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NORTH HYKEHAM RELIEF ROAD
BIRD HAZARD MANAGEMENT PLAN

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APPENDICES

1. INTRODUCTION

1.1 Background

The North Hykeham Relief Road (NHRR), previously known as the Lincoln Southern Bypass (LSB), will link the recently constructed Lincoln Eastern Bypass (LEB) with the Lincoln Western Relief Road (LWRR) and the A46 on the Strategic Road Network (SRN) which is also the western end of the Lincoln Western Relief Road (LWRR). The NHRR is the last element of a complete ring road around the greater Lincoln urban area comprising both Lincoln and North Hykeham and is the last major highway scheme contained within the Lincoln Integrated Transport Strategy (LITS).

The completed ring road will comprise four sections of carriageway: the Lincoln Western Relief Road (LWRR), the Lincoln Northern Relief Road (LNRR), the Lincoln Eastern Bypass (LEB), and the NHRR. The NHRR will also form part of the Lincolnshire Coastal Highway.

1.2 Purpose and Objective

This report presents the Bird Hazard Management Plan (BHMP), developed to meet the requirements of the County Planning Authority (Lincolnshire County Council). There has been ongoing communication with RAF Waddington throughout the design process, which will be continued throughout construction.

The BHMP will be submitted to the planning authority to discharge Condition 17, raised primarily from the concerns of the Ministry of Defence (MOD) represented by The Defence Infrastructure Organisation (DIO) Safeguarding Teams (see partly consultation response submitted 26/04/2024).

Condition 17 states:

Prior to the commencement of development, a Bird Hazard Management Plan (BHMP) shall be submitted to and approved in writing by County Planning Authority. The BHMP shall include, but not be limited to:

- ***Identification of species that may cause detriment to aviation safety;***
- ***Details of an inspection and monitoring schedule through which appropriately qualified individuals will identify bird numbers and potential attractants;***
- ***Details of design or management measures that will be employed to discourage birds from being attracted to the development/site (to address soil storage, and any permanent and/or temporary waterbodies);***
- ***Identification of the number of those species that should trigger dispersal or control actions;***
- ***Details of dispersal and bird control actions that may be applied;***
- ***A protocol for recording bird numbers, actions taken and their outcomes; and***
- ***A liaison protocol to provide RAF Waddington with notice that actions are to be taken.***

This is due to the application site occupying the statutory safeguarding zones surrounding RAF Waddington. Specifically, the development would fall within or pass through statutory safeguarding zones, designed to minimise the potential for development to introduce birdstrike hazard and for development to form a physical obstruction/obstacle for aircraft or to the operation and capability of technical assets. The proposed development would pass within 1000m of the threshold of runway 20/02 and would, at the connection to Sleaford Road roundabout, fall within an area drawn to assure an obstacle free environment for aircraft on approach to runway 20/02.

The BHMP describes how the proposed development of the site will potentially affect the presence of birds that are of concern and sets out what measures can be put in place through design and management to reduce the risk of hazardous bird activity in the RAF Waddington Safeguarding Zone.

The BHMP considers all bird species potentially associated with birdstrike in accordance with the wildlife hazard management at aerodromes advice published by the Civil Aviation Authority (CAA)[1], and the Safeguarding of Aerodromes advice published by the Airport Operators Association (AOA)[2].

A BHMP is required to prevent an increase in the number of hazardous species of birds in the vicinity of RAF Waddington that would increase the risk of a birdstrike to aircraft using the base. This also ensures the development meets the requirements of paragraph 101 of the National Planning Policy Framework (2023)[3] which states:

101. Planning policies and decisions should promote public safety and take into account wider security and defence requirements by:

a) anticipating and addressing possible malicious threats and natural hazards, especially in locations where large numbers of people are expected to congregate45. Policies for relevant areas (such as town centre and regeneration frameworks), and the layout and design of developments, should be informed by the most up-to-date information available from the police and other agencies about the nature of potential threats and their implications. This includes appropriate and proportionate steps that can be taken to reduce vulnerability, increase resilience and ensure public safety and security; and

b) recognising and supporting development required for operational defence and security purposes, and ensuring that operational sites are not affected adversely by the impact of other development proposed in the area.

This report sets out measures to be taken to assure that the risk of birdstrike is not increased with the addition of new landscape features during both the construction period and for the operation of the proposed NHRR.

The BHMP will be integrated into the construction phase plan for the works and overall management of health and safety, environmental and quality for the works.

A nominated contact from RAF Waddington will be shared with the site manager of the relief road before work commences.

Comments were received from the MoD safeguarding team regarding an initial draft of the BHMP on 28th October 2024. Table 1.1 provides the locations within this document where these comments have been addressed.

Table 1.1 MoD comments and locations within this document where 20/10/24 MoD comments have been addressed.

Subject	MoD Comment	Location in BHMP where addressed
Construction phase	The proposed monitoring will include continual monitoring by the site manager, resolving and recording any issues in the site diary. This is positive, but does not set out a frequency that the site will be checked for the presence of hazardous birds. Formal weekly monitoring is insufficient to identify and rectify a potentially fast evolving hazard and hourly monitoring during daylight hours is recommended for the parts of the scheme within 2km of the aerodrome. For the parts of the scheme further out this can be less frequent.	Full details of monitoring, including frequency of visits are provided at Section 3.3.

[1] Civil Aviation Authority, 2017. Wildlife Hazard Management at Aerodromes.

[2] Airport Operators Association, 2016. Safeguarding of Aerodromes, Advice Note 3, Wildlife Hazards around Aerodromes.

[3] National Planning Policy Framework - GOV.UK (www.gov.uk)

Thresholds	When monitoring the maximum observed flock will be recorded. It is not clear over what area or time period this maximum flock size is applied. Is it what is visible from a single point or across the whole scheme? It is at one point in time or in one hour or day? The maximum observed flock is of less interest than total numbers. If five flocks of ten gulls are observed, then it is relevant that there are 50 gulls, not ten. As such all hazardous birds should be identified and recorded. Threshold levels have been included, including a level of 30 gulls. This is appropriate at 6km from the aerodrome, but at 1km from the end of the runway and close to the approaches 30 gulls might constitute a significant hazard. As such the acceptable flock sizes at the eastern end of the scheme should be reduced. Likewise, a failure level of 100 gulls is too high for the pond and parts of the scheme closest to RAF Waddington.	Full details of monitoring are provided at Section 3.3 including timing of visits, and how total number of birds will be used as a measure rather than flock size. Thresholds for the construction period are provided at Table 3.2 and for the operational period at Table 3.3. Thresholds are provided for various distance zones from aerodrome.
Landscaping	The BHMP states that - Tree or hedgerow planting within the landscaping may provide additional nesting opportunities for various bird species including woodpigeon, rooks and jackdaws. It is not considered likely that the proposed planting will result in a significant increase in flocks of birds, as there are already significant areas of woodland and scrub in the surrounding area that provide a food resource throughout the year for birds. - Whilst it is accepted that landscaping at 6km is unlikely to impact on the birdstrike risk at RAF Waddington, the planting closer to the airport has the potential to significantly increase the available habitats in that area. This includes the use of larger trees such as Oak and Scots Pine which have an increased chance of developing into a Rookery once mature (with the presence of Rookeries being of particular concern at Waddington) and also the use of fruit and berry bearing plants which can result in an increased availability of an attractive food resource for flocking birds such as Starlings and winter thrushes. As such our previous recommendation to limit the fruit and berry bearing component of the planting to no more than 20% in areas closest, and within 2km of the airbase, and with a higher proportion being acceptable further out still stands. The numbers of larger tree species such as Oaks should also be limited closer to the airbase.	Additional information regarding the landscaping, areas of woodland and hedgerows and tree types to be used are provided at Section 2.2, Table 2.3 and Section 3.1.
SuDS attenuation	The development will include a series of surface water treatment and attenuation basins. 2-9 will be usually dry basins, but will hold water in a 1:1 year event with water still present 72 hours after, making it likely that they will hold water several times a year or for more prolonged periods. Basins 1 and 10 (located at either end of the proposed road) will hold permanent water. One of these will be situated less than one kilometre from RAF Waddington at RAF Waddington. **Important Note: in January 2025 a decision was made to modify the design to Basin 10 so that it will not hold permanent water.** It would appear from the included details that the basins will hold water on a regular basis (more often than a 1:30 year storm event). For a full assessment of the management plan further details of the basins and ponds are required, but as it stands the measures outlined will not be sufficient to ensure that the basins and ponds do not result in an increased presence of gulls, geese, swans or egrets. Therefore, full details of all the basins including how frequently they are predicted to be wet and for how long (to full drain down) and landscaping both through and around the basins has not been included, are requested.	Further details regarding Basins 1 and 10 have been provided in Section 3.1 and Table 3.1, including the areas that will hole water, and details of how only a small proportion of Basin 10 will permanently hold water. **Important Note: in January 2025 a decision was made to modify the design to Basin 10 so that it will not hold permanent water.** A detailed narrative on drain down periods in a 1:30 year storm is provided for each basin in Section 3.1. Details of depths and drain down periods are provided in Table 3.1.

		Further information on regular management of SuDS ponds is provided at Section 3.2.
Operational –	The operational monitoring will be limited to the waterbodies. This is appropriate for this type of development, as long as it includes the basins as well as the permanent ponds. Checking bird numbers after the construction phase will be undertaken during the regular maintenance scheduled for the attenuation basins and infiltration ponds as set out in the SuDS manual. Unfortunately, this is unlikely to be adequate to effectively identify and mitigate any attraction in a timely manner (depending on details), and will not identify any issues at other times of day, for example roosting Starlings or pre-roosting gulls.	Further details of operational monitoring, including updated thresholds is provided at Section 3.3. and Table 3.3.
Management details	The control and mitigation details set out are generally appropriate for this type of development, but this will depend on the drainage and landscaping details.	
Checking, communication and further commitments	The management plan should include a commitment that short notice visits by RAF Waddington or their nominated representatives should be accommodated, subject to relevant health and safety restrictions. Communications protocols should be in place to ensure there is a direct line of communication with the relevant parties at RAF Waddington. There should be provision for review and updating of the management plan with the agreement of all parties at relevant time points (for example after construction and five years post construction). The plan should be in perpetuity and should include a commitment to take further action at the reasonable request of RAF Waddington.	Further details of communications protocol are provided in Section 3.3, including accommodating short notice visits by RAF Waddington. Provision for updating the BHMP and also taking further action is also provided.

Further comments were made by the MoD regarding version 2 of the BHMP on 18th December 2024 which have been addressed within this updated version of the BHMP (version 3). Table 1.2 provides the locations within this document where these comments have been addressed.

Table 1.1 MoD comments and locations within this document where 20/10/24 MoD comments have been addressed.

Ref.	MoD Comment	Location in BHMP where addressed
1.	*There should be provision in the BHMP and/or Soil Management Plan to monitor stockpiles and to remove, compact or cover (eg with tarpaulins or tar spray) if they are attracting corvids, gulls or pigeons*	removed any mention of stockpiled material not presenting any risk to attracting flocking birds. Stockpiles are already included within the monitoring area as the monitoring area includes the entire development. Monitoring and control measures text provided regarding stockpiles in Dispersal and Bird Control Actions section.
2.	*Monitoring visits will be completed once a day during the winter period which is taken to commence on the 1st September and finish on 31st March. In the event that bird thresholds are being exceeded for three or more consecutive days, adaptive management would be employed which would increase the frequency of monitoring visits from once a day to twice a day. Monitoring visit frequency would be reduced to once a week*	The frequency of visits within the breeding season has been increased to daily as per Ref. 3. below.

	during the breeding bird period which is taken to commence on the 1st April and finish on the 31st August. In the event that bird thresholds are being exceeded for two or more consecutive weeks, adaptive management would be employed which would increase the frequency of monitoring visits from once a week to twice a week. During the winter this could be acceptable as long as the soil handling aspect of the site management is robust	
3.	*During the breeding season the frequency of monitoring should also be daily*	Monitoring Frequency updated to include increase of monitoring frequency during breeding period to once a day.
4.	*Threshold levels are for the winter period only include a threshold of 75 pigeons attracted to the site (and not adjacent) is way too high and this number would only be present if there is a significant attractant. If there is an attractant this should be addressed. If there is no attractant then this type of numbers should not be present. Therefore, this should be reduced in line with the numbers for corvids. It is not clear what threshold levels are suggested for during the summer period, eg feeding corvids or post breeding flocks of Starlings?*	Thresholds updated for pigeons in Table 3.2. Additional table (Table 3.3) provides thresholds for birds during the breeding season.
5.	*If any large flock of birds are observed, over 100 of any species, immediate dispersal may cause a risk to any aircraft in the area or approaching or leaving the RAF base imminently. Before dispersal of a flock of this size the nominated bird hazard control staff contact at RAF Waddington would be immediately notified.*	The statement that the mailbox will be used has been provided within the Dispersal and Bird Control Actions section.
6.	*This control measure requires a nominated contact from RAF Waddington being shared with the site manager of the relief road before work commence. Flocks of 100 is far too high for the parts of the site closer to the aerodrome – dispersing 50 gulls less than 1km from the aerodrome could constitute a significant hazard. For less than 2km from the runway dispersals at threshold levels should only be carried out after prior agreement with the aerodrome. For sites further than 2km from the aerodrome contacting the airport prior to dispersing more than 100 birds would be appropriate.*	Definitions regarding what constitutes a large flock that require contacting RAF Waddington prior to dispersal, have been added to the Dispersal and Bird Control Actions section.
7.	*The species to be used in woodland planting include field maple, alder, silver birch, downy birch, hornbeam, hazel, Midland hawthorn, hawthorn, common cherry, bird cherry, English oak, goat willow and grey willow. – Nine of 13 proposed plants are suitable, yet still attractive fruiting plants (cherries and hawthorn) will make up >40% of the planting and have the potential to result in an increase in available food for flocking bird species locally. This really is not necessary and should be reduced in favour of the other listed plant species.*	Planting proposals in Net Gain Plan and prior approved scheme are to be changed so that the fruiting plants of Midland hawthorn, hawthorn, common cherry and bird cherry are reduced to no greater than 40% between 2km and 1km and no greater than 20% within 1km of Waddington airfield. This is updated in the Landscape Design and Planting section.
8.	*only English oak had the potential to grow to a sufficient height to support either corvid roosts, rookeries or large flocks of other passerine birds. Any oak removed from the planting schedule would be replaced on a 1:1 ratio by either silver birch, alder or hazel.*	Planting proposals in Net Gain Plan and prior approved scheme are to be changed so that Oak is removed from trees within 2km of Waddington airfield and replaced by silver birch, alder or hazel. The removal of oak and replacement with these species is stated within the Landscape Design and Planting section.

9.	*It is not clear how frequently the basins will hold water – what is the situation in a 1:30 or 1:1 year storm event?*	Text updated in Sustainable Drainage Systems Section regarding Basin 10. This feature will no longer permanently hold water.
10.	*Threshold levels for further action are based on the numbers of birds in each basin. This is a sensible approach. However, the levels are too high for basin 10, which should have zero tolerance for geese and swans due to its critical location*	Table 3.4 updated to include threshold of 1 bird for geese and swans at Basin 10.
11.	*Following the construction phase, monthly visits will be undertaken to inspect the attenuation basins and infiltration ponds and record numbers of birds present on these features. Monitoring frequency for the operational phase will be reviewed post construction once a better idea of the birds present and the attractiveness of the basins has been gained – this is fine, but the monitoring frequency should not be less than weekly initially, and will only be reduced in agreement with RAF Waddington.*	Text added to Operational Monitoring section stating the monitoring frequency to be undertaken during the operational period at basin 10, which may be revised if the basin rarely holds water.

1.3 RAF Waddington Safeguarding Requirements

The principal concerns raised by the MOD and guidance from the CAA have been referenced in this BHMP.

CAA guidance on wildlife hazard management at aerodromes states that the following factors should be taken into consideration when assessing the potential increase in risk:

- The numbers, including seasonal variations, and types of birds that may be attracted to the development;
- Any proposed landscaping or habitat designs;
- The distance from the aerodrome;
- The location of the development relative to aircraft arrival and departure flightpaths and within the visual circuit;
- Bird movements in relation to the aerodrome; for example, waterfowl move primarily between wetlands and along watercourses. Creating new bodies of water may cause more waterfowl movements and the increase of birdstrike risk.

According to CAA and AOA guidance, large and/or flocking bird species present the greatest strike hazard including the following target birds:

- Wildfowl;
- Large water birds (e.g. herons, egrets and cormorant);
- Gamebirds;
- Raptors;
- Large waders (lapwing, curlew and golden plover);
- Gulls;
- Pigeons;
- Corvids;
- Starlings.

1.4 RAF Waddington Aerodrome Wildlife Control Management Plan

The Aerodrome Wildlife Control Management Plan (AWCMP) exists to ensure that rigorous processes are utilised at RAF Waddington to assess potential wildlife strike hazards and implement appropriate control measures to reduce or mitigate hazards, in accordance with the above references.

This plan is to be reviewed by the Airfield Wildlife Control Officer (AWCO) at least annually.

The primary aim of the Airfield Wildlife Control Unit (AWCU) is to reduce the risk of collision between wildlife and air systems by maintaining, as far as reasonably practicable, a wildlife-free environment on and around the airfield at RAF Waddington. To achieve this, AWCU and relevant station personnel work closely together to promote a holistic approach to environmental, habitat and wildlife management.

Wildlife Hazard Management is carried out primarily by the AWCU and is overseen by the Senior Air Traffic Control Officer (SATCO). The AWCU are responsible for elements relating to airfield wildlife and reporting observations about habitat management at Waddington.

1.4.1 Risk Identification

Aerodrome Operators are required to maintain a systematic method of obtaining information regarding hazardous wildlife species and their habitats to manage them effectively. The following methods are used at RAF Waddington:

- Monthly reports – The AWCU maintain an auditable record of bird control activities
- Defence Aviation Safety Occurrence Reports (DASORs) - submitted for significant Wildlife observations and occurrences.
- Off-aerodrome Wildlife Surveys - identifying and assessing risks, AWCU Operators monitor and periodically visit sites within a 13km radius of the aerodrome. Visits to local farmers and bird attracting sites within the safeguarding zone may be carried out for the purpose of bird counts, meetings, and risk assessment. The North Hykeham Relief Road development area is not specifically identified as a main area of interest. The main areas of interest for RAF Waddington which are reported on monthly are as follows:
    (1) Leadenham Landfill Site
    (2) Whisby Nature Park
    (3) Norton Disney Complex
    (4) East Mere Lake
    (5) Glebe Farm Reservoir
    (6) Whisby Quarry Silt Lagoons
    (7) Lakeside Nature Park
    (8) Hartsholme Country Park

- Agricultural Activity and Liaison – The AWCU team leader works with the Airfield Manager to liaise with local farmers, discussing planned crop rotations since agricultural fields are major attractants of wildlife.
- Risk Assessments (Birds) - are carried out by the AWCU Regional Manager.
- Periodical Standards Checks – are carried out once a year to assess current AWCU activity and provide air safety recommendations.

1.4.2 Risk Reduction

- Habitat Management – Grass – entails the monitoring and maintenance of grassland within the aerodrome at the recommended sward height.
- Habitat Management – Environmental – entails the general monitoring of habitats around the aerodrome, including trees and grassland
- Habitat Management – Pest Control – concerns bird control within the aerodrome.
- Habitat Management – Waste – concerns the removal of waste to avoid attracting gulls.

Active patrols by AWCU operators monitor bird activity, taking into account air system types, runway use, weather, daylight levels and habitat variations. AWCU Operators also deter wildlife from the airfield by making the area less attractive for birds. Some lethal control of gulls and corvids is occasionally undertaken, where the birds become less reactive to non-life-threatening techniques (RAF Waddington holds a Class Licence issued by Natural England allowing certain wild birds to be killed or taken to preserve air safety).

2. BASELINE DATA

2.1 Birds

Published guidance on birdstrike aviation safety states that bird monitoring and control protocols must be informed by bird survey baseline evidence.

To inform the BHMP and determine the bird species likely to use the site, a review was made of species records and habitat descriptions included within the ecological reports produced by TEP, to inform the NHHR Environmental Impact Assessment and subsequent planning application. This included the Winter Bird Survey (2022-2023) and Breeding Bird Survey (2023).

The TEP winter bird survey covered the redline boundary of the NHRR planning application site plus a 500m buffer of this area. The winter bird survey area is provided at Appendix 1. Seven intensive survey visits were undertaken on a monthly basis from October 2022 to April 2023, each survey visit taking two-man days to complete.

Detailed analysis of the bird survey results is presented in Appendix 2. This analysis specifically focusses on bird use of land within different distance bands from the aerodrome in accordance with published guidance. The distance bands used were: 0-1km, 1-2km, 2-6km and 6+km. The agricultural fields included in the distance bands 0-1km and 1-2km are illustrated in a drawing in the same appendix.

While the NHRR survey area is used by a number of aviation bird risk species, many of the species are not regularly present, and when they occur they are not present in high numbers. There are no large build ups of any gull or goose species and waders are mostly very infrequent within the survey area.

Table 2.1 Key findings of the NHRR Winter Bird Survey 2022-2023 (focus on aviation risk species)

Species	Survey Findings
Black headed gull	Very few occur within 0-1km and 1-2km. Occasional high counts within 2-6km.
Common gull	Had the highest peak count within 0-1km of any gull species (92 individuals), however generally recorded infrequently in very low numbers (<10 individuals across the entire survey area).
Herring gull	Only present infrequently and in very low numbers (<5 individuals in entire survey area)
Lesser black-backed gull	Similar result to herring gull, apart from a count of 13 individuals on one occasion within 0-1km.
Canada Goose	Rarely occurs within 0-1km and 1-2km. Infrequent within entire survey area.
Greylag goose	Absent within 0-1km and 1-2km. Peak count of two individuals within entire survey area.
Whooper swan	Absent from fields within 0-1km and 1-2km. Peak count of one individual within entire survey area.
Mute swan	Absent with 0-1km and 1-2km. Intermittent flock of peak count 69 individuals occurred by River Witham, 3.5km from runway.
Starling	Peak count of 231 individuals within 0-1km, although generally only present occasionally at much lower numbers. Infrequent within 1-2km but regular within 2-6km.
Redwing	Only recorded on one occasion within 0-1km where 17 individuals were recorded. Slightly more regular at 1-2km with peak count of 47 individuals, with similar occurrence in 2-6km.
Fieldfare	More numerous and regular than redwing. Peak count of 27 individuals for 0-1km, and 162 individuals within 1-2km.
Rook	Occasional within both 0-1km and 1-2km with a peak count of 10 individuals within each distance band. Numbers are higher within 2-6km where two well established rookeries are situated, with a peak count of 99 individuals.
Stock dove	Very irregular occurrence within 0-1km with a peak count of 16 individuals. Peak count of 25 individuals within 1-2km.
Woodpigeon	Regularly occurs within 0-1km and 1-2km, with peak counts of 180 and 250 individuals respectively.
Other Species of Note	
Goosander	Peak count of 4, single record.
Mallard	Peak count of 11, irregular records (4 dates).
Teal	Peak count of 1, single record.
Tufted Duck	Peak count of 5, irregular records (2 dates). Recorded on existing waterbody beyond 500m of the site.

Cormorant	Peak count of 1, irregular records (2 dates).
Little Egret	Peak count of 2, irregular records (3 dates).
Grey Heron	Peak count of 1, irregular records (4 dates).
Golden Plover	Peak count of 52, irregular records (3 dates).
Lapwing	Peak count of 3, irregular records (2 dates).
Oystercatcher	Peak count of 1, single record.
Snipe	Peak count of 4, irregular records (3 dates).
Grey Partridge	Peak count of 29 across the survey area, regular records.
Buzzard	Regularly recorded as single birds and pairs across the length of the survey area.
Kestrel	Regularly recorded as single birds across the length of the survey area.
Sparrowhawk	Irregular single bird records (3 dates).

The TEP breeding bird survey covered the redline boundary of the site (using the red line boundary provided in early spring 2023) plus a 100m buffer of this area. The survey entailed six visits between mid-March and early July 2023 and covered the site and a 100m buffer. The breeding bird survey area is provided at Appendix 3. Species relevant to the BHMP, which may constitute a strike hazard are presented in Table 2.2.

Table 2.2 Breeding Bird Species (2023), Presence and Breeding Status

Species	**2023 Breeding Status**
Mute Swan	Several family groups recorded along the River Witham >3km from the runway.
Greylag Goose	Possible breeding within 100m of the site, low numbers recorded on each visit.
Mallard	Confirmed breeding on the River Witham.
Little Egret	Presence on site and in the 100m buffer, no breeding.
Grey Heron	Presence on site and in the 100m buffer, no breeding.
Cormorant	Presence on site and in the 100m buffer, no breeding.
Grey Partridge	Probable breeding species throughout the site.
Pheasant	Probable breeding pairs recorded throughout the site and buffer.
Red-legged Partridge	Probable breeding within the site, low numbers recorded.
Hobby	Recorded feeding along the River Witham.
Sparrowhawk	Possible breeding within 100m of the site. Low numbers recorded.
Lapwing	Peak of 109 lapwing recorded within 100m buffer, assessed as lapwing on spring migration. No breeding.

Curlew	Peak of 2 birds recorded on two occasions – no breeding, low numbers.
Oystercatcher	Peak of 2 recorded on one occasion – no breeding, low numbers.
Gulls- Lesser black-backed, Black-headed and Herring	Low numbers recorded. No evidence of breeding. Black-headed gull was most numerous with peak count of 38 individuals.
Woodpigeon	Confirmed breeding throughout the site and 100m buffer.
Jackdaw	Peak of 66 recorded within 100m of the site. Probable breeding within 100m of the site.
Magpie	Peak of 18 recorded within 100m of the site, confirmed breeding.
Rook	Regularly recorded feeding in fields, two rookeries identified >2km from the runway. Peak count of 243 individuals.
Starling	Feeding flocks identified (peak count 122 in one flock)

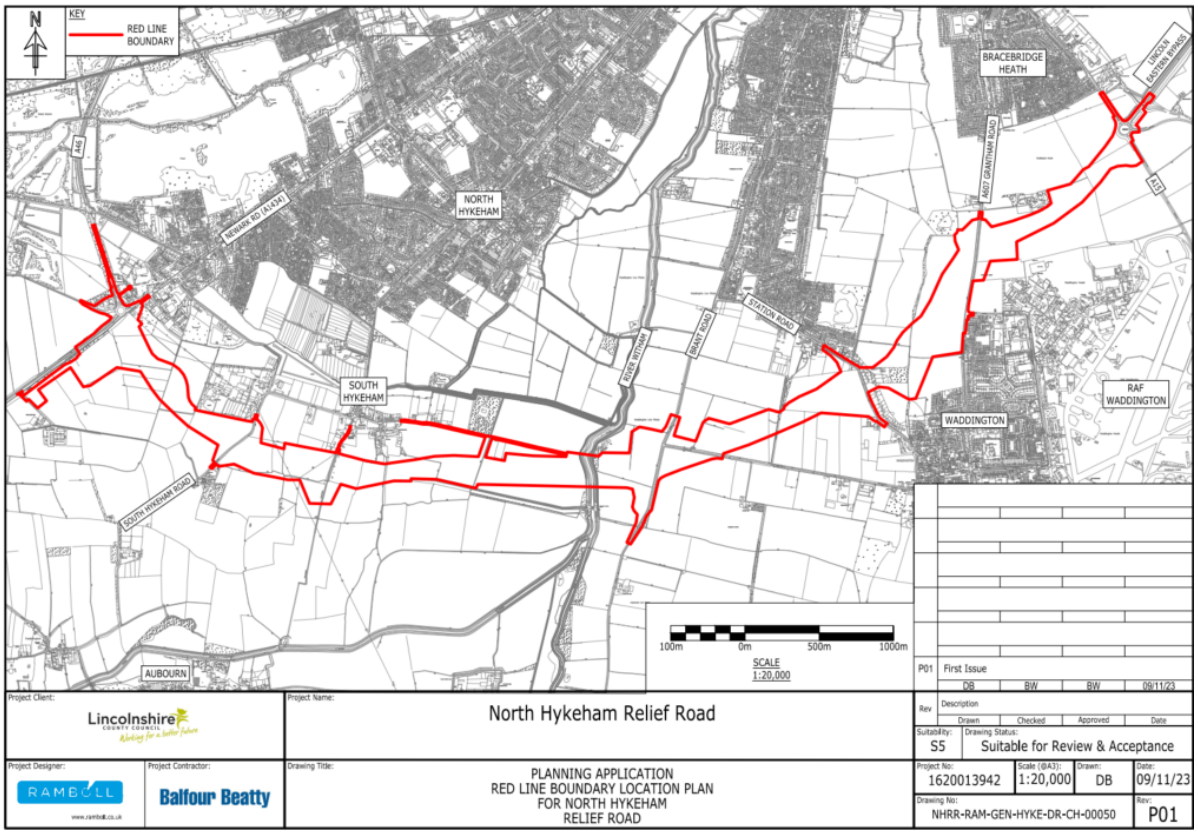
2.2 Habitat

The route extends south of South Hykeham, crossing Station Road near Waddington, and then curves north around the northern side of RAF Waddington. The Proposed Scheme is located to the south of the greater Lincoln urban area, specifically running to the south of the existing conurbations of North and South Hykeham in an east/west direction between the A46 Hykeham Roundabout (known locally as Pennell's Roundabout) and the A15 Sleaford Road Roundabout at the west end of the Lincoln Eastern Bypass. West of the River Witham, the NHRR will pass to the south of the existing conurbations of North and South Hykeham, crossing South Hykeham Road and Wath Lane. To the east of the River Witham, the NHRR will cross Brant Road and Station Road before passing to the north of Waddington and RAF Waddington, and to the south of Bracebridge Heath before crossing Grantham Road and connecting to the A15 Sleaford Road Roundabout. The Proposed Scheme will link the Lincoln Western Relief Road at the A46 Hykeham Roundabout on the Strategic Road Network with the Lincoln Eastern Bypass at the A15 Sleaford Road Roundabout. It will be the last element of a complete ring road around the greater Lincoln urban area comprising both Lincoln and North Hykeham. The ring road will therefore comprise four sections of carriageway: the Lincoln Western Relief Road, the Lincoln Northern Relief Road, the Lincoln Eastern Bypass, and the Proposed Scheme (the North Hykeham Relief Road). The Proposed Scheme will also form part of the Lincolnshire Coastal Highway.

The selected route passes mainly through flat mixed farmland on two levels. The lower level being the western part of the Proposed Scheme between Brant Road and Hykeham Roundabout at approximately 5m and 10m Above Ordnance Datum (AOD), will be crossed generally at grade or on low embankment rising to cross the River Witham on a combination of embankment and a bridge.

Between Brant Road and Station Road the scheme will be constructed on embankment. Station Road will be realigned and cross the Proposed Scheme on a new bridge to ensure that connectivity is maintained, whilst allowing the Proposed Scheme to pass under Station Road in cutting. Beyond Station Road, the Proposed Scheme transitions into a major cutting to reach the top of the escarpment known locally as both Lincoln Cliff and Lincoln Edge. Once the top of the escarpment is attained, the remainder of the Proposed Scheme crosses the landscape generally at grade or on low embankments to tie in with the A15 Sleaford Road and the Lincoln Eastern Bypass. The higher level to the east of Station Road at the top of Lincoln Cliff is at approximately 75m AOD. The site is shown at Figure 1.

Figure 1 Site location



A Phase 1 survey was undertaken at the site by TEP surveyors in September 2022, with extra surveys until June 2023 to address minor adjustments to the proposed planning application boundary.

The NHRR will cross low-lying, predominantly flat farmland. The majority of the site is arable farmland, with a network of ditches and hedgerows. The existing ditches are too narrow to attract and support flocks of waterbirds or wildfowl, many are also vegetated or bounded by trees or hedgerows further reducing their suitability for flocking waterfowl. There are a small number of existing waterbodies.

The River Witham flows south to north through the study area, over 3km from the runway at its closest point. Additionally, there are areas of both dense and scattered scrub, semi-natural mixed woodland, plantation broad-leaved woodland and plantation mixed woodland and areas of buildings. The overall site currently has 1.6ha of existing woodland and 17.4km of existing hedgerow within the red line boundary. The areas of existing woodland within the scheme and within 2km of the runway are presented in Table 2.3, as well as total areas of woodland and lengths of hedgerow to be planted as part of the scheme within those areas.

Table 2.3 Areas and lengths of Existing woodland and hedgerow to be retained within scheme and additional woodland and hedgerow to be planted both within the entire scheme and within 2km of runway.

Habitat	Within entire scheme	Within 2km of runway
Existing Woodland	1.60 ha	1.33 ha
Woodland post-construction	0.25 ha retained + 8.29 ha created **8.54 ha total**	0.02 ha retained + 4.75 ha created **4.77 ha total**
Existing hedgerow	17.4 km	6.0 km
Hedgerow post-construction	7.5 km retained + 20.3 km created **27.8 km total**	2.0 km retained + 7.4 km created **9.4 km total**

3. BIRD HAZARD MANAGEMENT PLAN

3.1 Potential Bird Strike Hazards

3.1.1 Preconstruction and Construction

The current extent of arable fields attracts numbers of foraging birds associated with birdstrike such as wildfowl, corvids, starling, gulls and waders, both in the winter and breeding season. as demonstrated in 2.1 above and Tables 2.1 and 2.2, while the NHRR survey area is used by some aviation bird risk species, many of the species are not regularly present, and when they do occur they are not present in high numbers. There are no large build ups of any gull or goose species and waders are mostly very infrequent within the survey area.

Exposing topsoil temporarily at the commencement of construction has the potential to attract foraging birds such as additional corvids or starling to the site compared to those already present. However soil stripping by excavator will be undertaken immediately following the removal of the vegetation by herbicide and other similar methods. Stripped topsoil will be transferred to dumper trucks which will stockpile the topsoil in accordance with the Soil Management Plan. During the construction period proactive and structured communication and engagement will be employed with RAF Waddington regularly updating them on what activities are being undertaken and when.

A build up and accumulation of water within open areas following site clearance could form temporary shallow pools and attract foraging or roosting waders, waterbirds and gulls, particularly in winter months. Water will not be allowed to accumulate in open areas following site clearance to avoid attracting foraging or roosting waders, waterbirds and gulls, particularly in winter months. Accumulation of water will be avoided by:

- Limiting time that underlying ground is exposed;
- Adequately reinstating excavations upon completion;
- The machines involved in the demolition will be tracked so that the risk of rutting will be reduced;

- The site manager will monitor the condition of the surface on a daily basis. If there is any indication of ponding, remedial steps will be taken to regrade the area to even the surface to prevent further ponding.

A storage area for materials is likely to be present within 2km of the runway. This area will be managed to avoid accumulations of water arising from compaction. The presence of stockpiles of material would reduce the openness in this area. Many bird species require openness to have clear sightlines to potential predators. Therefore the risk associated with storage areas would be low.

Welfare units and associated bins and skips which could attract feral pigeons, starlings, gulls, corvids and gulls. Bins and skips will be securely fastened and managed.

3.1.2 Landscape Design & Planting

Reprofiling and exposure of topsoil can attract foraging birds such as corvids or starling to the site, in both the breeding season and winter. Certain methods of grassland seeding could also provide an additional food source. It is not expected the planting on site will significantly cause the number of these birds to increase from what is there presently.

Significant tree planting would occur associated with the new road however the trees would be small when planted. TEP arborist experts confirm that regardless of the approach of undertaking tree planting it is very unlikely that any fruiting would occur in the first five years after planting, i.e. the trees would not fruit until well after the completion of the road construction.

Following the completion of landscape planting, the area of woodland within the overall site will be 7.98ha. This represents an increase of 6.38ha. There would be 4.74ha of this newly planted woodland within 2km of the RAF Waddington runway.

Following the completion of landscape planting, the final length of hedgerows within the overall site will be 27.83km. This represents an increase of 10.47km. There would be 7.39km of newly planted hedgerows within 2km of the RAF Waddington runway.

The additional new woodland and hedgerow planting at the site will all be close to a newly constructed dual carriageway main road that has been designed to support high traffic volumes. Disturbance from roads with a high traffic volume is known to reduce bird usage near these features (e.g. Reijnen and Foppen, 1997[4]). It is therefore likely that usage of the planted woodland and hedgerows will be low.

Introducing hedgerow and woodland into the landscape will reduce openness and therefore bird sightlines near to these features. This hedgerow and woodland will also provide an increased amount of habitat for predators such as foxes to use. These habitat features will therefore reduce the suitability of the agricultural fields for birds such as waders and wildfowl.

It is necessary for new woodland planting areas to constitute a minimum of 5 native tree species to fulfil Biodiversity Net Gain (BNG) criteria. The species to be used in woodland planting include field maple, alder, silver birch, downy birch, hornbeam, hazel, Midland hawthorn, hawthorn, common cherry, bird cherry, English oak, goat willow and grey willow.

[4] Reijnen, R and Foppen, R. (1997). Disturbance by traffic of breeding birds:evaluation of the effect and considerations in planning and managing road corridors. Biodiversity and Conservation 6, 567-581.

Of these species, only Midland hawthorn, hawthorn, common cherry and bird cherry would provide berries that could attract flocks of birds. The woodland and hedgerow planting will contain no more than 20% Midland hawthorn, hawthorn, common cherry and bird cherry within 1km of Waddington airfield and no more than 40% of these species within 1-2km of Waddington airfield.

Although there would be an increase in overall woodland, relative to the wider landscape, the mix ratios and overall proposal for woodland will not substantially increase the number of flocking aviation risk birds.

Following a review of the species composition and overall tree numbers within each woodland, it was determined that English oak would be removed from proposed woodland areas within 2km of the runway. It was considered that only English oak had the potential to grow to a sufficient height to support either corvid roosts, rookeries or large flocks of other passerine birds. Any oak removed from the planting schedule would be replaced on a 1:1 ratio by either silver birch, alder or hazel. These alternative tree species are considered to present a minimal risk with regards to attracting flocking birds.

This change was made specifically to reduce aviation risks at the design stage of the NHRR project. For those oak trees which will be planted, there is an ongoing commitment to manage these trees so that they do not become suitable for corvid roosts, rookeries or large flocks of other passerine birds.

3.1.3 Sustainable Drainage System (SuDS)

The SuDS includes a number of attenuation basins (Drawings NHRR-RAM-HDG-HYKE-DR-CD-05240 to 05249). Waterbodies may be attractive to wildfowl and waterbirds which are considered a birdstrike risk. However, the suitability of any SuDS feature is greatly affected by its size, the extent of open water that could occur, the duration of water holding and the profile of the banks as well as its proximity to other suitable bird habitat and features that may deter birds such as features that reduce sightlines and activity that causes disturbance.

The most attractive waterbodies to swans, geese, ducks and gulls are open and large. The SuDS scheme has been specifically designed to consist of small, largely isolated temporary waterbodies, rather than fewer large waterbodies which would support much greater numbers of aviation risk species. The only cluster of waterbodies present within the scheme (Basins 5a, 5b and 5c) are less than 300m^2 and so are highly unlikely to attract groups of aviation risk species. This is in line with guidance for design of clusters of waterbodies to minimise aviation risk (Freshwater Habitats Trust 2022[5]).

The proposed attenuation basins will not hold large amounts of open water. Basins 2 to 9 are infiltration basins specifically designed to allow any water to quickly drain away. These basins would be dry for the majority of the time, holding water temporarily after high rainfall, thus greatly reducing the appeal of the basins to these species.

Descriptions of how each of these basins will drain following a 1 in 30 storm event are provided below:

[5] Freshwater Habitats Trust (2022). Designing Wildlife Ponds to Minimise the Risk of Birdstrike. Supplementary Advice Factsheet. https://freshwaterhabitats.org.uk/?s=birdstrike

Basin 2 - After the water level peaks at around 0.75 days, it then steadily decreases until it plateaus at 4.5 days, where the water level decreases slowly over time. It then takes an additional 2.7 days for the basin to 100% drain. The water level drops below 50mm at around 3.75 days and remains below 50mm for around 3.5 days until it is 100% empty.

Basin 3 - After the water level peaks at around 1.5 days, it then steadily decreases until it plateaus around 6 days, where the water level decreases slowly over time. It then takes an additional 2.3 days for the basin to 100% drain. The water level drops below 50mm at around 6 days and remains below 50mm for almost 2.3 days until it is 100% empty.

Basin 4 - After the water level peaks at around 0.6 days, it then steadily decreases until it plateaus around 3 days, where the water level decreases slowly over time. It then takes an additional 5.4 days for the basin to 100% drain. The water level drops below 50mm at around 2.4 days and remains below 50mm for 6 days until it is 100% empty.

Basin 5 N1 - After the water level peaks at approximately 0.3 days, the depth steadily decreases until approximately 0.9 days when it begins to plateau and slow down. It then takes an additional 0.8 days the 100% drain. The water level drops below 50mm at approximately 0.9 days and remains below 50mm for 0.8 days until it is 100% empty.

Basin 5 N2 - After the water level peaks at approximately 0.1 days, the depth steadily decreases until approximately 0.3 days when it becomes 100% empty.

Basin 5 N3 - After the water level peaks at approximately 0.1 days, the depth steadily decreases until approximately 0.5 days when it becomes 100% empty.

Basin 6 - After the water level peaks at approximately 1.5 days, the depth steadily decreases until approximately 7.5 days when it becomes 100% empty.

Basin 7 - After the water level peaks at around 1.5 days, it then steadily decreases until it plateaus around 6 days, where the water level decreases slowly over time. It then takes an additional 3.4 days for the basin to 100% drain. The water level drops below 50mm at around 6 days and remains below 50mm for 3.4 days until it is 100% empty.

Basin 8 - After the water level peaks at around 1.5 days, it then steadily decreases until it plateaus around 4.5 days, where the water level decreases slowly over time. It then takes an additional 10.5 days for the basin to 100% drain. The water level drops below 50mm at around 3.75 days and remains below 50mm for just under 11.25 days until it is 100% empty.

Basin 9 - After the water level peaks at approximately 1.5 days, the depth steadily decreases until approximately 12 days when it begins to plateau and slow down. It then takes an additional 3 days the 100% drain. The water level drops below 50mm at approximately 12 days and stays below 50mm until the basin is completely empty.

Basin 10 –the water level drops below 50mm at around 1.2 days and stays below 50mm for an additional 0.1 days until completely empty at 1.3 days.

Drainage will be well-maintained, meaning there will be constant movement of water out of ponds 2-9 and they will not tend to retain water. Basins 2-9 are expected to be dry throughout the majority

of the year. The depth of the water is relevant to duck, goose and swan species. The expected depth of the ponds 72 hours after a 1 in 30 year storm event are all low enough to not be attractive to geese or swans (see Table 3.1).

Even following a critical storm event (1 in 100 year storm + 40% Climate Change) all of the basins will be completely dry following a maximum period of just over two weeks (see Table 3.1). It is important to note that for the majority of the time following the critical storm event, the water level would be exceedingly shallow and would therefore be highly unlikely to attract many aviation risk species. For example, Basin 7 would only hold a maximum of 50mm water depth for 10 out of the 15 days following a critical storm event.

Ducks show preference for feeding in water with a depth of less than 500mm (excluding diving ducks)[6] but due to the short period of time during which the ponds are wet, the suitability is low. During 2022-2023 winter bird surveys, ducks were recorded irregularly and in low numbers. It is highly unlikely therefore that temporary shallow water bodies such as these would attract significant numbers of ducks.

Gull species were generally only recorded in low numbers for the majority the 2022-2023 winter bird surveys undertaken, with particularly low numbers recorded within 2km of the aerodrome runway. The only higher counts of gulls were of black-headed gulls, which were very occasionally recorded and more than 2km from the runway. It is highly unlikely that the very limited periods for which basins 2 to 9 will be wet will be sufficient to attract significant numbers of gulls.

The very low, temporary water levels also mean that Basins 2-9 have extremely limited potential for holding fish, so are less attractive to cormorant, heron and egret species for feeding.

Only Basin 1 will permanently hold any water. The original proposals for Basin 10 were for it to permanently hold water within the forebay. A vortex flow control system has been introduced into the design of Basin 10 meaning that the forebay is no longer required as part of the design. Basin 10 will therefore not permanently hold water. The forebay will be replaced with an additional area of planted grassland identical to other parts of Basin 10. As a result the extent of Basin 10 that water infiltration will increase by at least 10%.

Basin 1 is proposed at the west end of the development site over 6km from the aerodrome runway. Basin 1 would be a small wet basin of approximately 0.1ha and will permanently hold water. It would comprise a sedimentation forebay and a detention basin. The sedimentation forebay would have a permanent water depth of 1m and the detention basin a permanent water depth of 0.5m. A flow control device would control the discharge rate from the pond to the outfall ditch. From the control device, the discharge would be piped to a carrier ditch, which would outfall to the IDB ditch. The basin would be adjacent to the major roundabout junction of the A46 (Strategic route Network dual-carriageway) and the North Hykeham Relief Road Dual-carriageway. The roads and junction will generate large amounts of disturbance that will largely reduce the suitability of the waterbody for birds. Basin 1 is within an area of tree planting and fully surrounded by hedgerows, again limiting suitability for aviation risk birds through limiting sightlines and openness.

Basin 10 is proposed at the east end of the NHRR approximately 760m from the aerodrome runway. It is the only pond proposed within 2km of the aerodrome runway. Basin 10 would be adjacent to the junction of the NHRR dual carriageway, the Lincoln Eastern Bypass and the A15, with roads on two sides of the waterbody. The In addition the pond will be fully surrounded by woodland planting,

[6] Behney (2020) The Influence of Water Depth on Energy Availability for Ducks. The Journal of Wildlife Management 84(3) p. 436-447 (Available at: The Influence of Water Depth on Energy Availability for Ducks (wiley.com)).

thus further greatly reducing its suitability for aviation risk birds through limiting sightlines and openness.

Both Basins 1 and 10 are proposed in areas that have recently been recorded as holding areas of standing water (2022 and 2023 TEP Phase 1 habitat surveys). This means the proposed construction of these two waterbodies, with features and activities around them which diminish their attractiveness to birds, has low risk of attracting additional wildfowl or waterbirds as compared to the baseline numbers in this area

The drawdown zone is an important feature of any waterbody; this is the section of bank profile which is dry some of the time and wet at other times due to fluctuations in water level. Large drawdown zones in waterbodies are attractive to birds because they tend to support good amounts of invertebrate life which provide a reliable food source for birds. The banks of the each of the basins will have a steep gradient (1 in 3) which will reduce the draw down zone, reducing the suitability for feeding birds of aviation risk.

Research into SuDS design at airports has found that stormwater-management ponds at airports should minimize the pond perimeter via circular or linear designs and ponds should be located so as to reduce the number and proximity of other water resources within 1 km (Blackwell et al., 2008[7]). The designs of the SuDS basins for NHRR minimise the pond perimeter and the locations minimise the number of these SuDS features within 1km. Only Basin 10 would be within 1km of the aerodrome.

As most of the basins are within sheltered areas, adjacent to small areas of woodland, hedgerow or scrub planting at field edges, and will be disturbed by the proposed road, their attractiveness for wildfowl and waders will be greatly reduced (Freshwater Habitats Trust, 2022[8]). Waders prefer areas to feed with open sightlines and mallard prefer ponds with a loafing area that gives a good view of the surrounding landscape.[9] Species such as ducks, swans, geese and cormorant require open flight lines to land in a waterbody. The planting designs surrounding the basins will reduce these, further reducing their suitability for these birds.

[7] Blackwell, B., Schafer, L., Helon, D., Linell, M. (2008) Bird Use of Stormwater-Management Ponds: Decreasing Avian Attractants on Airports. Landscape and Urban Planning. Volume 86, Issue 2, 26 May 2008, Pages 162-170

[8] Freshwater Habitats Trust (2022). Designing Wildlife Ponds to Minimise the Risk of Birdstrike. Supplementary Advice Factsheet. https://freshwaterhabitats.org.uk/?s=birdstrike

[9] Godin and Joyner (1981) Pond ecology and its influence on Mallard use in Ontario, Canada. *Wildfowl* **32** p. 28-34 (Available at: Pond ecology and its influence on Mallard use in Ontario, Canada | Godin | Wildfowl (wwt.org.uk)).

Table 3.1 Basin Information

Basin	Distance from RAF Waddington (m)	Area that may temporarily hold water (m^2)	Area that will permanently hold water (m^2)	Depth 72 hours after a 1 in 1 year storm event (mm)	Depth 72 hours after a 1 in 30 year storm event (mm)	Basin drain down time in days following critical storm (1 in 30 return period + 40% CC)*	Basin drain down time in days following critical storm (1 in 100 return period + 40% CC)*
Basin 1	6,422	-	1,311	-	-	-	-
Basin 2	6,075	2,340	-	107	100	7.2	8.3
Basin 3	5,958	4,240	-	119	266	8.3	10.2
Basin 4	5,215	2,264	-	11	17	8.4	10.5
Basin 5 (N1)	5,088	182	-	4	0	1.7	2.5
Basin 5 (N2)	5,181	282	-	15	0	0.3	1.6
Basin 5 (N3)	5,190	297	-	0	0	0.5	1.6
Basin 6	3,912	2,982	-	37	436	7.5	10.2
Basin 7	3,738	1,175	-	128	321	9.4	15.0
Basin 8	2,605	5,741	-	88	77	15	15.0
Basin 9	2,301	11,412	-	185	335	15	15.0
Basin 10	765	5,014	0	0#	0#	1.3#	2.0#

*It is important to note that this represents the time period taken for the basin to become completely dry. The basins will hold very shallow water for much of this time period, e.g. Basin 7 will hold a depth of less than 50mm for a period of approximately 10 out of the 15 days presented above following a critical storm event.

3.1.4 Operation

During operation the risk of birdstrike will not be significantly increased as compared to the existing situation:

- The proposed development is a dual carriageway road, unsuitable for use by species that pose an aviation birdstrike risk;
- The attenuation basins will not hold water for prolonged periods of time, thus not attracting wildfowl and waders (See Table 3.1);
- The attenuation basins and wildlife ponds will be in areas and within landscape features that reduce their attractiveness for species that are an aviation birdstrike risk, such as waders and wildfowl. See 3.2.3 for explanation.

Feeding of birds, particularly of wildfowl at ponds or swales by people could attract flocks of birds. It is highly unlikely that persons feeding birds, particularly wildfowl at ponds or swales, could attract flocks of birds associated with bird strike. The basins will be close to the road, with no general access to persons on foot and no parking provision nearby.

Tree or hedgerow planting within the landscaping may provide additional nesting opportunities for various bird species including woodpigeon, rooks and jackdaws. It is not considered likely that the

proposed planting will result in a significant increase in flocks of birds, as there are already significant areas of woodland and scrub in the surrounding area that provide a food resource throughout the year for birds.

3.2 Bird Strike Hazard Mitigation Measures

3.2.1 Broken Ground and Exposed Topsoil

Areas to be subject to ground stripping will require specific measures to reduce the identified risks. During the construction period proactive and structured communication and engagement will be employed with RAF Waddington regularly updating them on activities being undertaken. The full communication protocol is provided at Section 3.3.

Soil stripping by excavator will be undertaken immediately following the removal of the vegetation by herbicide and other similar methods. Stripped topsoil will be transferred to dumper trucks which will stockpile the topsoil in accordance with the Soil Management Plan.

The planting will be phased to ensure topsoil exposure at any given time is minimised. Ground works will be completed as near to the planting date as possible. Scattering of large quantities of seeds over open ground or overseeding will also be avoided, as this could attract foraging birds.

Any localised excavations will be controlled and planned by the site manager to minimise open areas at any given time. Unsuitable and surplus spoil will be loaded into wagons and removed from site on a frequent basis to minimise accumulation. Suitable spoil for backfilling the excavations will be stockpiled adjacent to the works and excavations backfilled and the ground reinstated promptly. Dependant on the location of these excavations within the overall site, excavations within areas that are to be retained as soft landscaping to be promptly reinstated via sowing with treated seed subject to it being an appropriate time of year for seeding.

3.2.2 Prevention of Ponding

Formation of waterlogged areas or pooling will be minimised by the following steps:

- Limiting time that underlying ground is exposed as detailed above;
- Adequately reinstating excavations upon completion;
- The machines involved in the demolition will be tracked so that the risk of rutting will be reduced;
- The site manager will monitor the condition of the surface on a daily basis. If there is any indication of ponding, remedial steps will be taken to regrade the area to even the surface to prevent further ponding.

3.2.3 Landscape Design & SuDS

Tree or hedgerow planting within the landscaping may provide additional nesting opportunities for various bird species including woodpigeon, rooks and jackdaws. It is not considered likely that the proposed planting will result in a significant increase in flocks of birds as there are already significant areas of woodland and scrub in the surrounding area that provide a food resource throughout the year.

Regular maintenance undertaken on the attenuation basins and infiltration ponds will include removal of silt and regular checking for damage, to ensure they are fully effective, see NHRR-TEP-EGN-HYKE-RP-LE-30022 SuDS Management Plan for further details. Ensuring they are fully

effective and draining correctly means the potential for creating extra standing water in the area and attracting waterfowl or other birdstrike risk species is very low.

3.2.4 Other Considerations for Construction Phase

During construction, the presence of workers and site activities would reduce the likelihood of large flocks of birds accumulating on site. During the breeding bird season (March-August inclusive) works will be at their highest with areas no left dormant for any period of time. Therefore it is highly unlikely that the site would attract ground nesting waders.

During the construction phase a nominated staff member, based on site, will highlight if any large flocks of birds have been noted on any part of the site (See section 3.3).

The nominated person should also check all drainage outflows on a weekly basis to ensure they are functioning and kept clear of debris, the frequency should be increased following periods of heavy rainfall, after any major storm they should be checked the day after. This will limit the potential for a build-up of rainwater on site and reduce the likelihood of wildfowl/wader flocks forming.

Waste bins and skips will be self-closing to prevent bird access, with the storing of food waste in the open in plastic bags prohibited, due to the risk of the bags being accessed by scavenging birds and mammals.

Briefing of the required control measures to all site personnel is essential and failure to comply with this plan by any individual that results in a potential risk to aviation is a criminal offence and this will be explained to all personnel involved in the project.

3.3 Objectives, Targets and Monitoring

It is considered very unlikely that the site will attract significantly higher numbers of birds than what is already within the area during construction, given the nature of the site and the nature of the activities. This opinion is based on the following information:

- Baseline winter bird surveys undertaken in 2022-2023 confirm that although the survey area supports a range of aviation risk bird species, the majority of these birds are present in low numbers (both within 2km of the runway and also further than 2km).
- Nearly all SuDS features are designed as infiltration basins which will only hold water for very short periods after storm events.
- Any trees planted during the construction period are highly unlikely to produce fruit during the construction period.
- Any trees planted during the construction period will be too small to provide either nesting or roosting habitat for birds

3.3.1 Bird Monitoring Methodology

Bird monitoring objectives

The primary purpose for bird monitoring during construction will be to identify flocks of any aviation risk bird species within the NHRR monitoring area. This information will be carefully recorded and reported to RAF Waddington. During this bird monitoring if bird flocks are observed which exceed

abundance thresholds identified in this report, this would trigger immediate communication with RAF Waddington and potentially bird control measures.

Monitoring Area

The NHRR monitoring area includes the entire development. Any bird flock that straddled the site boundary would also be recorded. Incidental observations of any large flocks of birds outside of the site boundary within 500m of the site would also be passed on to RAF Waddington.

Monitoring Frequency

Monitoring visits will be completed once a day during the winter period which is taken to commence on the 1st September and finish on 31st March. In the event that bird thresholds are being exceeded for three or more consecutive days, adaptive management would be employed which would increase the frequency of monitoring visits from once a day to twice a day.

Monitoring visit frequency would be continued at a frequency of once a day during the breeding bird period which is taken to commence on the 1st April and finish on the 31st August. In the event that bird thresholds are being exceeded for two or more consecutive days, adaptive management would be employed which would increase the frequency of monitoring visits from once a day to twice a day.

Timing of Monitoring Visits

The timing of each monitoring visit would be varied from one day to the next with some visits commencing at sunrise or midday or three hours prior to sunset. There would be a bias towards undertaking these visits commencing at sunrise or finishing at sunset since these periods are important for foraging and roosting flocking bird species. However, if monitoring visits indicate that a particular time of the day is more important for flocking birds within the survey area then adaptive management would be employed to bias the timing of monitoring visits to capture this period.

It is envisaged that each monitoring visit will last between two and three hours depending on the number of birds present to be recorded. A clearly defined survey route would be followed by the surveyor on each visit which would entail visiting a number of predefined viewpoints within the overall survey area. Viewpoints would be more frequent for parts of the survey area located within 2km of the runway. Elsewhere further than 2km from the runway fewer viewpoints would be utilised.

If it is known from previous visits that any particular SuDS basin is completely dry and therefore not attractive to birds. On this basis it would be appropriate to not visit a completely dry SuDS basin provided that no rainfall had occurred since the previous monitoring visit. However, a precautionary approach would be taken and SuDS basins would still be visited if there was any uncertainty over whether or not they were dry.

The locations of all viewpoints would be identified during a scoping visit which would be undertaken prior to the commencement of site clearance construction activities. These viewpoints would cover all SuDS features within the survey area as well as suitable locations for viewing agricultural fields.

Once the locations of the viewpoints have been identified and mapped, this will be shared with RAF Waddington Aerodrome who would be invited to provide feedback.

The site manager will appoint a responsible employee to carry out bird monitoring, the 'bird monitor'. The bird monitor will be briefed by an ecologist on how to recognise and count birds on site and will undertake this during the working day. They will record the maximum observed number of the target species, as listed above, on a bird monitoring record sheet which will be maintained in

a designated area in the welfare facilities. Any instances of these targets being exceeded must be reported immediately to the site manager. These results will be relayed to the TEP project ornithologists on a routine basis. Consultant attendance will be provided throughout the scheme construction.

Thresholds

It has been determined that the following numbers would represent thresholds for the maximum numbers of the most hazardous species. When an individual threshold is met it is understood that action may be required to reduce bird numbers to below the threshold. These thresholds are presented in Table 3.2 (winter period) and Table 3.3 (breeding period), and relate to the total number of birds recorded in each distance band.

Table 3.2 Acceptable total counts of Birdstrike Risk Species per distance band – Winter period only

Species	Threshold for 0-1km	Threshold for 1-2km	Threshold for 2-6 km
Gulls (all species combined)	20	30	120
Geese (all species combined)	5	10	50
Swans (all species combined)	5	10	70*
Ducks (all species combined)	10	20	80
Waders (all species combined)	10	20	80*
Pigeons (all species combined)	20	30	150
Starlings	50	50	250*
Thrushes (fieldfare and redwing)	50	50	250*
Corvids (crows, rooks and jackdaws only)	20	30	150

*** Due to the nature conservation importance of certain bird species exceeding thresholds, particularly for the distance band 2-6km while reportable, would most likely not result in active bird control.**

 # Please note: Bird counts relate to adult birds and fully grown juveniles. Flightless birds to be disregarded.

Table 3.3 Acceptable total counts of Birdstrike Risk Species per distance band – Breeding period only

Species	Threshold for 0-1km	Threshold for 1-2km	Threshold for 2-6 km
Gulls (all species combined)	20	30	120
Geese (all species combined)	5	10	50
Swans (all species combined)	5	5	30
Ducks (all species combined)	10	15	70
Waders (all species combined)	10	15	70
Pigeons (all species combined)	20	30	150
Starlings (only post breeding flocks)	50	50	250*
Corvids (crows, rooks and jackdaws only)	20	30	150

*** Due to the nature conservation importance of certain bird species exceeding thresholds, particularly for the distance band 2-6km while reportable, would most likely not result in active bird control.**

 # Please note: Bird counts relate to adult birds and fully grown juveniles. Flightless birds to be disregarded.

Performance against these targets will be monitored, recorded and reported throughout relevant elements of the works as detailed above. Failures to keep below these targets will be reported and managed as detailed below.

Compliance with the BHMP will be monitored, measured and recorded as part of the overall monitoring and measurement of health and safety on site, which includes:

- Continual monitoring by the site manager, resolving and recording any issues in the site diary.
- The site manager will monitor progress with the work to ensure open areas are minimised in accordance with the relevant section above and prevention of ponding on site.
- Formal weekly monitoring of health and safety on site, which will be recorded on the company standard monitoring form, which will include documented checks of bird hazard controls.
- Formal audits of health and safety will be carried out by company H&S Advisor or Contracts Manager and recorded on the company standard audit form, which will also be amended to specifically include bird hazard control measures.
- Ad hoc comments on adequacy of measures and compliance with the plan will be recorded by the site manager in the site diary.

- All monitoring and audit reports will be copied to the Contracts Manager and the relevant ecologist to ensure all issues resolved and any underlying issues identified are resolved in accordance with the protocol set out below.
- All monitoring and audit reports will be made available to RAF Waddington on request.

3.3.2 Operational Monitoring

Monitoring once the site is operational will be limited to checking the waterbodies, as once operational the NHRR will not pose a risk in attracting flocks of birdstrike risk species.

Following the construction phase, monthly visits will be undertaken to inspect the attenuation basins and infiltration ponds and record numbers of birds present on these features.

Based on the previous design of Basin 10 that had an area of permanent open water, Waddington aerodrome advised that basin 10 should have weekly visits during the operational period instead of monthly visits. This was because of the location of the basin relative to the aerodrome and also the design of the basin. Waddington aerodrome also advised that if a continuous period of monitoring had shown that basin 10 only rarely contained water and is therefore unattractive to waterbirds that this level of monitoring could be reduced to monthly visits.

Following a review of the design of Basin 10, a decision has been made by LCC Highways to take a different design approach, incorporating a vortex separator to remove solids. This modified design means Basin 10 will not have any permanent open water. The water bearing forebay has been removed from the design and the risk of attracting waterbirds is therefore greatly reduced.

Consistent with the RAF's requirement, bird and water level monitoring at Basin 10 is to be undertaken at a weekly basis, subject to review. This precautionary approach has been taken due to proximity of Basin 10 to the aerodrome rather than the potential for basin 10 to attract birds, which is now considered to be very limited. The bird monitoring priority for Basin 10 will be to commence weekly monitoring as soon as the road has been brought into operation regardless of when this takes place. Weekly monitoring will then be continued unless and until it is agreed that monitoring can be undertaken less frequently.

The first review of the frequency of monitoring will not take place until a minimum of twelve weekly monitoring visits have been completed and reported during the winter period (comprising October to March inclusive). Appendix 4 provides different scenarios of when this first review of the Basin 10 bird monitoring visit frequency would be undertaken depending on the date the road became operational.

This inclusion of winter monitoring is important since as a general rule birds tend to flock more often during the winter period. If the monitoring frequency is not reduced following the first review, further reviews of monitoring frequency would take place periodically thereafter (at not greater than quarterly intervals). Depending on results of reviews of weekly monitoring reports, LCC Highway wishes for Basin 10 monitoring visits frequency to become monthly in line with the monitoring regime of other basins within the scheme, rather than weekly.

A considerable amount of knowledge will be gained throughout the construction period bird monitoring regarding the attractiveness of the constructed SuDS features to birds. Therefore it is appropriate for this to be reviewed post construction, with a view to using Adaptive Management

to inform the operational monitoring method. This Adaptive Management could influence bot the locations of viewpoints and potentially the regularity of checks necessary.

The personnel undertaking the monitoring checks would be suitably trained and skilled to accuratley record numbers of birds and species on the basins and will be fully briefed on the BHMP, including acceptable numbers of birds observed.

It has been determined that the following numbers would represent thresholds for the maximum numbers of the most hazardous species during the operational period. When an individual threshold is met it is understood that action may be required to reduce bird numbers to below the threshold.

The thresholds for the operational period work in a different way to the thresholds for the conbstruction period since they relate to individual basins rather than distance bands from the runway.

These thresholds are presented in Table 3.4, and relate to the total number of birds recorded in each SuDS basin.

Table 3.4 Operational monitoring bird thresholds per basin – thresholds relate to individual basins* (winter and breeding seasons)

Species	**Basin 10** (within 1km of runway)	**Basin 1** (>6km from runway, but permanently wet)	**Basins 2-9*** (infiltration basins, predominantly dry, between 1 and 6km from runway)
Gulls (all species combined)	10	25	10
Geese (all species combined)	1	10	5
Swans (all species combined)	1	10	5
Ducks (all species combined)	5	20	5
Waders (all species combined)	5	20	5
Herons and Egrets (all species combined)	5	10	5

If the thresholds are reached then the number of birds, location and species recorded would be reported to RAF Waddington by LCC. All operational monitoring data would be made available to RAF Waddington on request.

3.3.3 Dispersal and Bird Control Actions

With the BHMP in place it is unlikely that dispersal and control actions will need to be applied.

Construction

The NHRR construction site will be busy and have a high disturbance level, people walking and machinery should naturally disperse any birds, not allowing large flocks to form and persist on site.

During construction in the first instance the bird monitor, or any other member of site staff can walk or drive the area within which birds have been observed to disperse them. On doing this the staff member (if not the bird monitor) will report the species and number of birds immediately to the bird monitor and site manager. The bird monitor and site manager then will judge why the area became a risk against the criteria in the bird hazard management plan e.g. that area of the site unused at that time, does a bund need to be covered, does waste management need to be improved. If no immediate action can be taken, or there is no clear cause other active bird dispersal actions may be required.

Other active bird dispersal action should be considered a last resort, the good practice guidance outlined in the BHMP should first be followed, actions include:

- Arm-waving
- Bio-acoustics (e.g. distress calls)
- Predator style decoys
- Use of approved hand-held laser

If stockpiles are observed to be attracting corvids, gulls or pigeons such that stated thresholds are being met, additional actions will be undertaken to reduce the attractiveness of stockpiles to these birds. These measures will include either removal of stockpiles, compacting them, or covering using either tarpaulins or tar spray.

If any large flock of birds are observed, immediate dispersal may cause a risk to any aircraft in the area or approaching or leaving the RAF base imminently. The risk presented by this depends on the distance from the runway. Before dispersal of a large flock RAF Waddington would be immediately notified using the mailbox, which is continually monitored. Details of the mailbox will be shared with the site manager of the relief road before work commences.

The definition of a large bird flock to be used in this instance, which would require contacting RAF Waddington prior to flushing, would be as follows:

- Any flock of birds equal or greater than the threshold number for that species within 2km of the runway
- Any flock of more than 100 birds more than 2km from the runway.

Operation

During operational checks the same dispersal actions will be undertaken as during the construction period.

3.3.4 Communication

The proposed construction methods and control measures as detailed within this BHMP will also be included within in the Reasonable Avoidance Method Statement (RAMS) and Construction Environmental Management Plan (CEMP).This is to ensure that the requirements of the BHMP are:

- Issued to any sub-contractors.
- Included in the formal and documented site induction training provided to all personnel, including all sub-contractors, site visitors and explained to visiting wagon/delivery drivers.
- Included in Site Rules, developed and managed in accordance with the CPP, which are also included in the site induction and displayed in the welfare facilities.
- Briefed to all site personnel in the form of a documented and signed tool box talk, including details of their specific and legal responsibilities.
- Included in the documented morning briefing record for each work day on site and signed by all personnel on site.
- Included in RAMS for each work activity on site, including being reflected in relevant sub-contractor's RAMS. All RAMS are also specifically briefed to personnel and signed by each individual to confirm this.

Personnel will be encouraged to provide feedback, communication will also be taken into account in terms of reviewing and improving control measures as necessary.

During the construction period there will be ongoing communication with RAF Waddington. This will include structured communication and engagement will be employed with RAF Waddington, regularly updating them on what activities are being undertaken and when these will be undertaken.

The BHMP will be approved by the Council as the planning authority. The NHRR project team are committed to liaising with RAF before seeking any changes to the BHMP but changes will be via the Council who will consult with the RAF prior to determining any request for changes to the BHMP.

The BHMP will be reviewed following construction within three months of the opening of the NHRR to taffic and five years post construction within three months of the fifth anniversary of it opening to traffic. If any necessary changes are identified during these reviews, the BHMP will be updated following the review with the agreement of all parties. The LPA will facilitate the review and agreement of the revised plan with RAF Waddington.

Short notice inspection visits by RAF Waddington or their nominated representatives will be accommodated, subject to relevant health and safety restrictions. Communications protocols will be put in place to ensure there is a direct line of communication with the relevant parties at RAF Waddington.

If necessary further action over and above that which is stated within this BHMP will be undertaken at the reasonable request of RAF Waddington.

4. CONCLUSIONS

The site of the NHRR in its current state has potential to support bird species associated with birdstrike. However, suitable habitat is not limited to the site itself as the wider habitat within and beyond 500m of the site is known to support these species. However, winter bird surveys undertaken between 2022 and 2023 found that any birdstrike risk species within the site and surrounding 500m typically only occur in low numbers that would not be of concern, particularly within 2km of the runway.

The proposals increase open areas (suitable for flocking birdstrike risk species) during construction, however works activity and measures noted as mitigation remove much of this risk.

Mitigation measures include landscape design specification, waste management, and monitoring practices. Implementing these measures will mean that the proposals would not result in an increased birdstrike risk for RAF Waddington. Bird count thresholds have been identified which will be used to determine whether a birdstrike risk is present at any stage in the future.

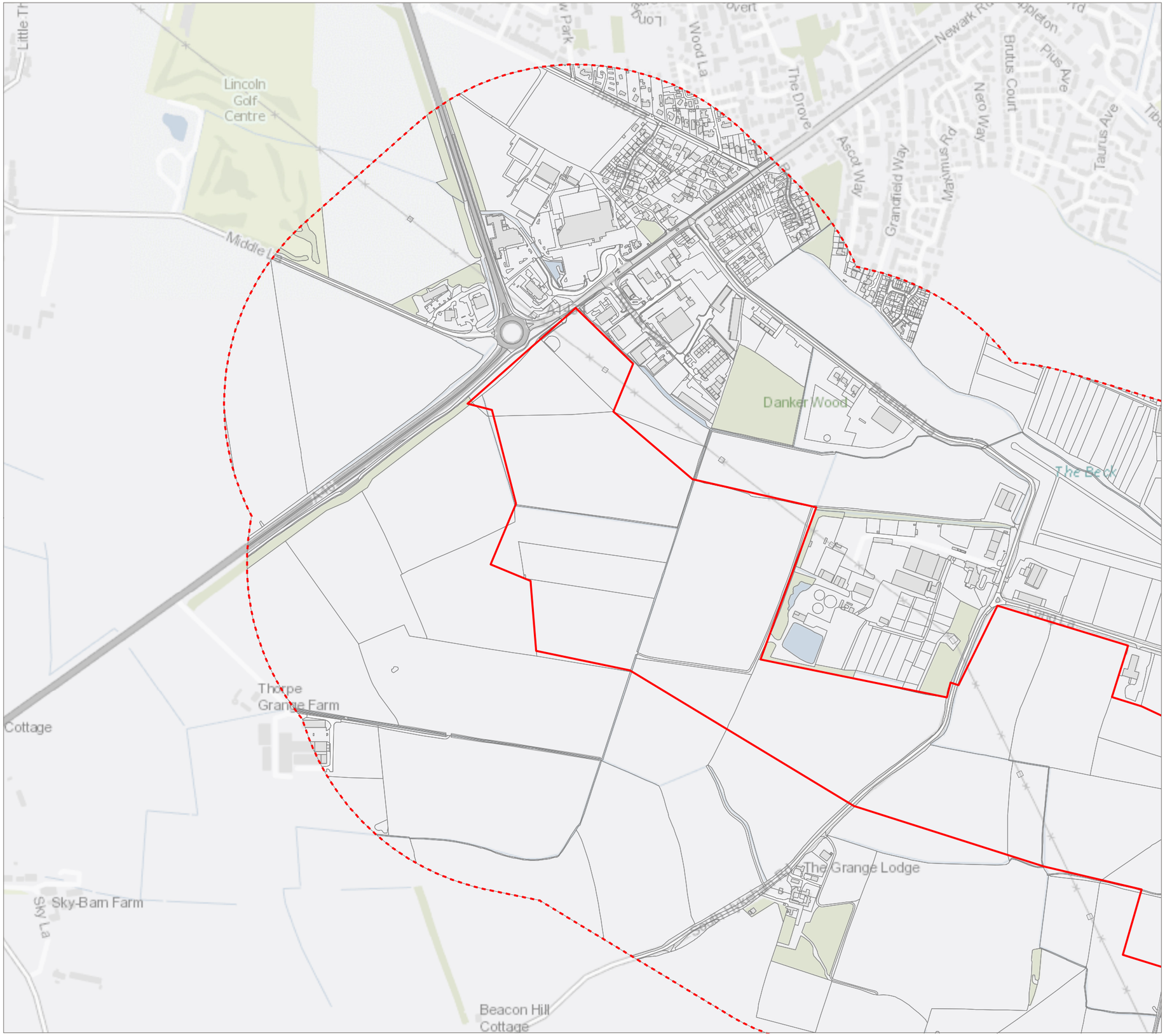
During operation the risk of birdstrike will not be significantly increased because:

- The NHRR will be a dual carriageway road, unsuitable for use by species that are a birdstrike risk;
- The attenuation basins will largely be dry or hold very minimal amounts of water unsuitable for attracting wildfowl and waders;
- The attenuation basins and infiltration ponds will be in areas, and within landscape features, that reduce their attractiveness for species that are a birdstrike risk.

Measures have been proposed in this BHMP for both the construction and operation of the NHRR to minimise risk and mitigate the potential impacts of the proposals in relation to birdstrike on a precautionary basis.

The BHMP will be carried out on site and is applied to the site itself, not the site owner. It will apply throughout the existence of the site as long as RAF Waddington is operational. During construction and aftercare implementing the BHMP will be the responsibility of the principal contractor. After this time the scheme will be owned and maintained by Lincolnshire County Council, the BHMP will need to be incorporated into the maintenance plans and documents.

APPENDIX 1 – WINTER BIRD SURVEY AREA



KEY

Winter bird survey boundary

Winter bird survey boundary - 500m buffer

Species List:

N

Visit		
Surveyor		
Date		
Time Start		
Time Finish		
Weather Conditions	**Start**	**Finish**
Temperature		
Wind Speed - Beaufort (0 - 5)		
Wind Direction (W → E)		
Rainfall (0 - 5)		
Cloud Cover (0 - 8)		
Visibilty (0 - 4)		

Rev	Description	Drawn	Approved	Date

THE ENVIRONMENT PARTNERSHIP

Genesis Centre, Birchwood Science Park, Warrington WA3 7BH
Tel 01925 844004 e-mail tep@tep.uk.com www.tep.uk.com

Project
North Hykeham Relief Road

Title
Winter Bird Survey Basemap

Drawing Number				
G9455.01.000.1				Sheet 1 of 4
Drawn	**Checked**	**Approved**	**Scale**	**Date**
CW		MHS	1:8,000 @ A3	22/09/2022

Metres
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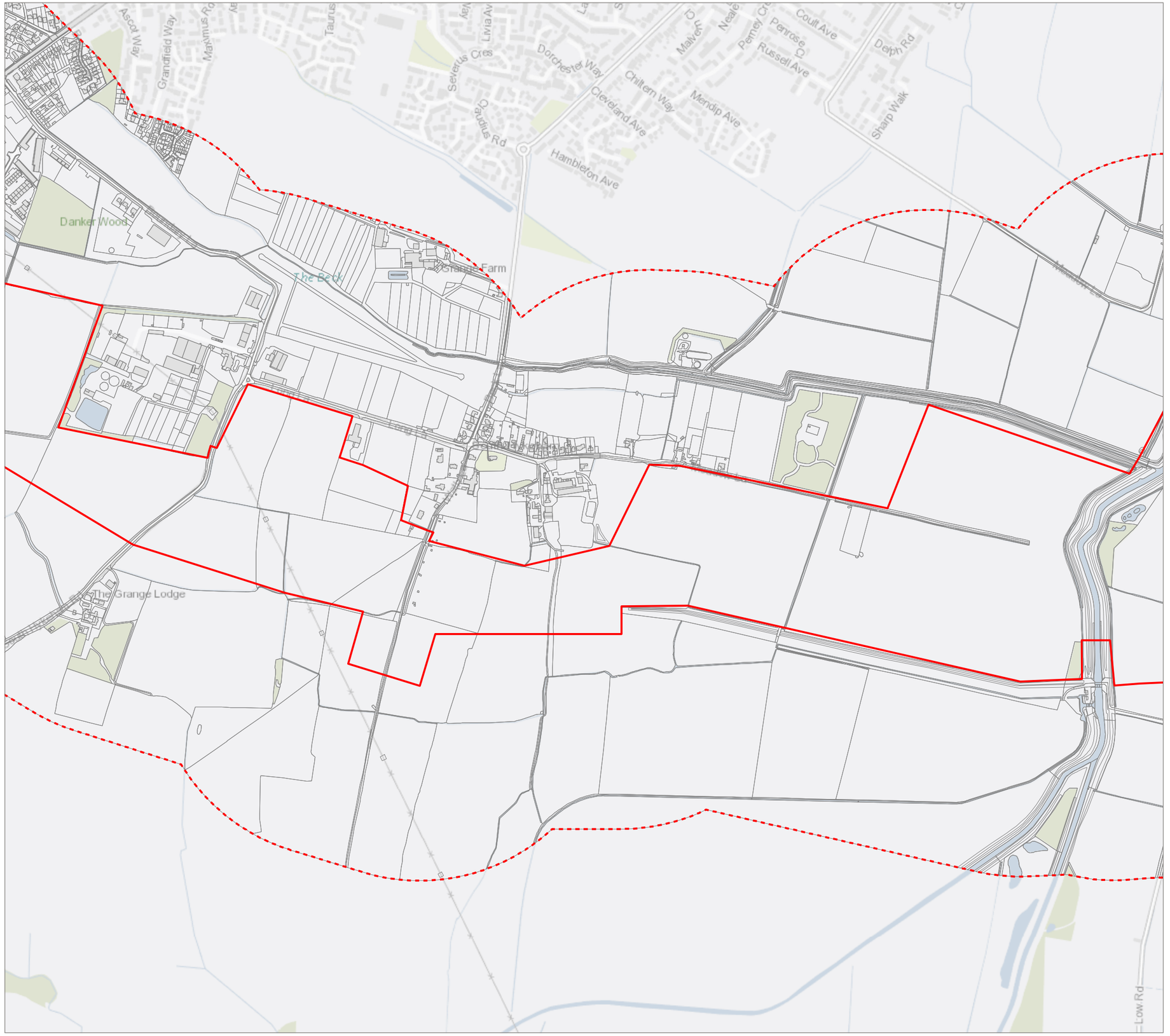

KEY

Winter bird survey boundary

Winter bird survey boundary - 500m buffer

Species List:

N

Visit		
Surveyor		
Date		
Time Start		
Time Finish		
Weather Conditions	**Start**	**Finish**
Temperature		
Wind Speed - Beaufort (0 - 5)		
Wind Direction (W → E)		
Rainfall (0 - 5)		
Cloud Cover (0 - 8)		
Visibilty (0 - 4)		

Rev	Description	Drawn	Approved	Date

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Title
Winter Bird Survey Basemap

Drawing Number
G9455.01.000.2

Sheet 2 of 4

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Metres
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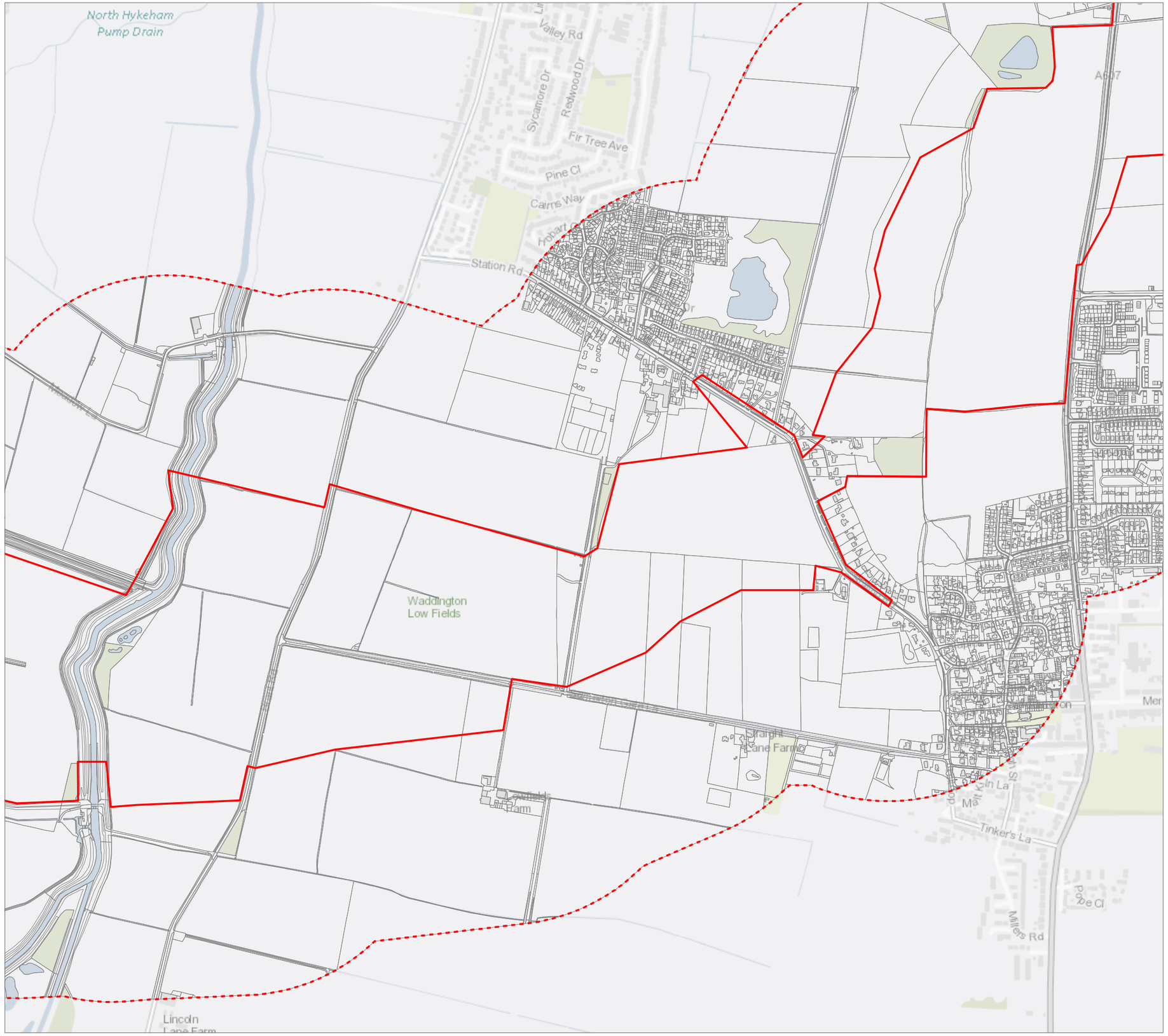

KEY

- Winter bird survey boundary
- Winter bird survey boundary - 500m buffer

Species List:

N

Visit		
Surveyor		
Date		
Time Start		
Time Finish		
Weather Conditions	**Start**	**Finish**
Temperature		
Wind Speed - Beaufort (0 - 5)		
Wind Direction (W → E)		
Rainfall (0 - 5)		
Cloud Cover (0 - 8)		
Visibilty (0 - 4)		

Rev	Description	Drawn	Approved	Date

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Title
Winter Bird Survey Basemap

Drawing Number
G9455.01.000.3

Sheet 3 of 4

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Metres
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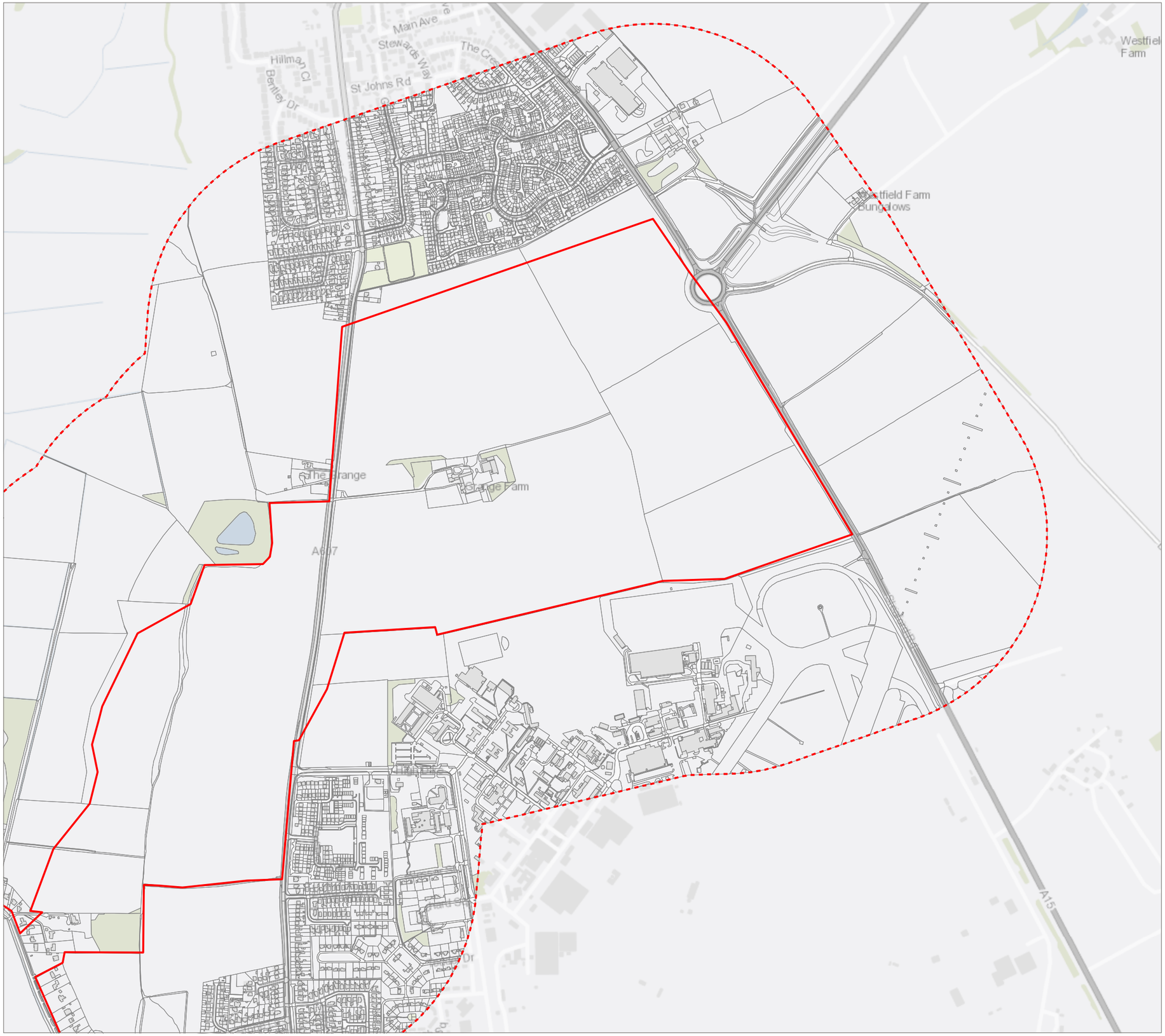

Metres
0 50 100 200 300 400 500

KEY

Winter bird survey boundary

Winter bird survey boundary - 500m buffer

Species List:

N

Visit		
Surveyor		
Date		
Time Start		
Time Finish		
Weather Conditions	**Start**	**Finish**
Temperature		
Wind Speed - Beaufort (0 - 5)		
Wind Direction (W → E)		
Rainfall (0 - 5)		
Cloud Cover (0 - 8)		
Visibilty (0 - 4)		

Rev	Description	Drawn	Approved	Date

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Title
Winter Bird Survey Basemap

Drawing Number
G9455.01.000.4

Sheet 4 of 4

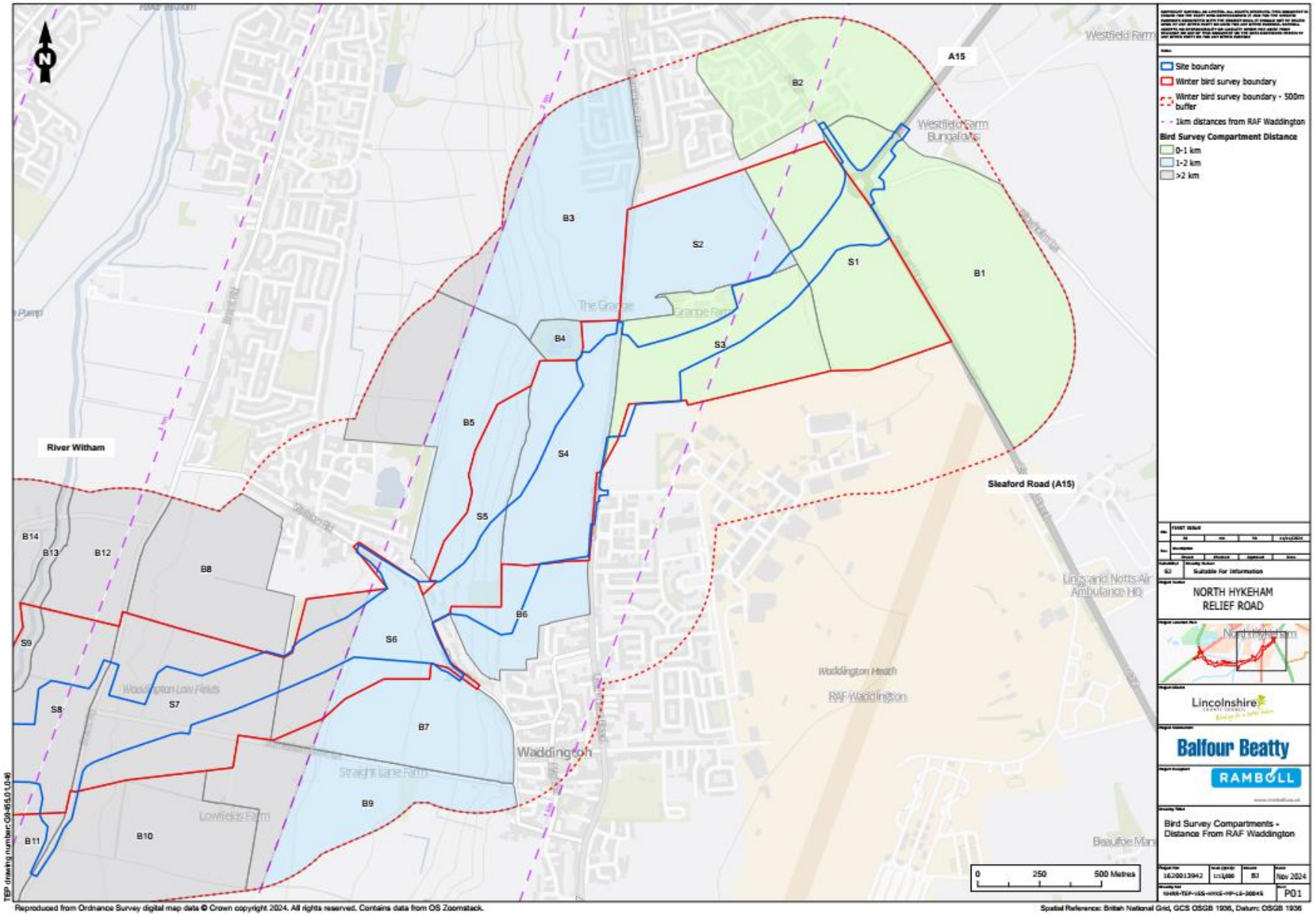
Drawn	Checked	Approved	Scale	Date
CW		MHS	1:10,000 @ A3	22/09/2022

APPENDIX 2 – DETAILED BIRD SURVEY RESULTS

Winter Bird Survey 2022 to 2023

- Seven survey visits – monthly Oct to Apr
- The entire redline plus 500 m buffer
- The redline did change but coverage remains good
- Survey area not regularly used by waders
- Common gull in highest numbers
- Very few geese within 2km runway
- Starling most abundance winter species (followed by woodpigeon)

Survey compartments relative to RAF Waddington



Black-headed gull

Date	Distance from runway				Total count
	0-1km	1-2km	2-6km	6km+	
18/10/2022		38	350		388
18/11/2022		6	6		12
19/11/2022					
15/12/2022	1		18	2	21
16/12/2022					
16/01/2023	2	6	111		119
17/01/2023					
17/02/2023		11	1		12
09/03/2023	12	7	70	2	91
10/03/2023					
18/04/2023		2	48		50

Common gull

Date	Distance from runway				Total count
	0-1km	1-2km	2-6km	6km+	
18/10/2022					0
18/11/2022		3			3
19/11/2022					
15/12/2022	8	1	6		15
16/12/2022					
16/01/2023	43				43
17/01/2023					
17/02/2023					0
09/03/2023	92	1			93
10/03/2023					
18/04/2023			1		1

Large gulls

Date	Distance from runway								Total count
	0-1km		1-2km		2-6km		6km+		
	Herring	Lesser black-backed	Herring	Lesser black-backed	Herring	Lesser black-backed	Herring	Lesser black-backed	
18/10/2022		13	1	5	2				21
18/11/2022			1						1
19/11/2022									
15/12/2022									0
16/12/2022									
16/01/2023			2						2
17/01/2023									
17/02/2023							4		4
09/03/2023			1			1			2
10/03/2023									
18/04/2023			1						1

Canada and greylag geese

Date	Distance from runway								Total count
	0-1km		1-2km		2-6km		6km+		
	Canada Goose	Greylag Goose	Canada Goose	Greylag Goose	Canada Goose	Greylag Goose	Canada Goose	Greylag Goose	
18/10/2022									0
18/11/2022									0
19/11/2022									
15/12/2022									0
16/12/2022									
16/01/2023					12	2			14
17/01/2023									
17/02/2023									0
09/03/2023					43	1			44
10/03/2023									
18/04/2023			2			1			3

Whooper swan

Date	Distance from runway				Total count
	0-1km	1-2km	2-6km	6km+	
18/10/2022	7(f)				0
18/11/2022			1		1
19/11/2022					
15/12/2022			1		1
16/12/2022					
16/01/2023			1		1
17/01/2023					
17/02/2023			1		1
09/03/2023			1		1
10/03/2023					
18/04/2023					0

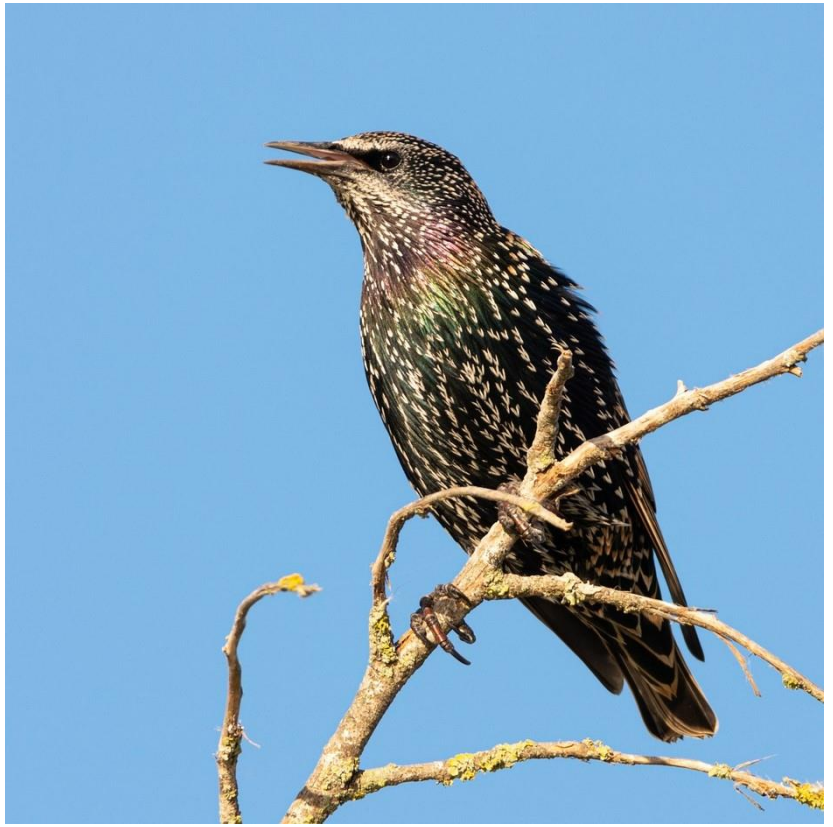
(f) = Birds were in flight

Mute swan

Date	Distance from runway				Total count
	0-1km	1-2km	2-6km	6km+	
18/10/2022			1		1
18/11/2022			6		6
19/11/2022					
15/12/2022			22		22
16/12/2022					
16/01/2023			49		49
17/01/2023					
17/02/2023			69		69
09/03/2023			59		59
10/03/2023					
18/04/2023			38		38

Starling

Date	Distance from runway				Total count
	0-1km	1-2km	2-6km	6km+	
18/10/2022	45		5		50
18/11/2022			28		28
19/11/2022					
15/12/2022	4		31		106
16/12/2022			71		
16/01/2023		2	57		59
17/01/2023					
17/02/2023	11	56	15		82
09/03/2023	231	82	143		478
10/03/2023			22		
18/04/2023					0



Redwing and fieldfare

Date	Distance from runway								Total count
	0-1km		1-2km		2-6km		6km+		
	Redwing	Fieldfare	Redwing	Fieldfare	Redwing	Fieldfare	Redwing	Fieldfare	
18/10/2022									0
18/11/2022					3	42			52
19/11/2022							5	2	
15/12/2022	17	16	9	162	61	77	22	58	530
16/12/2022						125			
16/01/2023		13	47	2	11	410			504
17/01/2023							18	3	
17/02/2023		27	5	11	3				46
09/03/2023		26	4		11	40			157
10/03/2023					76				
18/04/2023									0

Rook

Date	Distance from runway				Total count
	0-1km	1-2km	2-6km	6km+	
18/10/2022	10	10	10		30
18/11/2022	1	4	15		20
19/11/2022					
15/12/2022	8		75		83
16/12/2022					
16/01/2023			87		87
17/01/2023					
17/02/2023		10	99		109
09/03/2023			60		60
10/03/2023					
18/04/2023					0

Stock dove and woodpigeon

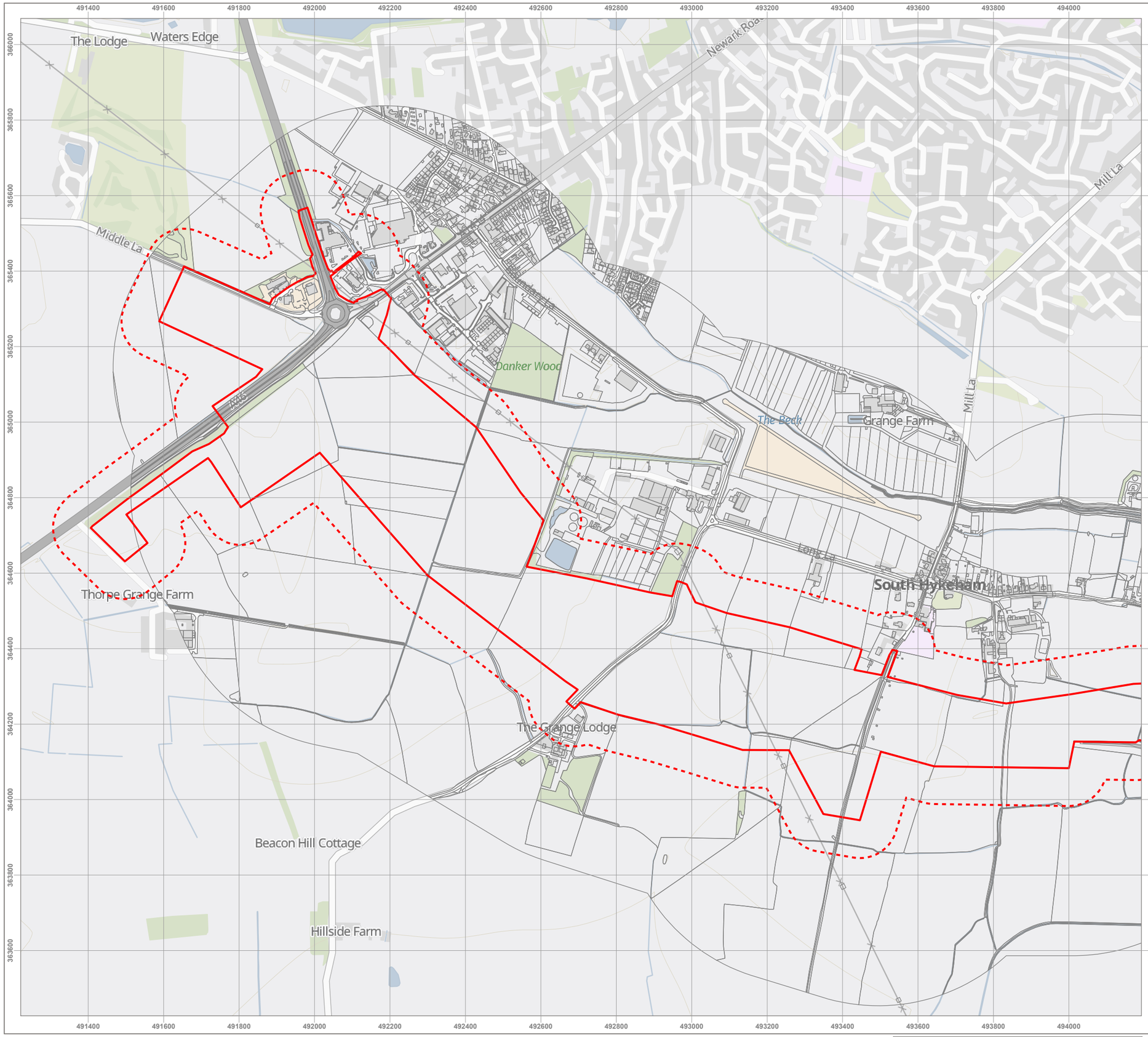
Date	Distance from runway								Total count
	0-1km		1-2km		2-6km		6km+		
	Stock Dove	Woodpigeon	Stock Dove	Woodpigeon	Stock Dove	Woodpigeon	Stock Dove	Woodpigeon	
18/10/2022		180		20		100		110	410
18/11/2022	16	86		19	5	103			295
19/11/2022							35	31	
15/12/2022		157	1	23	5	74		186	574
16/12/2022					13	115			
16/01/2023		73	25	215	1	21		82	727
17/01/2023						310			
17/02/2023		47		75	2	318		2	444
09/03/2023	1	132	1	171	4	188		79	898
10/03/2023						315		8	
18/04/2023		29	2	41	5	276		46	399

Breeding Bird 2023 survey results in brief

- Six visits 24th March to 3rd July 2023 covering site and 100 m buffer

- Rooks common and widespread – peak 243 – both rookies > 2km from runway
- Gulls in much lower numbers – peak black-headed gull was 38
- Mute swan family groups along River Witham
- Woodpigeon small groups widespread
- Lapwing did not breed – peaks of 82 and 24 in July

APPENDIX 3 – BREEDING BIRD SURVEY AREA



KEY

- Breeding bird survey boundary
- Breeding bird survey boundary - 100m buffer

Species List:

N

Visit		
Surveyor		
Date		
Time Start		
Time Finish		
Weather Conditions	**Start**	**Finish**
Temperature		
Wind Speed - Beaufort (0 - 5)		
Wind Direction (W → E)		
Rainfall (0 - 5)		
Cloud Cover (0 - 8)		
Visibilty (0 - 4)		

Rev	Description	Drawn	Approved	Date

TEP THE ENVIRONMENT PARTNERSHIP

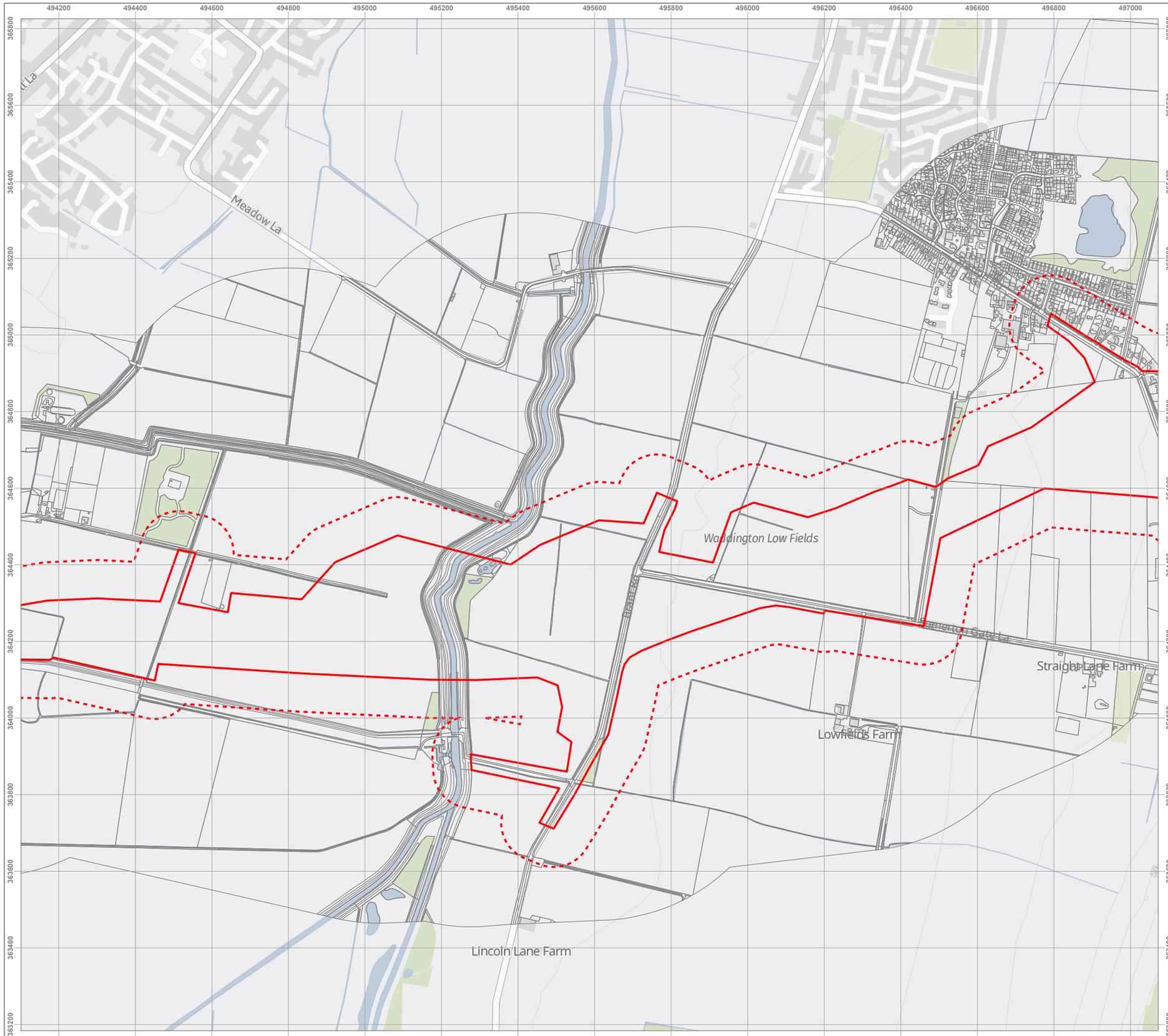
Genesis Centre, Birchwood Science Park, Warrington WA3 7BH
Tel 01925 844004 e-mail tep@tep.uk.com www.tep.uk.com

Project
North Hykeham Relief Road

Title
Breeding Bird Survey Basemap
OS

Drawing Number
G9455.01.1

Drawn	Checked	Approved	Scale	Date
AR	##	MHS	1:10,000 @ A3	17/03/2023



KEY

- Breeding bird survey boundary
- Breeding bird survey boundary - 100m buffer

Species List:

N

Visit		
Surveyor		
Date		
Time Start		
Time Finish		
Weather Conditions	Start	Finish
Temperature		
Wind Speed - Beaufort (0 - 5)		
Wind Direction (W → E)		
Rainfall (0 - 5)		
Cloud Cover (0 - 8)		
Visibilty (0 - 4)		

Rev	Description	Drawn	Approved	Date

TEP THE ENVIRONMENT PARTNERSHIP

Genesis Centre, Birchwood Science Park, Warrington WA3 7BH
Tel 01925 844004 e-mail tep@tep.uk.com www.tep.uk.com

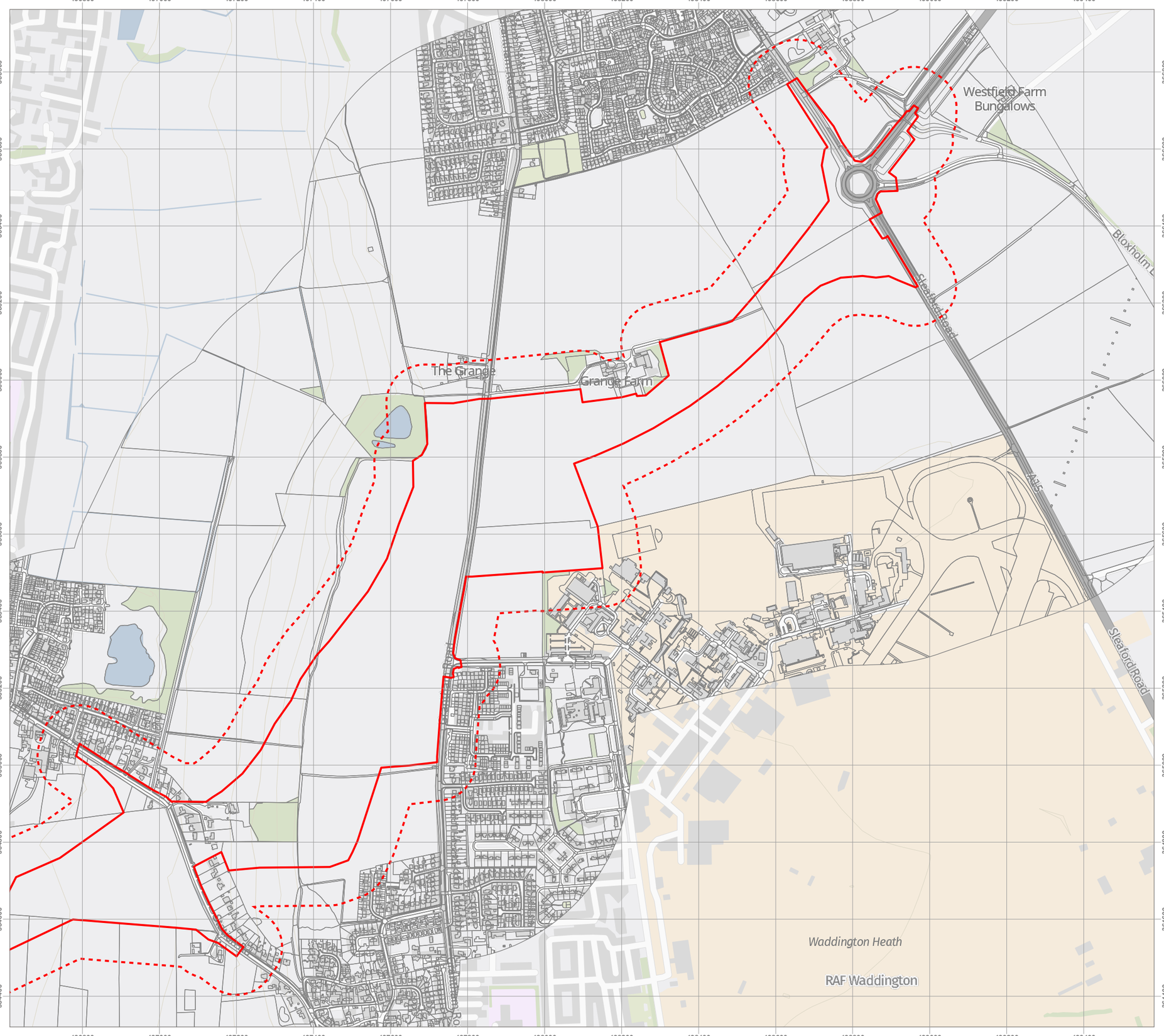
Project
North Hykeham Relief Road

Title
Breeding Bird Survey Basemap
OS

Drawing Number
G9455.01.2

Drawn	Checked	Approved	Scale	Date
AR	##	MHS	1:10,000 @ A3	17/03/2023

Metres
0 100 200 400 600



KEY

- Breeding bird survey boundary
- Breeding bird survey boundary - 100m buffer

Species List:

N

Visit		
Surveyor		
Date		
Time Start		
Time Finish		
Weather Conditions	Start	Finish
Temperature		
Wind Speed - Beaufort (0 - 5)		
Wind Direction (W → E)		
Rainfall (0 - 5)		
Cloud Cover (0 - 8)		
Visibilty (0 - 4)		

Rev	Description	Drawn	Approved	Date

TEP THE ENVIRONMENT PARTNERSHIP

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Project
North Hykeham Relief Road

Title
Breeding Bird Survey Basemap
OS

Drawing Number
G9455.01.3

Drawn	Checked	Approved	Scale	Date
AR	##	MHS	1:10,000 @ A3	17/03/2023

APPENDIX 4 – DIFFERENT SCENARIOS FOR THE TIMING OF THE FIRST REVIEW OF BIRD MONITORING VISIT FREQUENCY AT BASIN 10

Date NHRR first brought into operation	Date of monitoring review ensuring 3 months of winter monitoring data have been reported
1st January	1st April
1st February	1st November
1st March	1st December
1st April	1st January (following year)
1st May	1st January (following year)
1st June	1st January (following year)
1st July	1st January (following year)
1st August	1st January (following year)
1st September	1st January (following year)
1st October	1st January (following year)
1st November	1st February (following year)
1st December	1st March (following year)