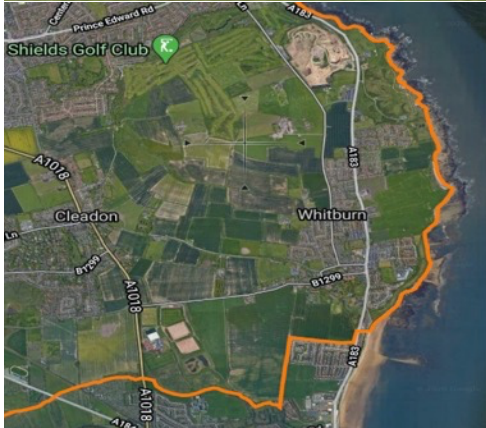


WADER SURVEY

SOUTH TYNESIDE



JANUARY
2023

FINAL

CLIENT South Tyneside Council
PROJECT NAME South Tyneside fields
PROJECT NUMBER 6097

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R01	Draft	August 2022	RA	JW	ADM
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UNLESS REQUESTED OTHERWISE, THE INFORMATION BELOW, RELATING TO THE LOCAL AREA, WILL BE PROVIDED TO THE ENVIRONMENTAL RECORDS CENTRE FOR THE NORTH EAST (ERIC)					
SPECIES	RECORDER	DATE	LOCATION (NGR)	PEAK COUNT	COMMENT
Golden Plover	E3 Ecology	14/02/22	NZ 4110 6250	260	Peak count of wintering birds using arable farmland and other grassland
Lapwing	E3 Ecology	12/11/21	NZ 3931 6173	250	Peak count of wintering birds using arable farmland and other grassland
Curlew	E3 Ecology	13/01/22	NZ 4120 6307	164	Peak count of wintering birds using arable farmland and other grassland
Oystercatcher	E3 Ecology	30/11/21	NZ 4076 6342	35	Peak count of wintering birds using arable farmland and other grassland
Redshank	E3 Ecology	30/11/21	NZ 4037 6193	32	Peak count of wintering birds using arable farmland and other grassland
Turnstone	E3 Ecology	16/03/22	NZ 4110 6250	24	Peak count of wintering birds using arable farmland and other grassland
Snipe	E3 Ecology	25/10/21	NZ 3940 6292	2	Peak count of wintering birds using arable farmland and other grassland
Jack Snipe	E3 Ecology	18/11/21	NZ 39405 62927	1	Peak count of wintering birds using arable farmland and other grassland

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A. SUMMARY

E³ Ecology Ltd was commissioned by South Tyneside Council to undertake surveys of wintering wading birds using fields in the Whitburn and Cleadon area of South Tyneside. The survey area comprised arable and pasture farmland, as well as amenity grassland, known to support roosting and foraging waders.

The aim of the survey was to inform the evidence base for the local plan. Knowledge of which fields are more important for waders can indicate which fields should be conserved and can highlight appropriate locations and design for habitat mitigation, compensation and enhancement measures.

A survey of the same area was undertaken using the same methodology in the winter of 2019-20. The results of the two surveys are compared and combined for analysis.

Red highlighted text indicates that the field (whole or in-part) was identified as a potential housing allocation in the Regulation 18 draft Local Plan (2022).

A total of 36 surveys (approximately six surveys per month) were undertaken between October 2021 and March 2022 (see Table 3). The duration of each survey was approximately six hours. Surveys were timed to coincide with the full range of tide heights. The start and end locations of each survey were varied to avoid bias. For each field, counts of wader species, activity and the habitats present in the field were recorded. Analysis considered peak counts as well as peak counts per hectare to identify high value smaller fields that held relatively high numbers of waders.

Consultation with the Multi Agency Geographic Information for the Countryside (MAGIC) website identified that the Northumbria Coast Special Protection Area (SPA) and Ramsar lies adjacent to the site to the east. The SPA is designated for its breeding Arctic tern (2.92% of UK breeding population) and little tern (1.7% of UK breeding population) and its wintering turnstone (2.1% of Western Palearctic wintering population) and purple sandpiper (1.5% of wintering Eastern Atlantic population). The Durham Coast Site of Special Scientific Interest (SSSI) lies adjacent to the survey area. The SSSI supports nationally important wintering populations of purple sandpiper and sanderling and breeding population of little tern.

A brief literature review indicated that habitat use in waders varies seasonally and also changes nocturnally, with waders using a wider range of fields at night. Weather can also influence wader distribution. Field use depends on the habitats in those fields and only a small proportion of fields are used. Permanent pasture has been used frequently by waders in the past, but arable farmland is increasingly used, particularly autumn-sown crop fields and unimproved pasture. Sward height, degree of enclosure, likelihood of predation and field size are all factors affecting field use. Artificial illumination has been shown to have a positive effect on the foraging of nocturnal feeding waders, but conversely, waders may be drawn to areas that are more exposed to predation.

A total of eight species of waders were recorded in the study area, of which golden plover, lapwing and curlew were the only species to have peak counts greater than 100. Waders were recorded in 50 (61%) of 82 fields. Three fields supported peak diurnal counts of more than 100 waders: fields 6, 7 and 56. The most attractive fields included 1, 3, 4, 5, 6, 7, 9, 10, 17, 18, 19, 20, 21, 22, 28, 30, 31, 33, 55, 56, 68, 69, 71, 73, 75, 76, 77, 78 and 79. These fields had the highest peak diurnal counts, the highest peak nocturnal counts, the highest wader densities, were used most frequently and were used by the highest diversity of species. The peak count in any one field was 282 in field 7. The fields that tended to be used by waders were generally those surrounding Whitburn village. The fields on top of Cleadon Hills tended not to be used by waders and, in the 2022 survey work, the fields towards the southwest corner of the study area

were not used. There was evidence that waders used fields in the study area in slightly higher numbers at high tide than at low tide.

Nocturnal surveys showed that fields that are not used during the day may be used at night. In some other fields, wader use during the day was low, but use increased at night. Redshank, lapwing and golden plover are more dispersed at night than during the day. The greater dispersion of waders at night is consistent with the literature, which suggests greater dispersion at night is likely to be due to reduced perceived or actual predation.

The habitats most used by waders in the study area were autumn-sown arable and horse-grazed pasture. In general within the survey area, the most attractive fields for waders are large with short sward height, smoothly ploughed soil surface, good sightlines (not enclosed by boundary features, woodland or housing), are close to the intertidal zone and are undisturbed by recreation.

There was variation in field use between years, for example field 10 was well used in 2019-20 but less so in 2021-22. Three fields were considered to be high value in 2019-20 that were not considered to be high value in 2021-22.

All waders recorded during survey work, except golden plover and jack snipe, are of sufficient conservation concern to be placed on the BoCC5¹⁸ list (their red or amber status is indicated by the colour in the species box in table 1). Local knowledge indicates that the fields in the study area support a significant proportion of the waders wintering in the South Tyneside borough. The peak counts of all species except snipe and jack snipe are likely to represent more than 1% of the county wintering population.

Species	Peak Count	National Priority	Schedule 1	Annex 1
Golden Plover	260			✓
Lapwing	250	✓		
Curlew	164	✓		
Oystercatcher	35			
Redshank	32			
Turnstone	24			
Snipe	2			
Jack Snipe	1			

Field	Date of Peak Count	Peak Count	Peak Count per Hectare	No. surveys wader present
7	14/02/22	282	8	24
56	12/11/21	180	21	13
6	13/01/22	130	22	10
10	30/11/21	80	1	7
30	18/11/21	51	4	15
22	08/11/21	46	5	15
68	02/03/22	41	7	8

¹ National Priority = Species of principal importance listed in Section 41 of the NERC Act (2006),
 Schedule 1 = Species listed on Schedule 1 of the Wildlife and Countryside Act (1981) as amended. These are birds and their young, for which it is an offense to intentionally or recklessly disturb at, on or near an 'active' nest,
 Annex 1 = Species listed on Annex 1 of the Bird Directive (1979) as amended. This lists 194 species and sub-species which are particularly threatened. Member States must designate Special Protection Areas (SPAs) for their survival.

21	28/01/22	37	10	17
75	12/11/21	36	3	6
4	10/01/22	33	21	8

The study area supported several BoCC5 listed seed-eating birds, primarily in stubble fields. In 2021-22, fields 41, 75 and 76 were left as stubble and attracted substantial numbers of linnet, skylark, yellowhammer, reed bunting and grey partridge. Scarce species recorded included buzzard, Mediterranean gull, merlin and peregrine.

Section F in this report discusses mitigation and compensation if fields used by waders are developed. A general overview is provided, followed by species-specific measures.

If you are assessing this report for a local planning authority and have any difficulties interpreting plans and figures from a scanned version of the report, E3 Ecology Ltd would be happy to email a PDF copy to you. Please contact us on 01434 230982.

B. INTRODUCTION

E³ Ecology Ltd was commissioned by South Tyneside Council to undertake surveys of wintering wading birds using fields in the Whitburn and Cleaton area of South Tyneside.

The purpose of this report is to:

- Record the species, abundance and distribution of waders using the survey area.
- Determine the fields in the survey area that are of the highest conservation value to waders.
- Identify habitat types used by waders in the survey area.
- Record other important species using the survey area.
- Identify potential conservation measures for waders should any fields in the survey area be considered for development.
- Compare results of winter 2021-22 surveys with results of winter 2019-20 surveys and combine for analysis.

The site location is illustrated below in Figure 1.

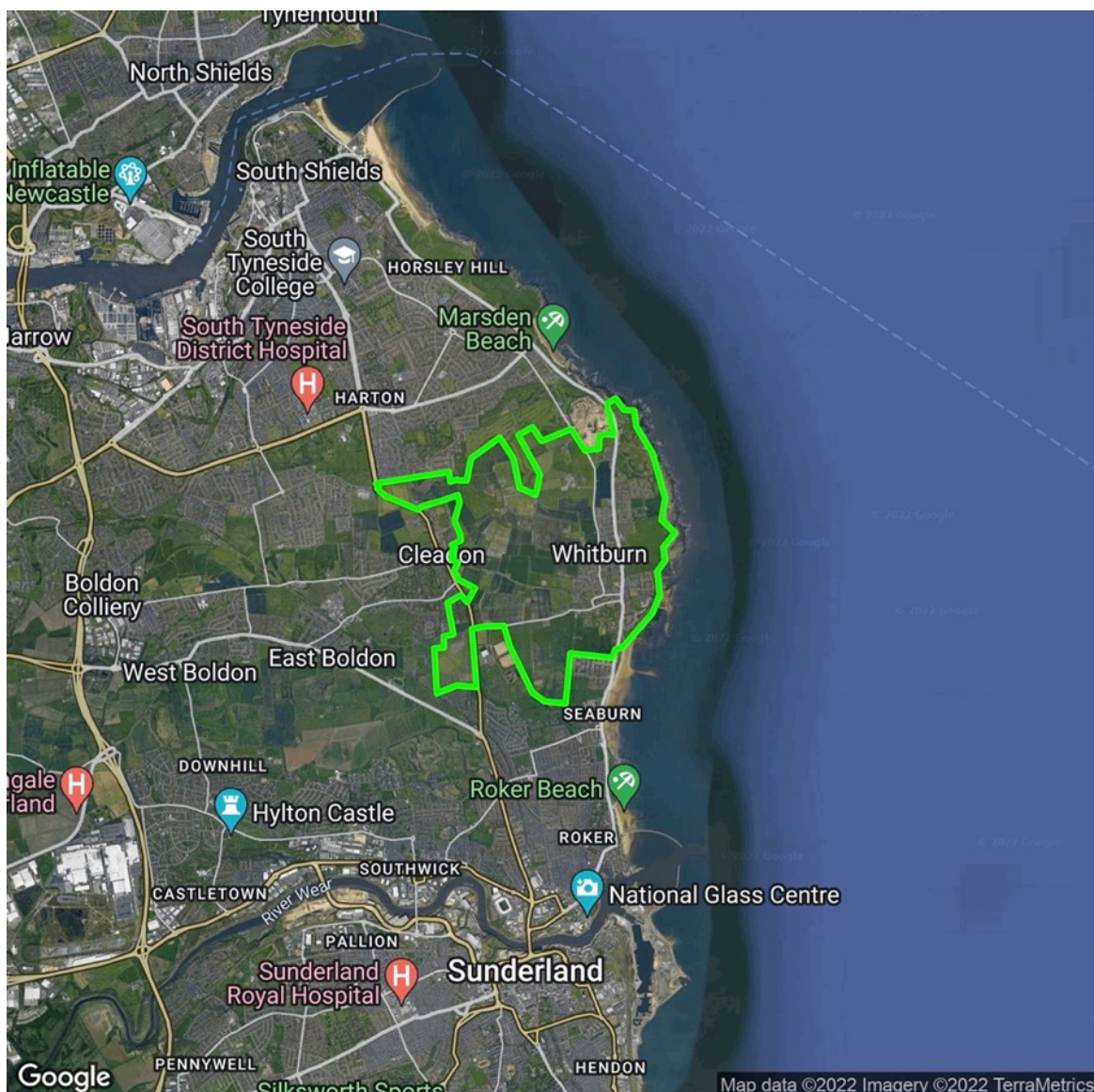


FIGURE 1: SITE LOCATION
(Reproduced under licence from Google Earth Pro.)

C. METHODOLOGY

C.1 SCOPE OF STUDY

From local knowledge and consultation with South Tyneside Council it was known, prior to undertaking survey work, that the non-breeding populations of waders using the survey area are of significant conservation value. The study area comprised 82 fields as shown in Figure 2 below. Fields potentially allocated for housing are shown using red text.



FIGURE 2: FIELD NUMBERS AND BOUNDARIES (GREEN LINE) AND SOUTH TYNESIDE DISTRICT BOUNDARY (ORANGE LINE)

(Reproduced under licence from Google Earth Pro. Fields with identified housing allocations in the draft Local Plan (2022) are shown using red text.

C.2 DESK STUDY

The Multi Agency Geographic Information for the Countryside website (MAGIC)² was searched for the following statutory protected sites designated for ornithological interests:

- Special Protection Areas (SPAs);
- Proposed Special Protection Areas (pSPAs);
- Sites of Special Scientific Interest (SSSIs); and
- Ramsar sites.

C.3 FIELD SURVEY

C.3.1 SURVEY EQUIPMENT

The following items of equipment were utilised during survey work and analysis:

- Swarovski EL 8x32 WB binoculars
- Swarovski ATS 80 HD scope with 25-50x W Eyepiece
- iPhone 12 Pro with Map Plus GIS application
- Pulsar Axion XM30S thermal camera
- IR night vision equipment allowing bird identification to 200m at night

C.3.2 BIRD SURVEY METHODS

A total of 36 surveys (six surveys per month) were undertaken between October 2021 and March 2022 (see Table 3). The duration of each survey was approximately six hours. Surveys were timed to coincide with the full range of tide heights. The start and end locations of each survey were varied to avoid biases.

The study area was surveyed by an experienced ornithologist who is able to identify all commonly occurring UK bird species by sight and call. Each of the 82 fields were scanned with binoculars and a telescope from the edge of the field or a suitable vantage point. Field numbers were cross-checked using Map Plus GIS application. Following the scan of a field, the following data were recorded:

- Field number (1-82).
- Wader species using the field.
- Count of each wader species using field.
- The general behaviour of each species using field (generally either foraging or roosting).
- Date and time.
- Tide height (metres).
- Habitat: one of the following categories: amenity, autumn-sown arable, ephemeral flood, fallow (ploughed and unsown), hay pasture (improved grassland that had been cut for hay), horse-grazed pasture, improved grassland, semi-improved grassland, spring-sown arable, stubble. If the majority of waders in a field were using a patch of ephemeral flood, then habitat use was classed as ephemeral flood.
- Numbers of incidental species using field (limited to scarce and/or declining species).

Survey techniques used good field craft to minimise disturbance to birds, wearing dull clothes, avoiding being silhouetted against the skyline, moving slowly and then spending time in one location to allow birds to become active again.

² Multi Agency Geographic Information for the Countryside (MAGIC) www.magic.gov.uk

Of the 36 surveys, 6 were carried out nocturnally (see Table 3). The aim of these surveys was to determine if the species and numbers of waders using each field differed to diurnal hours. The general methods of the nocturnal surveys were the same as diurnal surveys. However, the fields were scanned with an infra-red camera to detect, identify and count waders. Immediately following the initial scan of the field with the infra-red camera, each field was scanned again with a thermal camera and any additional birds to the initial scan were recorded.

C.3.3 SURVEY TIMING AND WEATHER CONDITIONS

The table below details the survey dates, timings and weather conditions. The start and end times of each survey were varied to avoid biases.

TABLE 3: SURVEY CONDITIONS							
Date	Temperature	Cloud Cover	Precipitation	Wind	Visibility	Time	Type
25/10/21	10°C	40%	None	SW3	>2km	12:00-18:00	Diurnal
26/10/21	16°C	80%	None	SW5	>2km	12:00-18:00	Diurnal
28/10/21	14°C	100%	None	S4	>2km	11:00-17:00	Diurnal
02/11/21	9°C	50%	None	N1	>2km	16:30-22:00	Nocturnal
08/11/21	12°C	100%	None	S3	>2km	10:30-16:00	Diurnal
10/11/21	9°C	30%	None	SW1	>2km	10:30-16:30	Diurnal
12/11/21	13°C	80%	None	S4	>2km	08:45-14:00	Diurnal
16/11/21	11°C	100%	None	SW3	>2km	10:30-16:30	Diurnal
18/11/21	14°C	80%	None	W4	>2km	10:30-16:15	Diurnal
24/11/21	5°C	30%	None	W3	>2km	10:30-16:15	Diurnal
30/11/21	10°C	80%	None	SW4	>2km	16:30-22:00	Nocturnal
06/12/21	5°C	70%	Showers	W3	>2km	09:45-15:45	Diurnal
09/12/21	6°C	50%	None	S3	>2km	10:30-16:00	Diurnal
13/12/21	7°C	100%	None	SW2	>2km	10:15-15:40	Diurnal
22/12/21	3°C	100%	Rain	S3	>2km	16:30-22:00	Nocturnal
27/12/21	7°C	100%	None	SE2	>2km	10:45-16:00	Diurnal
28/12/21	8°C	100%	Rain	NW4	>2km	08:00-14:00	Diurnal
30/12/21	14°C	60%	None	SW3	>2km	08:45-14:30	Diurnal
03/01/22	9°C	60%	None	W5	>2km	07:45-13:45	Diurnal
10/01/22	7°C	90%	None	S3	>2km	09:30-14:45	Diurnal
13/01/22	7°C	10%	None	W3	>2km	10:00-16:00	Diurnal
18/01/22	7°C	30%	None	S3	>2km	10:00-16:30	Diurnal
28/01/22	10°C	90%	None	SW4	>2km	09:15-15:00	Diurnal
31/01/22	5°C	30%	None	W2	>2km	16:30-22:30	Nocturnal
02/02/22	10°C	100%	None	W3	>2km	10:15-16:15	Diurnal
07/02/22	9°C	40%	None	SW4	>2km	11:00-17:00	Diurnal
10/02/22	6°C	30%	None	W6	>2km	11:00-16:45	Diurnal
14/02/22	8°C	90%	Rain	NW3	>2km	08:00-14:00	Diurnal
22/02/22	7°C	40%	None	W4	>2km	11:30-17:30	Diurnal
01/03/22	5°C	20%	None	SE1	>2km	17:30-22:30	Nocturnal
02/03/22	6°C	100%	Rain	SE4	>2km	07:30-13:30	Diurnal
10/03/22	14°C	50%	None	S3	>2km	11:00-16:00	Diurnal
14/03/22	7°C	60%	None	SW4	>2km	11:30-17:30	Diurnal
16/03/22	7°C	100%	Rain	NW3	>2km	11:00-16:45	Diurnal
18/03/22	9°C	70%	None	SW2	>2km	18:00-22:30	Diurnal
23/03/22	12°C	10%	None	SE2	>2km	12:15-18:15	Diurnal

C.4 PERSONNEL

The table below details the personnel who undertook the survey work.

TABLE 4: PERSONNEL

Name	Position	Professional Qualifications	Natural England Survey Licence Numbers
Ross Ahmed	Senior Field Ornithologist	BA (Hons) MPhil MCIEEM	CL29/00294 (Barn Owl)

Further details of experience and qualifications are available at www.e3ecology.co.uk.

C.5 INTERPRETATION OF RESULTS

The data were analysed by calculating peak and mean counts of waders in relation to a variety of factors including field number, field size, habitat, time of day and tide height. Results of 2019-20 surveys were compared with the results of the 2021-22 surveys.

C.6 EVALUATION

The relative ornithological value of the site and of each field was assessed using a geographical frame of reference. For designated sites this is generally a straightforward process with the assigned designation generally being indicative of a particular value, e.g. Sites of Special Scientific Interest are designated under national legislation and are therefore generally considered to be receptors of national value. The assignment of value to non-designated receptors is less straightforward and as recognised by the Guidelines for Ecological Impact Assessment produced by the Chartered Institute of Ecology and Environmental Management³, is a complex and subjective process and requires the application of professional judgement.

When assessing the value of species and habitats, a number of criteria are considered, including the abundance of the species, both on a national and local scale, the diversity of species present, the quality of the surrounding habitat and both local and national trends. Relevant documents and legislation are considered including the lists of species and habitat of principal importance annexed to the NERC Act (2006), those provided within relevant local Biodiversity Action Plans and the BoCC5¹⁸. Data provided through consultation is also considered. These data sources can provide context at a local, regional and national scale and take account of both national and local population trends.

The table below provides examples of receptors of value at different geographical scales.

³ CIEEM. 2018. Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester.

TABLE 5: VALUATION

LEVEL OF VALUE	EXAMPLES
International	An internationally designated site or candidate site (SPA/pSPA/Ramsar)
	A site meeting criteria for international designation.
	A species present in internationally important numbers (i.e. >1% of the biogeographic population)
National	A nationally designated site (SSSI/NNR).
	A species present in nationally important numbers (i.e. >1% of the national population)
Regional	A site that falls slightly below the criteria necessary for designation as a SSSI but is considered of greater than county value.
	A species present in important numbers in the context of the county (i.e. >1% of the regional population)
County	A Local Wildlife Site (LWS) or equivalent, designated at a County level
	A species present in important numbers in the context of the county (i.e. >1% of the county population)
District	A Local Wildlife Site (LWS) or equivalent, designated at a District level
	A species present in important numbers in the context of the district (i.e. >1% of the district population)

D. RESULTS

D.1 DESKTOP STUDY

D.1.1 PRE-EXISTING INFORMATION

ORDNANCE SURVEY MAPPING AND AERIAL PHOTOGRAPHY

The survey area primarily covers the area of farmland between the villages of Whitburn and Cleadon in the south-east corner of the borough of South Tyneside. The farmland is a mixture of arable and pasture. Other habitats in the survey area include several blocks of woodland and patches of scrub but wetland features are generally absent. The eastern boundary of the survey area lies adjacent to the coastline while the westernmost point of the survey area is approximately 2.4km from the coast.

MULTI AGENCY GEOGRAPHIC INFORMATION FOR THE COUNTRYSIDE WEBSITE²

The table below details the internationally and nationally statutorily designated sites in the surrounding area for which ornithological interest is a key reason for designation. It details all internationally designated sites within 10km of the survey area and all nationally designated sites within 5km.

Designation	Site Name	Reason for Designation	Distance from Site
Ramsar	Northumbria Coast	Breeding Arctic tern (2.92% of UK breeding population) and little tern (1.7% of UK breeding population); wintering purple sandpiper (1.6% of the East Atlantic Flyway wintering population); wintering turnstone (2.6% of the East Atlantic Flyway wintering population). Also supports nationally important numbers of sanderling, ringed plover and redshank	Adjacent to east
Special Protection Area	Northumbria Coast	Breeding Arctic tern (2.92% of UK breeding population) and little tern (1.7% of UK breeding population); wintering purple sandpiper (1.6% of the East Atlantic Flyway wintering population); wintering turnstone (2.6% of the East Atlantic Flyway wintering population). Also supports nationally important numbers of sanderling, ringed plover and redshank	Adjacent to east
Site of Special Scientific Interest	Durham Coast	Supports nationally important numbers of wintering purple sandpiper and sanderling, and breeding little tern. Turnstone and knot also use the site for feeding and roosting during winter.	Adjacent to east

D.1.2 LITERATURE REVIEW

Gillings *et al.*⁴ showed that golden plover and lapwing preferred permanent pasture in the past but increasingly use arable farmland. However, habitat use changed seasonally as the habitats present changed. In winter, use of cereal crops matched their availability: harrow (fields in which the soil surface was smooth) in early winter, sugar beet in mid-winter and other crops in late winter. Flocks occupied only a small proportion of the available fields, and were primarily found in large fields with good sightlines and open boundaries and where manure had been applied. Daytime feeding was more likely during cold days after nights with a new moon, short duration of moonlight or low-intensity moonlight. In the daytime, the nature of the vegetation and soil structure was important in determining the visibility of their invertebrate prey. Golden plover show strong site fidelity⁵, returning to winter in the same places each year. However, Fuller and Lloyd⁶ showed that cold winter weather can redistribute large numbers of golden plover into areas that are not otherwise used.

In his 2003 PhD thesis, Gillings noted that smaller flocks of golden plover and lapwing used a much wider range of fields and habitat types at night, and that nocturnal foraging was essential for their energetic balance. This implies that understanding nocturnal ecology and the differences in field and habitat selection between day and night are essential for effectively conserving golden plovers and lapwings.

Gregory *et al.*⁷ compared the diurnal winter feeding ecology of lapwings and golden plover on cereals and grasslands. They found that lapwing and golden plover chose autumn-sown cereal in preference to other field types including grassland. Lapwing numbers were highest in winter cereals 8-10cm high.

Barnett *et al.*⁸ looked at the use of unimproved and improved lowland grassland by wintering waders in Britain. They found that species that are dependent on soil invertebrates (especially earthworms), which includes many grassland feeding waders, were more numerous on unimproved grassland. In the last 50 years, the majority of grassland in Britain has been agriculturally improved.

Milson *et al.*⁹ looked at the relative importance of sward height, landscape factors and human disturbance at grassland feeding areas used by wintering waders. They found that the strongest factors determining field use were sward height and degree of field enclosure.

Natural England's report on the Management of Lowland Wet Grasslands for Birds (1999) states: "Waders (e.g. lapwing, golden plover, snipe) feed on soil-dwelling invertebrates especially earthworms and require high water tables which provides soft, damp soil together with areas of shallow, open water where species such as redshank forage at the water's edge. Islands of non-flooded grassland are used as secure roosting sites. Sward heights of <10cm

⁴ Gillings, S., Fuller, R. J. & Sutherland, W. J. 2007. Winter field use and habitat selection by Eurasian Golden Plovers *Pluvialis apricaria* and Northern Lapwings *Vanellus vanellus* on arable farmland. *Ibis* 149: 509–520.

⁵ Fuller, R. J. & Youngman, R. E. 1979. The utilisation of farmland by Golden Plovers wintering in southern England. *Bird Study* 26: 37–46.

⁶ Fuller, R. J. & Lloyd, D. 2009. The distribution and habitats of wintering Golden Plovers in Britain, 1977–1978. *Bird Study* 28: 169–185.

⁷ Gregory, R. D. 2009. Comparative winter feeding ecology of Lapwings *Vanellus vanellus* and Golden Plovers *Pluvialis apricaria* on cereals and grasslands in the Lower Derwent Valley, North Yorkshire. *Bird Study* 34: 244–250.

⁸ Barnett, P. R., Whittingham, M. J., Bradbury, R. B. & Wilson, J. D. 2004. Use of unimproved and improved lowland grassland by wintering birds in the UK. *Agriculture, Ecosystems & Environment* 102: 49–60.

⁹ Milsom, T. P., Ennis, D. C., Haskell, D. J., Langton, S. D. & McKay, H. V. 1998. Design of grassland feeding areas for waders during winter: The relative importance of sward, landscape factors and human disturbance. *Biological Conservation* 84: 119–129.

are generally preferred although snipe will forage in taller vegetation for concealment. Larger fields lacking tall boundary features and away from human disturbance are preferred (Milsom et al 1998).”

Curlew is one of the UK's highest priority bird species¹⁰ and is categorised as 'Near threatened' by the IUCN¹¹. The decline is thought to be due to factors operating on Curlew's breeding grounds, such as low chick survival¹², rather than in non-breeding areas. Curlew does not breed in South Tyneside but is present almost throughout the year as a non-breeding species. However, habitat quality at wintering sites has been shown to affect breeding success in several species of birds, with low habitat quality at wintering sites resulting in reduced breeding success. While such studies do not apparently exist for curlew, it is possible carry-over effects may be operating in the species.

Laidlaw *et al.*¹³ studied the influence of landscape feature on predation rates of waders nesting in grassland. They showed that vegetation structure was a factor affecting the level of predation suffered by nesting lapwings in grassland habitats. They indicated that field use by waders is likely to be influenced by the likelihood of predation.

Santos *et al.*¹⁴ looked at how artificial lighting in urban areas affected nocturnal habitat selection of foraging waders. They found that areas illuminated by streetlights were used more during the night by wader species that forage visually, than non-illuminated areas. Overall, artificial illumination was shown to have a positive effect on the foraging of nocturnal feeding waders, but conversely, waders may be drawn to areas that are more exposed to predation.

¹⁰ Brown, D. et al. 2015. The Eurasian Curlew – the most pressing bird conservation priority in the UK? *British Birds* 108: 660–668.

¹¹ IUCN. 2022. The IUCN Red List of Threatened Species. Version 2021-3. *The IUCN Red List of Threatened Species*.

¹² Woodward, I. D., Austin, G. E., Boersch-Supan, P. H., Thaxter, C. B. & Burton, N. H. K. 2022. Assessing drivers of winter abundance change in Eurasian Curlews *Numenius arquata* in England and Wales. *Bird Study*: 1–13.

¹³ Laidlaw, R. A., Smart, J., Smart, M. A. & Gill, J. A. 2015. The influence of landscape features on nest predation rates of grassland-breeding waders. *Ibis* 157: 700–712.

¹⁴ Santos, C. D., Miranda, A. C., Granadeiro, J. P., Lourenço, P. M., Saraiva, S. & Palmeirim, J. M. 2010. Effects of artificial illumination on the nocturnal foraging of waders. *Acta Oecologica* 36: 166–172.

D.2 FIELD SURVEY

D.2.1 HABITAT SURVEY

The habitat in the 82 fields was as follows: autumn-sown arable (37), horse grazed (19), improved (10), stubble (8), semi-improved (5) and amenity (3).

D.2.2 BIRD SURVEY

The table below shows that golden plover, lapwing and curlew were the three commonest waders recorded in the study area. All other species were considerably scarcer. Curlew was present considerably more frequently than other species (30 of 36 surveys; present during all diurnal surveys but no nocturnal surveys).

Species	Date of Peak Count	Peak Count	Mean Count	Surveys Present
Golden Plover	14/02/22	260	14	7
Lapwing	12/11/21	250	16	10
Curlew	13/01/22	164	59	30
Oystercatcher	30/11/21	35	4	16
Redshank	30/11/21	32	1	6
Turnstone	16/03/22	24	1	1
Snipe	25/10/21	2	0	11
Jack Snipe	18/11/21	1	0	1

The table below lists fields that recorded waders and the peak count of all individual waders using each field. Only fields in which waders were recorded are listed; waders were recorded in 50 (61%) of 82 fields. The highest number of waders recorded in any field was 282 waders in field 7 on 14th February 2022. Red highlighted text indicates that the field is allocated for housing.

TABLE 8: PEAK WADER COUNTS PER FIELD

Field	Date of Peak Count	Peak Count	Peak Count per Hectare	No. Surveys Waders Present
7	14/02/22	282	8	24
56	12/11/21	180	21	13
6	13/01/22	130	22	10
10	30/11/21	80	1	7
30	18/11/21	51	4	15
22	08/11/21	46	5	15
68	02/03/22	41	7	8
21	28/01/22	37	10	17
75	12/11/21	36	3	6
4	10/01/22	33	21	8
76	12/11/21	32	3	7
25	10/11/21	31	2	2
77	09/12/21	31	4	7
3	30/11/21	30	20	4
5	07/02/22	26	12	7
19	22/02/22	26	14	11
2	30/11/21	20	1	3
1	28/10/21	18	5	8
55	24/11/21	18	2	11
9	30/11/21	17	16	2
8	28/12/21	16	1	5
17	02/02/22	14	7	8
28	30/11/21	12	3	3
74	14/03/22	12	3	8
20	10/01/22	11	13	4
31	10/11/21	9	1	12
18	07/02/22	6	4	1
58	28/10/21	6	2	7
16	18/11/21	5	2	5
49	08/11/21	5	1	7
51	27/12/21	5	1	2
62	06/12/21	5	1	5
73	30/11/21	5	2	6
34	07/02/22	4	1	2
50	08/11/21	4	3	1
61	13/01/22	4	1	1
66	22/12/21	4	2	1
29	08/11/21	3	0	1
41	18/11/21	3	0	7
43	25/10/21	3	1	1
47	26/10/21	3	1	1
63	02/03/22	3	2	1
80	14/02/22	2	0	1
38	09/12/21	1	0	4
42	10/11/21	1	1	2
48	16/11/21	1	0	1
54	10/01/22	1	0	2
57	02/11/21	1	0	1
69	06/12/21	1	0	1
70	08/11/21	1	1	1

The table below shows the peak count of each species in each field. The largest numbers of

each species tended to be present in a small number of fields:

- Curlew: fields 4, 5, 6, 7, 19, 21, 22, 25, 30, 68, 76, 77.
- Golden plover: fields 7, 10.
- Lapwing: fields 6, 7, 56, 75.

Field	Species	Peak Count	Surveys Present
1	Golden Plover	13	1
	Oystercatcher	18	7
2	Oystercatcher	13	3
	Redshank	7	2
3	Lapwing	8	1
	Oystercatcher	22	4
4	Curlew	33	7
	Lapwing	3	1
5	Curlew	26	4
	Golden Plover	2	1
	Lapwing	8	2
6	Curlew	130	5
	Golden Plover	3	1
	Lapwing	49	5
7	Curlew	22	17
	Golden Plover	260	6
	Lapwing	37	2
	Oystercatcher	7	4
	Snipe	1	1
	Turnstone	24	1
8	Curlew	16	5
9	Redshank	17	2
10	Curlew	6	3
	Golden Plover	80	3
	Lapwing	2	1
16	Curlew	5	5
17	Curlew	14	8
18	Curlew	6	1
19	Curlew	26	11
20	Curlew	11	4
21	Curlew	37	15
	Lapwing	11	1
	Snipe	1	1
22	Curlew	46	14
	Lapwing	9	1
25	Curlew	31	1
	Lapwing	4	1
28	Curlew	1	2
	Golden Plover	4	1
	Redshank	8	1
29	Curlew	3	1
30	Curlew	51	15
31	Curlew	9	12
34	Curlew	4	1
	Lapwing	1	1
38	Redshank	1	4

TABLE 9: PEAK WADER COUNTS PER SPECIES PER FIELD

Field	Species	Peak Count	Surveys Present
41	Jack Snipe	1	1
	Snipe	2	7
42	Curlew	1	2
43	Curlew	3	1
47	Curlew	3	1
48	Curlew	1	1
49	Curlew	5	7
50	Curlew	4	1
51	Curlew	5	2
54	Curlew	1	2
55	Curlew	18	10
	Lapwing	3	1
56	Curlew	6	6
	Golden Plover	22	2
	Lapwing	180	5
57	Lapwing	1	1
58	Curlew	6	6
	Lapwing	2	1
61	Curlew	4	1
62	Curlew	5	5
63	Curlew	3	1
66	Golden Plover	4	1
68	Curlew	41	4
	Golden Plover	8	2
	Lapwing	8	3
69	Curlew	1	1
70	Curlew	1	1
73	Curlew	2	5
	Golden Plover	5	1
74	Curlew	12	8
75	Curlew	16	3
	Lapwing	36	2
	Snipe	1	1
76	Curlew	32	6
	Lapwing	2	1
	Snipe	1	1
77	Curlew	31	5
	Golden Plover	3	1
	Lapwing	2	1
80	Oystercatcher	2	1

The table below lists nocturnal peak counts of each species. The two most common/frequent species were golden plover and lapwing, which both forage nocturnally and roost diurnally.

TABLE 10: NOCTURNAL PEAK WADER COUNTS ACROSS WHOLE SURVEY AREA

Species	Date of Peak Count	Peak Count
Golden Plover	30/11/21	152
Lapwing	02/11/21	37
Oystercatcher	30/11/21	35
Redshank	30/11/21	32
Snipe	02/11/21	1

The table below shows peak counts of waders in each field during nocturnal surveys. Only fields

in which waders were recorded are listed; waders were recorded in 24 (29%) of 82 fields. Fields 2, 3, 7, 10 and 68 were the most used fields nocturnally.

TABLE 11: NOCTURNAL PEAK WADER COUNTS PER FIELD

Field	Date of Peak Count	Peak Count
10	30/11/21	80
3	30/11/21	30
56	30/11/21	22
2	30/11/21	20
7	02/11/21	19
9	30/11/21	17
1	30/11/21	13
28	30/11/21	12
6	30/11/21	11
21	02/11/21	11
68	02/11/21	10
22	02/11/21	9
5	30/11/21	8
73	30/11/21	5
25	22/12/21	4
66	22/12/21	4
4	30/11/21	3
55	31/01/22	3
76	02/11/21	3
77	30/11/21	3
58	02/11/21	2
34	22/12/21	1
57	02/11/21	1
75	22/12/21	1

The table below shows the peak count of each species in each field during nocturnal surveys.

TABLE 12: NOCTURNAL PEAK WADER COUNTS PER SPECIES PER FIELD

Field	Species	Peak Count	Surveys Present
1	Golden Plover	13	1
	Oystercatcher	2	1
2	Oystercatcher	13	2
	Redshank	7	2
3	Oystercatcher	22	1
	Lapwing	8	4
4	Lapwing	3	1
5	Lapwing	8	1
	Golden Plover	2	2
6	Lapwing	11	1
	Golden Plover	3	2
7	Golden Plover	19	5
	Lapwing	6	1
9	Redshank	17	2
10	Golden Plover	80	3
	Lapwing	2	1
21	Lapwing	11	1
	Snipe	1	1
22	Lapwing	9	1
25	Lapwing	4	1

28	Redshank	8	1
	Golden Plover	4	1
34	Lapwing	1	1
55	Lapwing	3	1
56	Golden Plover	22	2
	Lapwing	2	1
57	Lapwing	1	1
58	Lapwing	2	1
66	Golden Plover	4	1
68	Lapwing	8	2
	Golden Plover	8	3
73	Golden Plover	5	1
75	Lapwing	1	1
76	Lapwing	2	1
	Snipe	1	1
77	Golden Plover	3	1
	Lapwing	2	1

The figure below shows the most attractive fields for waders within the survey area based on the peak wader count (all individuals of all species) as a percentage of the estimated South Tyneside wader population. The South Tyneside wintering wader population was estimated at approximately 6,990 individuals using data from recent Durham Bird Club annual reports. Fields that recorded peak counts of 1% or more of 6,990 individuals are outlined in red, fields that recorded peak counts between 0.1-1% of 6,990 individuals are outlined in amber and fields that recorded peak counts of 0.1% or less of 6,990 individuals are outlined in green. Waders were not recorded in fields not outlined in red, amber or green. The red dots are fields that recorded the highest wader densities (peak counts of 4 or more individuals per hectare). The black dots are fields that recorded the highest peak counts during nocturnal surveys (peak counts of 2 or more individuals). Fields allocated for housing are shown using red text and red shading.



Legend

- Peak counts of 0.1% or less of 6,990 individuals
- Peak counts between 0.1-1% of 6,990 individuals
- Peak counts of 1% or more of 6,990 individuals

- Highest wader densities (peak count of 4 or more individuals per hectare)
- Nocturnal highest wader densities (peak count of 2 or more individuals per hectare)

Habitat

- | | | |
|--|-----------------------|--|
| 1 Amenity | 29 Horse grazed | 57 Horse grazed |
| 2 Semi-improved | 30 Autumn-sown arable | 58 Horse grazed |
| 3 Horse grazed | 31 Horse grazed | 59 Autumn-sown arable |
| 4 Autumn-sown arable | 32 Horse grazed | 60 Autumn-sown arable |
| 5 Autumn-sown arable | 33 Improved | 61 Autumn-sown arable |
| 6 Autumn-sown arable | 34 Horse grazed | 62 Horse grazed |
| 7 Horse grazed | 35 Horse grazed | 63 Horse grazed |
| 8 Autumn-sown arable | 36 Horse grazed | 64 Semi-improved |
| 9 Amenity | 37 Autumn-sown arable | 65 Horse grazed |
| 10 Autumn-sown arable | 38 Horse grazed | 66 Stubble |
| 11 Improved | 39 Autumn-sown arable | 67 Stubble |
| 12 Amenity | 40 Autumn-sown arable | 68 Autumn-sown arable |
| 13 Autumn-sown arable | 41 Stubble | 69 Improved |
| 14 Autumn-sown arable | 42 Improved | 70 Improved |
| 15 Autumn-sown arable | 43 Improved | 71 Improved |
| 16 Autumn-sown arable | 44 Improved | 72 Semi-improved |
| 17 Horse grazed | 45 Autumn-sown arable | 73 Autumn-sown arable |
| 18 Stubble | 46 Improved | 74 Autumn-sown arable |
| 19 Autumn-sown arable | 47 Autumn-sown arable | 75 Stubble |
| 20 Autumn-sown arable | 48 Semi-improved | 76 Stubble |
| 21 Autumn-sown arable | 49 Stubble | 77 Autumn-sown arable |
| 22 Autumn-sown arable | 50 Autumn-sown arable | 78 Autumn-sown arable |
| 23 Horse grazed | 51 Autumn-sown arable | 79 Autumn-sown arable |
| 24 Horse grazed | 52 Autumn-sown arable | 80 Semi-improved |
| 25 Autumn-sown arable | 53 Autumn-sown arable | 81 Autumn-sown arable |
| 26 Horse grazed | 54 Autumn-sown arable | 82 Autumn-sown arable |
| 27 Horse grazed | 55 Stubble | |
| 28 Improved | 56 Autumn-sown arable | |

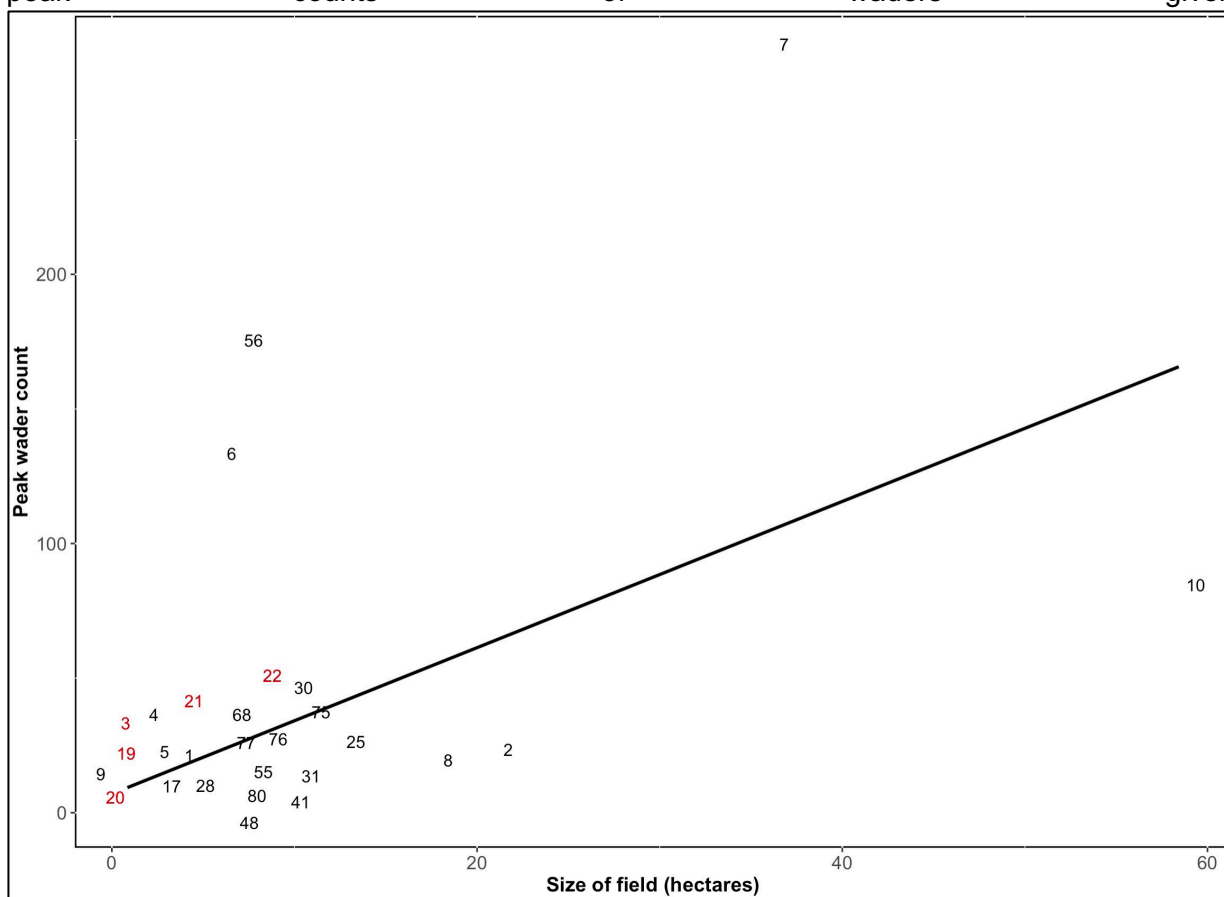
FIGURE 3: MOST ATTRACTIVE FIELDS WITHIN SURVEY AREA

(Reproduced under licence from Google Earth Pro. Fields allocated for housing are shown using red text and highlighting.)

The table below lists wader counts in each field type. The peak count column refers to the highest sum of all individuals of all species of waders in each habitat in any one survey. Horse-grazed pasture and autumn-sown arable were the most used habitat types, and were used considerably more than other habitat types.

Habitat	Peak Count	Mean Count	Surveys Present
Horse grazed	287	21	33
Autumn-sown arable	251	65	34
Stubble	72	6	23
Amenity	30	3	8
Semi-improved	20	1	5
Improved	12	1	8

The figure below considers peak wader counts in relation to field size. The figure provides some evidence that the larger fields attract higher numbers of waders. However, the relationship between peak wader counts and field size is not strong. This fairly weak relationship between wader counts and field size is likely to be because a number of other factors influence field use such as enclosure by hedgerows and trees, disturbance, habitat and distance from the sea. The graph also shows that fields 6, 7 and 56 attracted relatively high peak counts of waders given



their relatively small size. Fields 6 and 7 were likely to be attractive to waders because they provided suitable habitat close to the intertidal zone. Field 56 was attractive to waders because it is undisturbed, unenclosed on all sides and may provide plentiful invertebrate food.

FIGURE 4: PEAK WADER COUNTS IN RELATION TO SIZE OF FIELD. THE NUMBERS IN THE BODY OF THE GRAPH ARE FIELD NUMBERS. FIELDS ALLOCATED FOR HOUSING ARE SHOWN USING RED TEXT.

The table below provides some indication that numbers of waders using the survey area were higher at high tide compared to low tide. However, the difference between high and low tide counts are small, and average counts are very similar.

Tide	Peak Count	Mean Count	Surveys Present
High	355	53	28
Low	301	54	26

The table below provides an assessment of the conservation priority status of each wader species.

Species	National Priority	Schedule 1	Annex 1	Estimated South Tyneside Wintering Pop.	UK Wintering Population ¹⁶
Curlew	✓			300	120,000
Golden Plover			✓	4,000	400,000
Jack Snipe				20	100,000
Lapwing	✓			700	620,000
Oystercatcher				500	285,000
Redshank				500	94,500
Snipe				100	1,000,000
Turnstone				200	40,000

Wintering populations of waders in South Tyneside were estimated using data from recent Durham Bird Club annual reports. In addition to the species tabularised, wintering populations of the following species are estimated in South Tyneside: ringed plover (150), sanderling (200), dunlin (200), purple sandpiper (70), woodcock (50) and ruff (1). These species were not recorded in the study area during survey work.

The table below lists declining and/or scarce non-wader species recorded during surveys. The counts of a number of species were a result of the presence of stubble fields, which provided a winter foraging resource. In particular, fields 41, 75 and 76 were left as stubble throughout the survey period, and these fields were responsible for the peak counts of linnet, yellowhammer, grey partridge and skylark amongst other species. The counts of 45 yellowhammer and 34 grey partridge are particularly high, and are likely to represent a significant proportion of the borough's wintering populations.

¹⁵ National Priority = Species of principal importance listed in Section 41 of the NERC Act (2006),
 Schedule 1 = Species listed on Schedule 1 of the Wildlife and Countryside Act (1981) as amended. These are birds and their young, for which it is an offense to intentionally or recklessly disturb at, on or near an 'active' nest,
 Annex 1 = Species listed on Annex 1 of the Bird Directive (1979) as amended. This lists 194 species and sub-species which are particularly threatened. Member States must designate Special Protection Areas (SPAs) for their survival.

¹⁶ Woodward, I., Aebischer, N., Burnell, D., Eaton, M., Frost, T., Hall, C., Stroud, D. & Noble, D. 2020. Population estimates of birds in Great Britain and the United Kingdom. *British Birds* 113: 69–104.

TABLE 16: PEAK INCIDENTAL SPECIES COUNTS ACROSS WHOLE SURVEY AREA

Species	Date of Peak Count	Peak Count
Linnet	14/03/22	90
Fieldfare	13/01/22	55
Yellowhammer	18/01/22	45
Grey Partridge	16/11/21	34
Meadow Pipit	16/03/22	30
Stock Dove	24/11/21	21
Skylark	18/11/21	20
Wigeon	18/11/21	12
Reed Bunting	14/02/22	10
Grey Heron	09/12/21	7
Mistle Thrush	28/12/21	5
Mallard	01/03/22	4
Greenfinch	18/01/22	3
Redwing	10/02/22	3
Teal	10/02/22	2
Tree Sparrow	02/02/22	2
Buzzard	08/11/21	1
Grey Wagtail	28/12/21	1
Kestrel	18/11/21	1
Mediterranean Gull	26/10/21	1
Merlin	25/10/21	1
Peregrine	07/02/22	1
Pink-footed Goose	24/11/21	1
Starling	10/02/22	1

The table below provides an assessment of the conservation priority status of incidental species recorded during survey work (limited to scarce and/or declining species only).

TABLE 17: INCIDENTAL SPECIES EVALUATION¹⁷

Species	National Priority	Schedule 1	Annex 1	UK Wintering Population
Buzzard				
Fieldfare		✓		680,000
Greenfinch				
Grey Heron				45,000
Grey Partridge	✓			
Grey Wagtail				
Kestrel				
Linnet	✓			
Mallard				665,000
Meadow Pipit				
Mediterranean Gull		✓	✓	4,000
Merlin		✓	✓	
Mistle Thrush				
Peregrine		✓	✓	
Pink-footed Goose				510,000
Redwing		✓		650,000
Reed Bunting	✓			

¹⁷ National Priority = Species of principal importance listed in Section 41 of the NERC Act (2006),
 Schedule 1 = Species listed on Schedule 1 of the Wildlife and Countryside Act (1981) as amended. These are birds and their young, for which it is an offense to intentionally or recklessly disturb at, on or near an 'active' nest,
 Annex 1 = Species listed on Annex 1 of the Bird Directive (1979) as amended. This lists 194 species and sub-species which are particularly threatened. Member States must designate Special Protection Areas (SPAs) for their survival.

Skylark	✓			
Starling	✓			
Stock Dove				
Teal				430,000
Tree Sparrow	✓			
Wigeon				445,000
Yellowhammer	✓			

D.3 SURVEY RESULTS COMBINED FROM 2019-20 AND 2021-22

The table below presents counts of waders from both survey periods. The table is ordered by overall peak count and shows that golden plover, lapwing and curlew were the three commonest species across both survey periods. However, although ringed plover and dunlin were the fourth and sixth commonest species in 2019-20, they were not recorded during the 2021-22 survey period. Ruff and woodcock were also not recorded in 2021-22. Overall, more waders were present in 2019-20 and waders were present more frequently than in 2021-22.

Species	2019-20			2021-22			Overall Peak
	Peak	Mean	Surveys Present	Peak	Mean	Surveys Present	
Golden Plover	350	24	40%	260	14	19%	350
Lapwing	266	26	40%	250	16	28%	266
Curlew	168	80	80%	164	59	83%	168
Ringed Plover	60	2	3%	0	0	0%	60
Turnstone	41	4	27%	24	1	3%	41
Dunlin	40	1	7%	0	0	0%	40
Oystercatcher	1	0	7%	35	4	44%	35
Redshank	29	3	30%	32	1	17%	32
Snipe	4	0	10%	2	0	31%	4
Jack Snipe	0	0	0	1	0	3%	1
Ruff	1	0	3%	0	0	0%	1
Woodcock	1	0	3%	0	0	0%	1

The table below shows peak counts by field in 2019-20 and 2021-22. Field 10 recorded a considerably higher peak count (682) than any other field – the next highest peak count was 282 in field 7. However, the peak count of 80 in field 10 in 2021-22 was considerably lower. Overall, the peak counts in each field in 2021-22 are reflective of the peak counts in 2019-20, but this is not the case in all fields, as demonstrated by field 10.

Field	Peak Count 2019-20	Peak Count 2021-22	Overall Peak Count	Estimated % South Tyneside Population
10	682	80	682	9.8%
7	76	282	282	4%
56	53	180	180	2.6%
71	156	0	156	2.2%
6	154	130	154	2.2%
30	112	51	112	1.6%
22	70	46	70	1%
68	68	41	68	1%
14	56	0	56	0.8%
25	48	31	48	0.7%
5	38	26	38	0.5%
21	3	37	37	0.5%
75	30	36	36	0.5%

TABLE 19: PEAK WADER COUNTS PER FIELD

Field	Peak Count 2019-20	Peak Count 2021-22	Overall Peak Count	Estimated % South Tyneside Population
4	29	33	33	0.5%
33	33	0	33	0.5%
76	4	32	32	0.5%
77	2	31	31	0.4%
79	31	0	31	0.4%
3	3	30	30	0.4%
19	1	26	26	0.4%
69	23	1	23	0.3%
2	0	20	20	0.3%
1	0	18	18	0.3%
55	11	18	18	0.3%
18	18	6	18	0.3%
13	18	0	18	0.3%
9	0	17	17	0.2%
8	9	16	16	0.2%
78	16	0	16	0.2%
17	13	14	14	0.2%
28	0	12	12	0.2%
74	0	12	12	0.2%
20	2	11	11	0.2%
51	11	5	11	0.2%
31	2	9	9	0.1%
58	0	6	6	0.1%
12	6	0	6	0.1%
16	0	5	5	0.1%
49	0	5	5	0.1%
62	0	5	5	0.1%
73	0	5	5	0.1%
34	0	4	4	0.1%
50	0	4	4	0.1%
61	0	4	4	0.1%
66	0	4	4	0.1%
47	4	3	4	0.1%
29	0	3	3	0%
41	1	3	3	0%
43	0	3	3	0%
63	0	3	3	0%
80	0	2	2	0%
24	2	0	2	0%
38	0	1	1	0%
42	0	1	1	0%
48	0	1	1	0%
54	0	1	1	0%
57	0	1	1	0%
70	0	1	1	0%
59	1	0	1	0%

The map below places a value on each field for waders using data from both 2019-20 and 2021-22. The peak count in each field is pooled from both years, and the highest count is calculated as a percentage of the estimated South Tyneside wintering population of all waders. The peak counts of waders pooled from both survey periods in the following seven

fields (highlighted in red) are estimated to be at least 1% of the South Tyneside population of waders: 6, 7, 10, 22, 30, 56 and 71. Fields allocated for housing are shown using red text and red highlighting.

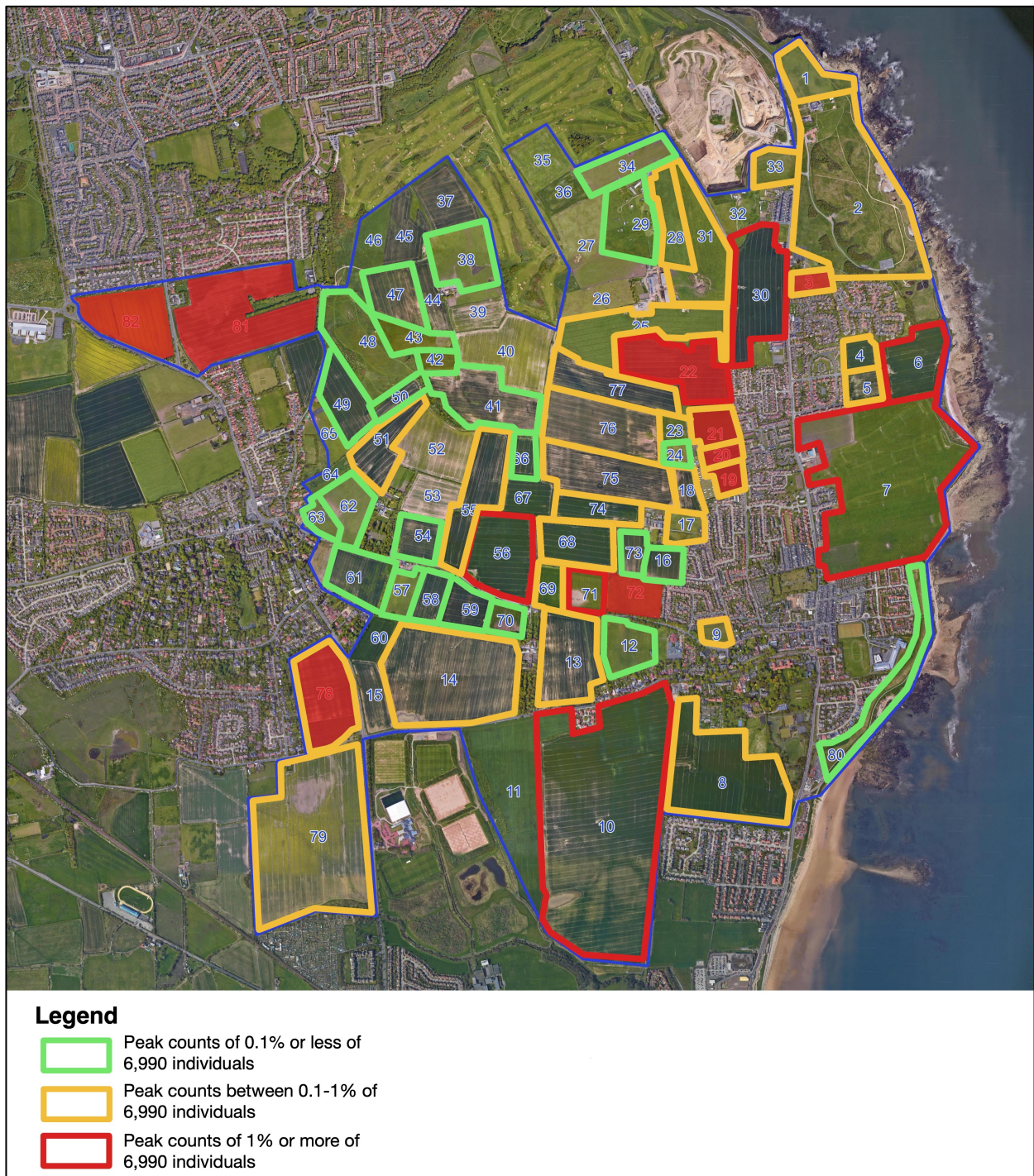


FIGURE 5: MOST ATTRACTIVE FIELDS WITHIN SURVEY AREA: 2019-20 AND 2021-22 COMBINED

(Reproduced under licence from Google Earth Pro. Fields allocated for housing are shown using red text and highlighting.)

E. ASSESSMENT

E.1 BIRD ASSESSMENT

The 2021-22 data, when combined with the 2019-20 data, allows a more robust assessment of each field's value to waders than only a single year of data. The most attractive fields to waders were those in which the highest diurnal and/or nocturnal peak counts were recorded, the highest wader counts per hectare were recorded, fields that were used most frequently and fields that were used by the highest diversity of species. Such fields included 1, 3, 4, 5, 6, 7, 9, 10, 17, 18, 19, 20, 21, 22, 28, 30, 31, 33, 55, 56, 68, 69, 71, 73, 75, 76, 77, 78 and 79. However, there was variation in field use between years, for example field 10 was well used in 2019-20 but less so in 2021-22. In both survey periods, the fields that tended to be used by waders were generally those surrounding Whitburn village. The fields on top of Cleadon Hills tended not to be used by waders, and in the 2022 survey work the fields towards the southwest corner of the study area were not used.

Three fields were considered to be high value in 2019-20 that were not considered to be high value in 2021-22: 22, 30 and 71. Fields 22 and 30 were used less in 2021-22, but field 71 was not used at all. The high vegetation in field 22 was less suitable for waders in 2021-22. It is unclear why field 30 was used less in 2021-22 as the habitat was suitable. Field 71 did not contain any ephemeral floodwater in 2021-22, whereas it did in 2019-20, which attracted waders. The lower use of fields 22 and 71 in 2021-22 demonstrates how habitat and crop type can influence wader use.

Each species present in the study area primarily uses it in slightly different ways as follows:

- golden plover (diurnal roosting, particularly at high tide, and nocturnal foraging)
- lapwing (diurnal roosting, particularly at high tide, and nocturnal foraging)
- curlew (diurnal foraging)
- ringed plover (roosting, likely due to high tide)
- turnstone (foraging, likely due to high tide)
- dunlin (roosting, likely due to high tide)
- oystercatcher (nocturnal foraging)
- redshank (diurnal and nocturnal foraging)
- snipe (diurnal and nocturnal foraging)
- jack snipe (passage migrant present on single occasion only)
- ruff (diurnal foraging on single occasion only)
- woodcock (nocturnal foraging)

In recent decades, field 7 at Whitburn (the old rifle range) has been favoured by up to several thousand golden plovers, but peak counts in field 7 in the two winters of this study were only 76 and 260, respectively. The decrease in use of field 7 could be related to a change in land use. Previously, it was used as a practice firing range, and when it was not used as a firing range, it was used by grazing cattle. During both winters of this study, it was grazed by horses, which require regular checks by people. This increase in people walking across the rifle range is likely to be causing greater disturbance to waders, resulting in lower use by waders. The golden plover that were using the rifle range may now be using fields with lower disturbance outside the study area. In previous decades, the species formerly used Boldon Flats for diurnal roosting, but stopped using the site in the 2000s and 2010s. However, during the last few winters, the species has again used Boldon Flats for roosting (albeit in relatively small numbers). It is possible that some of the birds using Boldon Flats are those that had been using field 7. Golden plover has recently moved from the amber list to the green list, which indicates it is not of high conservation concern. This suggests golden plover has shifted its local distribution rather than having undergone a population crash.

Larger fields tend to be used more by waders than smaller fields. Fields 7 and 10 are the two largest fields in the study area, and are also two of the most used fields in the study area. However, an unsuitable habitat type (e.g. high, coarse grassland) or heavy disturbance, will render even large fields unsuitable for waders.

The habitat within fields is also a factor affecting use by waders. The most used habitat types were autumn-sown arable and horse-grazed pasture, and ephemeral flood in 2019-20, because these habitats would have provided the best foraging conditions. In general, sward height needs to be relatively short and the density of grass quite low so waders can spot their prey species. Field 11 is relatively large with good sightlines, but the improved grassland was too dense and tall to be used by waders. Field 82 is fairly large and undisturbed, but in the 2021-22 survey work it was autumn-sown with oil seed rape, which caused the vegetation to be too high for wader use.

During 2019-20, waders were recorded in 35 (44%) of 80 fields, but in 2021-22 waders were recorded in 50 (61%) of 82 fields. The use of fewer fields during 2019-20 is likely to be partly explained by a greater number of fields in a fallow state (deeply ploughed but not sown). Fields in this state are generally not used by waders as they prefer the soil surface to be smooth.

Patches of floodwater are well used by waders, particularly if the wet patches lie towards the centre of the field away from boundary features and if the margins are shallow and unvegetated. However, the dry conditions during the 2021-22 fieldwork led to a lack of such habitat. The margins of fields need to be relatively open so that waders have long sightlines from the field. Small enclosed fields with poor sightlines, that have features such as woodland or housing situated adjacent to the field, tend to dissuade waders from using the field.

Survey work showed that fields closer to the intertidal zone tend to be used more by waders. This is because most of the waders recorded during survey work either forage or roost in the intertidal zone at some point during the day and seek to reduce the distance they fly to fields. The fields closest to the immediate coastline (fields 1-8 inclusive) were all well-used by waders, except field 80 which is heavily disturbed by people and dogs. Fields west of West Hall tended to be used infrequently by small numbers of waders.

A lack of recreational disturbance tends to increase the use of the fields. The following fields allow open access to people and dogs: 1, 2, 9, 11, 12, 41, 48 and 80. As a result, none of these fields supported large numbers of waders or supported waders with regularity, despite all of these fields being suitable for waders. All of the fields with the highest peak counts are undisturbed by human recreation because they are private fields that do not allow open access to people and dogs.

While waders in general prefer similar habitat types, finer preferences vary among species. Curlew use a variety of habitat types including autumn-sown arable, stubble fields and horse-grazed pasture. Curlew was frequently seen using stubble fields, while snipe tended to use stubble fields and the only sighting of jack snipe was in stubble (field 41). Curlew was also frequently seen using fields with a longer sward height, which is due to the species' longer legs and bill that allow foraging in such fields. Redshank and oystercatcher were only seen using fields with very short vegetation - amenity grassland, horse-grazed and improved (mown) grassland. Redshank also used field 38, which contains a shallow patch of water, which is an attractive habitat for redshank. Turnstone was only seen using field 7, which lies adjacent to the intertidal zone and contains short horse-grazed pasture. This reflects its dependence on intertidal habitat during the winter and its tendency to use fields with a very

short sward height. Lapwing and golden plover tended to use autumn-sown arable and horse-grazed pasture.

Nocturnal surveys revealed a number of insights into the way in which waders use the survey area at night. Fields 3 and 9 were not used at all by waders during daytime surveys, but both fields were used by waders at night, which highlights the value of undertaking nocturnal surveys. Their lack of use during the daytime is likely to be related to disturbance and predation issues. Both fields are disturbed during the day and both are enclosed. However at night, both fields are mostly undisturbed and the threat of predation is reduced. In some other fields, wader use during the day was low, but use increased at night. For example, the peak counts of waders in field 10 were during the night. Nocturnal surveys showed that flocks of lapwing and golden plover are more dispersed at night whereas during the day they form tightly packed flocks in a small number of fields. Redshank was also more dispersed at night – during the day it was only seen to use the patch of water in field 38, but during nocturnal surveys it was seen to use fields 2, 9 and 28. The greater dispersion of waders at night is consistent with the literature, which suggests greater dispersion at night is likely to be due to reduced perceived or actual predation from, for example, birds of prey. For what are likely to be similar reasons, flocks of lapwing and golden plover also allowed closer approach by humans at night and they regularly foraged closer to field edges. Survey work showed that lapwing and golden plover arrived to forage in fields after dusk and departed these fields before dawn. Curlew were not recorded at night because they roost nocturnally, with birds foraging in the survey area by day likely to use either Boldon Flats or the intertidal zone at night.

There was weak evidence that fields were used more at high tide, probably because waders were pushed out of the intertidal zone.

All waders recorded during survey work, except golden plover and jack snipe, are of sufficient conservation concern to be placed on the BoCC5¹⁸ list. Curlew is in steep decline and is now considered one of the UK's highest conservation priorities. Curlew belongs to the genus *Numenius* and two species belonging to this genus have recently become extinct; it is feared that curlew may suffer the same fate. Local knowledge indicates that the fields in the study area support a significant proportion of the waders wintering in the South Tyneside borough. The peak counts of all species except snipe and jack snipe are likely to represent more than 1% of the county wintering population. Based on the peak counts of these species, the survey area is likely to be of county value.

Of the incidental species recorded during 2021-22 survey work, the following are scarce species in South Tyneside: buzzard, Mediterranean gull, merlin and peregrine. Some red-listed farmland birds, including yellowhammer, skylark, linnet and grey partridge were present in the study area in relatively high numbers.

E.2 BIRD ASSESSMENT FOR FIELDS CONSIDERED FOR HOUSING ALLOCATIONS

No waders were recorded in fields 72, 78, 81 and 82 during the 2021-22 fieldwork. Waders were recorded in the following five fields during 2021-22 fieldwork (peak counts of all individual waders of all species in parentheses): 22 (46), 21 (37), 3 (30), 19 (26) and 20 (11). All five fields were in the top 50% of fields that supported waders, with fields 21 and 22 in the top 15%.

The following species were recorded using fields allocated for housing during the 2021-22 fieldwork (peak counts of each species in parentheses): 3 (eight lapwing and 22 oystercatcher),

¹⁸ Red list species are of high conservation concern; amber list species are of medium conservation concern; Stanbury, A. et al. 2021. The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds* 114: 723–747. National priority species are listed on the UK Post-2010 Biodiversity Framework published July 2012, formerly UK BAP.

19 (26 curlew), 20 (11 curlew), 21 (37 curlew, 11 lapwing and 1 snipe) and 22 (46 curlew and nine lapwing).

Waders were present in fields allocated for housing on the following number of occasions (percentage of surveys in which waders were present in parentheses): 3 (11%), 19 (31%), 20 (11%), 21 (47%) and 22 (42%).

Based on two winters of survey work combined, fields allocated for housing have been given a red, amber or green value as follows:

- 3: amber
- 19: amber
- 20: amber
- 21: amber
- 22: red
- 72: no value - no waders recorded
- 78: amber
- 81: no value - no waders recorded
- 82: no value - no waders recorded

The area of the fields allocated for housing sums to 54.5ha, of which 8.42ha are red value, 17.3ha are amber value and 28.8ha are of no value. The area of fields immediately adjacent to fields allocated for housing sums to 126ha, of which 13.7ha are red value, 83.4ha are of amber value, 20.4ha are of green value and 8.59ha are of no value.

E.3 ASSESSMENT OF FIELDS ADJACENT TO PROPOSED HOUSING AND POTENTIALLY AFFECTED BY DISTURBANCE

Consideration of the value of fields adjacent to those proposed for housing is important because the housing may cause disturbance that could negatively affect wader numbers using adjacent fields. A total of 31 fields lie immediately adjacent to fields allocated for housing. The combined value (2019-20 and 2021-22) of these fields was as follows: amber (17), green (7), no value (3) and red (3). The three red fields lie adjacent to fields 3, 22 and 72. The fields surrounding fields 72, 21 and 22 are the highest value. The fields surrounding 78, 81 and 82 are the lowest value.

E.4 LIMITATIONS AND CONSTRAINTS

The new data from the 2021-22 survey period provides a more robust assessment of each field's value to waders than just the 2019-20 data alone. However, more data would be required to look at longer-term trends in field use and influence of cropping.

The assessment of low, medium or high value fields only considers fields within the survey area. No comparison has been made with the value of fields outside the survey area. Fields identified as high value within the survey area could rank as higher or lower value elsewhere.

F. SPECIES CONSERVATION

F.1 GENERAL MITIGATION AND COMPENSATION

In the first instance, development should be avoided on the fields found to be most valuable for waders. These fields currently provide suitable foraging and roosting for significant numbers of waders and avoiding developing on these fields would help avoid a reduction in waders populations in South Tyneside. However, while development should be avoided in valuable fields, ideally it should also be avoided on a 750m buffer of land surrounding the most valuable fields. Waders use fields that are open, and not enclosed by buildings, in order to see approaching predators. If valuable fields are surrounded by housing, waders will perceive a greater vulnerability to predation, and actual predation rates may also increase through domestic pets. This in turn, could lead to valuable fields not being used by waders.

Mitigation undertaken within the development site is generally unsuitable for waders because they need large areas of open land grassland or wetland, which are not available at new housing sites. In general, waders will cease to use land once development is built on that land and therefore compensation for waders often needs to take place at a separate location to the housing site, where a sufficiently large area of open grassland or wetland is available. In this case, two sites are needed – the development site and the compensation site.

Careful design of the development could help reduce negative impacts on waders. Locating greenspace away from the most valuable fields for waders could help reduce disturbance. Similarly, the layout of paths should attempt to take people and dogs away from valuable fields. Dog / predator proof wire fencing that does not obstruct wader sight lines should be installed around adjacent valuable wader fields and any compensation wader fields. Visual and sound barrier fencing could be installed along the boundaries of new developments. Dedicated dog exercise areas situated away from valuable fields could help reduce disturbance from dogs, which are a major cause of disturbance to waders. Interpretation signs and leaflets could help educate local people on the disturbance they may be causing to waders.

Where impacts cannot be avoided or mitigated, off-site compensation measures will be required. Habitat creation in the form of wader scrapes can provide waders with valuable foraging and roosting habitat. Wader scrapes are, shallow areas of freshwater with gently sloping margins created by excavating a depression in the ground. They are often created on farmland grazed by cattle in areas that are open (not enclosed by for example woodland) and that are free from disturbance. They require vegetation surrounding the water to be kept short and sparse, and this can often be achieved by allowing cattle or horses to graze around the scrape. They can be created relatively cheaply and quickly (in as little as one week). Of the birds using the study area, Curlew can use wader scrapes for nocturnal roosting, golden plover and lapwing use scrapes for diurnal roosting, lapwing can use land immediately surrounding scrapes for nesting while their chicks use scrapes for foraging, snipe, jack snipe and redshank use scrapes for foraging during winter and dunlin can use scrapes for foraging during spring and autumn migration. A wide array of wader species not recorded in the study area use wader scrapes for foraging during migration periods, such as common sandpiper, green sandpiper, greenshank and black-tailed godwit.

A potential route via which habitat could be created or enhanced for waders is providing funding to a conservation organisation such as the RSPB or Durham Wildlife Trust to carry out the habitat works. It may be possible to essentially hire organisations such as these to create habitat in South Tyneside. In addition, working with local farmers, particularly through agri-environment schemes, may benefit some waders using the study area. Golden plover, lapwing, curlew, snipe and jack snipe were all seen using land owned by local farmers. Farmland in the study area could be improved by, for example, avoiding rolling damp parts of fields and maintaining damp areas in fields. Further advice is available on the RSPB website

(<https://www.rspb.org.uk/our-work/conservation/projects/wader-friendly-farming-initiative/>).

To make new housing as attractive as possible to non-wader species, there are various measures that can be undertaken. A recent RSPB report¹⁹ highlighted measures in a newly built housing development that were most beneficial to birds. The following bullet points provide a summary of the report:

- Given the low cost of swift bricks, aim for an average of one brick per house. Calls of swifts should be played to try to attract swifts to nest.
- If patches of scrub and copses within the housing development are too small, they will not be used by birds.
- Community engagement is likely to be beneficial, especially in encouraging residents not to use plastic grass, which is of no value to birds or other wildlife.
- Wildflower verges are not particularly valuable to bees, butterflies or birds, which is likely to be at least partly due to the species used in the wildflower mix.
- SuDS built as part of housing may prove to be one of the most valuable parts of the housing for birds.

In summary, waders using the study area require open fields with short vegetation that are not enclosed by housing or woodland and that provide access to invertebrate food, whilst also having low disturbance and predation rates. As new housing estates cannot incorporate sufficiently large and open short grassland, then off-site measures are generally required to compensate for loss of habitat. A key challenge for conserving waders is access to a sufficiently large area of land on which to carry out mitigation and compensation works. A strategic mitigation area providing for impacts across a number of development sites may be a desirable way forward.

Where development could adversely affect fields identified as being of higher value for waders, either directly or through increased recreational disturbance, it is recommended that any planning application is supported by at least one season's additional non-breeding (August to April) monitoring data for fields within 750m, including nocturnal survey with appropriate equipment, to better assess potential impacts. Applications should be required to demonstrate how wader species will be conserved and enhanced if the application is approved.

F.2 BOLDON FLATS AS A COMPENSATION SITE

Boldon Flats is an important site in South Tyneside because it is the only permanent wetland suitable for waders in the borough. It provides a significant area of disturbance-free freshwater with gently sloping margins that are grazed to maintain short vegetation. It is already used by a number of species recorded in the study area including golden plover and lapwing (for diurnal roosting and breeding lapwing), curlew (for nocturnal roosting and diurnal foraging), and dunlin, redshank and snipe (for foraging). However, its bird value could be increased further by implementing a number of measures as listed below:

- Ensure year-round shallow flooding.
- Increase the area of water and / or create new wader scrapes
- Flatten margins to create wider muddy margins.
- Cattle grazing, or possibly conservation horse grazing, to reduce disturbance (pet horses require more checks by their owners than cattle).
- Discourage bottle diggers at night and flatten the mounds they create.

¹⁹ Smith, A., Dieck, C., Stanbury, A., Stephen, P., Symes, N., Thomas, A., White, G., Wilding, D. & Nyul, H. 2022. Kingsbrook: Measuring the wildlife changes on a new exemplar housing development, 2015-22. RSPB Ecology & Land Management. RSPB Arne Work Centre.

- Consider predator control or predator-proof fencing (predators include foxes, crows, gulls) to increase the productivity of nesting lapwing and wildfowl.

F.3 SPECIES-SPECIFIC MITIGATION AND COMPENSATION

F.3.1 CURLEW

Of the wader species using the study area, curlew uses it most frequently and uses the largest number of fields, while the species is of high conservation concern on an international scale. As such, mitigation and compensation that benefits curlew is particularly pertinent. Fields that attracted peak counts of more than 50 curlew in one of or both of 2019-20 and 2021-22 were 6, 30, 22, 68, 71 and 56. Conservation of these fields would benefit the species. Earthworms are the most important food for wintering curlews and in general fields that provide higher earthworms will attract higher numbers of curlew. The best fields for curlew in the study area were likely to have provided suitable foraging. Sown grass, rather than tillage, increases the availability of earthworms as their burrow systems are kept intact²⁰.

At wintering sites, curlew is a wary species that easily flushes in response to disturbance from, for example, dog walkers and low flying aircraft. Less disturbance on wintering grounds could help increase curlew breeding productivity because the health of birds following the winter can carry over into the breeding season and affect breeding success. Unlike other waders using the study area, curlew is present in the study area during the daytime but not at night. At night, curlew roost at Boldon Flats, Washington WWT and possibly also on intertidal rocks at Whitburn. Therefore, works that could disturb curlew would cause less disturbance to the species if carried out at night. Boldon Flats is a nocturnal roost site for curlew and the continued provision of a winter flood would continue to provide a roost location for birds in the area.

As curlew is such a high conservation priority, the RSPB are currently running a recovery programme for curlew (<https://www.rspb.org.uk/our-work/conservation/projects/curlew-recovery-programme/>). The primary driver behind the decline of the species is poor breeding success and therefore most mitigation advice is focussed on improving conditions at breeding sites rather than in wintering areas. Many of the Curlew recorded were adults rather than juveniles, which reflects the species' low breeding productivity. There are a number of ways to support the Curlew Recovery Programme such as donations (further information here: <https://www.rspb.org.uk/our-work/conservation/projects/curlew-recovery-programme/how-you-can-help/>), although this may not have a direct positive effect on curlew in South Tyneside.

F.3.2 TURNSTONE, DUNLIN AND RINGED PLOVER

In 2019-20, turnstone (fields 4, 6, 7 and 10 only) was recorded on four occasions, dunlin (fields 7 and 10 only) on two occasions and ringed plover (field 10 only) on a single occasion. However, in 2021-22 dunlin and ringed plover were not recorded at all in the study area and turnstone was only present in a single field (field 7) on a single date. The fields used by these species provided a roosting location close to the intertidal zone whilst also being open and large enough to allow predators to be seen. Records of all three species in the study area generally occurred when the tide was high when they would have been pushed out of the intertidal zone and forced to find roost sites elsewhere. This highlights that suitable high tide roost sites can be difficult to find for waders. The best high tide roosts for waders are often on islands, including islands on both freshwater wetlands and along coastlines. Given it is well-known that waders will use artificial roost sites, artificial roost site creation could

²⁰ Berg, Å. 1993. Food resources and foraging success of Curlews *Numenius arquata* in different farmland habitats. *Ornis Fennica* 70: 22–31.

benefit all three species. Fields 4, 5, 6 and 7, which are situated adjacent to the intertidal zone, would be in a suitable position for a wader scrape with habitat creation features aimed at attracting roosting waders. Dunlin is a frequent user of wader scrapes.

F.3.3 GOLDEN PLOVER

Three fields attracted peak counts of more than 50 golden plovers in 2019-20: 10 (53ha), 7 (32ha) and 14 (20ha). Fields 7 and 10 also attracted peak counts of 80 and 260 respectively in 2021-22, but field 14 was not used at all, probably due to the combination of it being planted with oil seed rape and being disturbed by people shooting. Fields favoured by golden plover provide suitable roosting conditions; in particular used fields were large and open to enable approaching predators to be seen. Field 7 has in previous years attracted the highest numbers of golden plover in the study area, including counts of up to several thousand. At night, counts of four or more golden plover were recorded in fields 1, 5, 6, 7, 10, 28, 55, 56, 66, 68 and 73. Conservation of fields 10, 7 and 14 would most benefit the species. In particular, cows rather than horses in field 7 may enable it to be used again as a roosting site. Up to approximately 250 golden plover roosted just to the west of the study area at Boldon Flats in 2019-20 with slightly smaller numbers in 2021-22, and this is another important site for species. Jarrow Slake was used before reclamation of the mudflats. The availability of food, particularly earthworms, is an important factor influencing field use by foraging golden plovers. Certain field characteristics increase the availability of food for golden plover. Earthworm availability increases with time since ploughing, therefore, permanent pastures provides more earthworms, and annual application of farm yard manure can increase numbers. The survey area could be enhanced for golden plover by providing more permanent pasture.

F.3.4 LAPWING

Five fields attracted peak counts of 25 or more lapwing: 6, 7, 10, 56, 71, 75 and 79 and conservation of these fields would most benefit the species. All fields provided short vegetation for roosting or foraging, and were open and/or large to aid predator detection. Most conservation advice and mitigation for lapwing is focussed on improving breeding success on breeding grounds. A small number of lapwing nest in the study area. Lapwing requires short vegetation such as spring-sown arable (rather than autumn-sown arable) or lightly grazed grassland during their nesting season (March to June). Providing 'lapwing plots' (small unseeded patches of bare ground within arable crops) may encourage more pairs of the species to nest within the study area. Lapwing plots can be created using agri-environment scheme funding. Cutting or cultivating grassland should be avoided during nesting season. The provision of damp grassland can be very beneficial to breeding lapwing. Fields 71-77 would be appropriate for creating habitat suitable for breeding lapwing as the lower lying parts of these fields already become wet after rainfall. As with golden plover, the attractiveness of fields to non-breeding foraging lapwing could be enhanced by providing more permanent pasture. Further details regarding lapwing conservation are provided on the RSPB website (<https://www.rspb.org.uk/our-work/conservation/conservation-and-sustainability/farming/advice/helping-species/lapwing/>). Flocks of wintering and pairs of breeding lapwing have been known to use 'green roofs'²¹, and although this behaviour is uncommon, green roofs may benefit the species.

F.3.5 OYSTERCATCHER

In 2019-20, only a single bird was recorded on a single occasion in field 7. However, the species was more prevalent in 2021-22 when the species was recorded in five fields (peak counts in brackets): 1 (18), 2 (13), 3 (22), 7 (7) and 80 (2). Although oystercatcher is wary of human disturbance, it frequently nests close to human habitation. The species will

²¹ Baumann, N. 2006. Ground-Nesting Birds on Green Roofs in Switzerland: Preliminary Observations. *Urban Habitats* 4: 37–50.

occasionally nest on the roofs of larger buildings such as factories and schools, and providing a layer of gravel on the top of roofs may be used for nesting by the species. When foraging, oystercatcher often uses amenity grassland. As the species is boldly coloured, it should be fairly easily recognisable by dog walkers, and it may be worthwhile educating dog walkers on how to spot and avoid disturbing foraging oystercatchers. The species does not breed until four years old and there are often significant numbers of non-breeders in the study area throughout the year, and as a results, works carried out during the summer could still disturb the species.

F.3.6 REDSHANK AND RUFF

In 2019-20, redshank was generally attracted to ephemeral flood water and was recorded in the following six fields: 4, 6, 10, 14, 69 and 71. In 2021-22, ephemeral flood water was generally absent and the species was mostly recorded foraging on amenity grassland at night, particularly during rainfall, and was recorded in the following fields: 2, 9, 28 and 38. Ruff was recorded on a single occasion in 2019-20 on ephemeral flood water in field 71, but was not recorded in 2021-22. The creation of a wader scrape in the study area would benefit these two species as well as a number of other wader species including wintering waders such as lapwing and passage waders such as green sandpiper. Wader scrapes are small, shallow patches of freshwater with gently sloping, irregularly shaped muddy margins.

F.3.7 SNIPE AND JACK SNIPE

Small numbers (up to 4) of snipe were recorded in seven fields each across both survey years: 7, 21, 41, 47, 75, 76 and 79. Generally the habitat in the study area is too dry for snipe. Jack snipe was recorded on a single occasion only in field 41, which was likely to have involved a migrant bird using the field briefly; generally the study area is too dry to attract the species. During the non-breeding season both species prefer wet grassland, wetland margins and fen habitats. Wetland creation and avoiding draining damp areas of fields would benefit both species.

F.3.8 WOODCOCK

Woodcock was recorded on a single occasion in field 5 during a nocturnal survey in 2019-20. This species is in heavy decline and has recently been added to the BoCC5 red list. Reasons for the decline are not fully understood. Generally, the species is only seen in South Tyneside during migration periods, although small numbers also winter in the borough in patches of woodland. The individual recorded in the study area during the nocturnal survey may have been a migrant.

F.4 **MITIGATION AND COMPENSATION FOR FIELDS CONSIDERED FOR HOUSING ALLOCATIONS**

The following fields are being considered for allocation for housing (shown in Figure 2): 3, 19, 20, 21, 22, 72, 78, 81 and 82. Of the nine fields proposed for housing in the study area, six were used by waders: 3, 19, 20, 21, 22 and 78. The text below discusses mitigation and compensation specific to each field. In fields that are poor for non-wader species, measures such as swift bricks, wildflower verges and SuDS incorporated into new housing have the potential to increase the diversity and numbers of non-wader species.

F.4.1 FIELD 3

This small field was used by nocturnal foraging oystercatcher and lapwing at night, but was not used by any waders during daylight hours. New housing built in the field would not provide habitat for either species and therefore mitigation and compensation should be focused on reducing the effects that people have on nearby sites of value and off-site habitat creation and/or enhancement.

F.4.2 FIELDS 19, 20, 21 AND 22

These four fields lie adjacent to each other in a line and share similar characteristics. The fields lie within the core area in the study area for foraging curlew and mitigation and compensation for housing for loss of these fields should be focused on curlew, particularly as curlew is a high conservation priority. Curlew-specific mitigation is provided in Section F.3.1. New housing in these fields would not be suitable for curlew, and therefore mitigation and compensation should be focused on reducing the effects that people have on nearby sites of value and off-site habitat creation and/or enhancement.

Only part of these fields will be developed with housing, potentially leaving the undeveloped parts of the field still suitable for use by waders. To leave as much land as possible still suitable for waders, housing should be built immediately adjacent to existing housing – therefore along the eastern and southern edges of these fields. Fields 21 and 22 were more valuable than fields 19 and 20, and ideally housing would be built in fields 19 and 20 whilst leaving 21 and 22 undeveloped. The new housing should be screened as far as practicable from adjacent land, and the potential for disturbance to adjacent land should be minimised using measures such as creating access points away from sensitive areas and locating greenspace/car parks/footpaths within the housing away from adjacent areas used by waders.

F.4.3 FIELD 72

This field was not used by waders during either of the two winters of study. This is likely to be due to the long vegetation height, but also because it is enclosed by fencing and hedgerows. The field lies adjacent to the core area for foraging curlew, while the fields to the west, such as field 56, are valuable for foraging and roosting golden plover and lapwing. Therefore, efforts should be made to limit disturbance to waders using these fields by, for example, screening and siting greenspace away from parts of the housing that would disturb waders.

F.4.4 FIELD 78

This field was not used by waders during the winter of 2021-22 but was used by lapwing during 2019-20, and therefore it can be considered that lapwing is losing habitat if housing is built in the field. Lapwing-specific mitigation is provided in Section F.3.4. Although the field appeared to be suitable for curlew, it was not used by the species, and the field lies outside the core area within the study area for curlew.

F.4.5 FIELDS 81 AND 82

These two fields lie adjacent to each other, share similar characteristics and were not found to be used by any waders during this study. The vegetation was too long to be used by waders in field 82, but if the vegetation was shorter, it has the potential to be used by waders and, as a result, it could still be considered that waders are losing potential habitat if housing is built in the field, in which case mitigation and compensation would still be required. The habitat appeared suitable for waders in field 81 and the absence of waders in this field is likely to be due to other factors.

Only part of fields 81 and 82 will be developed with housing, potentially leaving the undeveloped parts of the field still suitable for use by waders. Housing should be built immediately adjacent to existing housing - therefore along the northern edge of both fields - to leave as much land as possible still potentially available to attract waders. The land that remains could be enhanced as much as possible to attract waders, and as waders were not recorded in either field during survey work, there would be potential for a net gain should waders use the fields.

A group of seven grey partridge were recorded in field 82 on 6th December 2021. Grey partridge is a declining red-listed farmland species, and is becoming increasingly scarce in South Tyneside. Off-site mitigation for farmland birds should be undertaken for the loss of

field 82. Such mitigation might include, for example, the provision of wild bird mixes which provide seed and invertebrate feeding.

APPENDIX 1. PLANNING POLICY AND LEGISLATIVE CONTEXT

National Planning Policy

The table below details the key paragraphs from the National Planning Policy Framework (NPPF)²² relating to the natural environment:

TABLE 20: NATIONAL PLANNING POLICY FRAMEWORK: CONSERVING AND ENHANCING THE NATURAL ENVIRONMENT	
Statement	Paragraph
<p>Planning policies and decisions should contribute to and enhance the natural and local environment by:</p> <ul style="list-style-type: none"> a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan); b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland; c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate; d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures; e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate 	174
<p>Plans should: distinguish between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value, where consistent with other policies in this Framework²³; take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries.</p>	175
<p>Great weight should be given to conserving and enhancing landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty which have the highest status of protection in relation to these issues. The conservation and enhancement of wildlife and cultural heritage are also important considerations in these areas, and should be given great weight in National Parks and the Broads²⁴. The scale and extent of development within all these designated areas should be limited, while development within their setting should be sensitively located and designed to avoid or minimise adverse impacts on the designated areas.</p>	176
<p>When considering applications for development within National Parks, the Broads and Areas of Outstanding Natural Beauty, permission should be refused for major development²⁵ other than in exceptional circumstances, and where it can be demonstrated that the development is in the public interest. Consideration of such applications should include an assessment of:</p> <ul style="list-style-type: none"> a) the need for the development, including in terms of any national considerations, and the impact of permitting it, or refusing it, upon the local economy; b) the cost of, and scope for, developing outside the designated area, or meeting the need for it in some other way; and c) any detrimental effect on the environment, the landscape and recreational opportunities, and the extent to which that could be moderated 	177
<p>Within areas defined as Heritage Coast (and that do not already fall within one of the designated areas mentioned in paragraph 176), planning policies and decisions should be consistent with the special character of the area and the importance of its conservation. Major development within a Heritage Coast is unlikely to be appropriate, unless it is compatible with its special character.</p>	178

²² National Planning Policy Framework. July 2021. Department for Communities and Local Government,

²³ Where significant development of agricultural land is demonstrated to be necessary, areas of poorer quality land should be preferred to those of a higher quality.

²⁴ English National Parks and the Broads: UK Government Vision and Circular 2010 provides further guidance and information about their statutory purposes, management and other matters.

²⁵ For the purposes of paragraphs 177 and 178, whether a proposal is 'major development' is a matter for the decision maker, taking into account its nature, scale and setting, and whether it could have a significant adverse impact on the purposes for which the area has been designated or defined.

TABLE 20: NATIONAL PLANNING POLICY FRAMEWORK: CONSERVING AND ENHANCING THE NATURAL ENVIRONMENT	
Statement	Paragraph
<p>To protect and enhance biodiversity and geodiversity, plans should:</p> <ul style="list-style-type: none"> a) Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity²⁶; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation²⁷; and b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity. 	179
<p>When determining planning applications, local planning authorities should apply the following principles:</p> <ul style="list-style-type: none"> a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused; b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest; c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons⁶³ and a suitable compensation strategy exists; and d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate. 	180
<p>The following should be given the same protection as habitats sites:</p> <ul style="list-style-type: none"> a) potential Special Protection Areas and possible Special Areas of Conservation; b) listed or proposed Ramsar sites²⁸; and c) sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites. 	1822
<p>The presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site.</p>	182

Section 40 of the Natural Environment and Rural Communities Act 2006, places a duty on all public authorities in England and Wales to have regard, in the exercise of their functions, to the purpose of conserving biodiversity.

Planning Practice Guidance²⁹ states:

- Planning authorities need to consider the potential impacts of development on protected and priority species, and the scope to avoid or mitigate any impacts when considering site allocations or planning applications. (para. 016)
- Information on biodiversity and geodiversity impacts and opportunities needs to inform all stages of development (including site selection and design, pre-application consultation and the application itself). An ecological survey will be necessary in advance of a planning

²⁶ Circular 06/2005 provides further guidance in respect of statutory obligations for biodiversity and geological conservation and their impact within the planning system.

²⁷ Where areas that are part of the Nature Recovery Network are identified in plans, it may be appropriate to specify the types of development that may be suitable within them.

²⁸ Potential Special Protection Areas, possible Special Areas of Conservation and proposed Ramsar sites are sites on which Government has initiated public consultation on the scientific case for designation as a Special Protection Area, candidate Special Area of Conservation or Ramsar site.

²⁹ Planning Practice Guidance: Natural Environment (www.planningguidance.communities.gov) Updated July 2019

application if the type and location of development could have a significant impact on biodiversity and existing information is lacking or inadequate. (para. 018)

- Even where an Environmental Impact Assessment is not needed, it might still be appropriate to undertake an ecological survey, for example, where protected species may be present or where biodiverse habitats may be lost. (para. 018)
- As with other supporting information, local planning authorities should require ecological surveys only where clearly justified. Assessments should be proportionate to the nature and scale of development proposed and the likely impact on biodiversity. (para. 018)
- The National Planning Policy Framework encourages net gains for biodiversity to be sought through planning policies and decisions. Biodiversity net gain delivers measurable improvements for biodiversity by creating or enhancing habitats in association with development. Biodiversity net gain can be achieved on-site, off-site or through a combination of on-site and off-site measures. (para. 022)

Protected Species Legislation

The table below details the relevant legislation for the protected species covered within the scope of the survey.

TABLE 21: SUMMARISED SPECIES LEGISLATION		
Species	Relevant Legislation	Level of Protection
Birds	<ul style="list-style-type: none"> • Protection under the Wildlife and Countryside Act (1981) as amended with the exception of some species listed in Schedule 2 of the Act 	<p>The WCA (1981) makes it an offence to (with exceptions for certain species):</p> <ul style="list-style-type: none"> • Intentionally kill, injure or take any wild bird • Intentionally take, damage or destroy nests in use or being built (including ground nesting birds) • Intentionally take, damage or destroy eggs • Species listed on Schedule 1 of the WCA or their dependant young are afforded additional protection from disturbance whilst they are at their nests

Schedule 1 Species

These are rare or threatened breeding UK birds, such as peregrine or corncrake, which are afforded special protection under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). In addition to the protection from killing or taking that all birds, their nests and eggs have under the Act, Schedule 1 birds and their young must not be disturbed at the nest.

These species are in general scarce breeders and will increase the ornithological value of the site in at least a district context. However, it includes barn owl, a much more common species, which is unlikely to be of greater than parish value, with the exception of more urban locations.

Annex 1 Species

These are rare breeding European birds such as golden plover and hen harrier, which are afforded special protection under Annex 1 of the EC Birds Directive (see below) and if recorded breeding on site will greatly increase the conservation value of the assemblage, with single pairs leading to at least county value up to national and international for SPA (see below) classified/significant populations.

Protected Site Legislation

Context in regard to the UK's Exit from the European Union

As of 1st January 2021, the UK is no longer bound by the Birds Directive and Habitats Directive. However, the Conservation of Habitats and Species Regulations still applies, which formerly acted to transpose the Birds Directive and the Habitats Directive into English and Welsh law. These are still referred to below for contextual purposes, as designated site citations and conservation objectives may not have been updated following the changes to applicable legislation and may still refer to the Directives.

Statutorily Designated Sites

Ramsar Site

Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. The Convention recognises wetlands as important ecosystems and includes a range of wetland types from marsh to both fresh and salt water habitats. The wetlands can also include additional areas adjacent to the main water-bodies such as river banks or coastal areas where appropriate.

Special Protection Area (SPA)

SPAs are classified by the UK Government under the EC Birds Directive and comprise areas which are important for both rare and migratory birds.

Special Areas of Conservation (SAC)

SACs are designated under the EC Habitats Directive and are areas which have been identified as best representing the range and variety of habitats and (non-bird) species listed on Annexes I and II to the Directive. SACs are designated under the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 unless they are offshore.

Sites of Special Scientific Interest (SSSI)

SSSIs are designated as sites which are examples of important flora, fauna, or geological or physiographical features. They are notified under the Wildlife and Countryside Act 1981 with improved provisions introduced by the Countryside and Rights of Way Act 2000.

National Nature Reserve (NNR)

NNRs are designated by Natural England under the National Parks and Access to the Countryside Act 1949 and the Wildlife and Countryside Act 1981 and support important ecosystems which are managed for conservation. They may also provide important opportunities for recreation and scientific study.

Country Parks

Country Parks are statutorily designated and managed by local authorities in England and Wales under the Countryside Act 1968. They do not necessarily have any nature conservation importance, but provide opportunities for recreation and leisure near urban areas.

Local Nature Reserves (LNR)

LNRs are designated under the National Parks and Access to the Countryside Act 1949 by local authorities in consultation with Natural England. They are managed for nature conservation and used as a recreational and educational resource.

Non-Statutorily Designated Sites

Non-Governmental Organisation Property

These are sites of biodiversity importance which are managed as reserves by a range of NGOs. Examples include sites owned by the RSPB, the Woodland Trust and the Wildlife Trusts.

Local Wildlife Site (LWS)

These are sites defined within the local plans under the Town and Country Planning system and are material considerations of any planning application determination. They are designated by the local authority although criteria for designation can vary between authorities.

Priority Species

Although not afforded any legal protection, national priority species (species of principal importance, as listed in Section 41 of the NERC Act (2006)), and local and regional priority species, as detailed within the relevant biodiversity action plans, are material considerations in the planning process and as such have been assessed accordingly within this report.

UK Post 2010 Framework

The UK Post-2010 Biodiversity Framework published July 2012, covers the period from 2011 to 2020. The framework enables work at a "UK level" to achieve the 'Aichi Biodiversity Targets' and the aims of the EU biodiversity strategy. Most work that was previously carried out under the UK Biodiversity

Action Plan (UK BAP) is now focused at the country level though many of the tools developed under the UK BAP remain of use; for example, lists of priority habitats and species. The lists of priority species and habitats agreed under UK BAP still form the basis of much biodiversity work in the countries. The Framework reflects a revised direction for nature conservation, towards an approach that aims to consider the management of the environment in a holistic manner, and to acknowledge the importance of nature in decision-making and as such is an important document implemented by the four countries.

BAP lists include both rare and common species whose populations' have declined. On most sites it is likely to be the common species that are likely to be present, resulting in local to district value depending on numbers.

The tables below detail the bird species/groups listed as priorities within the biodiversity action plans of the main Local Planning Authorities' within the north-east of England.

TABLE 22: BIODIVERSITY ACTION PLAN		
Durham Biodiversity Action Plan		
Species/Species Groups		
Barn Owl	Coastal Birds	Farmland Birds
Nightjar	Spotted Flycatcher	Upland Birds

Birds of Conservation Concern

Several long-term surveillance programmes are undertaken in the UK. The data from these schemes allow the population status of Britain's birds to be regularly reviewed, it is from these data that

Red List species

These are listed by the RSPB as species of high national conservation concern. Species are included on this list if they meet one or more of the following criteria:

- Globally threatened;
- Historical population decline in UK during 1800-1995;
- Rapid (> 50%) decline in UK breeding population over last 25 years; and
- Rapid (> 50%) contraction of UK breeding range over last 25 years.

Amber List species

These are listed by the RSPB as species of medium national conservation concern. Species are included on this list if they meet one or more of the following criteria:

- Historical population decline during 1800-1995, but now recovering with population size having more than doubled over the last 25 years;
- Moderate (25-49%) decline in UK breeding or non-breeding population or breeding range over the last 25 years;
- Species of European Conservation Concern;
- Five year mean of between only one and 300 breeding pairs in the UK;
- >50% of the UK breeding or non-breeding population in ten or fewer sites;
- >20% of the European breeding population in the UK; and
- >20% of the NW European (wildfowl), East Atlantic Flyway (waders) or European (others) non-breeding populations in the UK.

These birds of conservation concern are often common species or locally scarce species such as starling and tree sparrow, which may increase a sites value.