Planning Act 2008
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009
Regulation 5(2) [a]
Document reference: TR030001/APP/14b

Supplementary Environmental Information

Assessment Update for Breeding Birds

Supplementary Report EX 11.16

May 2012
Revision: 0
Dr. S. Percival

Able Marine Energy Park, Killingholme

Assessment Update for Breeding Birds

Dr Steve Percival, Tracey Percival and Tom Lowe

Report to Able UK Ltd

May 2012

Ecology Consulting, Swallow Ridge Barn, Old Cassop, Durham DH6 4QB

Email: [redacted]

TABLE OF CONTENTS

INTRODUCTION

1. A breeding bird assessment was included as part of the EIA for the Able Marine Energy Park [AMEP] at Killingholme, north Lincolnshire. The purpose of this report is to clarify the assessment of the effects of the AMEP development on breeding birds, providing additional analysis and assessment update on the potential impacts of the development on the local breeding bird populations using the data from the field surveys carried out during 2011.

2. The specific objectives of this work were to present additional analysis of the following:

   - The distribution and abundance of breeding bird territories within the 2011 breeding bird survey area;
   - An evaluation of the importance of the breeding bird populations within the potential impact zone of the development; and
   - The distribution and abundance of breeding bird territories of species of conservation importance within the footprint of the proposed development;
   - An updated assessment of the effects of the proposed development on the local breeding bird population, with particular focus on species of conservation importance.

THE STUDY AREA

3. The site is located approximately 3km north of Immingham in north Lincolnshire. The 2011 breeding bird study area was chosen to include all areas within the potential zone of ornithological influence of the proposed development. This included all the land that is being considered for development, plus a 500m buffer around this (as per NE guidance, Drewitt 2010). The study area covered a total area of 6.4km^2 (5.8km^2 of which was terrestrial habitat) and included arable farmland, industrial development (much of the core of the site was used as temporary parking for imported cars and vans), the North Killingholme Haven Pits, the Rosper Road Pools and a narrow strip of coastal marsh.

BREEDING BIRD SURVEY

Survey Methods

4. The breeding bird survey method followed the standard principles of the Common Birds Census; a walkover survey mapping all of the birds encountered (to 1:10,000 scale), recording their behaviour and location using the standard Common Birds Census notation. All species were recorded. Six survey visits were made, on 12 and

27 April, 10 and 25 May and 8 and 21 June 2011 (as per current NE guidance, Drewitt 2010). The surveys were carried out throughout daylight hours, avoiding strong winds, heavy rain, fog and low cloud. Birds were located by walking, listening and scanning by eye and with binoculars.

Data Analysis

5. The breeding bird data were used to determine the number of breeding pairs of each bird species and distribution, applying the standard Common Birds Census territory-based analysis (Gilbert et al. 1998) but also treating a single record of a bird in potentially suitable breeding habitat as breeding (a more conservative approach than the standard analytical method which requires more than one record). All of the breeding bird maps (Figure 1-19 show the estimated territory centres for each breeding pair, with subscript numbers to indicate more than one pair at one location).

6. The breeding bird distribution from the territory analysis was then overlaid onto the development footprint to determine the numbers of territories of each breeding species that could be affected by the development. This assessment was undertaken for each of the main breeding bird habitats that would be directly affected by the development (arable farmland, open gravel, coastal habitats, hedgerow and ditch).

Breeding Bird Survey Results

7. The estimated numbers of breeding pairs within the whole survey area derived from the territory analysis are given in Table 1. The Table also gives the peak number of pairs over the six survey visits (as previously reported in the ES) and the overall breeding density.

Table 1. Estimated number of pairs of breeding birds in the AMEP survey area at Killingholme, 2011.

Species	Map code	Estimated number of breeding pairs	Peak number of pairs (as reported in ES)	Breeding density (pairs/km^2)
Mute Swan	MS	2	2	0.3
Greylag Goose	GJ	1	1	0.2
Shelduck	SU	27	18	4.7
Gadwall	GA	2	2	0.3
Teal	T	2	2	0.3
Mallard	MA	39	23	6.7
Shoveler	SV	6	5	1.0
Pochard	PO	4	2	0.7
Tufted Duck	TU	5	4	0.9
Red-legged Partridge	RL	16	15	2.8
Pheasant	PH	30	20	5.2
Little Grebe	LG	2	2	0.3
Marsh Harrier	MR	1	1	0.2
Sparrowhawk	SH	2	1	0.3

Species	Map code	Estimated number of breeding pairs	Peak number of pairs (as reported in ES)	Breeding density (pairs/km^2)
Buzzard	BZ	1	1	0.2
Kestrel	K	5	4	0.9
Water Rail	WA	1	1	0.2
Moorhen	MH	14	8	2.4
Coot	CO	9	9	1.6
Oystercatcher	OC	8	4	1.4
Avocet	AV	8	8	1.4
Little Ringed Plover	LP	2	2	0.3
Ringed Plover	RP	4	3	0.7
Lapwing	L	13	11	2.2
Stock Dove	SD	21	11	3.6
Woodpigeon	WP	207	101	35.7
Collared Dove	CD	3	3	0.5
Great Spotted Woodpecker	GS	1	1	0.2
Skylark	S	45	24	7.8
Swallow	SL	36	18	6.2
Meadow Pipit	MP	23	11	4.0
Yellow Wagtail	YW	10	7	1.7
Pied Wagtail	PW	17	7	2.9
Wren	WR	48	31	8.3
Dunnock	D	18	6	3.1
Robin	R	16	8	2.8
Blackbird	B	36	16	6.2
Song Thrush	ST	13	8	2.2
Mistle Thrush	M	11	6	1.9
Grasshopper Warbler	GH	1	1	0.2
Sedge Warbler	SW	56	40	9.7
Reed Warbler	RW	37	26	6.4
Blackcap	BC	23	15	4.0
Garden Warbler	GW	7	3	1.2
Lesser Whitethroat	LW	20	11	3.4
Whitethroat	WH	81	70	14.0
Chiffchaff	CC	6	4	1.0
Willow Warbler	WW	13	10	2.2
Spotted Flycatcher	SF	1	1	0.2
Long-tailed Tit	LT	13	5	2.2
Blue Tit	BT	26	11	4.5
Great Tit	GT	17	8	2.9
Willow Tit	WT	1	1	0.2
Treecreeper	TC	1	1	0.2
Magpie	MG	20	17	3.4
Carrion Crow	C	21	12	3.6
Starling	SG	1	1	0.2

Species	Map code	Estimated number of breeding pairs	Peak number of pairs (as reported in ES)	Breeding density (pairs/km^2)
House Sparrow	HS	7	3	1.2
Tree Sparrow	TS	41	20	7.1
Chaffinch	CH	71	44	12.2
Greenfinch	GR	2	2	0.3
Goldfinch	GO	41	22	7.1
Linnet	LI	90	38	15.5
Bullfinch	BF	9	4	1.6
Yellowhammer	Y	14	10	2.4
Reed Bunting	RB	34	21	5.9

Conservation Evaluation

8. The sensitivity of the breeding bird populations was determined using the criteria specified in Table 2 (Percival 2007). This includes the criteria adopted by Natural England in Guidelines for Selection of Biological SSSIs (JNCC 1995), using 1% of the resource to define national and regional importance. The national and regional breeding populations were estimated with reference to Baker *et al.* (2006), Holling et al. (2010) and Chick (2011). A further category of 'local importance' was used for species that did not reach regional importance but were still of some ecological value. For bird species this included all species on the red or amber lists of the RSPB' *et al's* (Eaton et al. 2009) 'Birds of Conservation Concern' that did not reach national or regional importance at the site. In addition listing on Annex 1 of the EU Birds Directive, Schedule 1 of the Wildlife and Countryside, and the UK and Lincolnshire Biodiversity Action Plan [BAP] priority species were all considered in the evaluation process.

Table 2. Definition of terms relating to the sensitivity of the ecological components of the site.

Sensitivity	Definition
VERY HIGH	Cited interest of SPAs, SACs and SSSIs. Cited means mentioned in the citation text for the site as a species for which the site is designated (SPAs/SACs) or notified (SSSIs).
HIGH	Other species that contribute to the integrity of an SPA or SSSI. An impact on a local population of more than 1% of the national population of a species. Ecologically sensitive species, e.g. large birds of prey or rare birds (<300 breeding pairs in the UK). EU Birds Directive Annex 1, EU Habitats Directive priority habitat/species and/or W&C Act Schedule 1 species (if not covered above).
MEDIUM	Regionally important population of a species, either because of population size or distributional context. UK BAP priority species (if not covered above).
LOW	Any other species of conservation interest, e.g. species listed on the Birds of Conservation Concern not covered above, local BAP species.

9. The conservation importance of the bird populations using the study area during the breeding season is summarised in Table 3. This Table includes all the species recorded breeding during the surveys.

Table 3. Conservation evaluation of the breeding bird populations in the AMEP Killingholme breeding bird study area, 2011.

Species	Number of breeding pairs	>1% regional popul-ation	EU Birds Directive Annex 1	W and C Act Sch 1	UK BAP species	BoCC status [R]ed/ [A]mber	Sensitivity
Mute Swan	2						Nil
Greylag Goose	1					A	Low
Shelduck	27	✓				A	Medium
Gadwall	2	✓				A	Medium
Teal	2					A	Low
Mallard	39					A	Low
Shoveler	6	✓				A	Medium
Pochard	4	✓				A	Medium
Tufted Duck	5					A	Low
Red-legged Partridge	16						Nil
Pheasant	30						Nil
Little Grebe	2					A	Low
Marsh Harrier	1		✓	✓		A	Very high
Sparrowhawk	2						Nil
Buzzard	1						Nil
Kestrel	5					A	Low
Water Rail	1						Nil
Moorhen	14						Nil
Coot	9						Nil
Oystercatcher	8					A	Low
Avocet	8	✓	✓	✓		A	Very high
Little Ringed Plover	2	✓		✓			High
Ringed Plover	4	✓				A	Medium
Lapwing	13				✓	R	Medium
Stock Dove	21					A	Low
Woodpigeon	207						Nil
Collared Dove	3						Nil
Great Spotted Woodpecker	1						Nil
Skylark	45				✓	R	Medium
Swallow	36					A	Low
Meadow Pipit	23					A	Low
Yellow Wagtail	10				✓	R	Medium
Pied Wagtail	17						Nil
Wren	48						Nil
Dunnock	18				✓	A	Medium
Robin	16						Nil
Blackbird	36						Nil
Song Thrush	13				✓	R	Medium

Species	Number of breeding pairs	>1% regional popul-ation	EU Birds Directive Annex 1	W and C Act Sch 1	UK BAP species	BoCC status [R]ed/ [A]mber	Sensitivity
Mistle Thrush	11					A	Low
Grasshopper Warbler	1				✓	R	Medium
Sedge Warbler	56						Nil
Reed Warbler	37						Nil
Blackcap	23						Nil
Garden Warbler	7						Nil
Lesser Whitethroat	20						Nil
Whitethroat	81					A	Low
Chiffchaff	6						Nil
Willow Warbler	13					A	Low
Spotted Flycatcher	1				✓	R	Medium
Long-tailed Tit	13						Nil
Blue Tit	26						Nil
Great Tit	17						Nil
Willow Tit	1				✓	R	Medium
Treecreeper	1						Nil
Magpie	20						Nil
Carrion Crow	21						Nil
Starling	1				✓	R	Medium
House Sparrow	7				✓	R	Medium
Tree Sparrow	41				✓	R	Medium
Chaffinch	71						Nil
Greenfinch	2						Nil
Goldfinch	41						Nil
Linnet	90				✓	R	Medium
Bullfinch	9				✓	A	Medium
Yellowhammer	14				✓	R	Medium
Reed Bunting	34				✓	R	Medium

Note: Both of the 'very high' sensitivity species were classed as such as they are both qualifying features of the Humber Estuary SPA.

10. Two species were found breeding that were classed as very high sensitivity species, marsh harrier and avocet. Both are qualifying features of the Humber Estuary SPA, and are also specially protected from disturbance during breeding under Schedule 1 of the 1981 Wildlife and Countryside Act.

11. One breeding species was classed as high sensitivity, little ringed plover. This is another species specially protected from disturbance during breeding under Schedule 1 of the 1981 Wildlife and Countryside Act.

12. Twenty breeding species were classed as medium sensitivity: shelduck, gadwall, shoveler, pochard, ringed plover, lapwing, skylark, yellow wagtail, dunnock, song thrush, grasshopper warbler, spotted flycatcher, willow tit, starling, house sparrow, tree sparrow, linnet, bullfinch, yellowhammer and reed bunting. Most were classed

as medium sensitivity because of their listing on the UK Biodiversity Action Plan list of priority species, apart from shelduck, gadwall, shoveler, pochard and ringed plover, the populations of which were considered to be regionally important. A further 13 breeding species were classed as low sensitivity, through their listing on RSPB et al.'s (Eaton et al. 2009) amber lists of birds of conservation concern (Table 3).

Distribution of Species of Conservation Importance

Very High Sensitivity Species

13. Both of the two very high sensitivity species (Humber Estuary SPA breeding species) were breeding within the North Killingholme Haven Pits. The marsh harriers (a single pair) was breeding within the reed-bed on the western pit, and the avocets on the more open scrapes of the eastern pit (Figure 1).

High Sensitivity Species

14. One high sensitivity species was recorded breeding in the survey area, little ringed plover. The two pairs of this species were both breeding on the gravel area in the northern part of the development site (that is currently used primarily for temporary parking of cars and other vehicles). The central points of their territories are shown in Figure 2.

Medium Sensitivity Species

15. A total of 20 breeding species were classed as medium sensitivity. Each is considered in turn:

    - Shelduck (Figure 3) were found mainly along the foreshore and on North Killingholme Haven Pits but also with scattered pairs on the gravel area in the northern part of the development site, the arable/grassland habitats and on the Rosper Road Pools;

    - Gadwall (Figure 2) were only found breeding on the Rosper Road Pools;

    - Shoveler (Figure 2) were found mainly breeding on the Rosper Road Pools and the nearby ditches;

    - Pochard (Figure 2) were breeding on the North Killingholme Haven Pits (2 pairs) and on the Rosper Road Pools (1 pair);

    - Ringed plover (Figure 2) were breeding on the gravel area in the northern part of the development site (that is currently used primarily for temporary parking of cars and other vehicles);

    - Lapwing (Figure 4) – highest breeding densities were found on the gravel area in the northern part of the development site but this species was also widely

scattered across the arable/grassland habitats and was also breeding around the Rosper Road Pools;

- Skylark (Figure 5) were widely distributed over the arable and grassland habitats, and also on the gravel area in the northern part of the development site (though in lower numbers);

- Yellow wagtail (Figure 6) were largely restricted to the western part of the arable/grassland habitats;

- Dunnock (Figure 7) were widely distributed found in most hedgerow, scrub and woodland habitats;

- Song thrush (Figure 8) were similarly widely distributed across the hedgerow, scrub and woodland habitats;

- Grasshopper warbler (Figure 2) were breeding only within North Killingholme Haven Pits;

- Spotted flycatcher (Figure 2) – a single pair was breeding in the scrub on the southern edge of the North Killingholme Haven Pits;

- Willow tit (Figure 2) – a single pair was seen in the hedgerow on the southern edge of the Mitigation area A;

- Starling (Figure 2) – a single pair was breeding on the northern edge of the survey area beside the Humber Terminal;

- House sparrow (Figure 2) – there were scattered pairs across the survey area, associated mainly with buildings;

- Tree sparrow (Figure 9) were found mainly on the arable/grassland habitats and also around the North Killingholme Haven Pits;

- Linnet (Figure 10) were widely distributed across most of the survey area apart from the wooded areas;

- Bullfinch (Figure 2) had a scattered distribution across the woodland and hedgerow habitats;

- Yellowhammer (Figure 11) were widely distributed across the arable/grassland habitats but were not found elsewhere; and

- Reed bunting (Figure 12) were widespread across most of the survey area, on the arable/grassland and wetland habitats.

Low Sensitivity Species

16. A total of 13 breeding species were classed as low sensitivity. Each is considered in turn:

- Greylag goose (Figure 13) – a single pair was breeding on the North Killingholme Haven Pits;
- Teal (Figure 13) – a single pair was breeding on the North Killingholme Haven Pits;
- Mallard (Figure 13) were widely distributed across all of the wetland habitats, including many of the ditches;
- Tufted duck (Figure 13) – this species was found mostly on the Rosper Road Pools but there was also a pair on the North Killingholme Haven Pits;
- Little grebe (Figure 13) - a pair were breeding on the Rosper Road Pools and another on the North Killingholme Haven Pits;
- Kestrel (Figure 13) – scattered pairs, mainly in the central part of the survey area;
- Oystercatcher (Figure 13) – this species was found mostly along the foreshore but there were also pairs on the North Killingholme Haven Pits and on the gravel area in the northern part of the development site;
- Stock dove (Figure 14) were widely distributed, associated mainly with hedgerow habitat;
- Swallow (Figure 15) were found mainly across the arable/grassland habitats but also around the North Killingholme Haven Pits;
- Meadow pipit (Figure 16) were widely distributed over the arable and grassland habitats, and also on the gravel area in the northern part of the development site;
- Mistle thrush (Figure 17) were scattered across the woodland and hedgerow habitats;
- Whitethroat (Figure 18) were abundant across much of the survey area, associated mainly with hedgerow and scrub habitats; and
- Willow warbler (Figure 19) was another mainly hedgerow/scrub species, but was found at rather lower density than the former species.

Impact Assessment Update

Assessment Methodology

17. The evaluation of conservation importance has been carried out using the methodology published in Percival (2007), which has been adapted from the methodology developed by Scottish Natural Heritage (SNH) and the British Wind Energy Association (now RenewableUK). It identifies the sensitivity (based on their

conservation importance as defined in Table 2 above) of the receptors present in the study area, then determines the magnitude of the possible effect on those receptors (as described in Table 4).

Table 4. Definition of terms relating to the magnitude of ornithological effects

Magnitude	Definition
Very high	Total loss or very major alteration to key elements/ features of the baseline conditions such that post development character/ composition/ attributes will be fundamentally changed and may be lost from the site altogether. Guide: >80% of population/habitat lost
High	Major alteration to key elements/ features of the baseline conditions such that post development character/composition/attributes will be fundamentally changed. Guide: 20–80% of population/habitat lost
Medium	Loss or alteration to one or more key elements/features of the baseline conditions such that post development character/ composition/ attributes of baseline will be partially changed. Guide: 5–20% of population/habitat lost
Low	Minor shift away from baseline conditions. Change arising from the loss/ alteration will be discernible but underlying character/ composition/ attributes of baseline condition will be similar to pre-development circumstances/patterns. Guide: 1–5% of population/habitat lost
Negligible	Very slight or no change from baseline condition. Change barely distinguishable, approximating to the "no change" situation. Guide: <1% of population/habitat lost

18. The combined assessment of the magnitude of an impact and the sensitivity of the receptor has been used to determine whether or not an impact is significant. These two criteria have been cross-tabulated to assess the overall significance of that impact (Table 5).

Table 5. Matrix of magnitude of impact and sensitivity used to quantify the significance of impact

MAGNITUDE	SENSITIVITY				
		Very high	**High**	**Medium**	**Low**
	Very high	Major	Major	Major	Moderate
	High	Major	Major	Moderate	Minor
	Medium	Major	Major	Minor	Negligible
	Low	Moderate	Minor	Minor	Negligible
	Negligible	Minor	Negligible	Negligible	Negligible

19. The significance category of each combination is shown in each cell. Red and orange cells indicate potentially significant effects. The interpretation of these significance categories is as follows:

    - Negligible (white in Table 5) and minor (yellow) are not normally of concern, though normal design care should be exercised to minimise adverse impacts;
    - Major (red) represents an impact on bird populations which are regarded as significant in terms of the EIA Regulations; and
    - Moderate (orange) represents a potentially significant impact which, in comparison with very major adverse impact, may be reduced below the level of significance (in terms of the EIA Regulations) by mitigation measures.

20. The guidance threshold values given in the Table 5 have been used widely in the assessment process but are arbitrary, and expert judgement still needs to be applied in the process, particularly where effects may be potentially significant and where the magnitude of effects is close to a threshold value.

Assessment Update for Breeding Birds

21. The total number of breeding bird territories located within the footprint of the proposed development is shown in Table 6, together with the numbers in each of the four main areas of the development (a) the area of existing tarmac and gravel largely with extant planning consent for development, currently developed or under development for temporary car parking (122.4ha.), (b) the area of arable and grassland that would be lost to the development (100.3ha.), (c) the area of coastal/intertidal habitat that would be lost to the development through reclamation (45ha.) and (d) the area proposed for mitigation adjacent to the main development (48ha.).

Table 6. Breeding bird population estimates (number of pairs) for the AMEP site footprint and the predicted changes that would occur as a result of the habitat change associated with development.

Species	Number of pairs in site footprint					Predicted change (number of pairs)
	Current industrial	Arable/ grassland	Coastal/ intertidal reclamation	Mitigation area	TOTAL	
Mute Swan	1	0	0	0	1	0
Greylag Goose	0	0	0	0	0	0
Shelduck	3	3	4	0	10	-4
Gadwall	0	0	0	0	0	0
Teal	0	0	0	0	0	0
Mallard	5	5	3	3	16	-4
Shoveler	0	1	0	1	1	-1
Pochard	0	0	0	0	0	0
Tufted Duck	0	0	0	0	0	0
Red-legged Partridge	6	3	0	4	13	+2
Pheasant	3	12	0	6	21	-9
Little Grebe	0	0	0	0	0	0
Marsh Harrier	0	0	0	0	0	0
Sparrowhawk	1	1	0	0	2	0
Buzzard	0	0	0	0	0	0
Kestrel	0	1	0	0	1	-1
Water Rail	0	1	0	0	1	-1
Moorhen	1	4	0	1	6	-3
Coot	0	0	0	0	0	0
Oystercatcher	2	0	2	0	4	-2
Avocet	0	0	0	0	0	0
Little Ringed Plover	2	0	0	0	2	+2
Ringed Plover	3	0	0	0	3	+3
Lapwing	5	2	0	1	8	+2
Stock Dove	11	1	0	2	14	0
Woodpigeon	23	52	0	75	150	-31
Collared Dove	0	0	0	0	0	0
Great Spotted Woodpecker	0	0	0	0	0	0
Skylark	8	20	0	14	42	-13
Swallow	2	15	0	2	19	-13
Meadow Pipit	10	6	0	3	19	+3
Yellow Wagtail	0	6	0	3	9	-6
Pied Wagtail	6	4	0	0	10	+1
Wren	3	13	0	6	22	-10
Dunnock	1	4	0	2	7	-3
Robin	0	4	0	2	6	-4
Blackbird	2	8	0	4	14	-6
Song Thrush	0	2	0	1	3	-2
Mistle Thrush	0	5	0	0	5	-5

Species	Number of pairs in site footprint					Predicted change (number of pairs)
	Current industrial	Arable/ grassland	Coastal/ intertidal reclamation	Mitigation area	TOTAL	
Grasshopper Warbler	0	0	0	0	0	0
Sedge Warbler	7	14	0	7	28	-8
Reed Warbler	3	4	2	2	11	-3
Blackcap	0	5	0	1	6	-5
Garden Warbler	1	3	0	0	4	-2
Lesser Whitethroat	1	4	0	4	9	-3
Whitethroat	11	24	1	10	46	-15
Chiffchaff	0	1	0	0	1	-1
Willow Warbler	2	1	0	0	3	+1
Spotted Flycatcher	0	0	0	0	0	0
Long-tailed Tit	1	4	0	1	6	-3
Blue Tit	2	10	0	5	17	-8
Great Tit	1	8	1	2	12	-8
Willow Tit	0	0	0	0	0	0
Treecreeper	0	1	0	0	1	-1
Magpie	3	5	0	3	11	-2
Carrion Crow	5	5	0	1	11	-1
Starling	0	0	0	0	0	0
House Sparrow	0	0	0	1	1	0
Tree Sparrow	1	17	0	6	24	-16
Chaffinch	3	21	1	9	34	-19
Greenfinch	0	0	0	0	0	0
Goldfinch	5	14	0	5	24	-9
Linnet	36	18	0	5	59	+13
Bullfinch	1	3	0	0	4	-2
Yellowhammer	0	7	0	4	11	-7
Reed Bunting	3	9	0	6	18	-6

22. The impacts of the development relating to breeding bird habitats were described in ES (Chapter 11, Section 11.6) but are summarised here:

- Loss of 100 ha arable/semi-improved grassland to industrial land.
- Loss of ten ponds (three of which were confirmed in habitat surveys to be dry);
- Loss of a neutral grassland and elm hedge, both of local value and included as part of a Local Wildlife Site;
- Loss of breeding bird habitat including the loss of species poor hedgerow network (see ES Annex 11.12), tall ruderal herb vegetation, sand and gravel area, arable/pasture fields and semi-natural woodland. There would also be a loss of drainage ditches but these would largely be replaced by new drains.

23. In a worst case, the breeding birds currently found within the arable/grassland area that will be lost to the development and those in the coastal reclamation area would be lost too. The numbers that would be affected in such a case are shown in Table 6. However, the arable/grassland area would be converted to industrial land similar to that already existing in the northern part of the site, which the surveys have shown not to be completely devoid of breeding birds. A more reasonable assessment would therefore take into account the increase in the availability of this open industrial habitat as well as the loss of arable/grassland. Table 6 also therefore gives an estimate of the population changes that are predicted for each breeding species in such a scenario. These are based on the following assumptions (and also applying professional judgement):

    - No change to the populations within the existing industrial areas
    - Breeding bird densities within the current arable/grassland areas that will become industrial will be the same as the densities on the existing industrial areas
    - Coastal reclamation will result in a complete loss of breeding birds in that area.

24. Further assessment was also carried out of the numbers of breeding birds that could be directly affected by the proposed loss of hedgerow and ditches from the AMEP site (as described in ES Annex 11.12). The number of territory centres within 100m of all of the hedgerows/ditches that would be lost as a result of the development were calculated and are presented in Table 7. As a precautionary approach, where this predicted loss was higher than that from the previous habitat assessment the higher loss figure was used in the assessment summary in Table 8.

Table 7. Estimated breeding bird populations affected by hedgerow removal and ditch loss from the AMEP development.

Species	Map Code	Estimated number of pairs affected by hedgerow loss	Estimated number of pairs affected by ditch loss
Shelduck	SU	0	3
Mallard	MA	0	4
Shoveler	SV	0	1
Red-legged Partridge	RL	4	0
Pheasant	PH	10	0
Moorhen	MH	0	2
Stock Dove	SD	3	0
Woodpigeon	WP	43	0
Skylark	S	9	0
Meadow Pipit	MP	3	3
Yellow Wagtail	YW	3	2
Pied Wagtail	PW	4	0
Wren	WR	15	0
Dunnock	D	6	0
Robin	R	4	0
Blackbird	B	8	0

Species	Map Code	Estimated number of pairs affected by hedgerow loss	Estimated number of pairs affected by ditch loss
Song Thrush	ST	3	0
Mistle Thrush	M	6	0
Sedge Warbler	SW	0	18
Reed Warbler	RW	0	6
Blackcap	BC	5	0
Garden Warbler	GW	1	0
Lesser Whitethroat	LW	4	0
Whitethroat	WH	25	0
Chiffchaff	CC	1	0
Willow Warbler	WW	1	0
Long-tailed Tit	LT	6	0
Blue Tit	BT	12	0
Great Tit	GT	7	0
Magpie	MG	5	0
Carrion Crow	C	3	0
House Sparrow	HS	5	0
Tree Sparrow	TS	21	0
Chaffinch	CH	25	0
Goldfinch	GO	17	0
Linnet	LI	14	0
Bullfinch	BF	2	0
Yellowhammer	Y	6	0
Reed Bunting	RB	8	9

25. The predicted effects on breeding birds are summarised in Table 8, which gives the sensitivity of those populations, the magnitude of the effect predicted and an assessment of whether that was considered significant.

Table 8. Summary of impacts on breeding birds: estimated changes in breeding populations, and the magnitude and significance of those impacts.

Species	Sensitivity	Estimated change in breeding pairs	Magnitude of effect	Significance	Significant effect?
Mute Swan	Nil	0	Nil	Nil	No
Greylag Goose	Low	0	Nil	Nil	No
Shelduck	Medium	-4	Low	Minor	No
Gadwall	Medium	0	Nil	Nil	No
Teal	Low	0	Nil	Nil	No
Mallard	Low	-4	Negligible	Negligible	No
Shoveler	Medium	-1	Low	Minor	No
Pochard	Medium	0	Nil	Nil	No

Species	Sensitivity	Estimated change in breeding pairs	Magnitude of effect	Significance	Significant effect?
Tufted Duck	Low	0	Nil	Nil	No
Red-legged Partridge	Nil	-4	Negligible	Nil	No
Pheasant	Nil	-10	Negligible	Nil	No
Little Grebe	Low	0	Nil	Nil	No
Marsh Harrier	Very high	0	Nil	Nil	No
Sparrowhawk	Nil	0	Nil	Nil	No
Buzzard	Nil	0	Nil	Nil	No
Kestrel	Low	-1	Negligible	Negligible	No
Water Rail	Nil	-1	Negligible	Nil	No
Moorhen	Nil	-3	Negligible	Nil	No
Coot	Nil	0	Nil	Nil	No
Oystercatcher	Low	-2	Low	Minor	No
Avocet	Very high	0	Nil	Nil	No
Little Ringed Plover	High	+2	Positive	Minor	No
Ringed Plover	Medium	+3	Positive	Minor	No
Lapwing	Medium	+2	Positive	Negligible	No
Stock Dove	Low	0	Nil	Nil	No
Woodpigeon	Nil	-31	Negligible	Nil	No
Collared Dove	Nil	0	Nil	Nil	No
Great Spotted Woodpecker	Nil	0	Nil	Nil	No
Skylark	Medium	-13	Negligible	Negligible	No
Swallow	Low	-13	Negligible	Negligible	No
Meadow Pipit	Low	-3	Negligible	Negligible	No
Yellow Wagtail	Medium	-6	Negligible	Negligible	No
Pied Wagtail	Nil	+1	Positive	Negligible	No
Wren	Nil	-15	Negligible	Negligible	No
Dunnock	Medium	-6	Negligible	Negligible	No
Robin	Nil	-4	Negligible	Negligible	No
Blackbird	Nil	-8	Negligible	Negligible	No
Song Thrush	Medium	-3	Negligible	Negligible	No
Mistle Thrush	Low	-6	Negligible	Negligible	No
Grasshopper Warbler	Medium	0	Nil	Nil	Mo
Sedge Warbler	Nil	-18	Negligible	Nil	No
Reed Warbler	Nil	-6	Negligible	Nil	No
Blackcap	Nil	-5	Negligible	Nil	No
Garden Warbler	Nil	-2	Negligible	Nil	No
Lesser Whitethroat	Nil	-4	Negligible	Nil	No
Whitethroat	Low	-25	Negligible	Negligible	No
Chiffchaff	Nil	-1	Negligible	Nil	No

Species	Sensitivity	Estimated change in breeding pairs	Magnitude of effect	Significance	Significant effect?
Willow Warbler	Low	-1	Negligible	Negligible	No
Spotted Flycatcher	Medium	0	Nil	Nil	No
Long-tailed Tit	Nil	-6	Negligible	Nil	No
Blue Tit	Nil	-12	Negligible	Nil	No
Great Tit	Nil	-8	Negligible	Nil	No
Willow Tit	Medium	0	Nil	Nil	No
Treecreeper	Nil	-1	Negligible	Nil	No
Magpie	Nil	-5	Negligible	Nil	No
Carrion Crow	Nil	-3	Negligible	Nil	No
Starling	Medium	0	Nil	Nil	No
House Sparrow	Medium	-5	Negligible	Negligible	No
Tree Sparrow	Medium	-21	Low	Minor	No
Chaffinch	Nil	-25	Negligible	Negligible	No
Greenfinch	Nil	0	Nil	Nil	No
Goldfinch	Nil	-17	Negligible	Nil	No
Linnet	Medium	-14	Negligible	Negligible	No
Bullfinch	Medium	-2	Negligible	Negligible	No
Yellowhammer	Medium	-7	Negligible	Negligible	No
Reed Bunting	Medium	-9	Negligible	Negligible	No

26. The above assessment has not considered disturbance outside the footprint of the development. However, there is already an agreement in place to constrain potentially disturbing activities outside a 200m buffer from the North Killingholme Haven Pits, and that agreement would be further secured through the lifetime of the development in the Development Control Order (DCO) if consent were granted, so no increase in disturbing activities to breeding birds in that area would be predicted.

27. The other main area of particular importance for breeding birds was the Rosper Road Pools, which holds a regionally important wetland bird community. It is however over 500m from the AMEP development itself and would be outside any likely disturbance zone.

28. It was therefore concluded that disturbance outside the footprint of the AMEP site would not add materially to the effects described in Table 8 for breeding birds.

29. It should also be noted that this assessment update has not taken into account any of the proposed mitigation measures nor the creation of any of the new ditches that are proposed as part of the development.

Conclusions

30. The survey area supported a range of important breeding birds, but most of these were found in the buffer zone around the development site rather than on the site itself. The North Killingholme Haven Pits had the highest level of breeding bird importance (including breeding marsh harrier and avocet), and the Rosper Road Pools held a regionally important breeding waterfowl community.

31. Within the AMEP development site itself the highest breeding bird interest was a range of wader species nesting on the open gravel areas, particularly little ringed plover and ringed plover. The farmland and hedgerow habitats held a breeding bird community typical of the region, including a range of UK BAP priority species.

32. Several species specially protected under Schedule 1 of the Wildlife and Countryside Act from disturbance during breeding were found during the 2011 surveys, including marsh harrier, avocet and little ringed plover, and given the habitat present it is possible that others such as barn owl and quail could breed there in the future. It would be important to ensure that no Schedule 1 species are disturbed during the breeding season, particularly during the construction phase of the development. Further surveys for these species should therefore be undertaken immediately prior to construction, if construction were planned for the bird breeding season (April-July). If any were found then potentially disturbing activities should be suspended for the breeding season within an appropriate zone (dependent on the location of the birds) in consultation with Natural England.

33. All birds' nests are protected from malicious destruction under the Wildlife and Countryside Act, so it would be necessary to ensure that this does not occur. If any construction works were scheduled for the bird breeding season (April-July), then a nest search would need to be undertaken of any areas that would be affected and any active nests found avoided until the breeding attempt had been completed.

34. The assessment update presented above did not identify any effects on breeding birds from the AMEP development that would be considered significant, supporting the conclusions presented in the ES.

REFERENCES

Baker, H., D. A. Stroud, N. J. Aebischer, P. A. Cranswick, R. D. Gregory, C. A. McSorley, D. G. Noble, and M. M. Rehfisch. 2006. Population estimates of birds in Great Britain and the United Kingdom. British Birds 99:25-44.

Chick, A. 2011. Lincolnshire Bird Report 2009. Lincolnshire Bird Club, Horncastle.

Drewitt, A. 2010. Assessing the effects of onshore wind farms on birds. Natural England guidance.

Eaton, M.A., Brown, A.F., Noble, D.G., Musgrove, A., Hearn, R.D., Aebischer, N., Gibbons, D.W., Evans A. and Gregory, R.D. Birds of Conservation Concern 3: the population status of birds in the United Kingdom, Channel Islands and Isle of Man. British Birds 102: 296-341.

Gilbert, G., D. W. Gibbons, and J. Evans. 1998. Bird Monitoring Methods: a manual of techniques for key UK species. RSPB /BTO/WWT/JNCC/ITE/ The Seabird Group.

Holling, M. and the Rare Breeding Birds Panel. 2010. Rare breeding birds in the United Kingdom in 2008. British Birds 103: 482-538.

JNCC 1995. Guidelines for the selection of biological SSSIs. JNCC, Peterborough.

Percival, S. M. 2007. Predicting the effects of wind farms on birds in the UK: the development of an objective assessment methodology. In M. de Lucas, Janss, G.F.E. and Ferrer, M., editor. Birds and Wind Farms: risk assessment and mitigation. Quercus, Madrid.

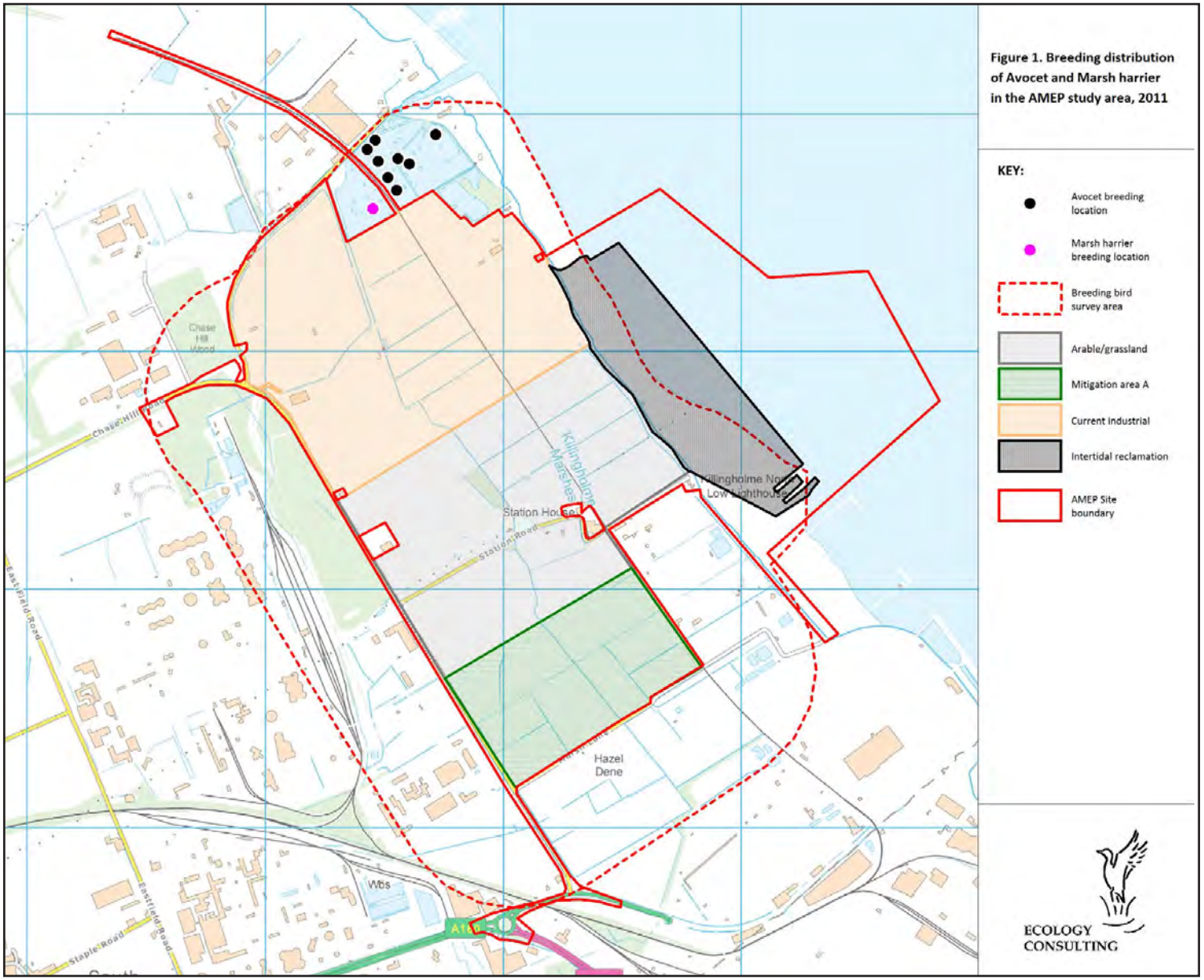

Figure 1. Breeding distribution of Avocet and Marsh harrier in the AMEP study area, 2011

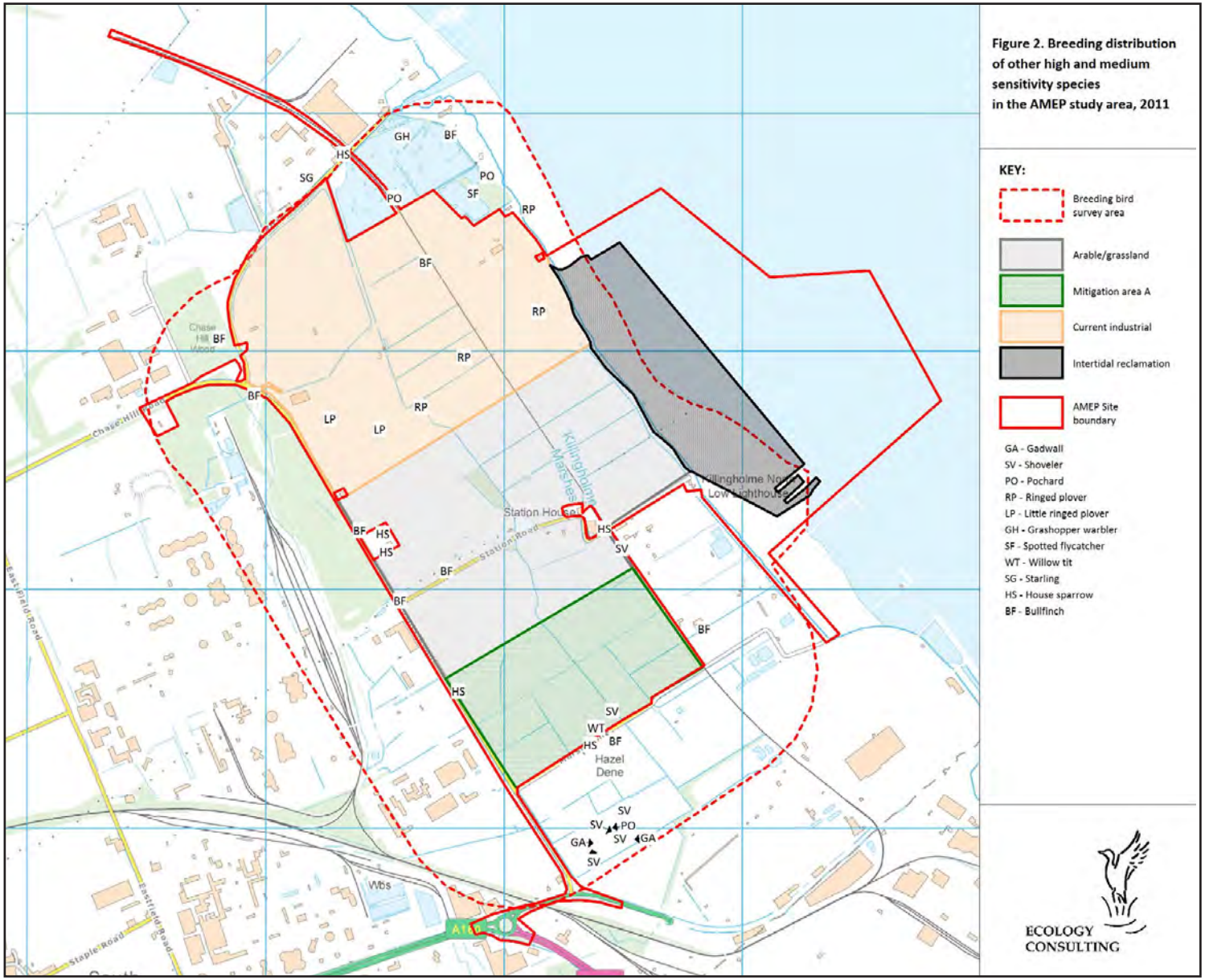

Figure 2. Breeding distribution of other high and medium sensitivity species in the AMEP study area, 2011

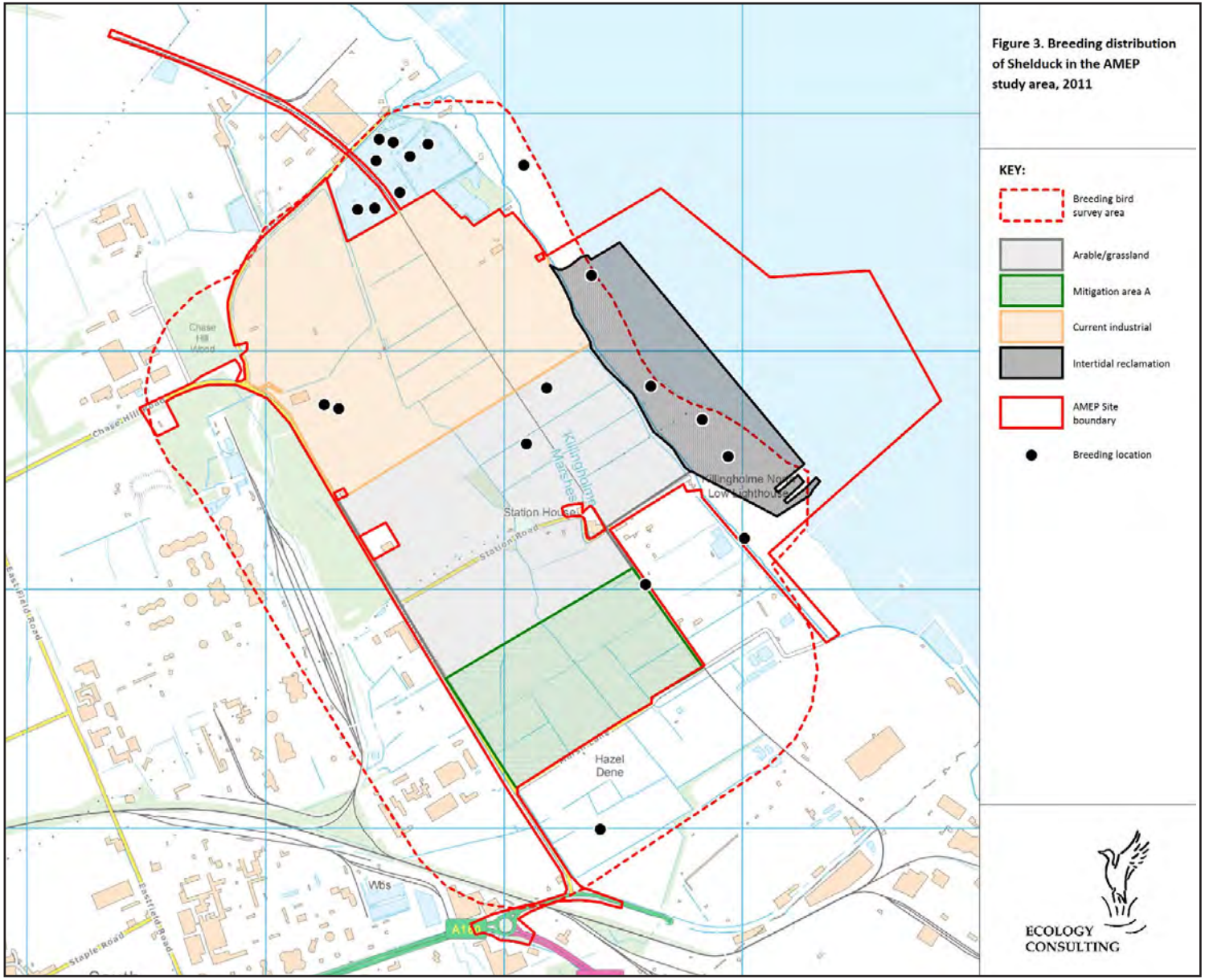
Figure 3. Breeding distribution of Shelduck in the AMEP study area, 2011
KEY:
Breeding bird survey area
Arable/grassland
Mitigation area A
Current industrial
Intertidal reclamation
AMEP Site boundary
Breeding location
Chase Hill Wood
Chase Hill Road
Killingholme Marshes
Killingholme North Low Lighthouse
Station House
Station Road
Eastfield Road
Hazel Dene
Staple Road
Wbs
A160
ECOLOGY CONSULTING

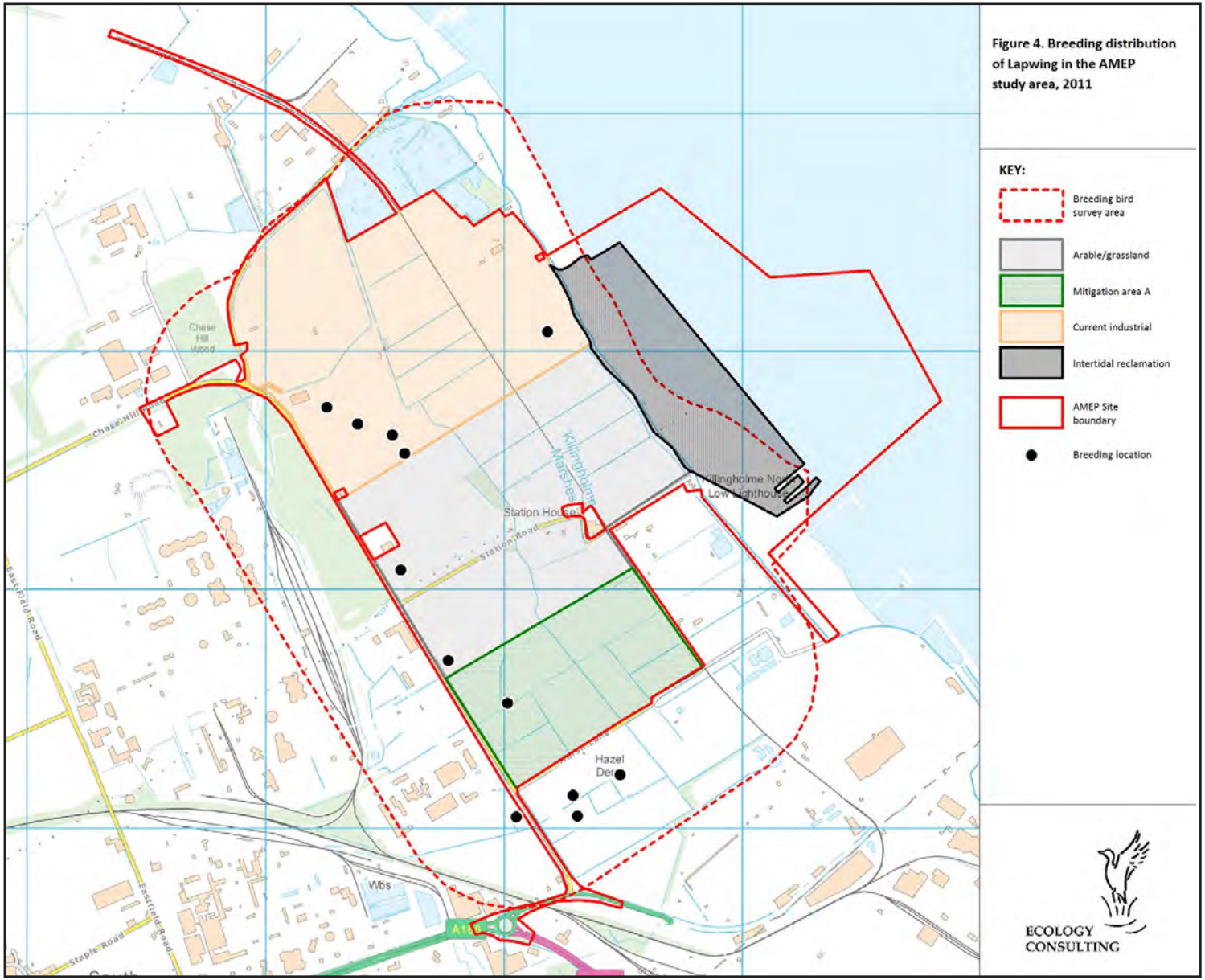
Figure 4. Breeding distribution of Lapwing in the AMEP study area, 2011
KEY:
Breeding bird survey area
Arable/grassland
Mitigation area A
Current industrial
Intertidal reclamation
AMEP Site boundary
Breeding location
Chase Hill Wood
Chase Hill Road
Killingholme Marshes
Killingholme North Low Lighthouse
Station House
Station Road
Eastfield Road
Hazel Der
Wbs
A160
Staple Road
ECOLOGY CONSULTING

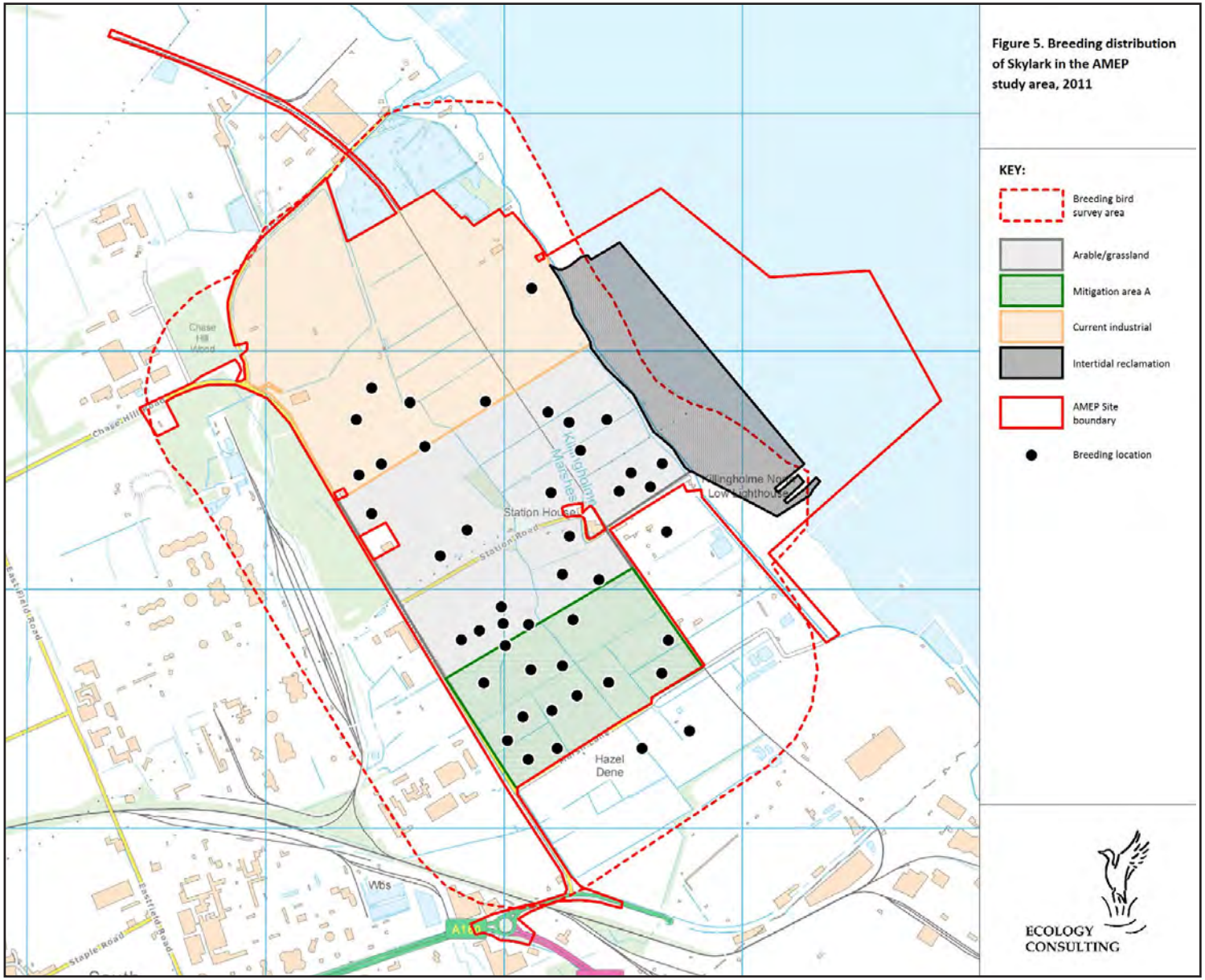
Figure 5. Breeding distribution of Skylark in the AMEP study area, 2011
KEY:
Breeding bird survey area
Arable/grassland
Mitigation area A
Current industrial
Intertidal reclamation
AMEP Site boundary
Breeding location
Chase Hill Wood
Chase Hill Road
Killingholme Marshes
Killingholme North Low Lighthouse
Station House
Station Road
Eastfield Road
Staple Road
Hazel Dene
Wbs
A160
ECOLOGY CONSULTING

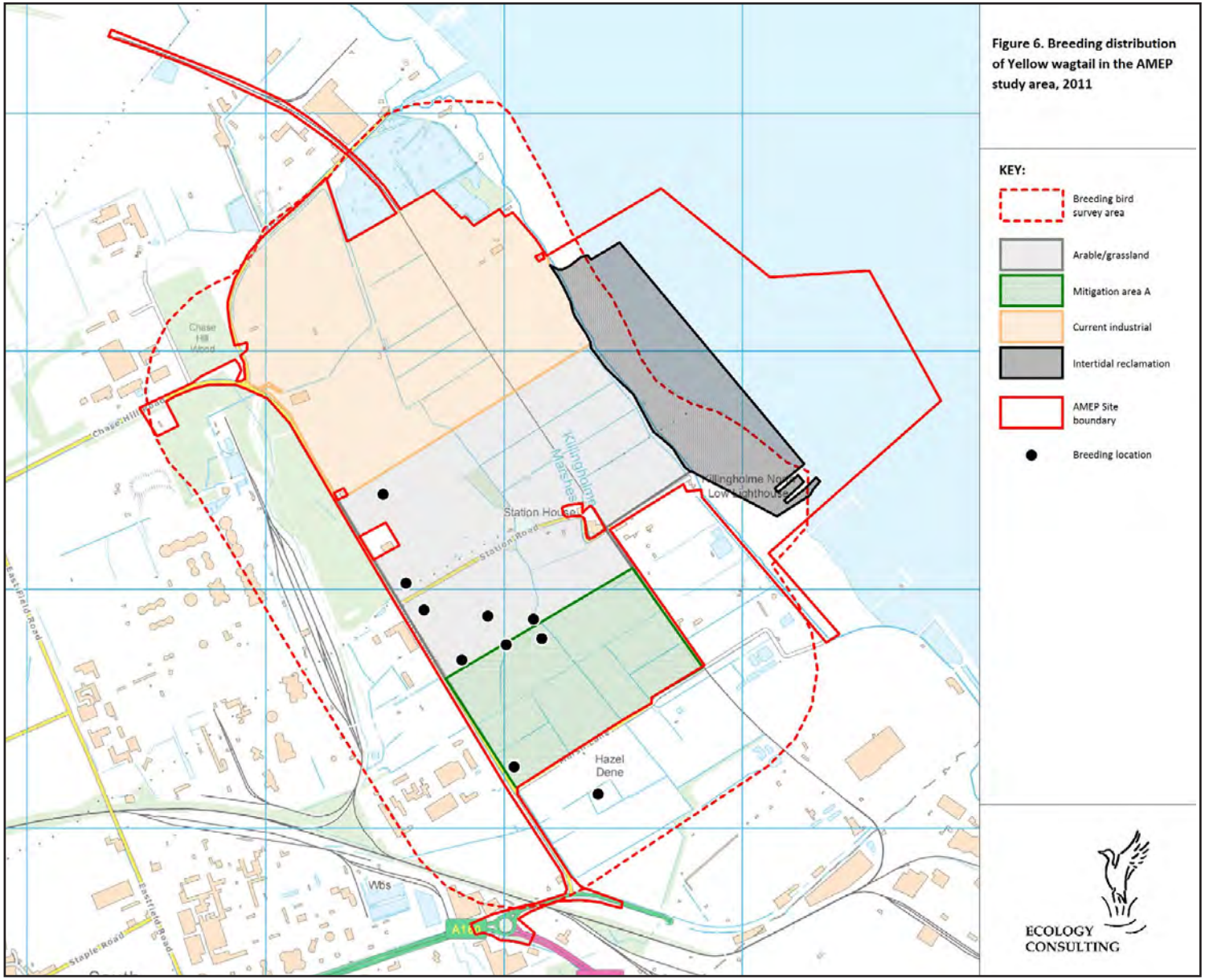

Figure 6. Breeding distribution of Yellow wagtail in the AMEP study area, 2011

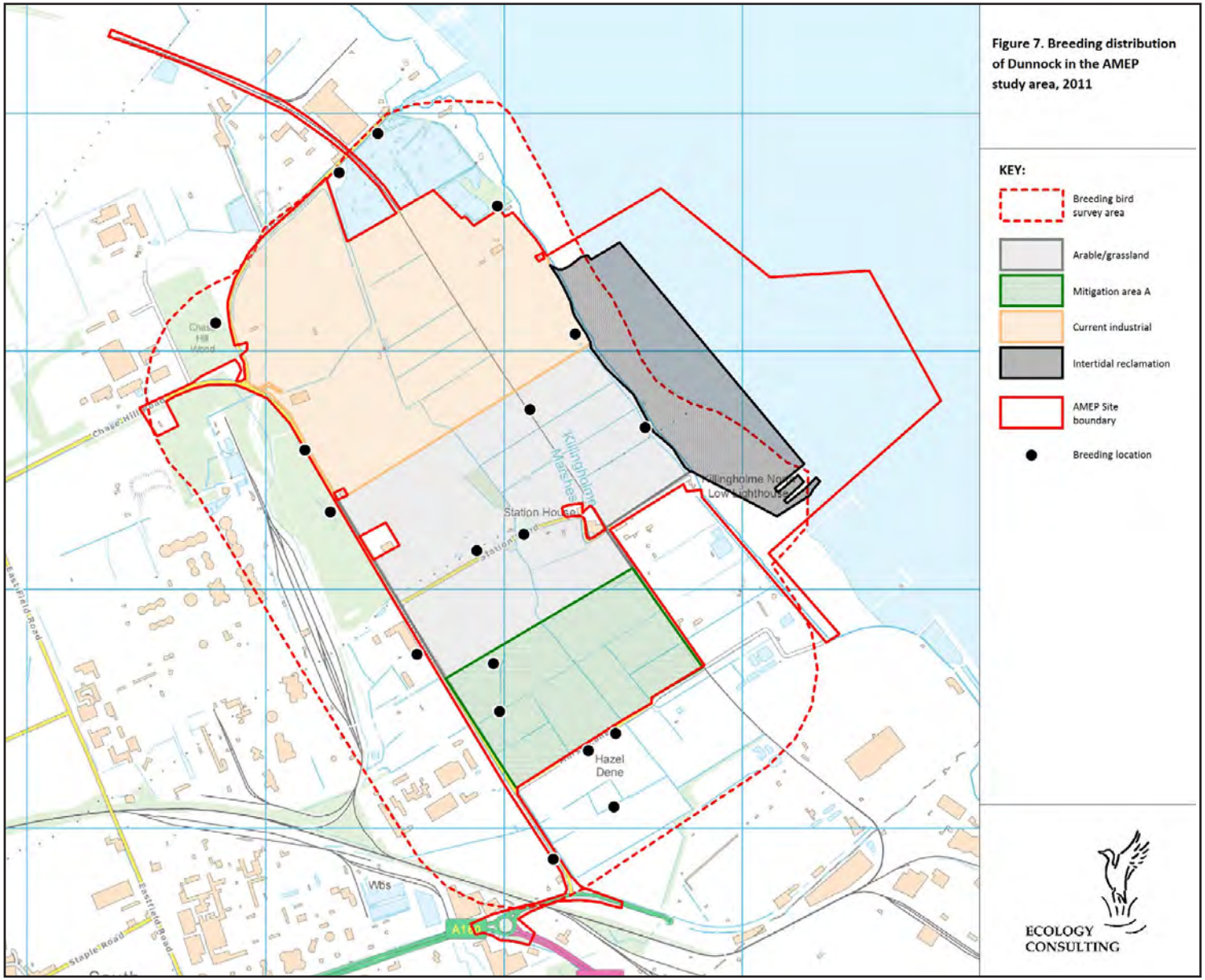

Figure 7. Breeding distribution of Dunnock in the AMEP study area, 2011

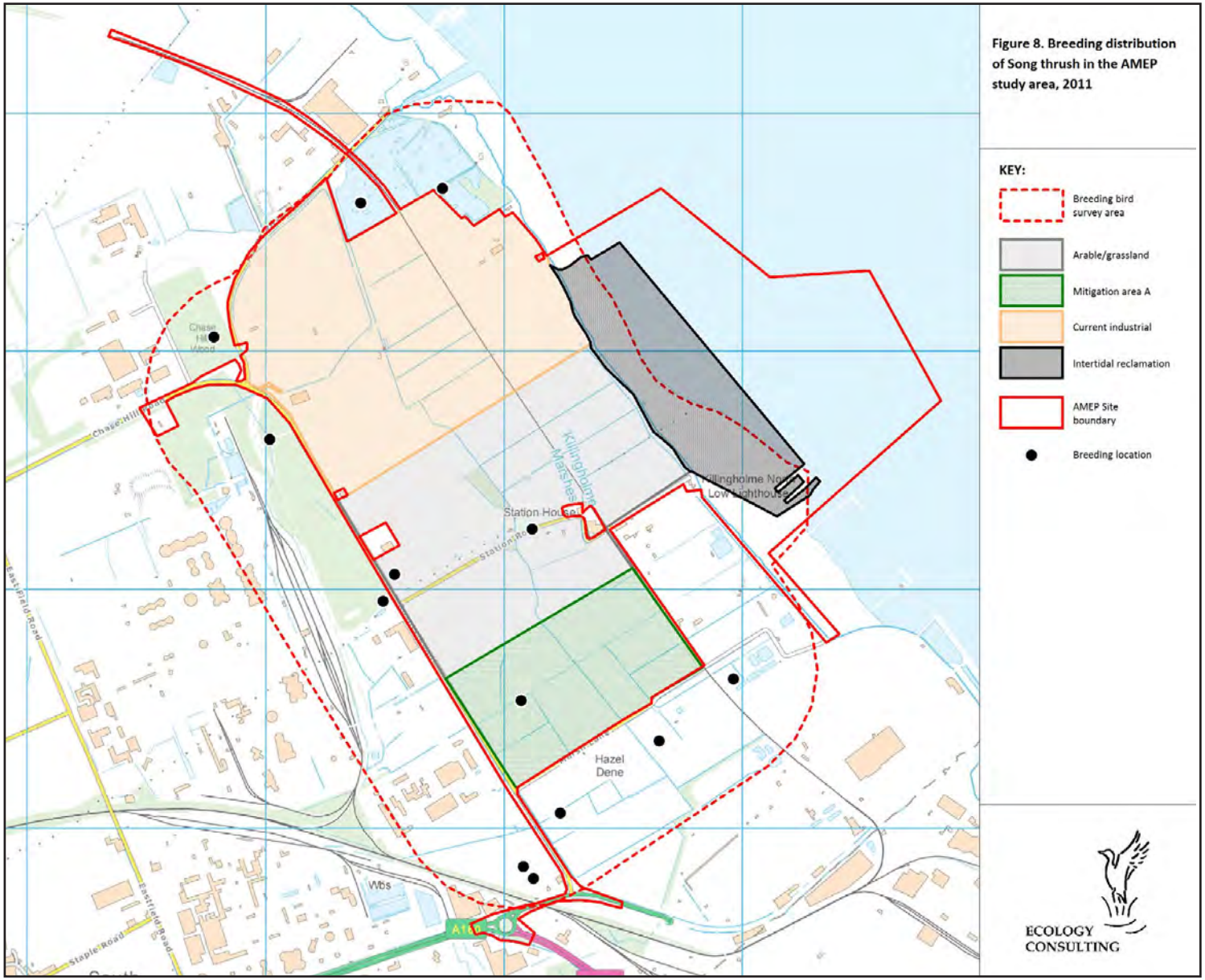
Figure 8. Breeding distribution of Song thrush in the AMEP study area, 2011
KEY:
Breeding bird survey area
Arable/grassland
Mitigation area A
Current industrial
Intertidal reclamation
AMEP Site boundary
Breeding location
Killingholme Marshes
Killingholme North Low Lighthouse
Station House
Station Road
Hazel Dene
Chase Hill Wood
Chase Hill Road
Eastfield Road
Staple Road
Wbs
A160
ECOLOGY CONSULTING

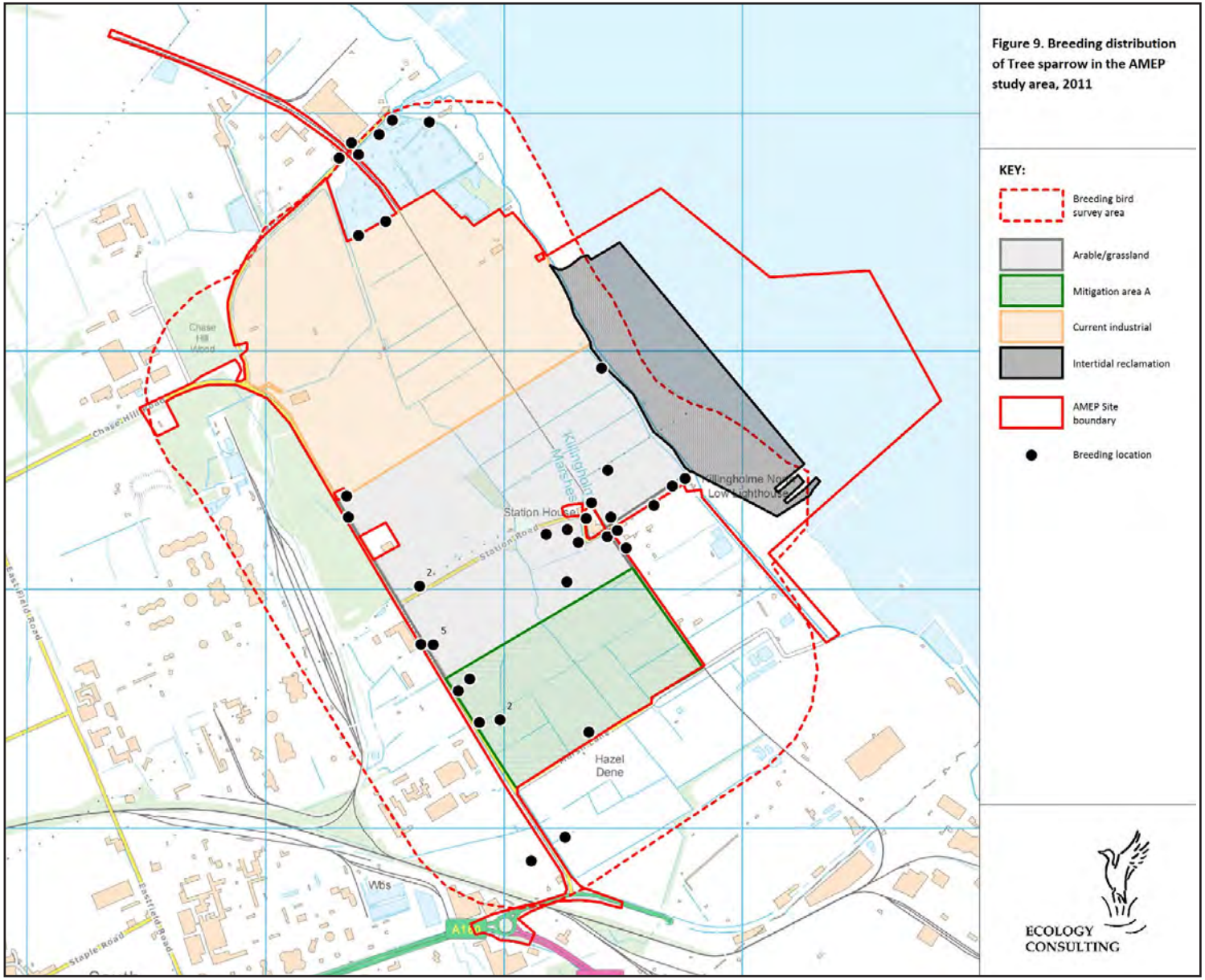

Figure 9. Breeding distribution of Tree sparrow in the AMEP study area, 2011

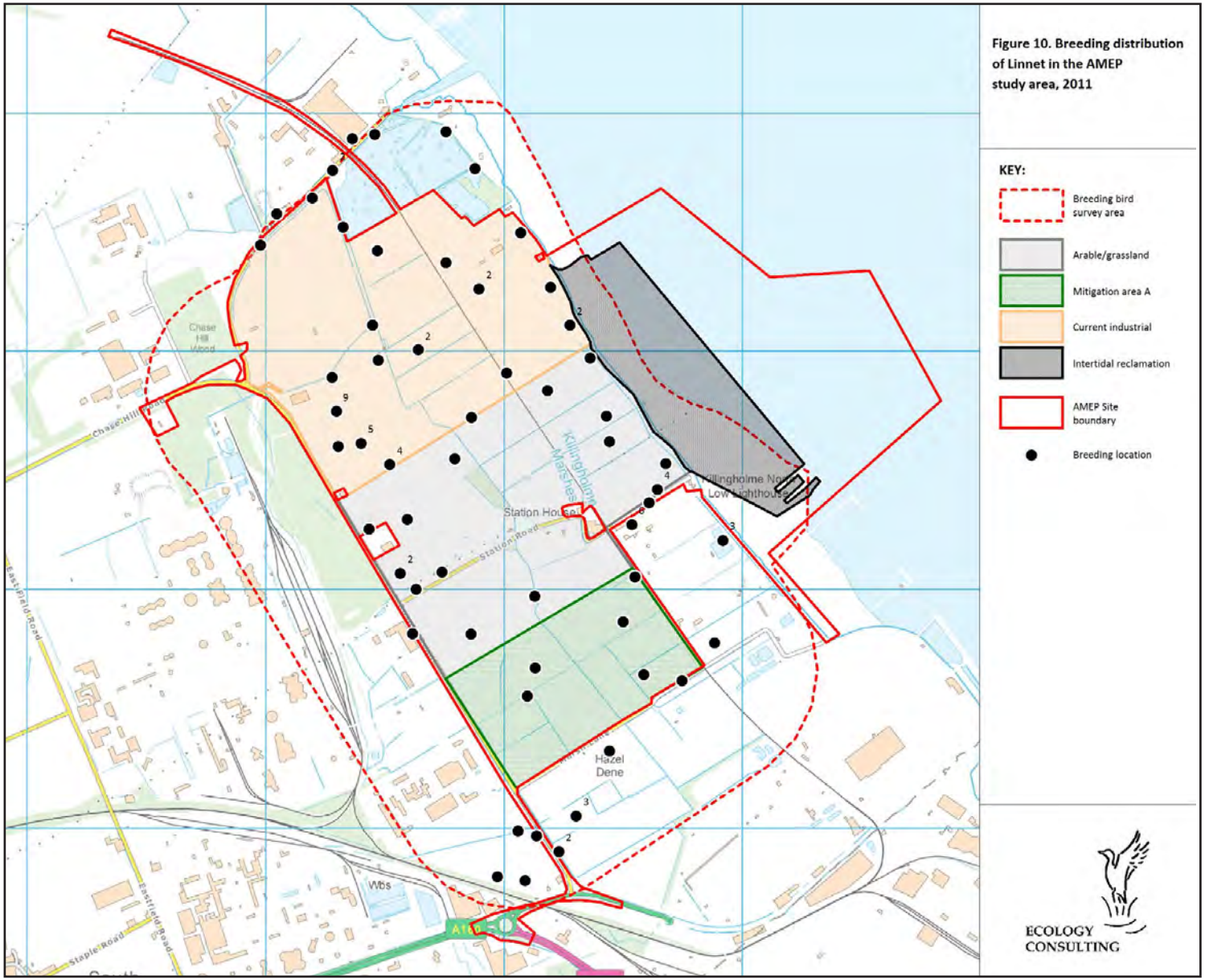
Figure 10. Breeding distribution of Linnet in the AMEP study area, 2011
KEY:
Breeding bird survey area
Arable/grassland
Mitigation area A
Current industrial
Intertidal reclamation
AMEP Site boundary
Breeding location
Chase Hill Wood
Chase Hill Road
Killingholme Marshes
Killingholme North Low Lighthouse
Station House
Station Road
Eastfield Road
Hazel Dene
Wbs
A160
Staple Road
ECOLOGY CONSULTING

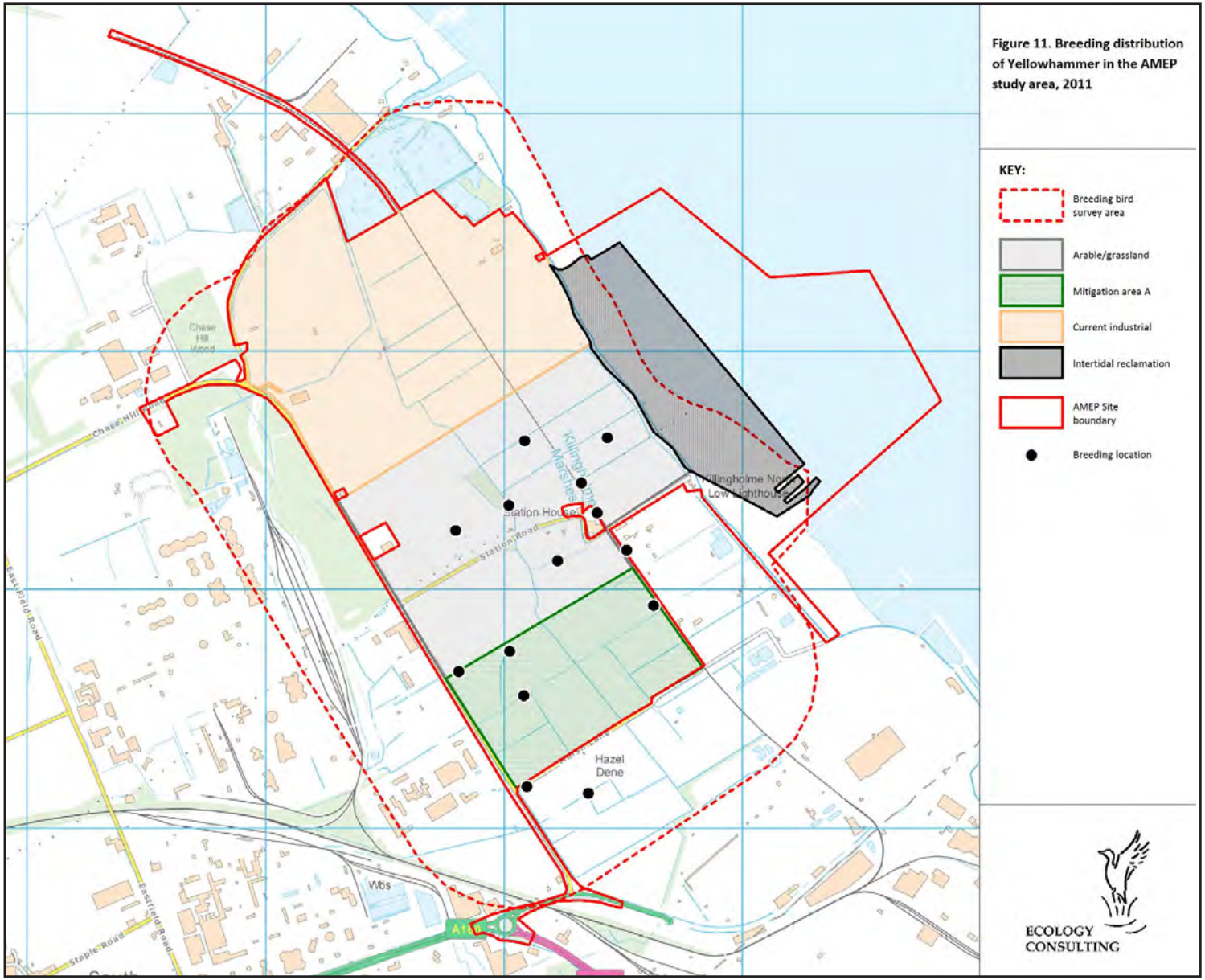

Figure 11. Breeding distribution of Yellowhammer in the AMEP study area, 2011

KEY:

- Breeding bird survey area
- Arable/grassland
- Mitigation area A
- Current industrial
- Intertidal reclamation
- AMEP Site boundary
- Breeding location

ECOLOGY CONSULTING

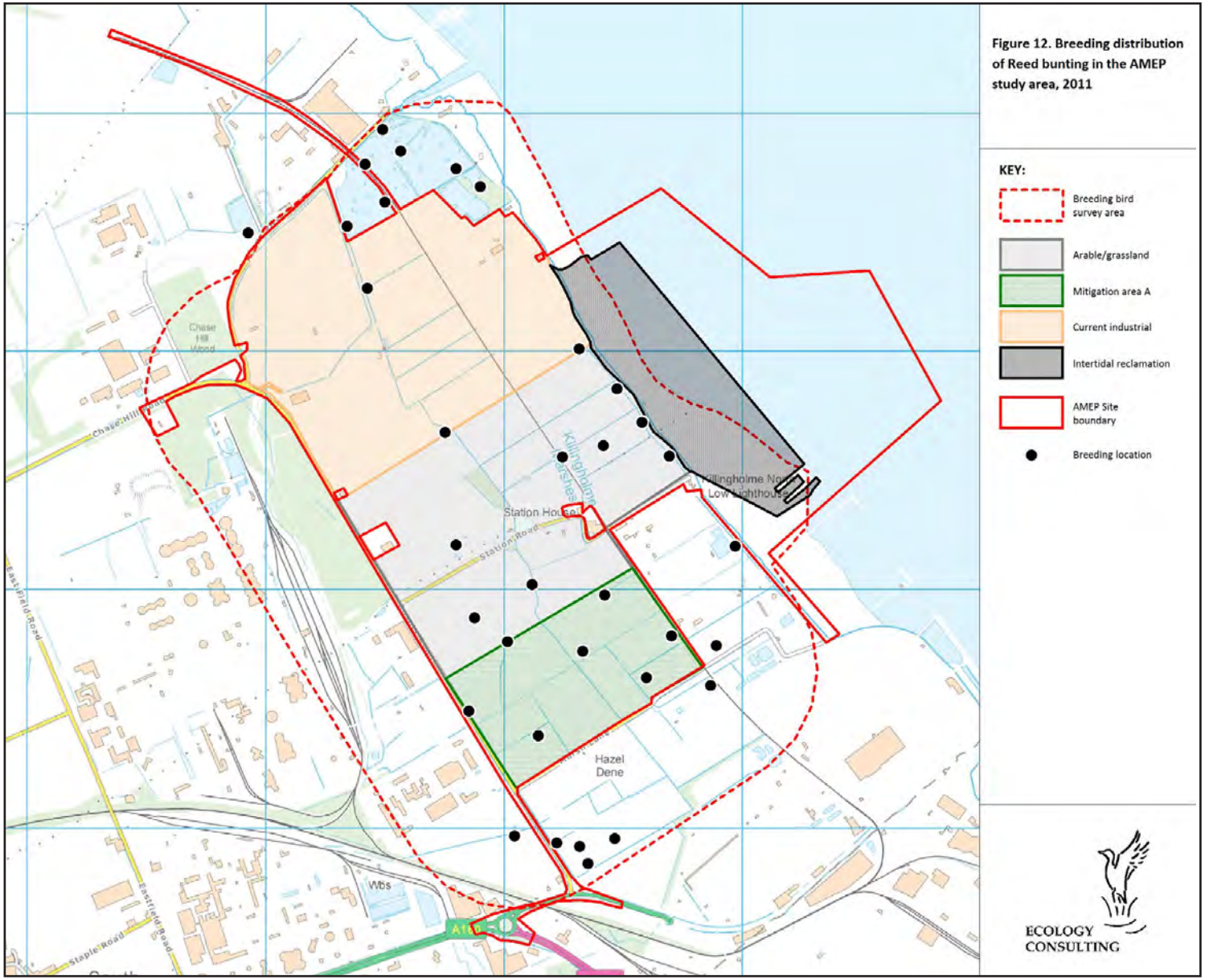

Figure 12. Breeding distribution of Reed bunting in the AMEP study area, 2011

KEY:

- Breeding bird survey area
- Arable/grassland
- Mitigation area A
- Current industrial
- Intertidal reclamation
- AMEP Site boundary
- Breeding location

ECOLOGY CONSULTING

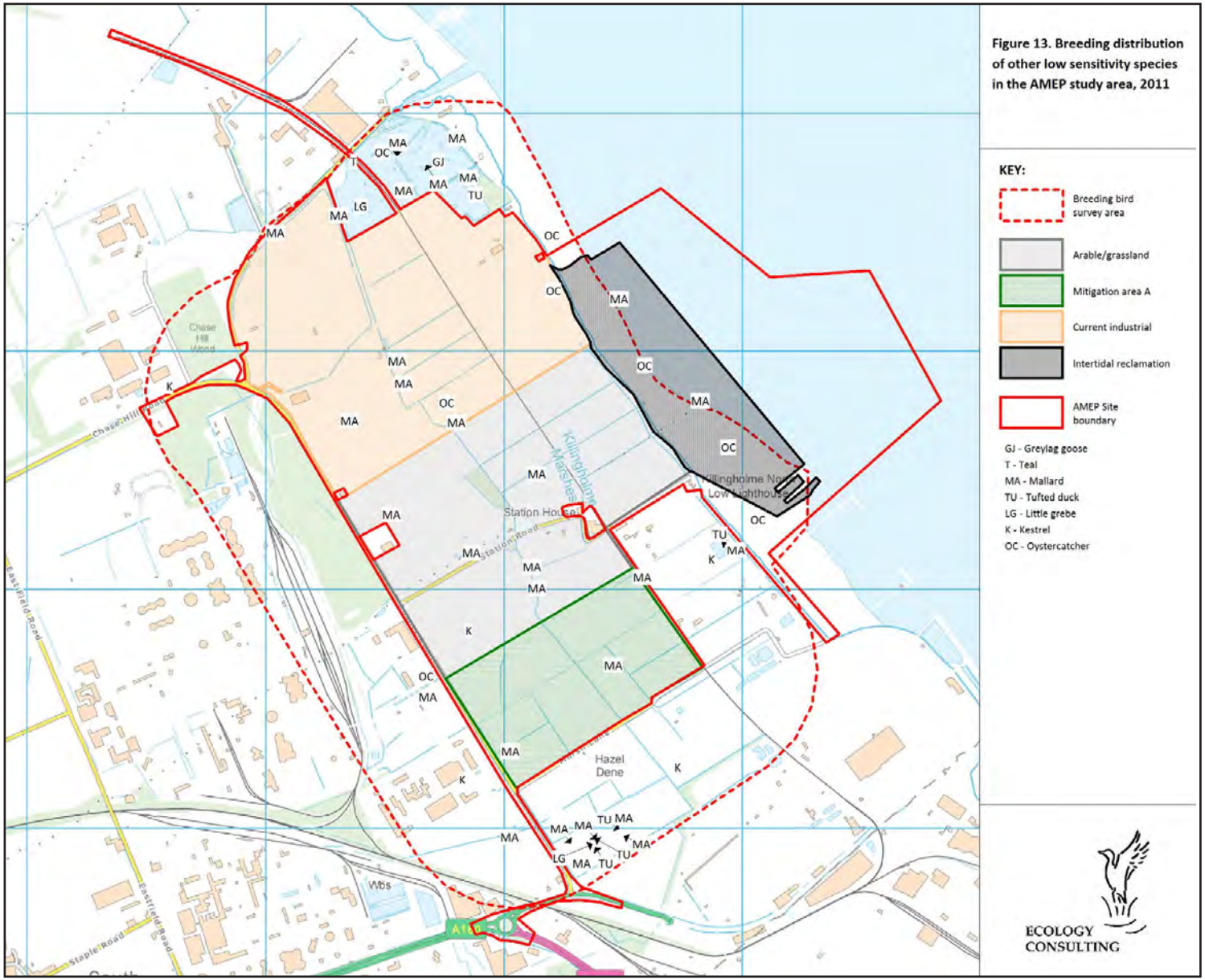
Figure 13. Breeding distribution of other low sensitivity species in the AMEP study area, 2011
KEY:
Breeding bird survey area
Arable/grassland
Mitigation area A
Current industrial
Intertidal reclamation
AMEP Site boundary
GJ - Greylag goose
T - Teal
MA - Mallard
TU - Tufted duck
LG - Little grebe
K - Kestrel
OC - Oystercatcher
ECOLOGY CONSULTING
Chase Hill Wood
Killingholme Marshes
Killingholme North Low Lighthouse
Station House
Hazel Dene
Chase Hill Road
Eastfield Road
Staple Road
Wks
A160

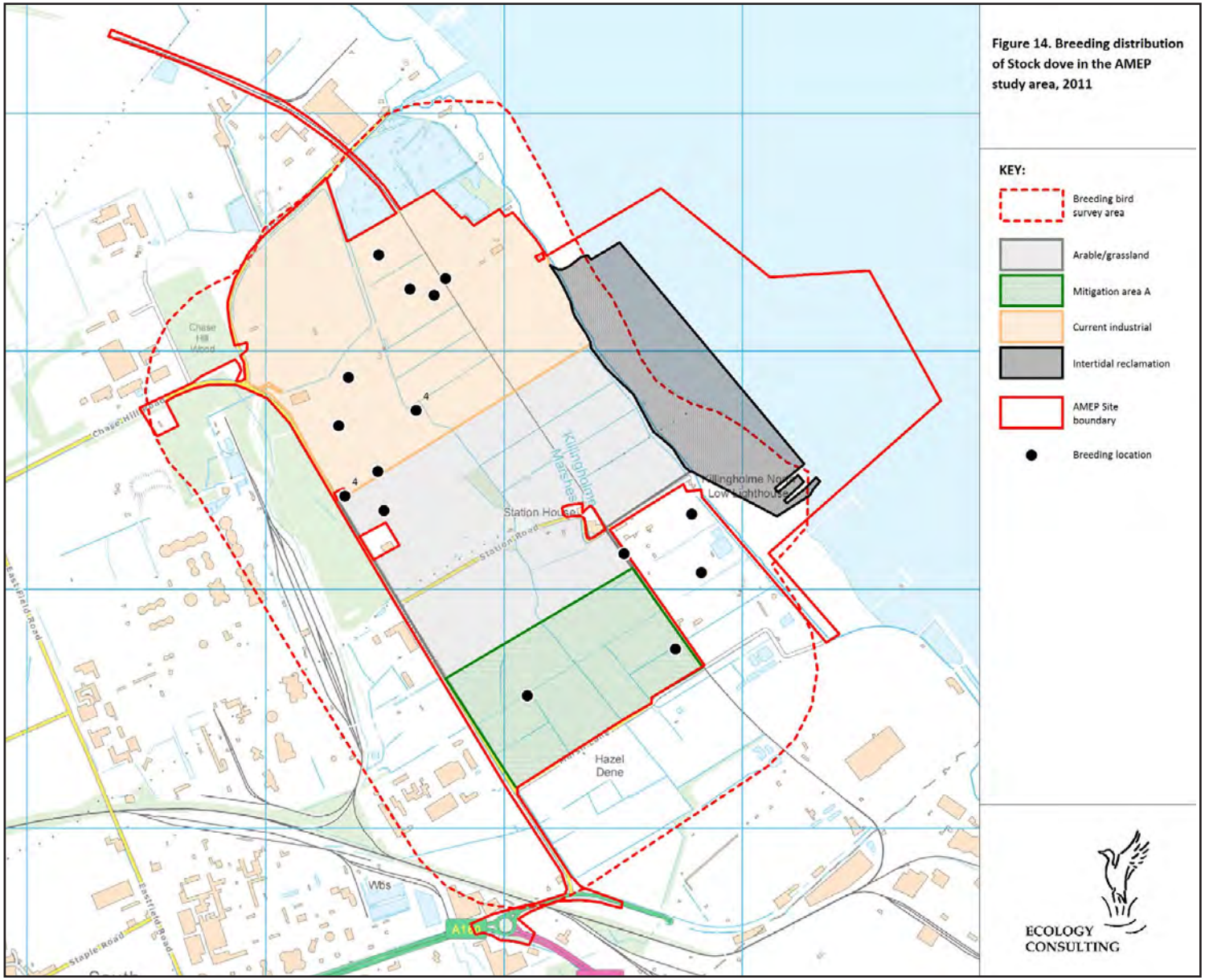
Figure 14. Breeding distribution of Stock dove in the AMEP study area, 2011
KEY:
Breeding bird survey area
Arable/grassland
Mitigation area A
Current industrial
Intertidal reclamation
AMEP Site boundary
Breeding location
Chase Hill Wood
Chase Hill Road
Killingholme Marshes
Killingholme North Low Lighthouse
Station House
Station Road
Eastfield Road
Staple Road
Hazel Dene
Wbs
A160
4
ECOLOGY CONSULTING

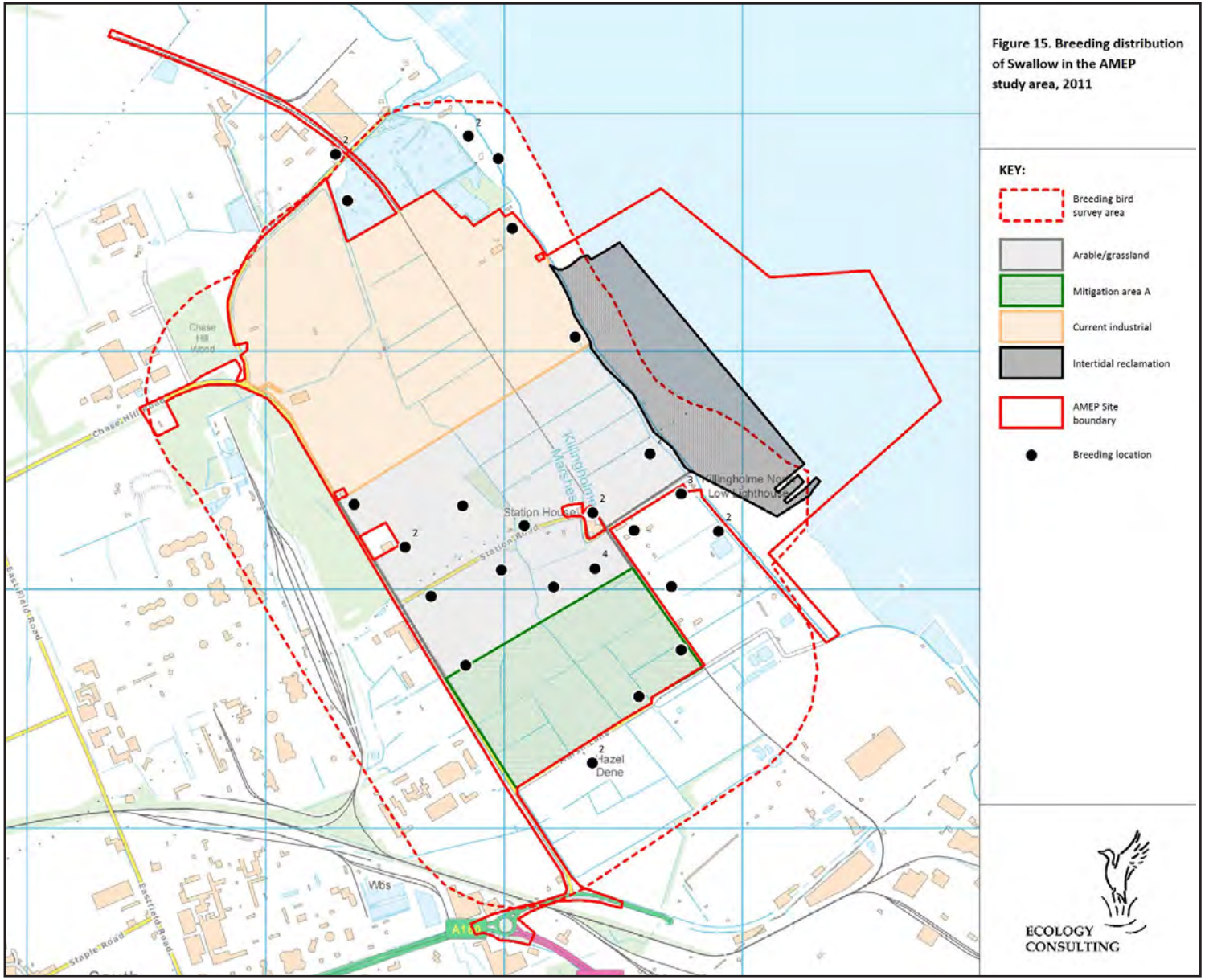
Figure 15. Breeding distribution of Swallow in the AMEP study area, 2011
KEY:
Breeding bird survey area
Arable/grassland
Mitigation area A
Current industrial
Intertidal reclamation
AMEP Site boundary
Breeding location
Chase Hill Wood
Chase Hill Road
Killingholme Marshes
Killingholme North Low Lighthouse
Station House
Station Road
Eastfield Road
Staple Road
Hazel Dene
VBs
A160
ECOLOGY CONSULTING

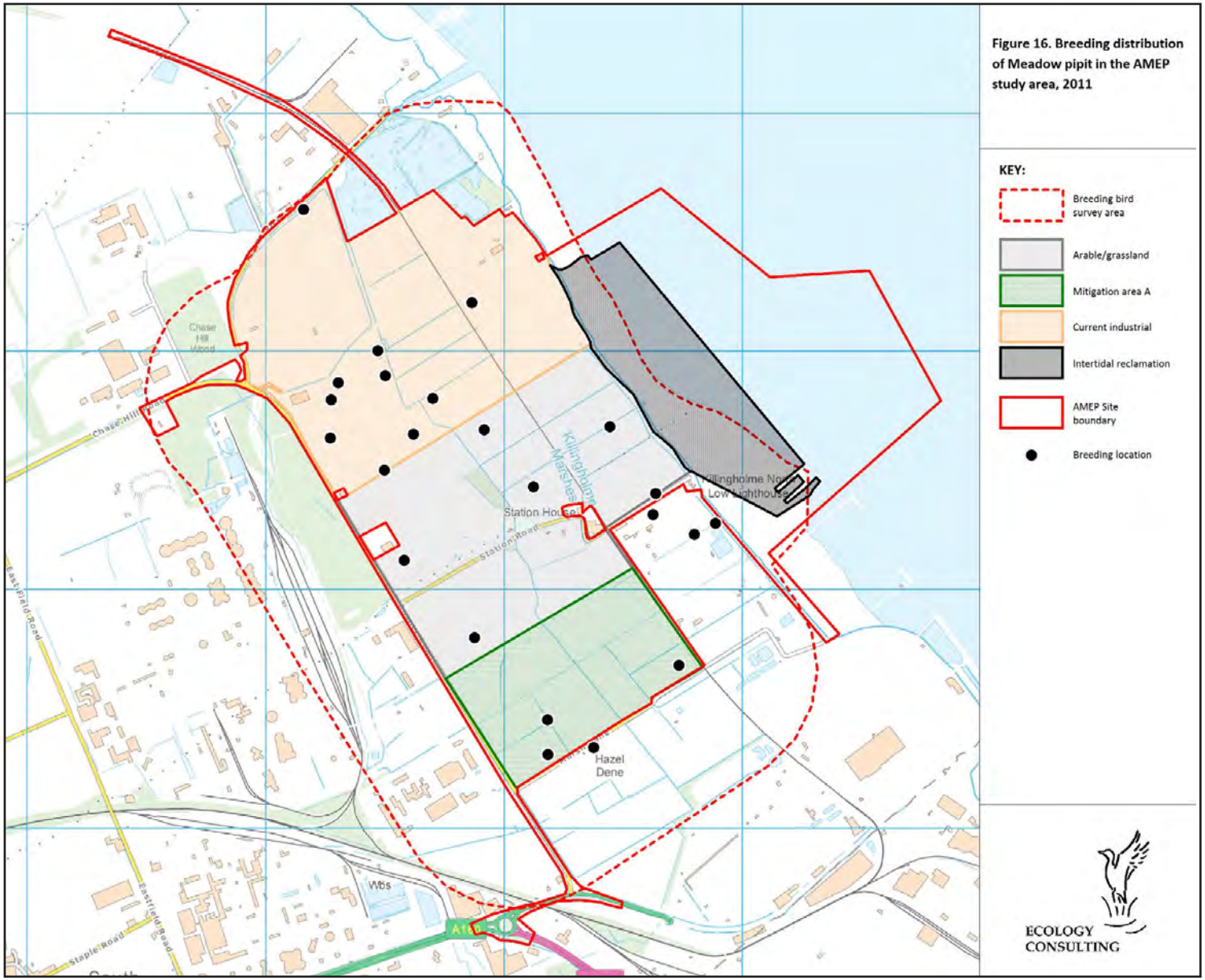

Figure 16. Breeding distribution of Meadow pipit in the AMEP study area, 2011

KEY:

- Breeding bird survey area
- Arable/grassland
- Mitigation area A
- Current industrial
- Intertidal reclamation
- AMEP Site boundary
- Breeding location

ECOLOGY CONSULTING

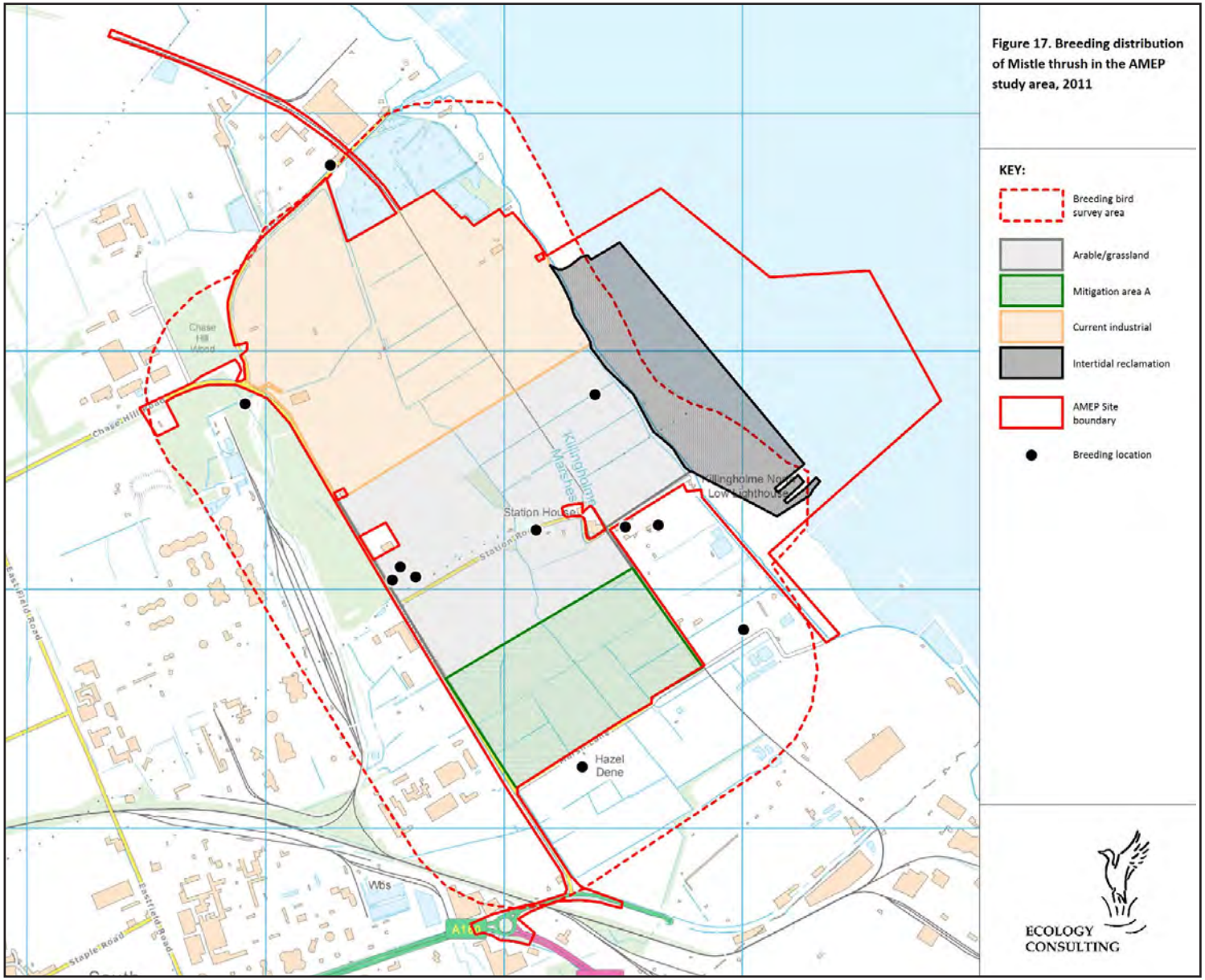

Figure 17. Breeding distribution of Mistle thrush in the AMEP study area, 2011

KEY:

- Breeding bird survey area
- Arable/grassland
- Mitigation area A
- Current industrial
- Intertidal reclamation
- AMEP Site boundary
- Breeding location

ECOLOGY CONSULTING

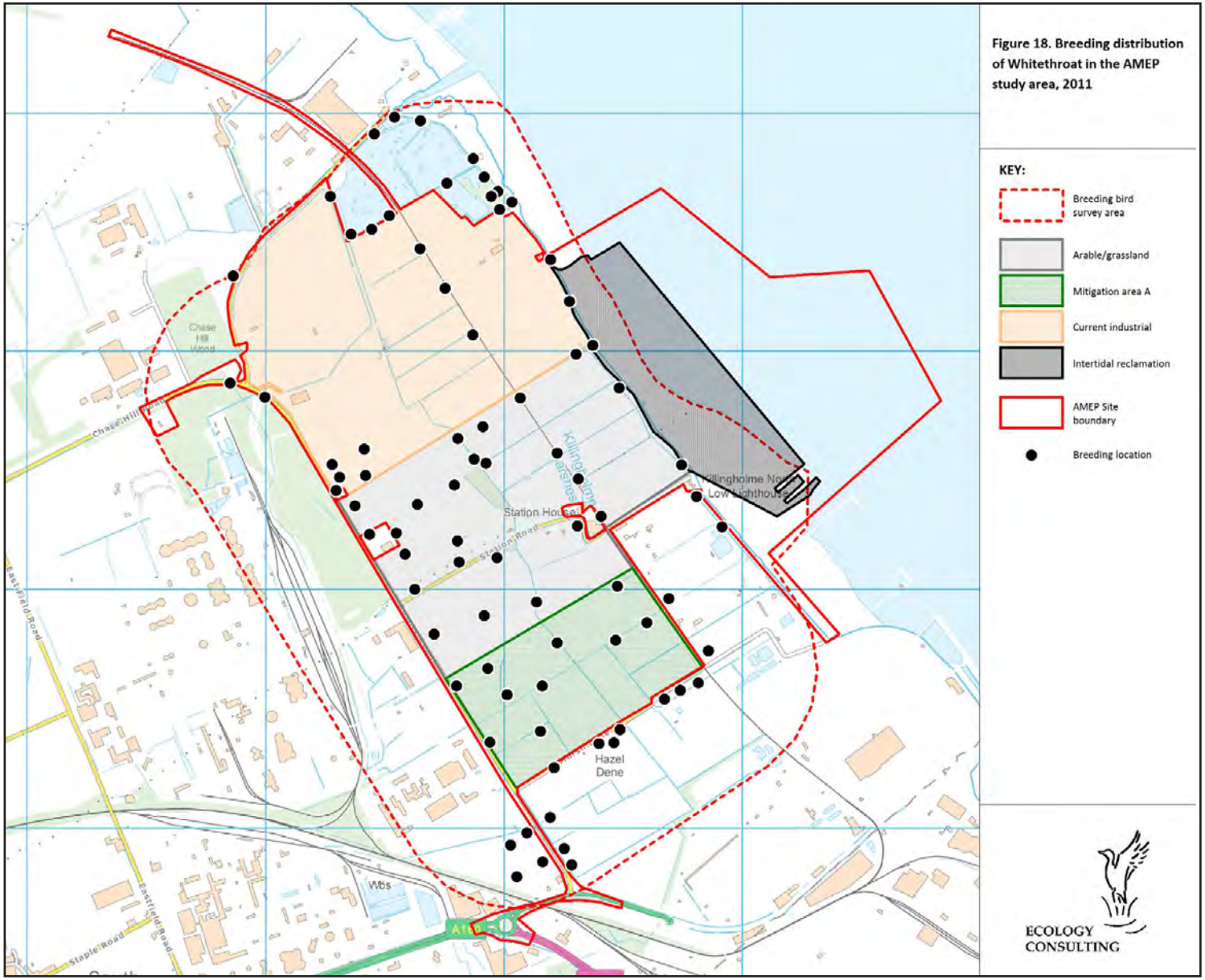

Figure 18. Breeding distribution of Whitethroat in the AMEP study area, 2011

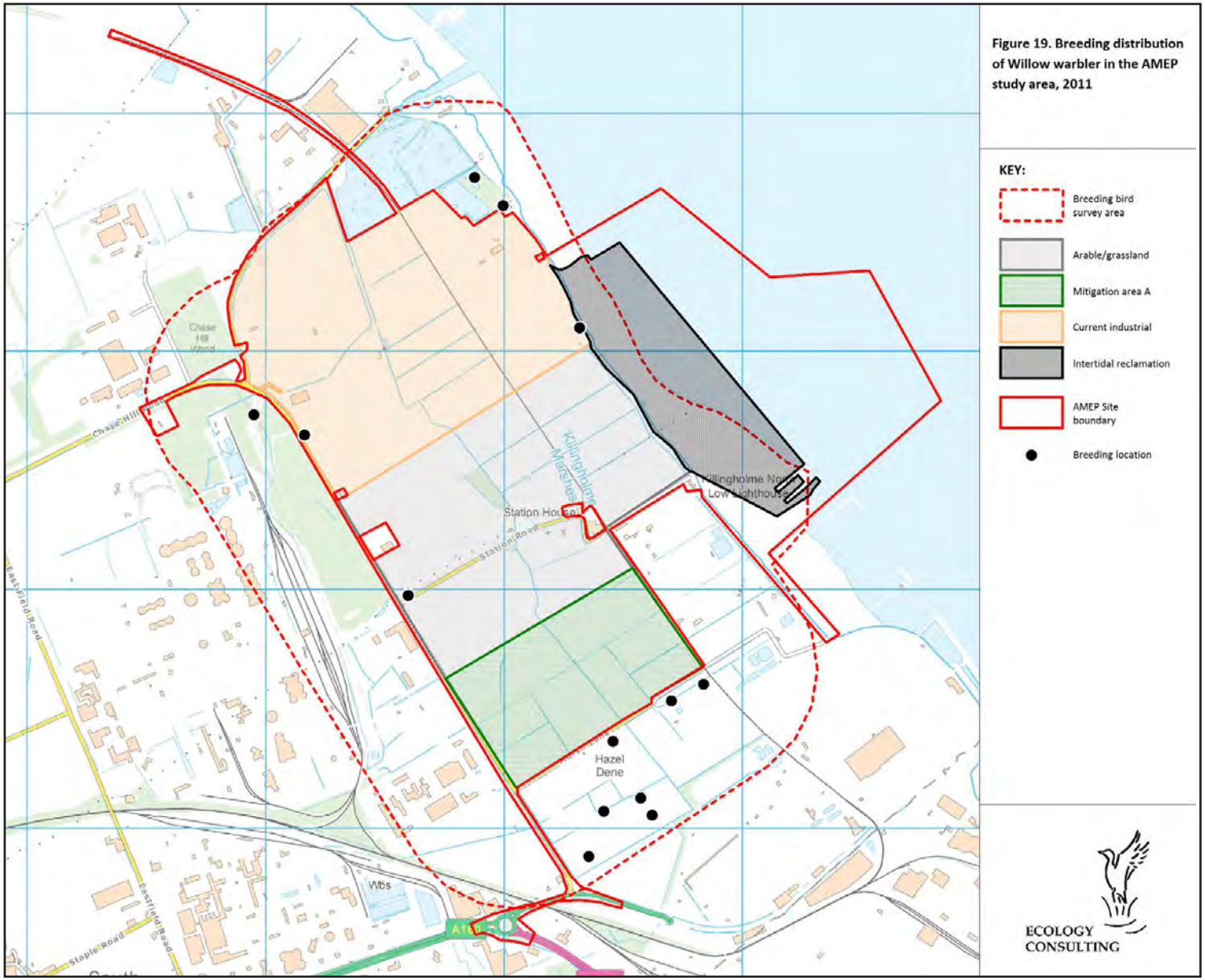

Figure 19. Breeding distribution of Willow warbler in the AMEP study area, 2011