

CHAPTER 7: ECOLOGY

INTRODUCTION

- 7.1 This Addendum assesses the effects of the proposed minor changes to the Heckington Fen wind park on ecological receptors. It uses the same data and follows the same methods and guidance as detailed in Chapter 7: Ecology in the original Environmental Statement (ES). The assessment considers the following changes to the permitted scheme:
- *Amending the onsite access track along two sections within the Development Site and an allowance for micro-siting as set out in **Figure 3.1**;*
 - *Relocating and increasing the footprint of the onsite substation, including relocating the temporary construction compound to an area of existing hardstanding, providing temporary auxiliary crane pad areas and an underground cabling corridor from the turbines to the onsite substation as set out in **Figure 3.1**; and,*
 - *Amending the turbine rotor diameter from 90m, as indicated on the consented Site Edged Red plan (4038_A0085_03), to a maximum rotor diameter of up to 103m and a 10 metre radius micro-siting allowance around each turbine location where onsite constraints allow as set out in **Figure 3.1**.*
- 7.2 **Chapter 3: Details of the Variation** provides further details of these amendments.
- 7.3 The proposed amendments would result in an overall decrease in the permanent loss of arable habitat from an original 99,035m² to 83,650m² as shown on **Figure 3.3**.
- 7.4 The proposed amendment to the maximum rotor diameter is due to rapidly improving wind turbine technology which would allow Ecotricity to maximise renewable energy generation on the site. The maximum tip height will remain the same at 125m; however the lower blade sweep could be reduced by a maximum of 6m from 28m to 22m.
- 7.5 These minor changes could result in a number of changes in the effects on ecological receptors compared to the permitted scheme during each phase of the development. The potential effects of the proposed wind park on ecological receptors are:
- Changes in the direct habitat loss: due to land-take by wind turbine bases, access tracks and ancillary structures;
 - Changes in indirect habitat loss: due to the displacement of species as a result of construction and maintenance activities, or due to the presence of the operating wind turbines close to resting sites or feeding sites or habitual commuting routes; and,
 - Changes in risk to protected species due to changes in turbine blade sizes.

CHANGES IN LAYOUT AND DESIGN

On-site access tracks

- 7.6 It is proposed that the location of onsite access tracks will change as shown in **Figure 3.3**. This will result in a reduction in the area of arable habitat lost by 1.54 ha.

Ditch crossings

- 7.7 The minor changes in turbine and access tracks will increase the number of crossing of dry ditches from 15 to 16 but will not change the number of crossing of permanently wet ditches (**Figure 3.3**).

Crane Pads and substation

- 7.8 The area of land required for permanent crane pad will remain the same as the original layout but the substation will be moved to the east of the site and the area required will increase by 0.27ha. An underground cable trench up to 2m wide and 1.2m in depth will run alongside the existing Six Hundred Drove in the field edge and to the substation in its new location. The trench will be backfilled once the cables have been laid and therefore represent a temporary disturbance for approximately four weeks whilst the cables are laid. The existing Six Hundred Drove will be used to gain access to the substation, and therefore does not appear as part of this development. The substation will be screened with new woodland planting and new hedgerow covering 660m² (**Figure 3.3**).

Temporary infrastructure

- 7.9 The area for temporary infrastructure will increase by 0.5 ha due to an increase in the area of the construction compound and the potential need for temporary auxiliary crane pads depending on the final turbine selected. The temporary construction compound will now be placed within an area of bare ground screen by existing woodland in the centre of the site (**Figure 3.3**).

Overall change in land take

- 7.10 Although the proposed changes in layout will result in a temporary increase in land take of 0.5ha, overall the new layout will require 1.53ha less of permanent land take assuming the 22 turbine layout. The land take will be less with the 18 turbine layout. There will be approximately 660m² of additional woodland planting and new hedgerow.

Change in blade size

- 7.11 The potential changes in blade size, whilst not increasing the maximum tip height, will increase the swept area and reduce the height of the lowest point of the blade sweep. The changes in total blade sweep length and lower height of the blade sweep are shown in **Table 7.1** below.
- 7.12 In order to optimise output from the permitted wind farm the number of turbines can be reduced with some models as set out in **Table 7.1**.

Table 7.1: Proposed new turbine dimensions

Turbine	Generator	Hub Height	Rotor Diameter	Lower sweep	Number of Turbines
Siemens SWT101	2.3MW	74.5m	101m	24m	22
GE 103	2.85MW	73.5m	103m	22m	19
Enercon E101	3.05 MW	74.5m	101m	24m	18

Changes in construction disturbance

7.13 The proposed alternative turbines will require the same construction techniques and construction time, although layouts with fewer turbines may slightly reduce the construction period. A 10 metre radius micro-siting buffer at each turbine location is applied where this would not impinge on the onsite constraints identified in **Figure 4.1**. This micro-siting buffer allows for minor alterations in the final constructed turbine location due to particular ground conditions that may be encountered during the construction phase. Where ecological features, such as watercourses or hedgerows, are in the vicinity of a turbine location, the appropriate distances from those features are maintained with the micro-siting buffer being reduced accordingly. Therefore, there will be no significant change in the level of construction disturbance due to changes in the micro-siting buffer, the access route realignment, the temporary auxiliary pads, cabling route, relocated substation or temporary construction compound. It is considered that changes in turbine blade lengths will not result in any significant change in the level of construction disturbance. It is therefore concluded that the level will be similar to that considered in the permitted layout; therefore no further assessment is required.

Changes in operation disturbance

7.14 The proposed alternative turbines will be in the same locations as the permitted turbines and therefore the level of maintenance disturbance will be similar. It is considered that changes in turbine blade lengths will not result in any significant change in the level of operational disturbance; therefore no further assessment is required.

Changes in collision risk

7.15 Increasing the blade size could in theory increase the potential risk of bat collision. However surveys on this recorded a low level of bat activity and very low bat activity within the arable fields. In a review of over 40 published and unpublished written reports in Europe¹ (Rydell et al. 2010) it

was found that bat casualties varied between different habitats. This risk was found to be low or does not occur on flat, open farmland, as found on this site, and is higher in more complex landscapes, close to woodlands (within 200m) and highest on the coast, wetlands and within forested hills and ridges. The original assessments considered there was no risk to bats. As there has been no change in the land use of the site since these surveys were conducted - it is still under intensive arable cultivation therefore the potential food supply of insects on the site will not have increased and is more likely to have decreased - the risk to bats, even with larger rotors, remains very low due to the low level of bat activity over the site.

ASSESSMENT OF EFFECTS

Construction

Statutory designated sites

Evaluation

7.16 There are no international or national statutory designated sites within the developable area or within 10km of the site.

Characterisation of effects and significance

7.17 Prior to mitigation it is certain that there will be **no effect** on statutory designated sites.

Mitigation

7.18 None required.

Non Statutory Designated sites

Evaluation

7.19 Cole's Lane Ponds LWS and South Forty Foot Drain LWS are both located within 1km of the site. Heckington Grassland and Old Wood Kyme SNCI's are both approximately 5km away. These are of county importance.

Characterisation of effects and significance

7.20 There will be no development within any non -statutory designated site and there will be no direct or indirect effects on them. Therefore it is certain that, prior to mitigation, there will be **no negative effect** on these non-statutory designated sites.

Mitigation

7.21 None required.

¹ Rydell,J., Bach, L., Dubourg-Savage, M., Green,M., Rodrigues,L., and Hedenstrom, A., (2010 (A)) Bat Mortality at wind turbines in northwestern Europe. Acta Chiropterologica. 12(2):262-274

Habitats – Trees and woodland*Ecological evaluation and assessment*

- 7.22 There are three young plantations of mainly small, deciduous trees scattered around Six Hundreds Farm, and one mature plantation. These are of site interest.
- 7.23 There are seven small, mature trees located within the site within the deciduous plantations and along the drains. These are of site interest.

Characterisation of effects and significance

- 7.24 There will be at least 160m between the deciduous plantation north of Six Hundreds Farm and the nearest turbine, and 170m between the small plantation west of Six Hundreds Farm and the nearest turbine. The substation has been relocated to the east of the site between the Six Hundred Foot Drove and a small plantation (see Figure 3.3). The substation will be approximately 40m from the plantation and be screened with native woodland species and hedgerow. The plantations will not be removed during the works, and it is extremely unlikely that there will be any significant disturbance. Prior to mitigation it is therefore probable that there will be **no negative effect** on the plantations.

Mitigation

- 7.25 None required.

Habitats – Hedgerows*Ecological evaluation and assessment*

- 7.26 There are two small sections of intact species-poor hedgerows, totalling approximately 380m. These are remnant sections of hedge and do not form links between habitat features. They are of low (site) conservation significance. The length of hedge to the west of the Six Hundred Foot Drove opposite the substation will be gapped up with native woody species and enhanced to create a thick visual screen.

Characterisation of effects and significance

- 7.27 The change in turbines will not result in any loss of any of the sections of hedgerow but screening of the substation for landscaping purposes will result in an enhancement of a hedgerow. Therefore, prior to mitigation, it is certain there will be **a minor positive effect** on hedgerow habitat of local importance.

Habitat – Standing water*Evaluation*

- 7.28 The site is divided by a network of drainage ditches and drains, several of which hold water permanently. Targeted surveys reveal no evidence of great crested newts, water or otter using the drainage ditches within the site. These ditches were, however, used by common frogs, common toads and smooth newts, as well as fish species. Dragonfly and damselfly larvae were found in

sweep netting surveys, along with other invertebrates, indicating that water quality in ditches across the site is generally good. These are of site interest.

Characterisation of effects and significance

- 7.29 The minor changes in turbine and access tracks will increase the number of crossings of dry ditches from 15 to 16 but will not change the number of crossings of permanently wet ditches, currently only one. Therefore, there will be no significant change in the effect and prior to mitigation there will be a **negligible negative effect**.

Mitigation

- 7.30 An engineering solution and associated pollution prevention plan (PPP) will be employed as part of the construction method statement to ensure that contaminated or silt laden run-off is prevented from reaching any water bodies or water courses.

Residual Significance

- 7.31 It is certain that after mitigation there will be **no significant negative effect** on watercourses during the construction phase.

Protected Species - Badgers*Evaluation*

- 7.32 There are no setts within the developable area and few signs of badger activity were recorded on the site. The site is suitable for use by foraging badgers and it is likely that badgers in the surrounding area make occasional use of the site for foraging. These populations would be of no more than local importance.

Characterisation of effects and significance

- 7.33 No setts were identified within the developable areas, therefore construction work will not cause sett disturbance. There will be a minor loss of foraging habitat although this will be less than 0.1% of the land holding. Therefore it is certain there will be **no negative effect** on badgers.

Mitigation

- 7.34 None required.

Protected Species - Otters*Evaluation*

- 7.35 The permanently wet drains (Head Dyke-Skerth Drain, Holland Dike and several of the smaller drains) are considered suitable for use by occasional foraging and commuting otters. No otters or signs of otters were recorded on the site during the surveys. The otter population in the area is considered to be of regional importance.

Characterisation of effects and significance

- 7.36 Construction of the access tracks will involve inserting short sections of pipe culvert into only one of the smaller wet drains to the north of Six Hundreds Farm. The large main drains (Head Dyke-Skerth Drain, Labour in Vain Drain, the unnamed drain running north-south through the site and Holland Dike) will not be affected by the development. There are approximately 5,450m of permanently wet drains on the site, of which approximately 10m will be affected (0.18%). It is extremely unlikely that any otters, which may make occasional use of the smaller wet drains, would be disturbed by this. It is therefore considered likely that there will be **no negative effect** on otters.

Further surveys

- 7.37 As the habitat was suitable for use by otters and because they are known to be present in the surrounding areas, a precautionary approach will be necessary. Further otter surveys will be carried out along the wet drains prior to construction, and should they reveal the presence of otters it may be necessary to undertake the work under licence and with a suitably experienced ecologist overseeing the work.

Protected Species –Water Voles*Evaluation*

- 7.38 Although the drains were considered to contain suitable habitat for use by water voles, no water voles were recorded on the site during targeted surveys, and no historical records of water voles on the site were revealed. The absence of water voles on the site may be explained by the presence of mink and the fact that many of the drains are only seasonally wet. Water vole populations in the wider area which could potentially make use of the site in the future are considered to be of no more than local importance.

Characterisation of effects and significance

- 7.39 Construction of the access tracks will involve inserting short sections of pipe culverts into one of the smaller wet drains to the north of Six Hundreds Farm. The large main drains (Head Dyke-Skerth Drain, Labour in Vain Drain, the unnamed drain running north-south through the site and Holland Dike) will not be affected by the development. As water voles are not currently present within the developable area, prior to mitigation it is certain there will be **no negative effect** on water voles. Should water voles become present on the network of drains, it is possible the construction of these access tracks could cause a minor negative effect on water voles.

Mitigation and further surveys

- 7.40 Although this species was not found to be present at the time of the surveys, as the habitat is suitable for use and water voles are known to be present in the surrounding areas, a precautionary approach will be necessary. In the season prior to construction all wet drain crossing points will be re-surveyed for water voles. Should water voles be found to be present sections of bank 20m either side of each proposed crossing will be kept bare of vegetation from March for at least 6 months prior to culvert construction to dissuade water vole use and colonisation of that section of bank, therefore avoiding risk of damage to any burrows or individual water voles.

Protected Species – Bats*Evaluation*

- 7.41 There was a low level of common pipistrelle bat activity over the site. A high proportion (25%) of the total number of foraging bats was recorded along the Head Dyke-Skerth Drain and Holland Dike, with the remainder largely associated with sheltered linear features, smaller drains and close to buildings. Several (mostly individual) myotis bats (likely to be Daubenton's) were recorded over the site, largely associated with Head Dyke-Skerth Drain, and a single probable brown long-eared bat was recorded at the north-east part of the site. No bat species considered to be at high risk from wind turbines were recorded. A small number of roost sites in the farm buildings were identified, used by individual common pipistrelle bats, located away from any proposed turbines. Maximum counts of five individuals at Barn B6 and one at the house B7 were recorded roosting at Six Hundreds Farm, and two at barn B14 at Sadland Farm. See Appendix 7.3: Bat Activity Surveys 2009 and Appendix 7.4: Bat Activity Surveys 2010 from the original ES. The small population of bats present in the site is considered to be of local importance.

Characterisation of effects and significance

- 7.42 No roost sites or potential roost sites will be damaged during construction of turbines or associated infrastructure, and there will be no construction of turbines within 200m of any roost sites.
- 7.43 There will be no loss of foraging habitat due to the construction of the turbines and therefore prior to mitigation there will be **no significant negative effects**.
- 7.44 Safety lighting may be used in the construction compound. While some lighting can sometimes disrupt commuting flight paths of some bat species, the species of bat recorded on site are not disturbed by lighting, unless close to a roost, and they may even be attracted to feed on insects around bright white lighting² which may create enhanced feeding opportunities.

Mitigation

- 7.45 Any lighting required for safe working would be limited to winter use when bats are inactive. If security lighting is required during the summer this will be of low intensity and only be used within the construction compound, as well as being directed away from the buildings and any important bat features.

Residual Significance

- 7.46 It is certain that after mitigation there will be **no significant effect** on bat populations during the construction phase.

² Rydell J & Racey, P A (1993) Street lamps and the feeding ecology of insectivorous bats. *Recent Advances in Bat Biology Zool Soc Lond Symposium abstracts*

Operation**Statutory and Non Statutory designated sites and Habitats***Evaluation*

- 7.47 There will be **no operational effect** of the proposed wind turbines on any habitat or designated site.

Characterisation of effects and significance

- 7.48 Not significant.

Mitigation

- 7.49 None required.

Protected Species – Badgers*Evaluation*

- 7.50 No setts are present on or surrounding the site and badgers are likely to make limited use of the site for foraging.

Characterisation of effects and significance

- 7.51 Access for maintenance of turbines will be by van along the access tracks. The frequency of movement by maintenance vehicles each year will be significantly less than the typical annual vehicle movements associated with agricultural practice on the site. It is certain that there will be **no significant** effect on badgers during the operational phase.

Mitigation

- 7.52 None required.

Protected Species – Bats*Evaluation*

- 7.53 There was a low level of bat activity over the site with a large proportion of foraging common pipistrelles recorded close to Head Dyke-Skerth Drain and Holland Dike. The closest turbine is over 250m to the south of this dyke. There was a lower level of activity along the smaller drains, at the woodland and around the buildings. Several recordings of probable Daubentons and one brown long-eared bat were made. No noctules or other high-flying, high-risk bats were recorded on the site. A small number (up to six) of individual common pipistrelles were roosting in farm buildings at Six Hundreds Farm. These buildings are over 200m from the closest turbines.

- 7.54 There is concern, particularly in mainland Europe and America, that onshore and offshore wind turbines in certain locations can be a collision or barotrauma³ hazard to bats if they fly close to moving turbines. The most serious incidents have involved migratory tree-dwelling bat species that fly very high and for long journeys across North America. The latest interim guidance from Natural England² states:

“that most bat species in the UK are unlikely to come into contact with the blades during their normal movements, because, to the best of our knowledge, these bats do not migrate at high altitude and rarely fly at heights that intersect with the blades”.

Characterisation of effects and significance – Bat flight

- 7.55 Common pipistrelle, brown, long-eared bat and Myotis populations, are considered by Natural England to be at low risk from wind turbines. Surveys on this site recorded low number of bats largely foraging along water courses during the bat surveys.

- 7.56 There is emerging evidence from Europe that certain bat species are potentially at risk of direct collision or barotraumas from wind turbines at particular locations, during certain weather conditions and at certain times of the year.

- 7.57 In a review of over 40 published and unpublished written reports from across Europe (Rydell et al. 2010)⁴ it was found that bat casualties varied between different habitats. This risk is generally low or does not occur on flat, open farmland and is higher in more complex landscapes, close to woodlands and highest on the coast, wetlands and within forested hills and ridges. In a few locations significant casualties have been recorded. There was no relationship between the mortality per turbine and the number of turbines in the wind farm, e.g. turbines in larger wind farms did not pose a higher risk to bats than a single turbine in a high risk location. In habitats where casualties did occur the casualty rate was positively correlated with turbine tower height and rotor diameter but not with minimum distance between the rotor and the ground. At locations where bat casualties were recorded they were frequently recorded in large numbers flying around the turbines and feeding.

- 7.58 Therefore, given the low level of bat activity on this site and that any foraging activity was associated with permanent water courses, it is considered that, prior to mitigation there will be a **negligible negative effect** on these populations.

Mitigation

- 7.59 The turbines will be located in the centre of the site and the blade sweep will be over 50m from Head Dyke-Skerth Drain and Holland Dike, the areas of highest activity.

- 7.60 The location of turbines has been designed to ensure the sweep of the blades is at least 50m from hedgerows, trees and wet drains likely to be used by foraging bats in accordance with Natural England guidance TIN051. Where appropriate the turbine micro-siting buffer has been removed to ensure at least 50m clearance. The turbines are at least 200m from any buildings used by small

³ Baerwald E,F, D'Amours G, H, Klug,B, J and Barclay R M R 2008 Current Biology, Volume 18, Issue 16, R695-R696, 26 August 2008

⁴ Rydell,J., Bach, L., Dubourg-Savage, M., Green,M., Rodrigues,L., and Hedenstrom, A., (2010 (A)) Bat Mortality at wind turbines in northwestern Europe. Acta Chiropterologica. 12(2):262-274

numbers of roosting bats. These roosts will be monitored following the construction of the turbines to ensure their continued use.

- 7.61 All hedgerows within the site will be managed so that they are tight and low which makes them less attractive for foraging bats (Barndt et al 2007)⁵.

Residual Significance

- 7.62 It is certain that after mitigation there will be **no significant effect** on bat populations during the operational phase.

Decommissioning

- 7.63 Decommissioning is likely to have similar effects to those in construction, although over a much shorter period of time. However, there may well have been significant changes in habitat and species present on the site due to predicted changes in climate and associated changes in any use of the surrounding area. Therefore, further surveys will be required prior to the assessment of any effects on particular species or habitats. The turbine towers and blades will be removed from the site by the same means as they arrive, but the foundations will remain on the site unless otherwise specified. This minimises the level of disturbance to the area and allows for any vegetation which has established itself over the lifetime of the proposed development to remain undisturbed. Therefore, the effect of decommissioning is likely to be significantly less than that of construction.

MITIGATION

Design mitigation

- 7.64 Access track routes and turbine locations have been selected to ensure that there is no loss of existing hedgerows.
- 7.65 The location of turbines has been designed to ensure that the sweep of the blades is at least 50m from hedgerows, trees and wet drains likely to be used by foraging bats in accordance with natural England guidance TIN051. They are also at least 200m from any roosts used by individual bats.
- 7.66 An engineering solution and associated pollution prevention plan (PPP) will be employed as part of the construction method statement to ensure that contaminated or silt laden run-off is prevented from reaching any water bodies or water courses.

Construction mitigation

- 7.67 Other measures involving avoidance, reduction and enhancement, will be implemented during construction in order to offset effects identified in the previous section. These include:
- The use of noisy earth-moving machinery which will be restricted to normal working hours, to reduce levels of disturbance generally to wildlife in the area;

- Any lighting used for the construction process will be installed in such a way as to avoid excessive illumination of areas of scrub, hedge, trees or woodland. Directional lights will be used, in keeping with considerations of human safety, to reduce light pollution to areas important for wildlife. Lighting the working areas at night during the summer will be avoided;
- Preparation and implementation of an overall Environmental Management Plan (EMP) to ensure best environmental working practice, proper implementation of mitigation measures and to minimise the potentially adverse effects of construction activity;
- In the season prior to construction all potential crossing points of water courses will be re-surveyed for water voles. Should they be found to be present, sections of bank 20m either side of each proposed crossings will be kept bare of vegetation for at least 6 months prior to bridge construction to dissuade water vole use and colonisation of that section of bank, therefore avoiding risk of damage to any burrows or individual water voles; and
- Should further surveys prior to construction reveal the presence of otters using the drains it may be necessary to undertake the work under licence and with a suitably experienced ecologist overseeing the work.

Post-construction mitigation

- 7.68 Other measures, involving avoidance, reduction and enhancement, will be implemented post-construction in order to offset effects identified in the previous section. These include ongoing hedgerow management to ensure all hedgerows on site are kept low and tight.
- 7.69 The location of turbines has been designed to ensure the sweep of the blades is at least 200m from any buildings used by individual roosting bats. These roosts will be monitored following the construction of the turbines to ensure their continued use.

Decommissioning Mitigation

- 7.70 Due to the fact that the decommissioning process will not take place for over 25 years after the turbines become operational, it is very difficult to predict the ecological effects the decommissioning process will have. However, decommissioning is likely to replicate the effects given above for construction. Therefore a full Environmental Management Plan should again be prepared and decommissioning should avoid the bird breeding season.
- 7.71 At the time of the decommissioning the developer will, if requested, consult with Natural England (or the appropriate contemporaneous authority) to check whether any specific measures are required to protect any ecological interests on, or near to, the site.
- 7.72 As a current baseline, all the mitigation measures which are undertaken for construction should be implemented, unless otherwise deemed unnecessary by the appropriate authority.

⁵ Brandt, G. Blows, L. Linton, D. Plaing, N. and Prescott, C. *Habitat associations of British bat species on lowland farmland within the Upper Thames catchment area*. Centre for Wildlife Assessment and Conservation *E journal* (2007) 1 10-19

RESIDUAL SIGNIFICANCE

7.73 This section considers the effect of the development after mitigation. The potential residual significance of the proposed development is summarised in **Tables 7.2, 7.3 and 7.4**.

Proposed Additional Monitoring

7.74 This section provides a summary of additional monitoring which will be undertaken when the development has obtained planning permission.

7.75 The bat transect surveys and dusk emergence/dawn re-entrance surveys will be repeated following the construction of the wind park to assess the effect of the turbines on the existing bat populations. These will be undertaken in July, August and September in the first two seasons after the beginning of operation. Transects A, B and C (the transects with most bat activity) will be re-surveyed.

BIODIVERSITY ENHANCEMENTS

7.76 An Environmental Management Plan will be drawn up identifying key management policies. These will be implemented following construction of the turbines for the duration of the operational phase. This will include details of management and cutting/clearing regimes for the remnant sections of hedgerow, the ditch network, and the areas of grassland.

7.77 The habitat on site, outside the developable area but inside the land ownership boundary, will be improved, specifically for birds but also to the benefit of other wildlife. This will include:

- Creating skylark scrapes (small areas of ground left bare) in the crops within fields away from the developable area. Two plots per hectare (at least 16m² each) in fields larger than five hectares can boost productivity by almost 50%⁶. These will also benefit corn buntings and will be of benefit to invertebrates, including bees;
- Create beetle banks as over-wintering habitat for beneficial insects. Beetle banks are two-metre grass strips through the middle of arable fields;
- Nest boxes for house sparrows, tree sparrows, barn owls and starlings, on buildings within the farm complexes;
- Allowing weeds to grow up on non-cropped areas, such as access tracks and the field boundaries, to encourage invertebrates which are an important food source for birds, such as corn bunting and are of biodiversity value in their own right; and
- Improving existing/creating new hedgerows surrounding the farm away from the turbines (specifically to the south adjacent to the A17). This will be done by adding whips of an appropriate mix of hedgerow species to any gaps, and cutting and laying appropriate sections.

SUMMARY

7.78 Following analysis of available survey work and assessment of the minor changes proposed, it is considered that there is no evidence to suggest that the proposed changes in the turbine size, layout of access tracks, substation and associated underground cabling, micro-siting buffers and temporary construction compound will result in any significant change in the effect on any known protected species or ecological features of value at the national, county or local level as compared with the original permitted scheme.

⁶ RSPB (2008) - Advice for farmers: Skylark. Available online: www.rspb.org.uk

Table 7.2: Summary table of Construction Effects on Habitats and Designated sites

Habitat	Indicative importance	Nature of effect	Potential unmitigated effect on the feature	Likely occurrence	Magnitude	Significance without mitigation	Mitigation and Enhancement	Residual significance
Statutory / Non-Statutory designated sites	National	Removal or alteration of habitat	Loss of habitat	Extremely Unlikely	Negligible	Not significant	None required	N/A
Trees and woodland	Site	Removal or alteration of habitat	Loss of habitat	Extremely Unlikely	Negligible	Not significant	None required	N/A
Hedgerows	Site	Removal or alteration of habitat	Loss of habitat	Extremely Unlikely	Negligible	Not significant	None required	N/A
Standing water	Site	Heavy rain during construction could increase risk of silt run-off. Damage to banks during construction of new crossing points (culverts)	Degradation of habitat downstream of site through increased turbidity, nutrient load and smothering habitats. Loss of small sections of habitat, disturbance or risk of injury to protected species	Probable	Negligible	Potential for temporary significant effects downstream of site	An engineering solution and associated pollution prevention plan (PPP) will be employed as part of the construction method statement to ensure that contaminated or silt laden run-off is prevented from reaching any water bodies or water courses	Not significant

Table 7.3: Summary of Construction Effects on Protected Species

Species	Indicative Importance of populations	Potential effect on population of wind farm based on NE Guidance	Nature of effect	Potential Effect	Likely occurrence	Magnitude	Significance without mitigation	Mitigation & Enhancements	Residual significance
Badger	Local	N/A	Removal or alteration of habitat	Disturbance to individuals	Extremely Unlikely	Negligible	Not significant	None required	N/A
Otter	National	N/A	Removal or alteration of habitat	Disturbance to individuals	Extremely Unlikely	Negligible	Not significant	None required	N/A

Water Vole	National	N/A	Removal or alteration of habitat	Disturbance to individuals	Extremely Unlikely	Negligible	Not significant	None required	N/A
Common Pipistrelle	Local	Low	Removal or alteration of habitat or roost	No roosts will be affected	Due to low numbers using the site and foraging patterns of species it is considered to be extremely unlikely.	Negligible	Not significant	Any lighting required for safe working would be limited to winter use when bats are inactive. If security lighting is required during the summer this will be of low intensity and will only be used within the construction compound and directed away from the buildings and any important bat features.	Not significant
Myotis sp. and brown long-eared	Local	Low	Removal or alteration of habitat or roost	No roosts will be affected	Due to low numbers using the site and foraging patterns of species it is considered to be extremely unlikely.	Negligible	Not significant	Any lighting required for safe working would be limited to winter use when bats are inactive. If security lighting is required during the summer this will be of low intensity and will only be used within the construction compound and directed away from the buildings and any important bat features.	Not significant

Table 7.4: Summary table of Operational Effects on Habitats and Designated sites

Habitat	Indicative importance	Nature of effect	Potential unmitigated effect on the feature	Likely occurrence	Magnitude	Significance without mitigation	Mitigation and Enhancement	Residual significance
Statutory designated sites	National	Disturbance to species within designated sites	Loss of species	Extremely Unlikely	Negligible	Not significant	None required	N/A

Table 7.5: Summary of Operational Effects on Protected Species

Species	Indicative Importance of populations	Potential effect on population of wind farm based on NE Guidance	Nature of effect	Potential Effect	Likely occurrence	Magnitude	Significance without mitigation	Mitigation & Enhancements	Residual significance
Badger	Local	N/A	Vehicle access for turbine maintenance	Disturbance to foraging individuals	Maintenance vehicle activity will be significantly less than typical agricultural practices, therefore disturbance to badgers is extremely unlikely.	Negligible	Not significant	None required	N/A

Common Pipistrelle	Local	Low	Movement of blades	Disturbance Collision resulting in injury or death	Due to low numbers using the site and foraging patterns of species it is considered to be extremely unlikely	Negligible	Not significant	The sweep of the blades is at least 50m from hedgerows or trees likely to be used by foraging bats, and at least 200m from any buildings used by roosting bats. All hedgerows within the site will be managed tight and low which are less attractive for foraging bats	Not significant
Myotis sp. and brown long-eared	Local	Low	Movement of blades	Disturbance Collision resulting in injury or death	Due to low numbers using the site and foraging patterns of species it is considered to be extremely unlikely	Negligible	Not significant	The sweep of the blades is at least 50m from hedgerows or trees likely to be used by foraging bats, and at least 200m from any buildings used by roosting bats. All hedgerows within the site will be managed tight and low which are less attractive for foraging bats	Not significant