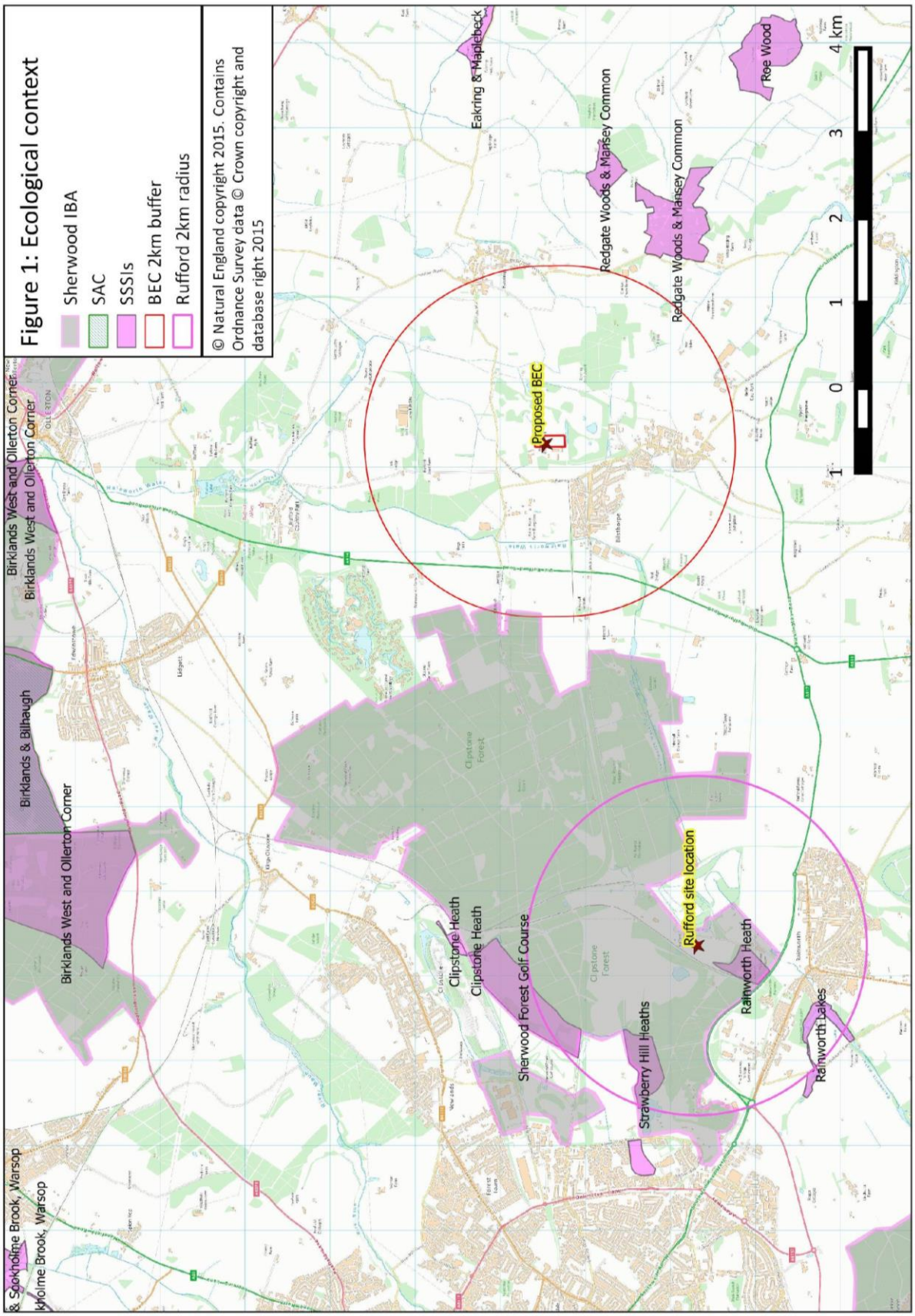


Figure 1: Ecological context
Sherwood IBA
SAC
SSSIs
BEC 2km buffer
Rufford 2km radius
© Natural England copyright 2015. Contains Ordnance Survey data © Crown copyright and database right 2015
Proposed BEC
Rufford site location
Birklands West and Ollerton Corner
Birklands & Bilhaugh
Clipstone Heath
Sherwood Forest Golf Course
Strawberry Hill Heaths
Rainworth Heath
Rainworth Lakes
Redgate Woods & Marsey Common
Eakring & Maplebeck
Roe Wood
Clipstone Forest
0 1 2 3 4 km

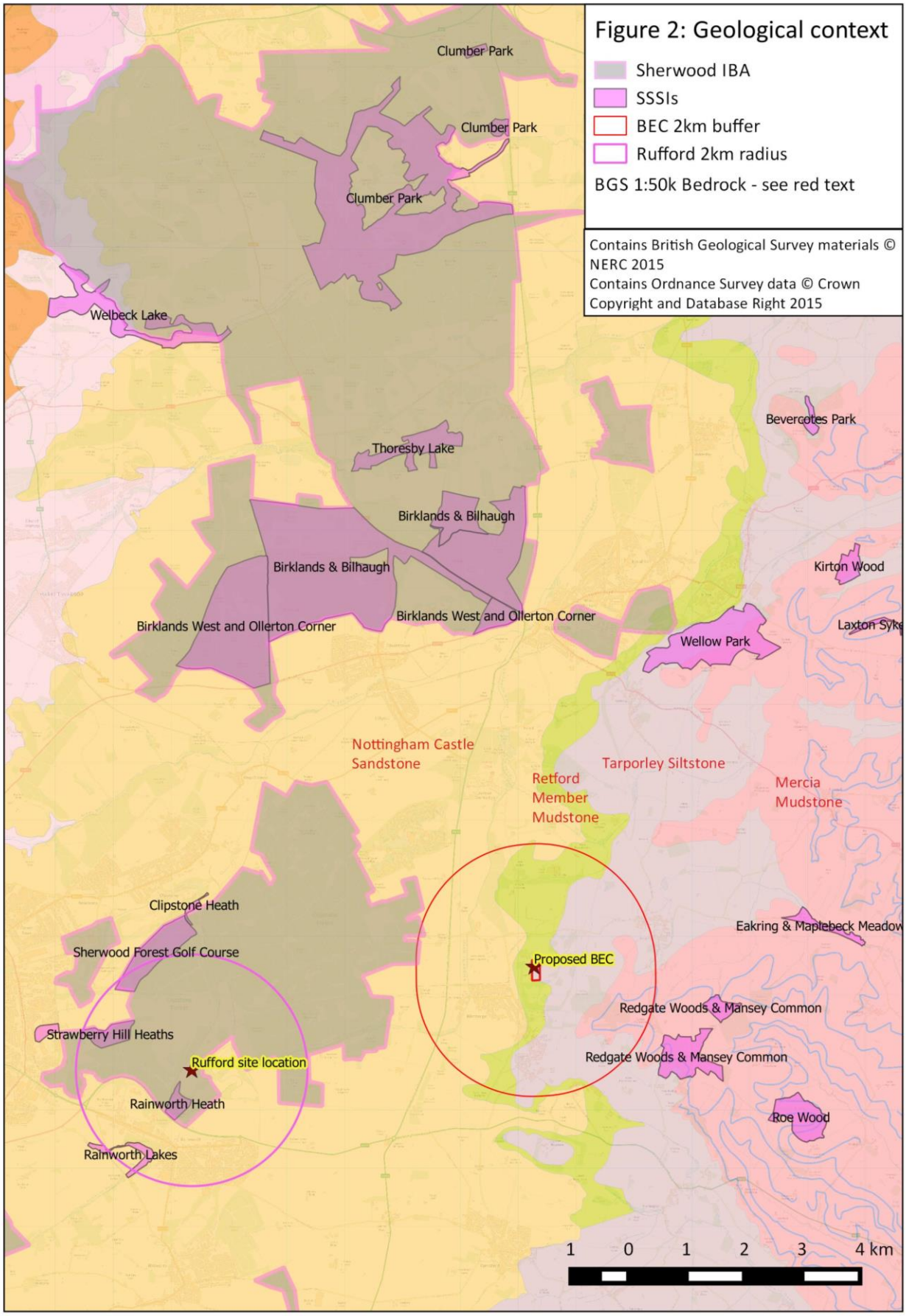


Figure 2: Geological context
Sherwood IBA
SSSIs
BEC 2km buffer
Rufford 2km radius
BGS 1:50k Bedrock - see red text
Contains British Geological Survey materials © NERC 2015
Contains Ordnance Survey data © Crown Copyright and Database Right 2015
Clumber Park
Clumber Park
Clumber Park
Welbeck Lake
Thoresby Lake
Birklands & Bilhaugh
Birklands & Bilhaugh
Birklands West and Ollerton Corner
Birklands West and Ollerton Corner
Bevercotes Park
Kirton Wood
Wellow Park
Nottingham Castle Sandstone
Tarporley Siltstone
Retford Member Mudstone
Mercia Mudstone
Clipstone Heath
Sherwood Forest Golf Course
Proposed BEC
Eakring & Maplebeck Meadow
Redgate Woods & Mansey Common
Redgate Woods & Mansey Common
Strawberry Hill Heaths
Rufford site location
Rainworth Heath
Rainworth Lakes
Roe Wood
1 0 1 2 3 4 km

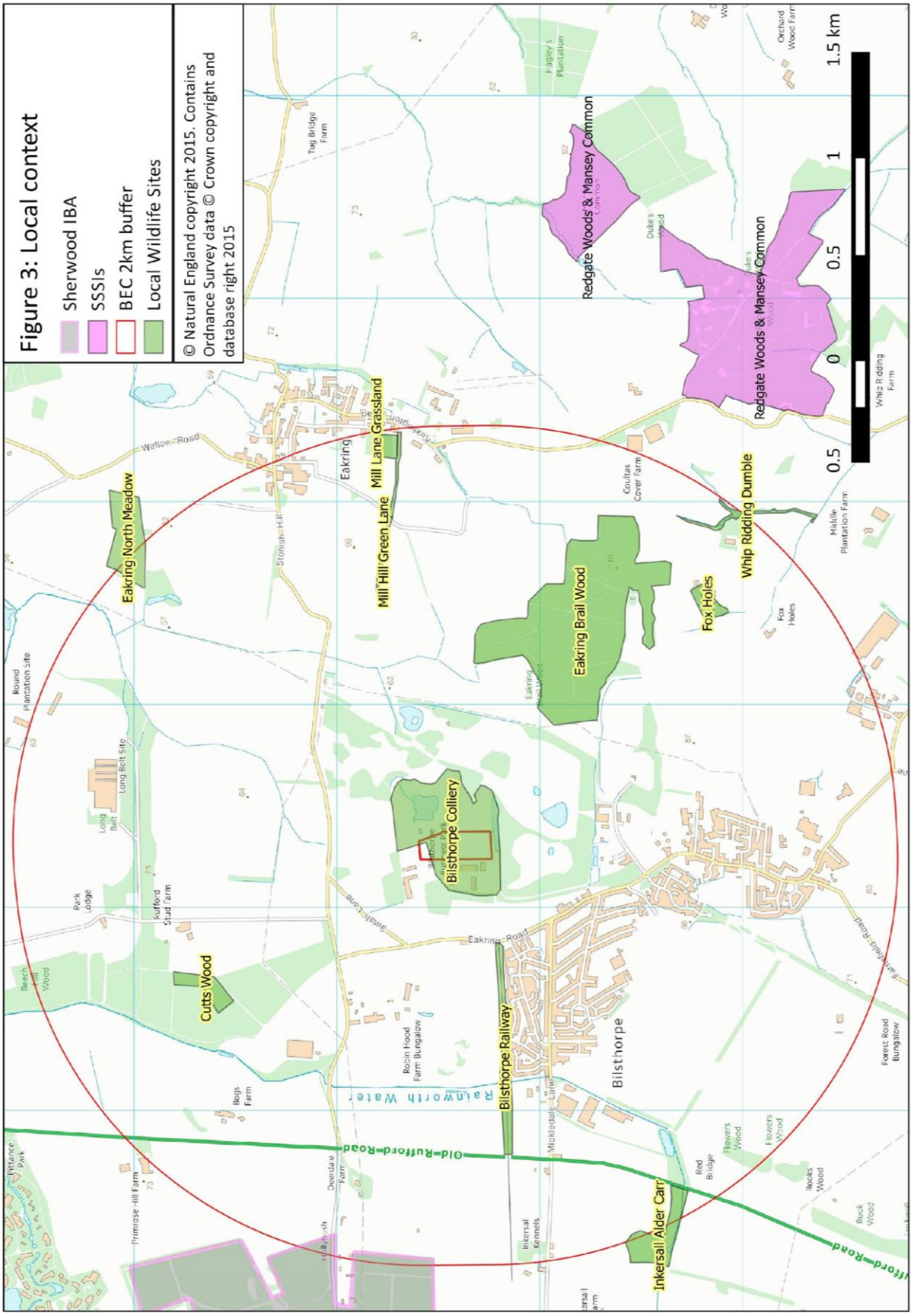


Figure 3: Local context
Sherwood IBA
SSSIs
BEC 2km buffer
Local Wildlife Sites
© Natural England copyright 2015. Contains Ordnance Survey data © Crown copyright and database right 2015
Eakring North Meadow
Mill Hill Green Lane
Mill Lane Grassland
Redgate Woods & Mansey Common
Redgate Woods & Mansey Common
Whip Ridding Dumble
Eakring Brail Wood
Fox Holes
Bilsthorpe Colliery
Cutts Wood
Bilsthorpe Railway
Inkersall Alder Carr
Old Rufford Road
Eakring Road
Wellow Road
Bilsthorpe
Rainworth Water
0.5
0
0.5
1
1.5 km


Figure 4: Bilsthorpe Colliery 1999
Proposed BEC site
Local Wildlife Site boundaries
Aerial photography © Getmapping plc
Contains Ordnance Survey data © Crown Copyright and Database Right 2015
Bilsthorpe Colliery
Eakring Brail Wood


Figure 5: Bilsthorpe Colliery 2013
Proposed BEC site
Local Wildlife Site boundaries
RGB Aerial Photography - ©Bluesky International Limited
Contains Ordnance Survey data © Crown Copyright and Database Right 2015
Bilsthorpe Colliery
Solar Farm site
Eakring Brail Wood

Advice Note to Local Planning Authorities regarding the consideration of likely effects on the breeding population of nightjar and woodlark in the Sherwood Forest region

March 2014

This advice note updates and replaces the previous note dated 5 September 2012 to reflect the introduction of the National Planning Policy Framework ('NPPF') and amendments to the Conservation of Habitats and Species Regulations 2010 ('the Habitats Regulations').

Summary

While no conclusion has yet been reached about the possible future classification of parts of Sherwood Forest as a Special Protection Area (SPA) for its breeding bird (nightjar and woodlark) interest, Natural England advise those affected Local Planning Authorities (LPAs) to be mindful of the Secretary of State's decision in 2011, following Public Inquiry, to refuse to grant planning permission for an Energy Recovery Facility at Rainworth where the potential impacts on these birds and their supporting habitats was given significant weight.

In light of this decision we therefore recommend a precautionary approach should be adopted by LPAs which ensures that reasonable and proportionate steps have been taken in order to avoid or minimise, as far as possible, any potential adverse effects from development on the breeding populations of nightjar and woodlark in the Sherwood Forest area. This will help to ensure that any future need to comply with the provisions of the 2010 Regulations is met with a robust set of measures already in place.

This Advice Note provides a brief explanation of the background to the current situation and suggests a 'risk-based' approach that could be followed to help future-proof decision-making on plans and projects. In addition a summary of the current LPA statutory duties in relation to birds is provided for clarity and there are links to further information relating to the legislation and policy that affects SPAs. The document is set out as follows:

- **Background – including reference to planning case law**
- **Current situation**
- **The recommended 'risk-based' approach**
- **Existing statutory duties relevant to birds**
- **Further information**
- **Map highlighting the areas of greatest ornithological interest for breeding nightjar and woodlark**

Background – the possibility of a protected area (Special Protection Area) for nightjar and woodlark in Sherwood and Rufford Energy Recovery Facility planning case law

The UK government is required by European law to identify how it can contribute to the conservation of particular bird species across their natural range in Europe through the protection of suitable sites. In doing this exercise it has identified that the populations of nightjar and woodlark in Sherwood may warrant such protection. A final decision has not been made and it remains under consideration as part of a UK-wide SPA Review Programme being led by the Joint Nature Conservation Committee[1]. The possibility of the area becoming an SPA creates a risk for spatial planning in the Sherwood area. This is because any formalisation of the site as a Special Protection Area (SPA) would place a legal

[1]See http://archive.defra.gov.uk/rural/documents/protected/spareview-tor.pdf

obligation on decision-taking bodies requiring past decisions to be reviewed and potentially modified.

In 2011, following a Public Inquiry, the Secretary of State decided to refuse to grant planning permission for an Energy Recovery Facility on land at the former Rufford Colliery site at Rainworth. The likely effect on the breeding populations of woodlark and nightjar was a key consideration in the Secretary of State's decision[2].

The Secretary of State agreed that whilst the application site was not within an area currently identified as a Special Protection Area (SPA), there was merit in following the formal approach required for SPAs. He agreed that when considering the impact of the development on the use of the area by the bird species listed on Annex 1 of the European Wild Birds Directive – in this case woodlark and nightjar - an approach similar to that set out in the relevant legislation (Regulation 61 of the Habitats Regulations[3]) should be adopted. The Secretary of State concluded that he could not be sure that the proposed development would not harm the integrity of the area used by the birds and that the conflict this created with the aims of the Regional Spatial Strategy and the potential harm to the integrity of the habitat used by woodlark and nightjar weighed significantly against the proposal.

Current situation

Until the SPA Review concludes and provides further guidance as to whether new SPAs for nightjar and/or woodlark should be classified in the UK to meet the obligations of the Wild Birds Directive, there continues to be uncertainty about the future classification of an SPA in the Sherwood Forest area. However it is our view that, based on the evidence from the most recent national nightjar and woodlark surveys in 2004 and 2006 and the interpretation of that data, there remains a possibility of an area of Sherwood Forest being recommended for future classification.

We recognise that in the interim this creates difficulty for LPAs in how they should consider land allocations and policies in Development Plans and individual planning applications within the Sherwood Forest area. How local authorities choose to confront this issue is ultimately a matter for them, however Natural England advise that LPAs should adopt a form of 'risk based approach' or similar of the kind taken by the Secretary of State in the case referred to above. This should provide decision-making with a degree of future-proofing until such a time that there is greater certainty on whether the Sherwood Forest area is to be afforded pSPA or SPA status and whether the provisions of the 2010 Regulations are to take effect as a matter of policy or law.

The recommended 'risk-based' approach

The 'risk based' approach advocated by Natural England was endorsed by the Secretary of State in coming to his decision on the development proposal at the former Rufford Colliery.

Natural England suggest that in taking a risk-based approach to development plan making and decision-making, LPAs seek to ensure that plans and proposals are accompanied by an additional and robust assessment of the likely impacts arising from the proposals on breeding nightjar and woodlark in the Sherwood Forest area. This should ideally cover the potential direct, indirect and cumulative impacts which may include, but may not be limited to, the following;

- disturbance to breeding birds from people, their pets and traffic
- loss, fragmentation and/or damage to breeding and/or feeding habitat
- bird mortality arising from domestic pets and/or predatory mammals and birds
- bird mortality arising from road traffic and/or wind turbines

[2] See http://webarchive.nationalarchives.gov.uk/20120919132719/http://www.communities.gov.uk/documents/planning-callins/pdf/1914959.pdf

[3] See http://www.legislation.gov.uk/uksi/2010/490/made

- pollution and/or nutrient enrichment of breeding habitats

No formal assessments of the boundary of any future SPA have been made; therefore it is not possible to definitively identify whether individual application sites would fall inside or outside any possible future designated area. However the enclosed map, which highlights the areas of greatest ornithological interest for breeding nightjar and woodlark, was submitted as evidence to the Rufford ERF Public Inquiry and could be of assistance to your Authority in this regard[4]. It is worth noting that the Inspector at the Rufford ERF Inquiry decided it appropriate to consider both boundaries to inform his recommendations.

We also advise that LPAs should seek to satisfy themselves that planning applications contain sufficient objective information to ensure that all potential impacts on the breeding nightjar and woodlark populations have been adequately avoided or minimised as far as is possible using appropriate measures and safeguards. It may be necessary to obtain ecological advice in relation to the potential impacts of a proposal and any possible avoidance or mitigation measures.

Natural England would encourage those LPAs in the Sherwood Forest area to work together, in compliance with the duty to cooperate, to consider the combined effect of their plans and proposals in order to gain a strategic overview and develop a collaborative approach. We are of the view that taking the approach outlined above represents good planning practice which will assist your Authority should the site be classified as SPA in limiting the number of plans and projects which would need to be re-considered as part of the review of consents process required by the 2010 Regulations.

Existing biodiversity and wild bird duties

In addition to advising that a risk based approach will assist LPAs in future-proofing plans and decisions, Natural England advises that there are other relevant duties in legislation and policy that direct you to consider the protection and enhancement of nightjar and woodlark populations in the Sherwood area.

Your Authority must discharge its statutory duty given under Section 40 of the Natural Environment and Rural Communities Act 2006 to have regard to the purpose of conserving biodiversity. It follows that your authority should have regard to conserving nightjar and woodlark, owing to their inclusion as Species of Principal [conservation] Importance in England[5].

Your Authority should also have regard to new duties given under regulation 9A of the Habitats Regulations, which requires LPAs to apply all reasonable endeavours to avoid the deterioration of wild bird habitat (including that of nightjar and woodlark) when exercising their statutory functions. The presence of either or both species and any effects on them is a material consideration when considering planning applications, regardless of whether the Sherwood area is put forward for classification as an SPA in due course.

Further information

Information on the legislation, policy and classification process affecting Special Protection Areas (SPAs) is available from the following websites:

- JNCC http://jncc.defra.gov.uk/page-162
- Natural England http://www.naturalengland.org.uk/ourwork/conservation/designations/spa/default.aspx
- Defra https://www.gov.uk/protected-or-designated-areas

[4] http://www.nottinghamshire.gov.uk/planningsearch/plandisp.aspx?AppNo=ES/1144%20

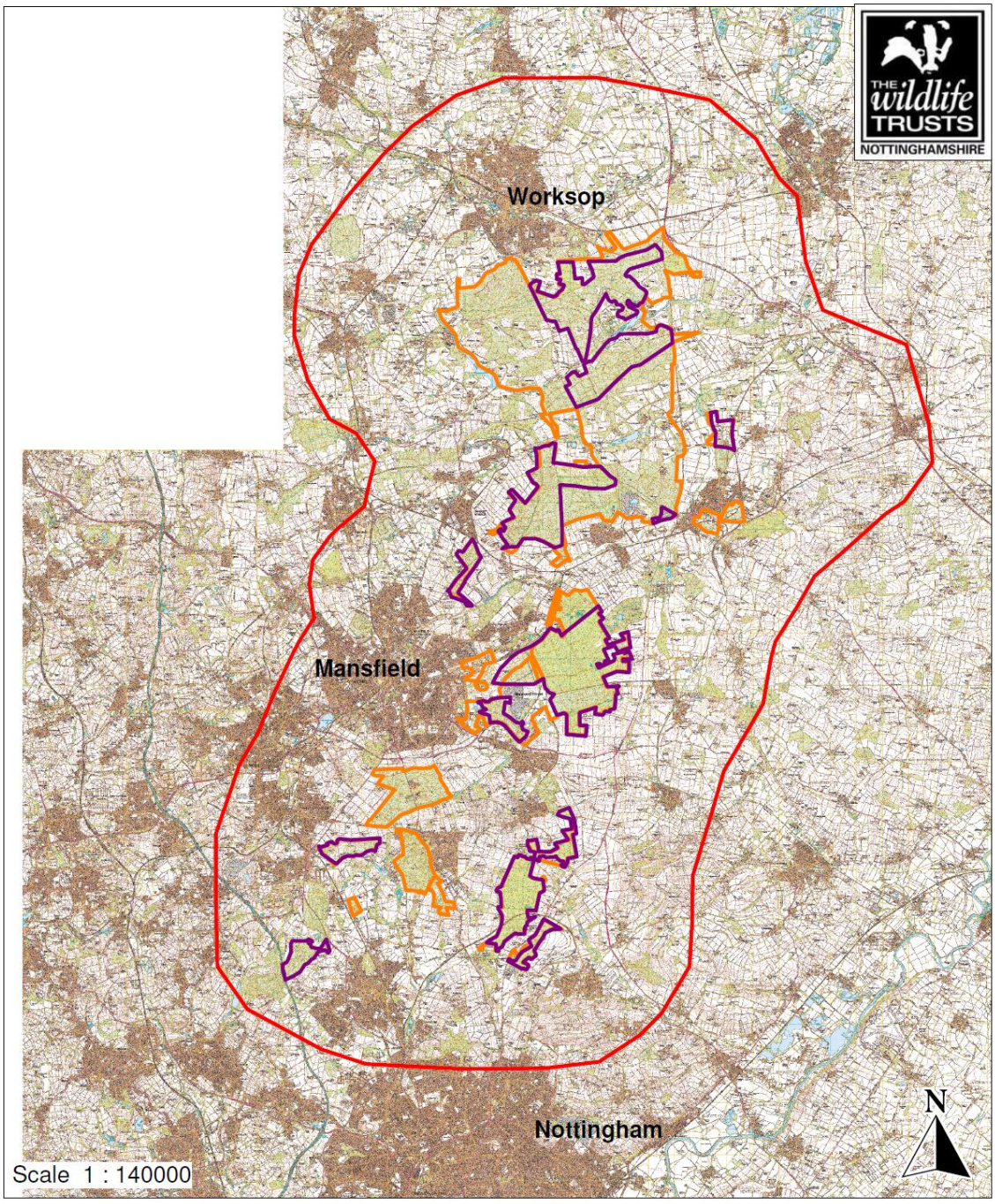
[5] As listed in section 41 of the Natural Environment and Rural Communities Act 2006 to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under section 40 of that Act

We hope this advice is helpful and provides further assistance. Should Natural England be in a position to update these views and advice, we will do so and notify you accordingly.

If you have any queries about this advice, please contact either Liz Newman elizabeth.newman@naturalengland.org.uk or Ryan Hildred ryan.hildred@naturalengland.org.uk

Natural England
Land Use Operations
March 2014

Map highlighting the areas of greatest ornithological interest for breeding nightjar and woodlark, submitted as evidence to the Rufford ERF Public Inquiry 2010



Key

- RSPB IBA Boundary with 5Km buffer
- NE Indicative Core Area
- RSPB IBA Boundary

Plan 1

Bilsthorpe,

Extended Phase 1 Habitat Survey

August 2012

Client: Re - Fin Solar Limited

Consultant: Applied Ecological Services Limited

Bilsthorpe

Extended Phase 1 Habitat Survey

Report Reference & History: Bilsthorpe Solar Farm: Extended Phase 1, Document 1, version 1, revision 1			
	Name	**Signature**	**Date**
Originators	BM, GT		July / August 2012
Author	BM		August / September 2012
Approved By	AES - Ltd		September 2012

conifers. Both plantations bordering the main proposed development site were used for 'raising' pheasants, large feed bins / hoppers were placed at regular intervals throughout the plantations and pheasants were visible in high numbers.

4.10 There were no hedgerows located in the survey area. A line of semi – mature hawthorn was present to the northwest of the site, which bordered a waterbody known locally as the 'finger pond'. Whilst the species diversity and intrinsic ecological value of this feature was **low** it will offer nesting potential to a range of common birds.

4.11 There were no ponds or other aquatic habitats located in the actual site. The finger pond was located to the northwest of the main site and two further ponds were located to the north. All waterbodies located in the site are used and managed by a local angling club and consequently they are either used directly as fishing lakes and/or for fish rearing. Waterbodies supported common reedmace (*Typha latifolia*), common reed (*Phragmites australis*), reed canary grass (*Phalaris arundinacea*) and a range of Juncus species, white water lilies (possibly *Nymphaea alba*) were also present in the finger pond as was water mint (*Mentha aquatic*a) and amphibious bistort (*Persicaria amphibia*). Wildfowl were present in large numbers on the finger pond. The opportunity for amphibian species in these ponds was limited by the general condition of the ponds and the presence of relatively high numbers of wildfowl and the presence of large fish. Although the ponds did add to the biodiversity value of the wider site their ecological value was considered **low** mainly due to their use and management.

Protected species

4.12 **Bats**

There were no features found in the site that would provide roosting opportunities for bats. Evening surveys did record the presence of four common pipistrelle bats flying in a westerly direction along the southern plantation woodland located in the south of the site. The site is very exposed and possibly of limited value to bats but will provide occasional foraging opportunities. The site was deemed to have a low potential for supporting bats and no potential for providing roost sites in its current condition. In this regard bats were scoped out for further assessment.

advised that a *Breeding Bird Mitigation Scheme* is drafted prior to the onset of the development.

4.18 **Other species**

No other species were recorded during the survey but roe deer tracks and rabbit pellets were observed adjacent to the site.

5.0 Site Assessment

5.1 Habitats

The proposed development site supports a limited range of locally common species that are typical of a restored agricultural landscape. Species recorded were of **local** botanical value. Disturbed land and areas of hard standing situated outwith the site are currently considered to be of **negligible** ecological / botanical value.

5.2 Protected Species

5.3 Bats

The site has no features that would provide potential or actual bat roosts. Bats might occasionally forage across the site, but the frequency of this is likely to be limited given the limited availability of suitable linear habitats and potential food resources.

5.4 Amphibian species

The site has a low - no potential for great crested newt or any other amphibian species. The actual development site supports no ponds or other potential breeding habitats and suitable habitats situated adjacent to the site were disturbed, frequented by relatively large numbers of wildfowl and stocked with large numbers of fish. The site has a higher potential to support terrestrial based amphibian species including common toad and common frog. Common toad is a UK BAP priority species and as such mitigation will be required.

5.5 Water vole

No evidence indicating the presence of water vole was recorded within the site. There was no habitat present in the actual site that would attract or support this species. Habitats located adjacent to the site do have the potential to support this species although no evidence was found to indicate its current presence.

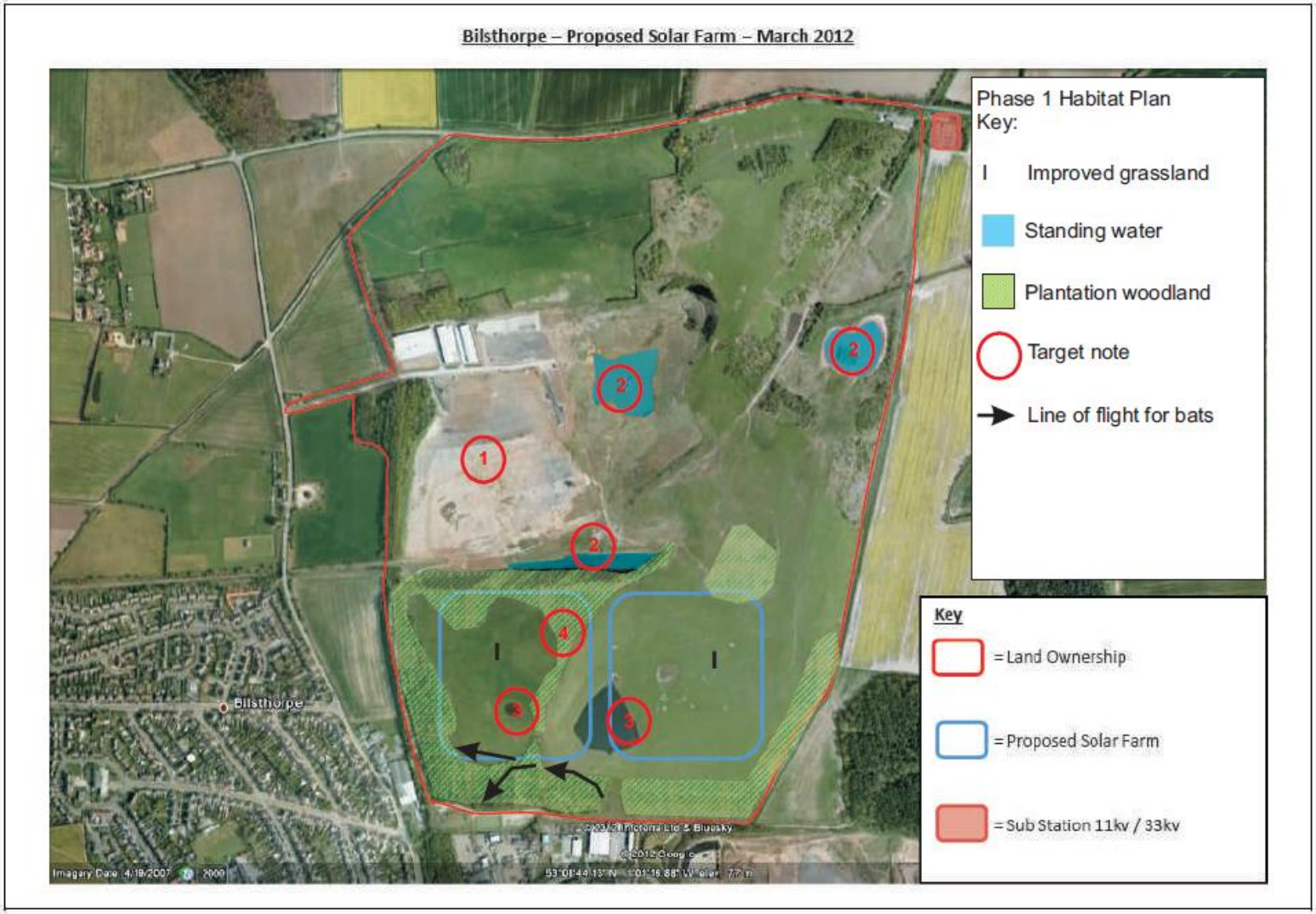
5.6 **Birds**

The proposed development site is considered to have the potential to support a small range of locally common species of breeding and foraging birds. The small size of the site and the limited numbers of habitat types available within the proposed development area are likely to limit the number of species and individuals which may be present, thereby limiting the value of the site for such species. The proposed development area is therefore likely to be of, at most, of **local** value to breeding birds. In this regard if development is to commence during the breeding season (March – August, inclusive) then bird checking surveys will be required along with the production of a *Breeding Bird Mitigation Scheme*.

6.0 **Preliminary assessment of Impacts**

With the absence of significant habitat types and/or protected species in the site no significant ecological impacts are predicted as a result of the proposals. There is a low risk to breeding birds and common amphibian species and mitigation is required for both of these species groups. Based on the work completed to date, without the implementation of an appropriate mitigation strategy the proposals may result in the following impacts:

- The loss of habitats of negligible to local value, consisting of a disturbed environment and areas of improved grassland;
- The potential disturbance of adjacent habitat outwith the proposed development area, of negligible and local botanical value, through secondary effects e.g. during the construction period;
- The disturbance of foraging areas potentially of low to local value to any bats present in the surrounding area;
- The loss of small areas of foraging habitat potentially of low to local value to any bats which may be present in the surrounding area;
- The disturbance of small areas of habitat with the potential to be used by small numbers of breeding, foraging or loafing birds;
- The loss of small areas of habitat with the potential to be used by small numbers of breeding, foraging or loafing birds;
- The disturbance of small areas of habitat with the potential to be used by small numbers of common amphibian species; and
- The loss of small areas of habitat with the potential to be used by small numbers of common amphibian species.


Bilsthorpe – Proposed Solar Farm – March 2012
Phase 1 Habitat Plan
Key:
I Improved grassland
Standing water
Plantation woodland
Target note
Line of flight for bats
Key
= Land Ownership
= Proposed Solar Farm
= Sub Station 11kv / 33kv
Bilsthorpe
1
2
3
4

global environmental solutions

Former Bilsthorpe Colliery Site, Nottinghamshire

Extended Phase 1 Habitat Survey (including desk study), Badger, Breeding Bird, Great Crested Newt and Reptile Survey Report for Proposed Solar Park

SLR Ref: 424-04114-00004

June 2013

Re-Fin Solar (Bilsthorpe) Limited

Rev 02

EXECUTIVE SUMMARY

This report assesses the potential impact of erecting a 7.741MW solar photovoltaic farm within a part of the former Bilsthorpe Colliery site, Nottinghamshire. The footprint of the solar park would be approximately 17.29 ha, positioned within two sheep-grazed improved grassland fields.

Proposals would involve the erection of 32,256 non-rotational solar panels, fixed at an angle of 25^{o}. The panels would be arranged in 655 (4x12) arrays, each array being approximately 19.8 metres long, and 2.7 metres across (as measured from above, taking into account the tilt of the panels) and 34 (4x6) arrays of proportional dimensions. There would be circa 7.1 metre wide strips of grassland depending on site topography between the lines of arrays, which would be subject to a low-level management regime (involving some re-seeding and low intensity mowing). In the north-western and north-east corners of the solar park, the gaps between the arrays would be larger (approximately 13-14 metres in the NE and up to 20 metres in the NW) to allow for the north-facing aspects of these parts of the site. Other associated infrastructure would involve the construction of eight inverter and transformer stations, and an exit point sub-station building.

The footprint of the solar park currently contains two large, shallow pools, used by small numbers of waterfowl, and by small numbers of lapwing and oystercatcher chicks (in the case of the latter, which bred off-site and moved onto the site after hatching). The lagoons also support a small population of common frog and smooth newt; these shallow lagoons, and a number of smaller, more ephemeral ponds, will need to be in-filled.

Access to the site, for construction vehicles, would be via an existing site entrance off Eakring Road, through the Bilsthorpe Business Park, joining an existing dirt track, recently created to construct and maintain an adjacent and now operational Wind Farm named Stonish Hill.

A narrow strip/ fringe of woodland located to the south and west of the proposed solar park, and on steeply-sloping ground which falls sharply away, would need to be pollarded/ coppiced, to avoid shading of the panels. This fringe of woodland, and the newly-planted woodland to the east of the solar park (which currently only supports saplings) would need to be managed/ height-reduced every two or three years, to prevent the trees from reaching a height where they may cast shade on the panels. The steep slopes on which these trees have been planted, mean that the tree tops of many trees would actually be below the height of the field in which the solar panels would sit, even when they are fully mature, and as such the pollarding/ coppicing operations would only need to be limited in extent, and would mostly affect only the first few metres of woodland edge. None of the trees would need to be felled completely. Furthermore, none of the trees to be affected contain cracks, rot holes, woodpecker holes or other features of potential value to roosting bats. Height-reduction works would be undertaken outside of the main bird breeding season, and would not have an appreciable impact on the potential of these trees to support nesting birds.

Long-term direct loss of existing grassland habitat would be negligible in extent, restricted to land directly beneath the sub-station and inverter/ transformer buildings, resulting in the loss of approximately 0.007ha of improved grassland. Grassland temporarily damaged during construction activities, such as by trenching for cables, and minor ground-levelling, would be re-instated and re-seeded using a wildflower-rich seed mixture, to create appropriate conditions for dingy skipper, a ‘priority species’ of butterfly, as well as other butterflies and invertebrates. Vegetation immediately beneath the solar arrays would continue to grow, as light levels would be within the normal range tolerated by plants (similar in intensity to an open-canopy woodland in summer); light levels in the 7.1 metre wide (minimum, and up to

20 metres wide in places) grassland strips between the arrays would remain high, and the vegetation here would be largely unaffected. There would be some subtle changes in the composition of the grassland beneath the panels and within these grassy strips, over time, due to differences in light levels and rainfall, but this would, most likely lead to a greater botanical diversity overall.

The impact of the proposals upon ground-nesting birds, such as skylark and lapwing (which are known, in the case of lapwing, or suspected, in the case of skylark, to have bred on site), is difficult to predict with certainty. However, it is considered most likely that whilst there will probably be a reduction in the number of breeding skylark (estimated to be two breeding pairs within the footprint of the solar park at present) it is anticipated that this species will not be deterred from using the site entirely, as the vegetation beneath the panels will be retained, and sensitively managed, and the 7.1 metre wide gaps (up to 20m wide in places) are likely to be large enough to allow breeding by a low number of this species. However, lapwing (two successful breeding pairs in 2013) is more likely to be displaced from the solar park and its immediate vicinity, as this species requires substantial areas of open habitat in which to nest. Oystercatchers, which currently breed in an adjacent area of bare ground habitat, approximately 50 metres to the north of the application site, but which use the application site, and more specifically the shallow lagoons within it, as a feeding ground for their chicks, are also likely to be affected, even though their nesting grounds would not be. The proposals will not have an impact upon woodlark or nightjar, neither of which were recorded on site during fieldwork, nor are there any site records of either species in the desk study data.

In order to avoid any direct impact to ground-nesting birds, construction of the solar farm would, as far as possible, start outside of the bird breeding season (which for most species extends between March and August inclusive); if it is not possible to avoid the bird breeding season entirely, a search shall first be made for nesting birds by a qualified ecologist, and any active nests (if found) protected until the young have successfully fledged.

Efforts shall be made to maintain, or potentially enhance, at least in places, the botanical diversity of the grass sward beneath and between the solar panels by seeding those areas which are subject to ground-disturbance during construction operations with a wildflower-rich seed mix, containing a high proportion of bird's-foot trefoil, greater bird's-foot trefoil, and horseshoe vetch, as well as other low-growing species such as kidney vetch, of value to dingy skipper and common blue butterflies, and as a nectar source for other invertebrates.

Surveys have shown that there are no reptiles on site, nor were great crested newt recorded within any ponds located within 500 metres of the site boundary, that were accessible for survey. Great crested newt surveys undertaken by a third party (Mr Barry Collins) on an additional pair of recently created mitigation ponds approximately 300 metres to the south of the application site boundary, did find small numbers of great crested newts, however, these are a sufficient distance from the site not to be affected, and there would therefore be no impact upon herptiles.

Similarly, there would be no impact upon badger or bats (in terms of roosting or foraging). The perimeter fence will not be buried beneath the ground, leaving a small gap between the bottom of the fence and the ground-level; this will enable all but the largest of animals to pass, or dig a shallow scrape in the case of badger, beneath the fence.

Overall it is considered that any minor impacts, for example upon ground-nesting birds such as lapwing would not be significant in a regional context, and that certain species, for example dingy skipper and common blue butterfly, would benefit as a result of the sensitive grassland management associated with the scheme.

Plate 5: *Existing recently-planted woodland to east of application site, which will, once it has developed, also need coppicing every two or three years, to prevent shading of the solar panels*

Grassland

The application site consists of two fields of largely herb-poor improved grassland which are separated by a strip of young broad-leaved plantation, as described previously, and as illustrated in Plate 1, and which are both heavily sheep-grazed. The grassland occupying the main part of the western half of the site is on higher ground than the eastern field. (Plate 6). The grassland in the western field is dominated by the grasses Yorkshire fog *Holcus lanatus* and smooth meadow grass *Poa pratensis*. Other grasses present are perennial rye-grass *Lolium perenne*, marsh foxtail *Alopecurus geniculatus*; the finer-leaved grass crested dog's-tail Cynosurus cristatus was locally frequent along tracks and the field edges. The broad-leaved herbs in the sward were few, with white clover *Trifolium repens*, curled dock *Rumex crispus*, broad-leaved dock *Rumex obtusifolius*, spear thistle *Cirsium vulgare*, lesser trefoil *Trifolium dubium* and creeping buttercup *Ranunculus repens*, comprising the sum of the species seen.

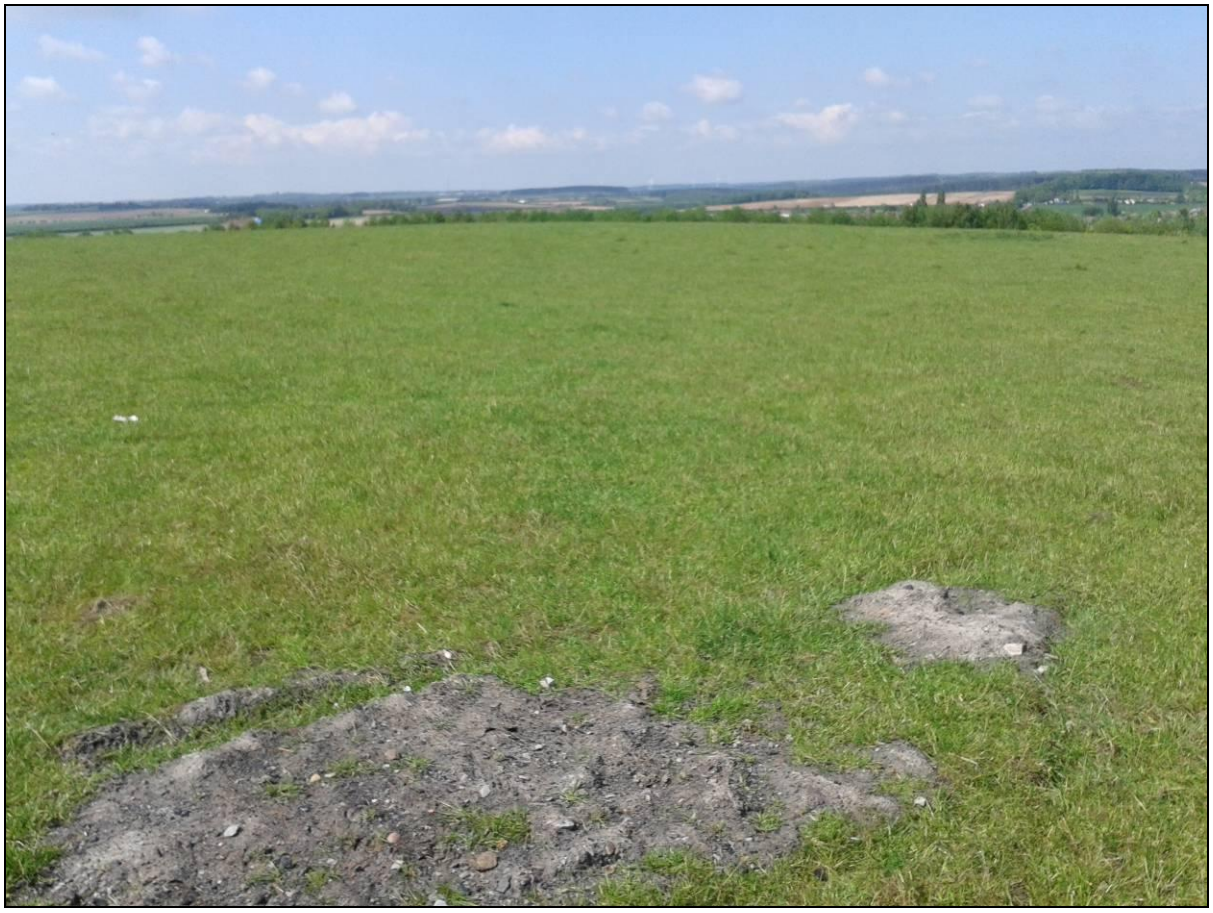


***Plate 6**: Area of improved, sheep-grazed grassland which would form the western part of the proposed solar park.*

The bulk of the grassland in the eastern half of the application site is on level ground and is highly susceptible to water-logging with a number of temporary and semi-permanent water bodies present (Plate 7). In combination with water-logging, a protracted period of low winter temperatures and frequent frosts (inhibiting growth), and trampling by sheep, the grassland here appeared rather sparse and thin. Species present within the sward include perennial rye-grass, timothy *Phleum pratense*, marsh foxtail, white clover, lesser trefoil, creeping buttercup, broad-leaved dock, curled dock, spear thistle, smooth meadow-grass, daisy *Bellis perennis*, Yorkshire fog, square-stemmed willowherb *Epilobium tetragonum* and cut-leaved crane's-bill *Geranium dissectum*. As per the western field, crested dog's-tail was locally abundant on tracks, and around the field edges; in certain sparser areas of the sward within the field it also achieved a higher abundance. Around the field edge the grassland contains a number of additional broad-leaved herb species, such as common bird's-foot trefoil *Lotus corniculatus*; these had apparently seeded in from the slightly richer grassland along the edges of the woodland (outside of the fenced boundary).

Towards the northern boundary of the site the grass was less wet, much coarser and tusssocky (having species such as cock's-foot *Dactylis glomerata* more evident in the sward) and looked to be able to withstand grazing more readily. This type of grassland extended on to the east facing slope of the strip of broad-leaved plantation separating the two main areas of grassland on the site. Here there were locally frequent tall herb communities comprising spear thistle *Cirsium vulgare*, common nettle *Urtica dioica* and cow parsley *Anthriscus sylvestris*.

5.1.2 Potential impact upon birds

The vast majority of the birds recorded during the breeding bird surveys will not be affected by the proposals, as no woodland or scrub will be removed, and the low levels of pollarding required to avoid over-shading will not fundamentally affect bird nesting opportunities. However, lapwing (two successful pairs) and skylark (an estimated two pairs) which breed, or are suspected to breed, on site, are likely to be affected. Furthermore, oystercatcher, which breed within an area of bare ground circa 50 metres from the site boundary, but whose chicks, once hatched and mobile, feed around the margins of the shallow pools within the solar park itself, may be also be affected.

The impact of the solar arrays on these species is difficult to predict with certainty, as it has been little-studied. Whilst superficially the habitat will remain suitable, the influence of the arrays may deter breeding lapwing and skylark, at least to some degree, as these species tend to favour open habitats, well away from hedgerows and woodland edge. The 7.1 metre wide gaps (minimum, up to 20m wide in places) between the arrays may be sufficiently wide for skylark to adapt, and continue to nest on site as the arrays are not solid linear features (such as a dense hedgerow or woodland), but rather have at least 60 cm ground-clearance (at the lower end of the angled panels), giving far-ranging views at ground-level.

Advice provided by the Royal Society for the Protection of Birds (RSPB, 2011) does not raise this as an issue, in fact this guidance states that the RSPB is in favour of developing solar farms on arable land (which is also used by breeding skylark), stating that the impacts are unlikely to be significant and may be positive (Appendix 3).

Lapwing, however, are likely to be less adaptable than skylark, and a reduction in the number of breeding pairs, or perhaps the loss of this species from the application site, would be expected. Desk study data received from NBGRC indicates that lapwing successfully nested on the Bilsthorpe Colliery site (local Wildlife Site 5/2161), circa 50 metres to the north of the application site, in 2011, and as this habitat remains fundamentally suitable for breeding lapwing, it is therefore considered unlikely that this species will be displaced totally from the local area.

Oystercatcher are also unlikely to feed within the solar park once constructed, both because of the presence of the arrays, but also due to the in-filling of the shallow pools around the margins of which the young oystercatchers currently feed. However, the Bilsthorpe Colliery site also contains shallow lagoons and fringing areas of longer grassland, in which the oystercatcher could shelter and feed, and it is therefore also considered unlikely that the loss of the application site as a foraging resource (as a worse case scenario) would result in this species being lost entirely from the general area.

The proposals will not have an impact upon woodlark or nightjar, neither of which were recorded on site during fieldwork, nor are there any site records of either species for the site itself in the desk study data.

5.1.3 Potential impact upon reptiles

No reptiles were found during the 2013 presence/ absence surveys, and no reptile records were produced for the site, or immediately adjacent areas, during the desk study. As the grass sward develops, the site may become more suitable for reptiles, and it is possible that they will colonise over time, however, in its current condition, the results indicate that there will not be an impact upon this taxa.

5.1.4 Potential impact upon great crested newt (GCN) and other amphibians

No GCN were recorded during the 2013 presence/ absence survey work undertaken by SLR Consulting, in those accessible ponds found within 500m or so of the site boundary. The two on-site lagoons (Pond 12) were found to support a single female smooth newt and three clumps of frogspawn; a smaller, more ephemeral pool, also within the application site (Pond 11) was found to support a single male smooth newt on one occasion. Information received from another consultant ecologist, Mr Barry Collins, indicates that Pond 17 (which consists of two mitigation ponds, which were inaccessible to SLR staff but which Mr Collins had access to), located circa 300 metres south of the application site boundary, supported a maximum population of 3 great crested newt in 2012, one GCN in 2011 and no GCN in 2010.

The majority of the amphibian records provided via the desk study relate to common frog, common toad and smooth newt; however there are five records of great crested newt. Of the great crested newt records, the most recent dating from 2010, relates to a count of one adult at a site called 'Bilsthorpe landfill' (OS grid reference SK656607), approximately 200 metres south east of the application site. The second most recent record, dating from 2006, relates to a count of six adults within a garden pond in Kirklington (SK674618), approximately 2km north east of the application site). Two further great crested newt records date from 2004, the first of these (no count information given) relates to a ditch within the Bilsthorpe landfill site (SK656606) approximately 200 metres south-east of the application site, and the second relates to a pond (again, no count information given), also within the Bilsthorpe landfill site (SK654604), approximately 200 metres from the application site boundary. The final great crested newt record dates from 1989, and relates to a population count of 15 adults, in Radcliffe-on-Trent (SK655596), approximately 1.5km to the south of the application site.

There will be no direct impact to any of the ponds supporting great crested newt. Ponds 11 (small ephemeral pool) and 12 (two large, but shallow lagoons) will both be in-filled, resulting in the loss of habitat for a small population of smooth newt, and common frog. This will be compensated for by the creation of three new amphibian breeding ponds, on the edge of the application site. Long-term impacts on amphibian terrestrial habitat will be modest; the vegetation beneath the panels would provide suitable terrestrial habitat in the long-term, although there could be some inadvertent mortality during strimming and grass cutting operations.

5.2 Provisional Opportunities for Mitigation and Site Enhancement (including compensation)

5.2.1 Enhancement of grassland

In order to maintain, or potentially increase the botanical diversity and value of the sward, any bare ground created during construction works or in-filling operations will be seeded with a wildflower mix containing a high proportion of bird's-foot trefoil, greater bird's-foot trefoil; horseshoe vetch, and kidney vetch. A sensitive mowing regime shall be employed, and the vegetation immediately beneath the solar panels shall be strimmed rather than treated with herbicide (which is the standard method of suppressing plant growth directly beneath the solar arrays).

The grassland must be kept below a height of 60 cm (the height of the solar panels at their lowest points) to prevent shading of the panels. The grassland within most solar farms is normally mown four times a year, and the arisings left on the ground to decompose, however, at Bilsthorpe the relatively low levels of fertility within the soil mean that the vegetation is likely to grow less vigorously and less tall than in high-fertility situations, and

therefore less frequent mowing should be acceptable without shading the solar panels, and compromising their efficiency.

It is therefore recommended that the grassland is cut up to three times a year, and that the grass cuttings are removed.

Grass cutting will therefore take place in July and October, and again in March, if required. No cutting shall take place between the months of April and June, to allow any birds which are nesting to breed successfully, and to maximise the availability of caterpillar food and nectar sources for dingy skipper, and other butterflies and invertebrates.

The arisings cut from wildflower-rich areas could potentially be spread elsewhere on un-vegetated parts of the colliery site to help stabilise spoil heaps or seed bare ground, or they could potentially be put to some commercial use (i.e. sold as animal feed). If the latter approach is adopted, then it is recommended that hand removal or spot-treatment of ragwort should be permitted.

5.2.2 Measures to enhance the site for birds

Once the solar farm has been constructed and fenced off, it will be a secure site, subject to very limited disturbance. Three pole-mounted nest boxes shall therefore be erected, one of a design suitable for breeding kestrel and two for barn owl; one or more of these boxes could be erected on the back of the inverter buildings, rather than on a pole. These shall be placed away from the boundary fence to minimise disturbance still further.

There is an anticipated reduction in the numbers of nesting skylark and lapwing within the boundary of the solar park, but this will not be significant in a regional context.

It is further recommended that, as a precaution, the solar panels and perimeter fencing are not erected during the main bird breeding season, and that any pollarding works are also not undertaken during this time (which for most species extends between March and August inclusive). If this is not possible, then an ecologist shall inspect the site prior to the start of works, and identify and nests, which would be safeguarded until the young have fledged.

5.2.3 Measures to enhance the site for reptiles and amphibians

Reptiles were not recorded on site, however, they could re-colonise over time, should the grassland sward beneath and between the arrays become suitable.

In order to enhance the site for reptiles, particularly common lizards, three hibernacula/ basking mounds shall be created at intervals within the site. Each hibernacula would involve digging a 0.5 metre deep, and 10 metre x 5 metre long scrape, and filling it with rocks and/ or tree stumps, then capping this with earth to create a mound which is between 0.5 and 1 metres above ground-level. The mounds would therefore provide hibernation sites during the winter, and basking sites during the summer. These should be located in sunny locations, close to scrub cover (some localised scrub planting may also be required). These mounds could also provide suitable hibernacula for amphibians, including common toad, common frog and smooth newt.

In order to mitigate for the loss of the two shallow ponds (Ponds 12) and small ephemeral pond (Pond 11) which supported a small number of common frog (three clumps of frogspawn in Pond 12) and smooth newts (maximum count of one smooth newt in each of these ponds), three new ponds shall be created. Each of these ponds shall have a surface area of at least 50m^2, with shallow sloping margins, and they shall be planted with a range of

aquatic, emergent and marginal plants, including plants, such as water forget-me-not, which is often used as an egg-laying plant by smooth newt and great crested newt.

5.2.4 Measures to enhance the site for invertebrates

The installation of the solar panels, and the mosaic of full sun, shaded, dry and wet soil conditions beneath and immediately adjacent to the panels will provide a range of vegetation types and therefore conditions for a range of invertebrates. Seeding areas of bare ground created during the construction phase and in-filling operations will be seeded with a wildflower mix containing a high proportion of birds'-foot trefoil; greater bird's-foot trefoil, and horseshoe vetch ~ the larval food plants of the dingy skipper, as well as kidney vetch ~ the larval food plant of the common blue butterfly. Cutting of the grassland no more than three times a year will also ensure that most invertebrates are able to complete their life cycle, prior to cutting.

5.2.5 Design of the boundary fence

The boundary fence, if dug in beneath ground level, would have the potential to make the site inaccessible to larger mammals, such as rabbit *Oryctolagus cuniculus*, brown hare *Lepus europaeus*, fox *Vulpes vulpes* and badger *Meles meles*. However, the proposals involve leaving a small gap at the base of the fence, this will allow most mammals to push under the fence, some of the larger mammals, such as badger or fox would excavate a shallow scrape beneath the fence.

Newsletter - Spring 2014

emec ECOLOGY

© Chris Dutton *Evarcha falcata* (a Jumping Spider)

In this issue…

- **Nightjar GPS /Radio Tracking**
- **Harvest Mouse Re-introduction Project**
- **Bat Survey Season**
- **New Faces**
- **Wildlife Trust News**

Welcome...

Welcome to the spring edition of EMEC Ecology's newsletter. In this edition we bring you news about some of our recent projects. 2013 was a successful year with a range of projects being undertaken, as well as a few new faces joining the team.

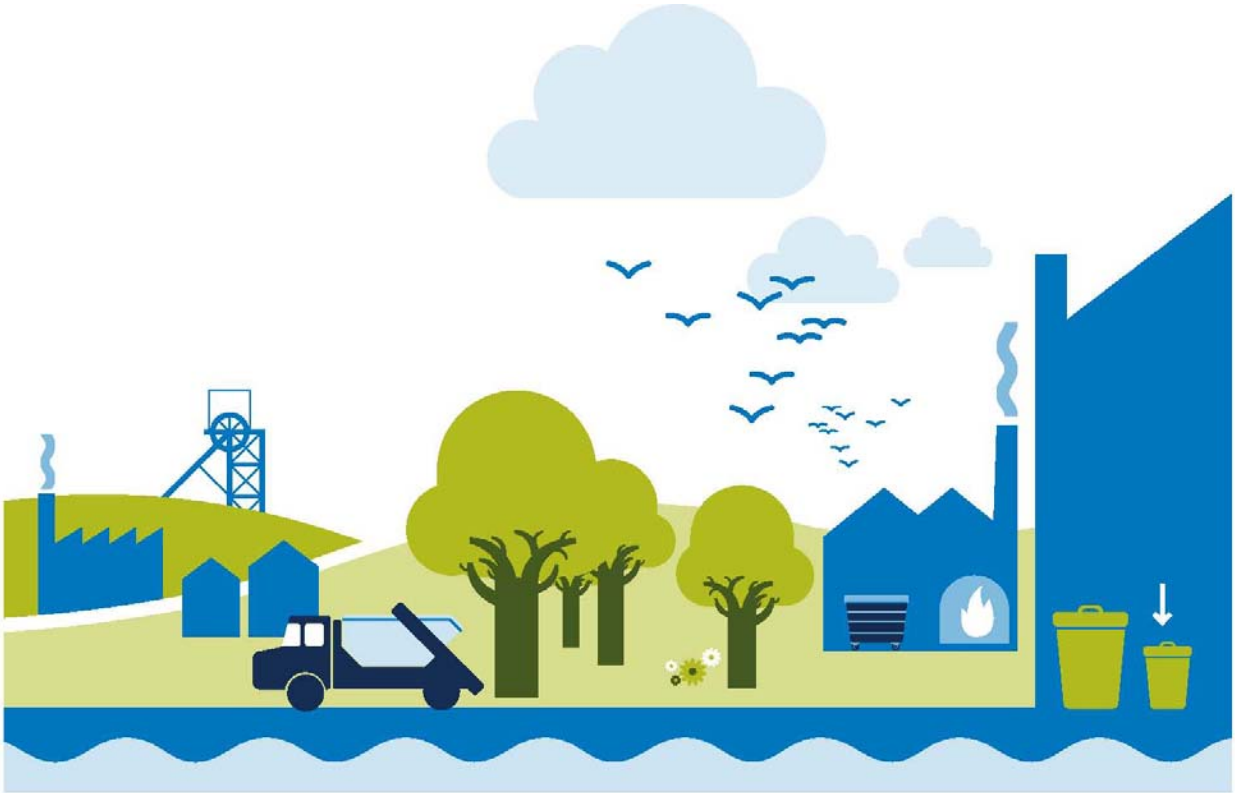
Nightjar Study

Nightjar (*Caprimulugus europaeus*) is a summer visitor to the UK and is a crepuscular species which breeds on heathland and in woodland clearings. They forage over a variety of habitats and feed on insects caught in pursuit flight or during short flights from a perch. Despite recent population declines, Nottinghamshire still has strongholds of this species making the population of national importance.

In the summer of 2013, EMEC Ecology was commissioned by RWE Npower Renewables Ltd to carry out a nightjar study in Clipstone Forest near Rainworth. The main aim of the study was to determine the foraging and commuting behaviour of nightjars in the area. So a telemetry study using new GPS data logger / VHF radio tracking tags was undertaken. This work was carried out in partnership with Birklands Ringing Group and the British Trust for Ornithology. Birds were caught using mist nets and tags were attached to their central tail feather shafts under the appropriate licensing. The tags took GPS fixes of the bird's position producing some fascinating results on their movements following release. Unpaired males invested much time in attracting females and were active through the night visiting neighbouring territories. This limited foraging to occasional flights from a song perch. Paired males on the other hand, spent more time foraging in pursuit flight over favoured habitats close to their territory, although the foraging distance from their nest reduced after eggs hatched. One female bird was found to forage over 8.3km from her roost site, although she was between broods at this time. It is likely foraging distance would be greatly reduced when she is incubating or has dependent young.

The distance of foraging flights was ultimately related to the habitat surrounding a territory and the local food abundance; however behaviours did vary depending on breeding status and over the season. The use of GPS tags on nightjar has not been carried out before, therefore this study produced ground breaking data on foraging nightjar movements and we are hoping to secure funding to keep the project running in 2014.

H1 Annex F – Air Emissions



Content

Where groups of emissions have not been characterised (e.g. volatile organic compounds or metals), the most stringent standard should be applied as a precautionary approach. You may prefer to characterise the emissions composition more accurately to apply the less precautionary standards.

Care should be taken to ensure that standards and process contributions are expressed in the same statistical basis. Conversion factors for different averaging times are provided in Table 2.1.

Screening for nature conservation sites

Nature conservation sites should be screened against the relevant standards in Appendix B if they occur within specified distance criteria, as detailed below.

- Special Protection Areas (SPAs), Special Areas of Conservation (SACs) or Ramsar sites within 10km of the installation (or 15km coal- or oil-fired power station)
- Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs), Local Nature Reserves (LNRs), local wildlife sites and ancient woodland within 2km of the location of the installation

Some larger emitters may be required to screen to 10km or 15km for SSSIs. Relevant screening distances should be discussed with the permitting officer where clarification is required.

The deposition of S and N at these sites should also be assessed against the relevant Critical Load for acidification and nutrient enrichment, as identified using the Air Pollution Information System (apis.ac.uk)

Screen out insignificant process contributions

Short-term and long-term process contributions should be screened against relevant standards provided in Appendix B.

Process contributions can be considered insignificant if:

- the long term process contribution is <1% of the long term environmental standard; and
- the short term process contribution is <10% of the short term environmental standard

(NB: Different significance criteria apply for the intensive livestock sector. See application guidelines in H1 Annex (b) Intensive farming)

The long term process contribution 1% threshold is based on the judgements that:

- it is unlikely that an emission at this level will make a significant contribution to air quality since process contributions will be small in comparison to background levels, even if a standard is exceeded;

- the proposed 1% threshold is two orders of magnitude below the standard and provides a substantial safety margin to protect health and the environment.

The short term 10% process contribution threshold is based on the judgements that:

- spatial and temporal conditions mean that process contributions are more likely to dominate ambient environmental concentrations;
- short term background concentrations can be assumed to be twice long term concentrations;
- the proposed 10% threshold is an order of magnitude below the standard and provides a substantial safety margin to protect health and the environment.

Where potentially significant emissions are identified, the operator will need to decide whether more detailed air modelling is needed before choosing control measures.

Decide if you need detailed air modelling

It may be worth carrying out more sophisticated modelling of air emissions before choosing control measures. Such modelling will require specialist expertise but may produce more accurate risk estimates to justify the use of less precautionary control measures.

Guidelines on choosing more detailed modelling is given below. Note that these guidelines are 'rules of thumb' rather than absolute thresholds and operators should take a broad view of the costs and benefits of carrying out more detailed modelling.

Operators should provide a reasoned explanation for their judgement on whether detailed modelling is needed.

Detailed modelling of long term emissions

As a guide, detailed modelling of long term emissions may be useful where:

- local receptors may be sensitive to long term emissions
- released substances fall under an Air Quality Management Plan
- the sum of the background concentration and process contribution exceed 70% of the appropriate long term standard:

$$PC_{long\ term} + \text{background concentration} > 70\% \text{ standard}$$

This 70% suggested guideline is based on the judgements that:

- background concentrations will usually dominate process contributions for long term releases
- process contributions may lead to a breach of standards where background levels of a substance are already high

- there is a likely possible error margin of ± 50% in monitoring data of background levels.

Whilst it could be argued that background measurements include existing process contributions, it is likely that ambient background monitoring points underestimate the local ground level impact of process contributions. Adding the process contribution and background concentration to decide the need for detailed modelling is therefore precautionary.

Estimated background air pollution maps for 2006 and projections for other years may be obtained from the UK Air Quality Archive website [5]. You should explain the location and measurement basis of background data and ensure that the same statistical basis is used to calculate process contributions and background concentrations.

Detailed modelling of short term emissions

As a guide, detailed modelling of short term emissions may be useful where:

- local receptors may be sensitive to short term emissions;
- the short term process contribution is more than 20% of the relevant short term environmental standard minus twice the long term background concentration:

$$PC_{\text{short term}} > 20\% \ (\text{standard}_{\text{short term}} - 2\text{x}\text{background}_{\text{long term}})$$

Note that this assumes the short term ambient background concentration to be twice the long term ambient concentration.

Detailed assessment of short-term effects is often complex because the maximum process contribution and maximum background concentration may be separated both temporally and spatially so that the addition of the two “worst case” short-term concentrations together is unlikely. Estimates of short term predicted environmental concentration (PEC) may also have an error factor of 4 to 5.

Detailed modelling of small point sources

You may make a case to the Environment Agency that detailed modelling is not warranted for some small, low risk releases:

- gas and distillate oil-fired boilers with an aggregated thermal input less than 20MW
- small point sources such as vents and short stacks.

Combustion plants with a thermal input less than 20MW are only covered by PPC regulations if they are an associated activity to any of the listed activities. As stand-alone units, they are not considered to be major sources of pollution but are subject to the requirements of the Clean Air Act. Whilst it is important that the environmental impact of

[5] http://www.airquality.co.uk/laqm/tools.php?tool=background06

Environment Agency
Asiantaeth yr Amgylchedd

Detailed assessment of the impact of aerial emissions from new or expanding IPPC regulated industry for impacts on nature conservation

Operational instruction 67_12 **Issued** 08/05/2012

What's this document about?

This document explains how to assess aerial emissions from new or expanding Integrated Pollution Prevention and Control (IPPC) regulated industry applications, issued under the Environmental Permitting Regulations (EPR).

It outlines the process to follow to satisfy the requirements of the Conservation of Habitats and Species Regulations 2010, Countryside and Rights of Way (CRoW) Act 2000, and our wider duties under the Environment Act 1995 and the Natural Environment and Rural Communities Act 2006 (NERC06).

It takes you through the steps you need to follow to assess aerial emissions on nature conservation sites.

An overview of the process is given in the process flow diagram at the end of this document.

This document will use the term 'application' to cover EPR installations and variations that are under consideration.

What does this document not cover?

This instruction does not include guidance on:

- simple assessment of aerial emissions from new and expanding IPPC installations;
- emissions from Intensive Farms;
- the impact of noise on sites of nature conservation;
- the assessment of permissions issued under the COMAH Regulations 1999 SI 473.

Who does this apply to?

Staff from:

- National Permitting Service (NPS);
- Environment Management (EM);
- Fisheries and Biodiversity (F&B) staff;
- Conservation and Ecology Technical Services (CETS);
- Air Quality Modelling and Assessment Unit (AQMAU).

Document details

Related documents

Feedback

Contact for queries

ConsEcoHelpdesk

Contents

Introduction

When to use this guidance

A detailed assessment must be carried out for any application that can not be screened out using 66_12 Simple assessment of the impact of aerial emissions from new and expanding IPPC regulated industry for impacts on nature conservation.

If a permit application involves a direct discharge to controlled waters, it must be assessed in accordance with the water quality instruction. If the application is for a waste management activity, it must be assessed in accordance with the waste management instruction.

! Important Minor technical variations or normal variations that do not result in increased emissions, or changes to emission characteristics, do not require an assessment.

! Important legislation

The processes described in this document must be carried out on the conservation sites listed below. These sites are protected by specific legislation.

Statutory nature conservation sites	Legislation
European sites: ▪ Special Areas of Conservation (SACs) ▪ candidate Special Areas of Conservation (cSACs); ▪ Special Protection Areas (SPAs); ▪ potential Special Protection Areas (pSPA); ▪ Ramsar sites (as a matter of government policy); ▪ Marine Protected Areas (MPA).	The Conservation of Habitats and Species Regulations (2010); known as the 'Habitats Regulations'.
Sites of Special Scientific Interest (SSSI)	The Countryside and Rights of Way (CRoW) Act 2000

Undertake the detailed assessment

Advice

A detailed assessment is required where modelling predicts that Process Contribution (PC) > Y% **and** Predicted Environmental Contribution (PEC) > Z% long-term critical levels and/or loads.

For short-term emissions, modelling is required at European sites and SSSIs where PC > 10% critical level. For NNR, LNR, LWS and ancient woodland the threshold is 100%.

Modelling must be audited either by a competent permitting officer or AQMAU, and must be in line with the guidance given in AQTAG06 Technical guidance on detailed modelling approach for an appropriate assessment for emissions to air.

The detailed assessment must ensure that the application **will not**:

- result in an 'adverse effect' on the integrity of a European site;
- be an operation likely to damage (OLD) a SSSI;
- result in significant pollution of a NNR, LNR, LWS or ancient woodland.

Wording must be as non-technical as possible, with highly technical issues kept as separate, technical reports to which the detailed assessment should refer.

! Important AQMAU are available to support you with complicated air quality modelling assessments.

Screening criteria	European Sites	SSSIs	NNR, LNR, LWS, ancient woodland
Y (% threshold)	1	1	100
Z (% threshold)	70	70	100

Legal obligations

You must carry out any detailed assessment at a level that is relative to the level of protection afforded to the site, the issues on the site and the type of IPPC installation or variation.

For European sites and SSSIs the assessment must be carried out in view of the site's Conservation Objectives.

Where the site is designated as a Ramsar site, guidance should be obtained from Natural England or CCW's protected areas team on the appropriate objectives for the site.

For European sites make sure you have enough information to carry out a full in combination assessment for the new application, including consultation responses from other competent authorities.

! Important The detailed assessment must be in proportion to the nature, scale and duration of the proposed activity and the sensitivity of the site.

! Important Where a site has multiple designations, for example a SAC and SSSI, separate assessments must be carried out under the relevant legislation.

Concluding the detailed assessment: NNR, LNR, LWS, ancient woodland

Use the table below to determine whether there will be significant pollution at the NNR, LNR, LWS or ancient woodland

If…	then…
the process contribution is less than 100% of the appropriate environmental criterion	it can be assumed there will be **no significant pollution.**
the process contribution is greater than 100% of the appropriate environmental criterion	it can be assumed that there **will be significant pollution.**

Avoiding significant pollution

Where it has been concluded that the permit application will lead to an exceedance of 100% of the relevant critical level or load, the applicant will be required to apply the best available techniques (BAT) to operate at or below this threshold level.

BAT is determined by taking into account the costs of potential control techniques and the environmental benefits arising. Discuss options with the relevant technical and biodiversity leads in the NPS.