

8.0 ECOLOGY AND NATURE CONSERVATION

8.1 Introduction

8.1.1 This section of the ES assesses the impacts on ecology and nature conservation that may result from the proposed development. The assessment of ecological impacts follows current guidelines set out by the Institute for Ecology and Environmental Management (IEEM, 2006). It essentially involves:

- determining the scope of the ecological investigation;
- the identification of valued ecological resources and features which may be affected by the development;
- assessing whether ecological interest features will be impacted by any changes arising from the development, and
- setting out proposed ecological enhancement, mitigation or compensation measures to avoid or offset any impacts, where possible providing net ecological benefits.

8.1.2 This section first outlines the methodology used to acquire ecological data, determine the scope of investigation, identify ecological interest features, and assess impacts. The ecological characteristics of the site and its surroundings are then described and evaluated, identifying any valued ecological receptors. The ecological impact assessment considers the potential impacts of development proposals upon these features, and their level of importance. Mitigation, compensation and enhancement measures are then proposed, which are designed to avoid or offset any losses to ecological resources within the development site.

8.2 Assessment Methodology

Scope of ecological surveys

8.2.1 The scope of ecological investigation was initially determined after consideration of consultation responses from Natural England and North

Lincolnshire Council, and refined by acquisition of background data and initial field surveys.

- 8.2.2 North Lincolnshire Council suggested a walkover Phase 1 Habitat survey should be carried out between April and October, in order to inform the scope of subsequent ecological surveys. In order to adequately accommodate surveys which would have to commence before April, an initial scoping survey was carried out in February, involving both an experienced habitat surveyor and a protected species specialist.
- 8.2.3 North Lincolnshire Council's suggested ecological scope formed the basis of decision-making with regard to the surveys undertaken to inform this development proposal. Following the initial field survey, some of the surveys within the council's scope could be justifiably excluded, on the grounds that there would be an extremely low risk of a significant effect as a consequence of the development. Others surveys were undertaken and are reported below. As the site lies adjacent to Scawby Beck, which supports a protected species, and a non-statutory nature conservation site, Silversides SSSI, the geographical scope of survey was extended in subsequent surveys to include these areas.
- 8.2.4 The suggested surveys set out by the local authority are listed in the table below, with the scope and status of the actual survey undertaken.

Table 8.1: Scope of Ecological Surveys

	Suggested survey	Scope of works undertaken
1	Badgers: search for field signs, potential bait marking	2 surveys undertaken by 2 experienced badger surveyors, after initial survey revealed activity near site boundary.
2	Bats: Search for suitable roost sites and existing records; activity survey	Bat records obtained from local records centre; risk assessment carried out of all structures on site; emergence and activity survey in June 2008.
3	Reptiles: surveys for grass snake, slow worm and common lizard carried out in accordance with Herpetofauna Workers Manual	Lack of records in vicinity and lack of suitable habitats within development footprint gave rise to assessment of low risk of occurrence, so no survey undertaken.
4	Amphibians: surveys carried out in accordance with Herpetofauna Workers Manual and Great Crested Newt Mitigation Guidelines	4 surveys carried out between April – June 2008 of ditches and wetland within 500m of site, in accordance with current guidelines.
5	Bird survey: survey according to CBC methodology, with evening surveys for barn owl	Carried out in accordance with suggested methodology, including evening / crepuscular visits to record barn owl which were extended to June 2008.
6	Water vole survey: Scawby Beck and other suitable watercourses to be surveyed	Scawby Beck and ditch to south of development surveyed with positive results on both watercourses; potential impacts of development on these populations considered below
7	Vascular plants: Site and Scawby Beck to be surveyed for vascular plants in Phase 1 survey	Site, Scawby Beck and Silversides SNCI surveyed for vascular plants in June 2008.
8	Invertebrates: Survey may be necessary following Phase 1 survey	Phase 1 did not identify any areas of high habitat quality for invertebrates within development boundary, and a survey is not considered necessary
9	Other protected or BAP species: To be considered if revealed in surveys	Bird survey revealed a number of UK and Lincolnshire. BAP species, which have been considered in the impact assessment.
10	Desktop search: Local Biological Records Centre data	Carried out and summarised below

Consultation and data acquisition

- 8.2.5 Data were obtained from web-based sources, and by consultation with statutory and voluntary agencies. Details of the nearest statutory nature conservation sites, and the local Natural Area profile were obtained from the government multi-agency geographic information website (www.magic.gov.uk), with linked Natural England data. Lincolnshire Biodiversity Partnership were consulted for records of protected species and non-statutory conservation sites within 2km of the proposed development.
- 8.2.6 There are records of bats and water vole (*Arvicola terrestris*) relevant to the site. The closest records of bats are of two common pipistrelle (*Pipistrellus pipistrellus*) roosts 500m and 600m to the north of the site. There are records of roosts of unidentified bats 600m to the north and 800m to the north east. There is also a record of water vole in Kettleby Beck, 1.2km to the south east of the site. The site is bordered to the north by Silversides Site of Nature Conservation Interest (SNCI) which has a record of nesting little ringed plover (*Charadrius dubius*) from 1977.

Field survey methods – initial habitat / protected species survey

- 8.2.7 An extended Phase 1 Habitat Survey was carried out on 8th February 2008, in accordance with the standard methodology set out in JNCC (1991), as modified by Institute of Environmental Assessment (IEA, 1995). The geographical scope of this survey included the planning application boundary, together with the adjacent ditch to the north. Habitats were mapped, and a series of notes made of the species composition of habitat compartments.
- 8.2.8 The potential of the site to support protected species such as badger (*Meles meles*), bats, otter (*Lutra lutra*), amphibians and water vole was assessed in terms of available habitats on site and proximity of suitable habitats. Maps and aerial photographs were used to make an initial assessment of the suitability of the site for protected species. The survey was carried out on the 8th February 2008. The site and surrounding area was walked and features of interest for protected species noted and mapped.

- 8.2.9 Bats roost in both buildings and trees, and structures located on site were assessed for their potential to support bats. Suitable structures that could support bats were identified and these were assessed for physical evidence of bats such as droppings. Holes, cracks and crevices were inspected for 'brush' marks which would indicate use by bats. An assessment of the foraging potential of the site was also made.
- 8.2.10 Ditches and watercourses identified near the site were assessed for their quality as habitat for water vole and otter. The ditches/watercourses were inspected systematically for signs of water vole and otter. Water vole signs include droppings/latrines, tracks, runways and burrow systems/nests with their distinctive grazed 'lawns'. Signs of otter include spraints, often placed on rocks and dens or couches.
- 8.2.11 The site was searched for signs of badger. Efforts were made to identify any setts, latrines, tracks and/ or snuffle holes which would positively identify the presence of badger on, or close to, the site. Tracks, where found, were followed to investigate patterns of movement across the site.
- 8.2.12 Ponds or standing water located on land to the north of the site were assessed for their suitability for breeding great crested newts. The quality of available terrestrial habitat was also assessed for amphibians and reptiles.
- 8.2.13 Areas of the site with potential for nesting birds were identified; these include woodland, scrub and areas suitable for ground nesting birds such as little ringed plover (*Charadrius dubius*).

Vascular Plant Survey

- 8.2.14 A habitat and vegetation survey of the site and adjacent Silversides SNCI was carried out on 16th-17th June 2008. Habitats were mapped with the aid of an aerial photograph and a differential GPS, with an abundance-weighted vascular plant species list compiled for each discrete habitat compartment. The earlier Phase 1 survey was updated to reflect seasonal changes in the visibility of flora.

Water vole / badger survey methods

- 8.2.15 Following the assessment of the site's potential to support protected species, a further visit was undertaken on 2nd April 2008, in order to record water vole activity in nearby watercourses, and track badger foraging activity in an effort to locate the nearest sett. Signs of water vole activity, including grazing, droppings and holes were recorded and plotted.

Breeding bird survey methods

- 8.2.16 A breeding bird survey was undertaken over the course of 3 visits, encompassing the site and open space to the north of the site. Survey methodology was based on an abbreviated Common Bird Census method, typically used for ecological impact assessment purposes. Visits were made roughly one hour after sunrise until mid-morning (1000-1100h), as birds are generally most active at this time of day and most inactive in the early afternoon. The survey area was walked at a slow walking pace with frequent pauses, so that all birds detected could be identified. Days of inclement weather (persistent rain, high winds, poor visibility) were avoided. Survey routes were varied between visits so that there was no tendency for any part of the survey area to be visited later or earlier in the survey period. The route was organised such that any point within 50m of the survey site was visited. Surveys also incorporated evening visits to determine whether the site or adjacent land was used by foraging barn owl (*Tyto alba*). Bird surveys were carried out on 28th - 29th March, 21st - 22nd April and 11th - 13th May 2008.

- 8.2.17 While previously recorded on several occasions on Silversides SNCI during the bird and amphibian surveys, the 11th June amphibian survey recorded barn owl in and around the sugar beet factory. Further efforts were therefore made on the evening of 16th June to determine the location of the nest. In order to avoid disturbance, survey methods were confined to observing owls from vantage points within and outside the site.

Amphibian survey methods

- 8.2.18 There are three ditches and a wetland within 500m of the development site. One ditch is on the site itself and two are offsite to the east; the wetland is

offsite to the north, within Silversides SNCI. Their locations are shown on the habitat survey plans.

- 8.2.19 Ditch 1 is a small ditch 10m in length before a culvert and 0.5m wide holding only 5-10cm water; abundant aquatic macrophytes include bulrush (*Typha latifolia*), water starwort (*Callitriche sp.*) and celery-leaved buttercup (*Ranunculus sceleratus*). The substrate is sandy and banks steep in places. Ditch 1 is located within the red-line planning boundary.
- 8.2.20 Ditch 2 is a drainage ditch offsite to the east, approximately 30m in length and 3m wide throughout its length. It was up to 0.75m deep, with a silty substrate and few submerged or emergent plants. During early survey visits the surface was thickly covered with algae but this was gone by later survey visits.
- 8.2.21 Ditch 3 is a drainage ditch offsite to east, 60m in length and culverted downstream. Varying in width between 1m and 3m, it was up to 0.5m deep with a silty substrate. Algae covered the ditch during early survey visits, and it was dry in later surveys.
- 8.2.22 Silversides SNCI supports a wetland area with fairly diffuse margins, varying with the extent of inundation. It is dominated by common reed (*Phragmites australis*), leaving only a few areas of open water, with a depth of up to 0.5m.
- 8.2.23 Survey methods conformed to Natural England's standards as outlined in English Nature's Newt Mitigation Guidelines. A combination of three of the four survey techniques (egg searching, netting, torching and bottle trapping) was used on each visit. The survey work was carried out over four separate visits.
- 8.2.24 Bottles were placed along the edge of the ditches at an approximate density of 1 per 2m of margin. In the wetland bottles were confined to the areas of open water. Bottles were retrieved the following morning and any newts caught were recorded. From dusk, the waterbodies were inspected by torchlight to carry out an individual count. The ditch margins and as much of the centre of the ditches as possible were searched by slowly scanning the water with a 500,000-candle power torch.

8.2.25 Netting and egg searching were carried out during daylight hours. Submerged vegetation was searched for the presence of great crested newt eggs. Netting was undertaken around the margins of the pond in order to locate newts that might be buried in the substrate during the day.

8.2.26 Weather conditions were generally good during the evening surveys. Evening air temperature was between 8°C and 14°C during the surveys. Detailed weather conditions for each survey occasion are provided in Table 8.2 below.

Table 8.2: Great Crested Newt Surveys

Date Survey Occasion	Weather	Temperature (°C)
21/04/08	Clear, dry, slight breeze	8
09/05/08	Clear, dry, still, humid	11
11/06/08	Overcast, dry, still	14
16/06/08	Overcast, fine and dry	12

Bat activity / emergence

8.2.27 A bat activity and emergence survey was carried out around the old sugar beet factory on the evening of 16th June 2008. Four observers were stationed around the western end of the site, in order to cover potential emergence from buildings and mature trees in this area, although all structures had previously been assessed as having a low risk of supporting a bat roost. All observers were equipped with ultrasonic bat detectors, comprising 3 Batbox heterodyne detectors, and 1 Peterson time expansion detector linked to sound recording equipment. Surveys commenced at 2130, continuing until 2330.

Personnel

8.2.28 Water vole, badger surveys, and a risk assessment of bat suitability were carried out by Claire Henderson MSc and Paul Lupton MSc. Both are experienced protected species specialists; Paul has a current bat handler's licence. Amphibian surveys were led on each occasion by Claire Henderson, assisted by Paul Lupton and Frank Daly, all of whom hold current GCN survey licenses, and James Gilchrist.

- 8.2.29 The bird survey was carried out by Frank Daly MSc AIEEM, and the habitat surveys by Kevin Honour MSc MIEEM; both are very experienced in their respective disciplines. All surveyors are full-time employees of Argus Ecological Services Ltd.

8.3 Site Evaluation

Ecological context

- 8.3.1 The site is located in the North Lincolnshire Coversands and Clay Vales Natural Area. The local context of the site is a flat, lowland landscape, with open fields bounded by ditches.

Statutory designated sites

- 8.3.2 A site check on the Magic database revealed one statutory designated conservation site of international or national importance within 5km of the site (search centred on grid reference SE 989 061). Manton & Twigmoor SSSI is located 4.9km to the west, extending beyond the area of search.

Non-statutory designated sites

- 8.3.3 Lincolnshire Biodiversity Partnership provided details of Sites of Nature Conservation Interest (SNCIs) within 5km of the site; these are listed in the table overleaf:

Table 8.3: Sites of Nature Conservation Interest within 5km

Site	Location	Interest features
Manton, Twigmoor & Greetwell	SE940050	Woodland and wetland
Greetwell Bog	SE940052	Open water and bog
Staniwells Plantation	SE945033	Plantation with open clearing
Manby Wood	SE950075	Coniferous and deciduous plantations
Broughton West Wood	SE950090	Deciduous woodland
Staniwells Verge	SE958030	Road verge with sand leek
Broughton East Wood	SE965099	Coniferous plantation
Scawby Park Ponds	SE966062	Wetland and woodland
Traffords Covert	SE985041	Broadleaved woodland
Broughton Far Wood	SE958104	Broadleaved woodland
Silversides Settling Ponds	SE988063	Infilled settling lagoons with grassland, avian interest
Far Wood Farm Meadow	SE959100	Calcareous grassland
Faraway Drain, Newstead	TA002053 - TA005039	Wetland
Candley Beck, Westrum	TA006065 - TA014064	Wetland
Cadney Carrs Reservoir	TA013047	Open water with avian interest
Howsham Barff Wood	TA034065	Broadleaved woodland, heronry

8.3.4 Most of these sites are located some distance to the west of the site, and are associated with the heavily wooded limestone escarpment of the Lincolnshire Wolds; they are unrelated geographically or ecologically to the site. Silversides SNCI, however, is located just north of the site, and occupies the now infilled settling ponds of the old sugar beet factory.

8.3.5 The key interest feature of Silversides SNCI was the presence of little ringed plover (*Charadrius dubius*) during surveys in 1977 and 1994. The site is currently predominantly composed of tall grassland with smaller areas of shallow vegetated wetlands and seasonal pools; it is lacking the conditions which would continue to support this species, which prefers much more open habitats.

Protected species records

8.3.6 A list of protected species for a 2km radius of the site obtained from Lincolnshire Biodiversity Partnership included the following:

- pipistrelle;
- other unidentified bats; and
- water vole.

8.3.7 Reports from site staff at the former factory suggested that barn owl and kingfisher (*Alcedo atthis*) were occasionally recorded to the north of the site.

Habitats within application area

8.3.8 The disposition of habitats in and around the planning application boundary is shown on Figure 8.1 (Habitat Survey), with mapping based on standard Phase 1 categories (JNCC, 1991). Target notes are given in Appendix 8-1, with a vascular plant species list in Appendix 8-2.

8.3.9 Component habitats occupy the following approximate areas:

Table 8.4: Areas of Phase 1 Habitats

Habitat	Area (ha)
Bareground / hardstanding	1.906
Ephemeral / short perennial vegetation	1.264
Buildings	1.007
Neutral grassland	0.499
Tall ruderal	0.211
Scrub	0.158
Amenity grassland	0.052
Swamp	0.002

8.3.10 Around 85% of the total area of the site is occupied by derelict or partly used former industrial buildings, hard standing around the buildings, or sparse vegetation in the early stages of colonising formerly bare ground. There are patches of better established grassland in the main part of the site, and a lawn

with small fruit and ornamental cherry trees is located near the former factory entrance.

- 8.3.11 Better established vegetation is largely confined to the north-eastern corner of the planning application area, and the site boundaries. The north-east corner forms part of a more elevated area, with a small ditch containing bulrush (*Typha latifolia*) and great willow-herb (*Epilobium hirsutum*) at its base. The slopes of this elevated area support a mosaic of elder (*Sambucus nigra*) and hawthorn (*Crataegus monogyna*) scrub, interspersed with tall herbs such as stinging nettle (*Urtica dioica*). This gives way to a plateau of short, rabbit-grazed grassland, extending off-site to the east.
- 8.3.12 There are further areas of scrub and a conifer hedge along part of the western and northern site boundaries, while a small group of mature trees are located to the south of the factory buildings; both of these boundaries are fenced. The southern and eastern boundaries of the site are undefined, the former including a more extensive area of bare and newly-colonised land between the site and a gas-fired power station.
- 8.3.13 To the north of the site is an area of rough grassland with a footpath. A ditch separates this area from the tall grassland and wetland vegetation of Silversides SNCI. The ditch is <4m wide, and is bounded by very steep grassy banks; water depth varied from 0.5m at the edges to 1.2m in the central channel. In-channel vegetation varied in cover, and included water-cress (*Rorippa nasturtium-aquaticum*) and lesser water-parsnip (*Berula erecta*), with submerged water starwort (*Callitriche* sp.). A further ditch is located to the south-east of the site, near the existing power station. This is smaller, with a width of 0.5-1m, and water depth to 0.5m; in-channel vegetation includes bulrush, great willowherb and water starwort, with brambles, tall herbs and grasses on the steep banks.

Habitats within Silversides SNCI

- 8.3.14 Silversides SNCI is predominantly composed of tall, false oat-grass (*Arrhenatherum elatius*) – dominated grassland, and extensive areas of tall ruderal vegetation, largely dominated by stinging nettle (*Urtica dioica*), or a mix of stinging nettle and great willow-herb (*Epilobium hirsutum*). Smaller

areas of low-lying ground are located on the now infilled former settling lagoons. These support seasonally wet inundation communities, characterised by abundant creeping buttercup (*Ranunculus repens*) or creeping bent (*Agrostis stolonifera*). An area of more permanent shallow standing water remains in the southern part of the site; this is largely dominated by common reed (*Phragmites australis*).

- 8.3.15 Habitats on Silversides SNCI are shown in Figure 8.2; the boundaries between 'grassland' and 'tall ruderal' categories are not very clear-cut in many parts of the site, depending on the relative proportion of false oat-grass and stinging nettle in the sward. Target notes in Appendix 8-1, and the species list in Appendix 8-2 give more detail.

Protected species

- 8.3.16 There was evidence of use of the grassland and scrub on the north-eastern boundary of the site by **badger**, with a fresh dung-pit and trail recorded running close to the undefined north-eastern boundary during the February 2008 visit. Trails appeared to be passing under the northern boundary fence, and crossing a bridge over the ditch onto Silversides SNCI, before radiating out. Subsequent visits found little or no activity, and were unable to track these trails to a sett. A careful search of suitable locations did not reveal any active setts in the vicinity of the site.
- 8.3.17 No other protected species were recorded within the boundary of the proposed development site during the initial survey.
- 8.3.18 The structures within the site were subject to an assessment of their suitability to support **bat** roosts. The buildings are of mainly brickwork construction with either flat or pitched metal sheeted roofs. Some of the buildings are disused and inhabited by pigeons and some have industrial usage. Although the interiors of buildings were not inspected it is unlikely that roof voids suitable for bats were present given their construction. The potential of the buildings to support summer roosting bats is low. Cracks and holes in brickwork walls and gaps under weatherboards and under wooden soffits offered some opportunities for occasional use by small numbers of bats of crevice-dwelling species such as pipistrelle. The potential for the site to support winter

hibernating bats is very low. Several mature trees on the site (see Figure 8.1) were assessed as being of low risk of supporting a bat roost.

- 8.3.19 The bat survey recorded relatively little activity around the sugar beet factory; 2 45kHz pipistrelles were recorded at 2155, foraging around the loading bay area. Occasional 45 kHz pipistrelles were recorded foraging around the site, but none were recorded emerging from buildings. Given the limited opportunities for bat roosts in the industrial buildings, this supports the inference that there are no current roosts on site.
- 8.3.20 More bats were recorded foraging to the north of the site later in the evening, with activity concentrated along the main ditch, which provides much better quality habitat for bats. It is likely that these originated from roosts some distance from the site.
- 8.3.21 **Water voles** were recorded along the ditches to the north and south-east of the site. The northern ditch had a range of evidence of voles along its whole surveyed length, which included an approximately 250m reach adjacent to the site (from grid ref. SE 98529 06199), extending 175m upstream, and approximately 250m downstream to a culvert at SE 99022 06534. Features included numerous holes at a variety of levels; runs; latrines; footprints; and evidence of grazing. Several voles were also observed during one of the evening site visits. At its closest, the ditch is within 6m of the planning application boundary.
- 8.3.22 A smaller population of water voles were also recorded on a ditch to the south-east of the site, with 3 latrines and 2 holes near grid reference SE 99227 06163, around 235m east of the site boundary.
- 8.3.23 Lincolnshire Biodiversity Partnership holds no records for **great crested newts** within 2km of the site. The National Biodiversity Network holds a record for SE90 'Scawby' a village 1.5km to the west, dating from 1967.
- 8.3.24 No great crested newts were found during the surveys, although smooth newt were recorded from the ditches to the north of the site, and the wetland at Silversides. Results are summarised in Table 8.5.

Table 8.5: Amphibian Survey Results

Waterbody GCN		Smooth		Method
M	F	M	F	
Ditch 1	0	0	0	-
Ditch 2	0	26	11	Torching
Ditch 3	0	9	11	Torching
Wetland	0	4	0	Bottles

8.3.25 Given that good numbers of smooth newts were detected, it is highly likely that great crested newts would also have been found, if present. Great crested newt immigration into ponds tends to be staggered over a few months. Therefore, one would expect that if great crested newts had been present they would have been discovered during the field survey work. The maximum count for Ditch 2 is significantly higher than other counts and may be due to the fact that Ditch 3 had by this time completely dried out.

8.3.26 Prior to 11th June, previous breeding bird surveys and great crested newt surveys had recorded single **barn owls** foraging over Silversides SNCI, but with no evidence of breeding in the vicinity of the site. On the 11th June amphibian survey, a barn owl was recorded in the entrance yard of the sugar beet factory, indicating a possible breeding site in the factory or in close proximity; the security guard also confirmed that barn owls had been seen around the site regularly over the previous week.

8.3.27 A careful watch was therefore made of buildings on the evening of 16th June. Barn owls were seen around the factory from early evening (around 1930), and nesting was confirmed by the presence of birds accessing the building with food. Birds entered the building linked to the south-west part of the main factory building from an access point on the east elevation; it was not possible to view this access point directly, since it was hidden by the adjacent structure. Because of their special protection, care was taken not to cause any disturbance, and no further investigations were made of their position within this structure. The security guard was also aware of the need to avoid disturbance during the breeding season.

- 8.3.28 No other bird species with special protection under Schedule 1.1 of the 1981 Wildlife & Countryside Act, or Annex I of the EU Birds Directive were recorded in any of the surveys. In particular, there were no records of kingfisher along Scawby Beck, or of little ringed plover in suitable open habitats.

Breeding birds

- 8.3.29 A list of bird species recorded from the site and its surrounds is appended (see Appendix 8-13). There are very few breeding species on site, due to the lack of cover, aside from a population of feral pigeons occupying one of the old factory buildings, and of course the barn owl referred to above. The site security officer reported that little owl previously bred in a cavity in one of the old buildings, but the pair had been replaced by jackdaw in the 2007 breeding season, and no evidence of breeding of either species was noted in 2008. Some species such as chaffinch and robin were holding territory in peripheral scrub habitats, while a wider range of species were recorded foraging over open habitats within the site.
- 8.3.30 One species, song thrush, which is listed under Section 74 of the 2000 Countryside and Rights of Way Act was recorded in the scrub on the eastern boundary of the site.
- 8.3.31 The wider vicinity of the site held more avian interest. As well as providing a habitat for the foraging barn owl, Silversides SNCI also held another 'Section 74' species, reed bunting, while linnets were recorded from the scrub to the east of the site boundary, skylark from arable land to the south, and grey partridge from arable land to the west. BAP Priority Species recorded in the vicinity included yellowhammer, house sparrow, and dunnoek, with overflying lapwing and lesser redpoll. Numbers of snipe, a Lincolnshire BAP priority species, were recorded in marshy grassland habitats in the SNCI.
- 8.3.32 A vertical earth bank in the raised bund just under 200m to the east of the site at SE 99157 06308 supported a small colony of 8-10 pairs of sand martin, a BTO / RSPB Amber list species.

Summary of ecological interest features

Table 8.6: Ecological Interest

Feature	Scale of Importance	Reason
Water vole	Regional	Good population in adjacent ditch to north of site, smaller population in ditch to east.
Silversides SNCI	District	Designated site of nature conservation interest (but see comments below)
Barn owl	District	Bird species with special protection under 1981 Wildlife & Countryside Act, utilises old sugar beet factory for breeding and SNCI for foraging.
Badger	Local	Protected species under 1992 Protection of Badgers Act; however, no more than intermittent use of site margins, site not important for this species.
Pipistrelle	Local	European protected species, but limited use of site.
Song thrush Reed bunting Linnet Skylark	Local	Section 74 Countryside & Rights of Way Act & UK BAP Priority Species; site not important for populations of any of these species.
Lapwing Dunnock Lesser redpoll Yellowhammer	Local	UK BAP Priority Species; site not important for populations of any of these species
Snipe	Local	Lincolnshire BAP Priority Species found on SNCI; flooded areas more important for overwintering birds.
Sand martin	Local	Amber List species with restricted breeding habitat availability – occurs off-site.

8.3.33 The geographical scale of importance of ecological interest features recorded within the site and its local context (including Silversides SNCI) is summarised in the table below:

8.3.34 None of the habitats within the site are of more than negligible interest for nature conservation. The small area of scrub, tall herbs and grassland in the eastern corner of the site could be regarded as being of local interest when combined with the greater area of similar habitat extending to the east. This will form a territory for interest features such as song thrush (the only species of interest recorded on site), and is the location of a sand martin breeding site. The following ecological interest features are present in the vicinity of the site:

- 8.3.35 The presence of a breeding pair of barn owls on site is a feature of at least district-level importance, and raises the evaluation of the site for nature conservation accordingly. Investigation of other aspects of the site's ecology (bats, amphibians) has not revealed any other interest features which could result in a significant change in site evaluation.
- 8.3.36 Surveys on Silversides SNCI have revealed few features of significant nature conservation interest, aside from bird species such as reed bunting which have already been reported in the ecological impact assessment, and of course foraging barn owl. In particular, the vegetation over most of the site consists of species-poor tall grassland and tall-herb communities, with slightly more diverse inundation communities occupying a relatively limited area of the site. These are themselves relatively species-poor in wetland plants, and of less value for amphibians than the smaller ditches to the north of the factory site such as Ditch 2. It is likely that the SNCI contained higher quality habitats before infilling of the settlement lagoons, but its current value barely justifies its status as a site of at least district-level importance.

8.4 Impact Assessment

- 8.4.1 Construction and operation of the development will primarily affect an area of existing former industrial structures, bare ground and sparse vegetation. A small area of scrub and tall herbs in the eastern part of the site will be affected, forming part of a much larger area of similar habitat, and supporting one locally significant species, song thrush.
- 8.4.2 The key features of conservation interest in the vicinity of the site are the significant population of water voles and the breeding barn owl.
- 8.4.3 The reasonably large population on Scawby Beck to the north is of key importance; the smaller population to the east is less significant in nature conservation terms, but still enjoys legislative protection. Direct impacts are likely on a small section of the beck used by this population, due to the construction of an outfall from the development. The significance of this impact will depend on its location relative to areas of water vole burrows and activity. Indirect impacts are possible if there is any reduction in ditch water quality as a result of construction or operation of the development.

- 8.4.4 The use of one of the buildings for a breeding barn owl is also significant because of their conservation status and special protection under Schedule 1.1 of the Wildlife and Countryside Act. This nest site will be lost by the proposed development, and there is a risk of legislative contravention if the breeding site is disturbed.
- 8.4.5 Use of the site by other protected species is limited; following the February 2008 survey, little evidence of regular use of the site's environs by badger has been detected. There was some use by foraging pipistrelles, a European protected species, but the site was not of particular importance for this species, with significantly less activity recorded than in more suitable habitat in its surroundings.
- 8.4.6 Most of the avian interest features are associated with Silversides SNCI, notably including foraging barn owl. These features will not be affected by the proposed development. Other interest features elsewhere, such as the sand martin colony, will be similarly unaffected.

8.5 Mitigation and ecological enhancement

Mitigation measures

- 8.5.1 Mitigation measures are necessary to avoid any disturbance to breeding barn owls, and to avoid any off-site impacts on the nearby colony of water voles.
- 8.5.2 To avoid impacts on water voles a commitment to maintain high levels of water quality in site drainage is necessary, including during the construction phase. Measures to intercept any fuel oil or other spillage from the site prior to discharge into the ditches are strongly recommended to minimise the risk of impacting on the water vole population. These measures should be implemented in advance of site clearance / demolition works.
- 8.5.3 The outfall to Scawby Beck will require further water vole surveys to determine the current locations of the population, and aid in micro-siting to avoid or minimise disturbance. Following an amendment on 6th April 2008, water voles have enjoyed full protection under Section 9 of the 1981 Wildlife & Countryside Act. It is not possible to obtain a Natural England licence to

disturb water voles for development purposes, although in some circumstances a translocation licence may be issued if there is a significant, unavoidable risk that voles will be killed or injured by the development. The best course of action is to seek to avoid disturbance, and seek to remain within the law by ensuring there is no 'intentional or reckless' disturbance or damage to burrows. Further details are given in Natural England (2008) *Water voles and development; licensing policy* (Technical Information Note TIN042).

8.5.4 Measures to mitigate impacts on barn owls should follow recommendations in the Barn Owl Trust / English Nature (2003) *Barn owls on site. A guide for developers and planners* publication. A detailed mitigation plan will be produced in accordance with these guidelines, covering the following measures:

- internal inspection of all structures by a licensed barn owl surveyor after the end of the breeding season to locate nesting and roosting sites;
- provision of outdoor nestboxes around the site periphery;
- scheduling of demolition outside the main barn owl breeding season (September to February; avoiding March – August); and
- incorporation of voids with entrance holes and indoor nest boxes in the new structure (if feasible).

8.5.5 Although a small area of scrub will be lost from the site, the site's landscape design envisages a larger area of vegetated land around the site than is present at the moment. The net result will be an increase in grassland and scrub habitats. The actual value of such habitats to wildlife will depend on species mix, spatial design and structure, and maintenance. There is the potential to provide a net benefit for nature conservation, which may be utilised by species of conservation interest such as the Section 74 and BAP bird species recorded in the wider vicinity of the site.

8.6 Summary and conclusions

8.6.1 The proposed site contains one protected species, barn owl, and lies adjacent to the Scawby Beck which has a population of water voles. It is also close to a non-statutory site of conservation importance.

- 8.6.2 While the predicted impacts of the development will involve loss of a small amount of scrub and associated habitats, this can be compensated by new planting within the curtilage of the development site.
- 8.6.3 Further survey work and detailed micro-siting of the outfall to Scawby Beck is necessary to avoid impacts on water voles and ensure legislative compliance. Further mitigation works may also be necessary, depending on the results of this survey. In addition, careful attention to treatment of surface water runoff from the site is recommended to avoid indirect impacts.
- 8.6.4 Careful timing of demolition works is necessary to avoid impacts on breeding barn owls, preceded by a licensed inspection of the breeding site. Mitigation works should be implemented to provide alternative nest sites, including nest boxes and, possibly, suitable voids within the new build.
- 8.6.5 Based on currently available data, the development should be neutral with respect of its ecological impact. Ecological enhancement measures incorporated into site landscaping can produce a net positive impact, potentially benefiting a range of bird species, depending on detailed design and after-care.