MOTT MACDONALD

# King’s Lynn – Parkway

## Breeding Bird Survey

December 2019

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# Executive summary

Mott MacDonald Ltd was commissioned by the Borough Council of King's Lynn and West Norfolk to conduct a Breeding Bird Survey (BBS) on several land parcels bordering the Gaywood and Fairstead estates in King's Lynn. In the United Kingdom, wild birds, their eggs and nests are protected under the Wildlife and Countryside Act, 1981 (as amended) and the Protection of Birds Act 1954. In total, 34 species of bird were recorded from the three surveys at the project site, with all apart from one being included in analysis. Five species present at the project site were confirmed to be breeding, a further 10 species are categorised as 'probable' breeding species and 15 are possibly breeding. Data analysis allowed the breeding bird community to be classified as one of local importance. The potential impacts of the proposed development and the mitigation actions intended to reduce these impacts are outlined herein.

# 1 Introduction

## 1.1 Background

Mott MacDonald Ltd was commissioned by the Borough Council of King's Lynn and West Norfolk to conduct a Breeding Bird Survey (BBS) of several land parcels bordering the Gaywood and Fairstead estates in King's Lynn. The area is intended to be developed into social housing, offering over 300 new homes, hereafter this project will be referred to as the Proposed Scheme.

This report will be used to inform the mitigation strategy(s) necessary to comply with the legal protection and conservation status of the wildlife present at the site.

## 1.2 Description of the Proposed Scheme

The Proposed Scheme includes several main features, the first is a road bridge that will form a connection to the site at the south east corner. The bridge will run north – south to the east of the Anglia Water reservoir (Sections 5 & 6, Appendix A: Figure A.4). This will enter the site and connect to the eastern housing development (Section 3, Appendix A: Figure A.4). This section of housing will be connected via a link road to another area of housing situated to the east of the King's Lynn academy (Section 1, Appendix A: Figure A.4).

## 1.3 Legislation

In the United Kingdom, wild birds, their eggs and nests are protected under the Wildlife and Countryside Act, 1981 (as amended) and the Protection of Birds Act 1954. Offences under these acts include:

- Intentionally kill, injure or take any wild bird.
- Intentionally take, damage or destroy the nest of any wild bird while it is in use or being built.
- Intentionally take or destroy the egg of any wild bird.
- Have in one's possession or control any wild bird, dead or alive, or any part of a wild bird, which has been taken in contravention of the Act or the Protection of Birds Act 1954.
- Have in one's possession or control any egg or part of an egg which has been taken in contravention of the Act or the Protection of Birds Act 1954.
- Use traps or similar items to kill, injure or take wild birds.
- Have in one's possession or control any bird of a species occurring on Schedule 4 of the Wildlife and Countryside Act unless registered, and in most cases ringed, in accordance with the Secretary of State's regulations.
- Intentionally or recklessly disturb any wild bird listed on Schedule 1 while it is nest building, or at a nest containing eggs or young, or disturb the dependent young of such a bird.

Birds listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) have further protection making it an offence to intentionally or recklessly disturb any wild bird listed on Schedule 1 while it is nest building, or at/near a nest containing eggs or young, or to disturb the dependent young of such a bird.

The UK Biodiversity Action Plan (UK BAP) 1994 – 2010 has been superseded by the UK Post2010 Biodiversity Framework covering the period 2011 - 2020. UK BAP priority habitats and species were used to form the basis for the statutory list of habitats and species of 'principal

importance for the conservation of biodiversity in England' under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

Section 40 of the NERC Act 2006 requires public bodies, including local authorities, 'to have regard to the conservation of biodiversity in England' when carrying out their normal functions. The list of species of 'principal importance for the conservation of biodiversity in England' (Section 41) guides public bodies in implementing their duty. The Local Authority therefore must consider the impact on biodiversity of the proposed development.

# 2 Methodology

## 2.1 Desk Study

A desk study was conducted to inform the survey strategy at the Project Site and assess any potential impacts on nearby designated sites. Through the use of Google maps, Magic (DEFRA, 2019) and the JNCC website, it was determined that no Natura 2000 sites will be impacted by the Proposed Scheme. Using google maps and online resources yielded valuable information about the habitats present and aided with the design of the transects and positioning of the point count locations.

## 2.2 Field surveys

### 2.2.1 Study Area

The study area for the Breeding Bird Survey is located south of the Gaywood estate in King's Lynn, Norfolk. The survey area is comprised of the site area plus a 250m buffer. Appendices; Appendix A: Figure A.1 shows the approximate site boundary and the 250mm buffer. The project site can be broken into seven main sections (Appendices; Appendix A: Figure A.4). The Zone of Influence (ZoL) was used to inform the survey area, due to the layout of the project site and the surrounding habitat types, the ZoL is largely confined to within the survey area. The 'zone of influence' for a project is the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities. However, as many species of bird migrate the ZoL (species dependent) extends far beyond the survey area. For the purpose of the report and the mitigation actions outlined within, the ZoL can be taken to be the survey area.

### 2.2.2 Methodology

Field methods were based on the British Trust for Ornithology's Common Bird Census (Marchant, 1983) with the number of visits undertaken in accordance with Scottish Natural Heritage (2005; 2009). For each survey the site was surveyed in its entirety, using carefully designed defined transects, to cover all the habitats present within the site.

An initial site visit was carried out to assess the sites' accessibility, habitat types and to help inform the Breeding Bird Survey strategy. The two transects were designed based upon the information gathered from the initial site visit and the desk study. The aim of these transects was to cover the different habitat types approximately equally, each be roughly 1km long and cover the site wholly. These can be viewed in Appendices; Appendix A: Figure A.2. While walking the transects, binoculars were used to aid with the identification of bird species along with identification tools such as guide books and bird song recordings. BTO species symbology was used to note the bird species, in conjunction with the BTO bird activity map symbology to denote the activity (where applicable). The species and activity were both noted on a map of the study area.

### 2.2.3 Visit Timing

Three visits during the breeding season defined by Balmer et al. (2013). (April 1st to July 31st) were conducted to assess the presence of breeding bird species; the three visits followed on from the initial visit. Surveys were conducted on days that largely, where possible, avoided

strong wind and/or heavy rain in order to adhere to optimal or near optimal surveying conditions. The survey data can be seen in Table 1.

**Table 1: Project Site survey data**

| Visit | Date | Start / Finish | Total Cloud Cover | Wind Speed & direction | Precipitation | Surveyors |
|---|---|---|---|---|---|---|
| 1 | 15.04.19 | 07:30 – 10:30 | 3 | 13mph E | None | JC & AG |
| 2 | 22.05.19 | 07:30 – 10:00 | 2 | 5mph W | None | JC & AG |
| 3 | 02.07.19 | 07:30 – 10:00 | 2 | 9mph SW | None | JC & AG |

Source: BBC Weather, 2019.

### 2.2.4 Data Collection

Bird species identified either visually (aided or unaided), or by sound were recorded on a map using BTO species codes. Where applicable indicative behaviours of breeding (Table 2) were used to determine whether the species present was likely to be breeding.

**Table 2: Breeding evidence categories and indicative behaviours**

| Possible | Probable | Confirmed |
|---|---|---|
| Observed in suitable nesting habitat. | Pair observed in suitable nesting habitat. | Distraction display of injury feigning. |
| Singing male in suitable breeding habitat. | Permanent territory presumed through registration of territorial behaviour (song etc.) from many individuals on one day. | Used nest or eggshells |
| | Courtship and display. | Recently fledged young. |
| | Visiting probable nest site. | Adults entering or leaving nest site or adults seen incubating. |
| | Agitated behaviour or calls suggesting probable presence of nest or young nearby | Adult carrying faecal sac or food for young |
| | Nest building or excavation. | Nest containing eggs. |
| | | Nest with young |

Source: Sharrock, 1974; Mott MacDonald, 2016.

## 2.3 Spatial Mapping and Analysis

### 2.3.1 Spatial Mapping

A data management tool in ArcMap 10.6.1 called Generate Tessellation was used to create a tessellated grid of regular (50m wide) hexagon polygon features over the survey area. From the resultant grid, only hexagons which contained recorded bird location points were selected. Then a tool called Spatial Join was used to join the hexagon layer to the point layer (bird coordinates). Then the layer was exported to Excel, allowing species richness and abundance to be calculated. This method was chosen as it allows the species richness to be mapped spatially, which in turn can be used to help identify any areas of the Project Site that represent areas of importance to breeding birds. Areas of notably high species richness can be located and their ecological receptors that would be lost to the development can be investigated. No noteworthy areas of particularly high species richness were identified.

### 2.3.2 Data Analysis

The methodology described by Fuller, 1980 was used to aid the analysis of the Breeding Bird community present at the project site. The number of breeding pairs for each of the species recorded during the surveys was taken and used to inform a rarity category and therefore a community score index; details can be seen below in Table 3. A community score index is a method defined by Fuller (1980) that allows a population of birds to be assigned an importance factor, e.g. regional importance (Table 4).

The list of species identified during the surveys can be found in Table 6. Only those species with evidence that either confirms that breeding is taking place or suggests breeding is probable are included in community quality analyses. Calculating a community score index and assigning an importance category allows the population's value to be assessed on a national scale. A nationally important community would require much more mitigation compared to a locally important community. Assigning the community to a category helps inform the level and extent of mitigation actions, such that the mitigation is proportional and therefore cost effective.

**Table 3: Breeding pairs per annum and the associated rarity category**

| Not scarce (E) | Less scarce (D) | Scarce (C) | Rare (B) | Very rare (A) |
|---|---|---|---|---|
| 10,001 + | 1,001 – 10,000 | 101 – 1,000 | 11 – 100 | ≤10 |

Source: Adapted from Fuller, 1980.

**Table 4: Breeding bird community score categories**

| Conservation status | Local | County | Regional | National |
|---|---|---|---|---|
| Index scores total | 10-19 | 20-39 | 40-59 | 60+ |

Source: Adapted from Fuller, 1980.

# 3 Results

## 3.1 Summary

In total 34 positively identified species were recorded from the three surveys at the Gaywood Sites, with all apart from two being included in analysis. A full species list for those included in analysis can be found in Table 6, along with the breeding status and evidence for breeding. Pheasants were found on site but were not considered for analysis. A sparrow hawk (*Accipiter nisus*) was suspected to have been present at the project site, although a positive identification was not made. Two additional species were noted outside of the three Breeding Bird surveys. A pair of tawny owls (*Strix aluco*) were heard and seen during a bat emergence survey (within the breeding bird survey season). This was included in the analysis data; the specific ecology of this species makes it difficult to detect during diurnal surveys and therefore unlikely to have been detected otherwise. During a site visit outside of the typical breeding bird season (early November 2019) a snipe (*Gallinago gallinago*) was spotted at the northern part of section 6 (south of the railway, adjacent to the industrial estate) (Appendices; Appendix A: Figure A.4). This species is not counted for any portion of this report.

Five species present at the project site were confirmed to be breeding, a further 10 species are categorised as probable and 15 are possibly breeding at the Gaywood Sites. One species present is very unlikely to be breeding (Brambling, *Fringilla montifringilla*) as only up to two pairs breed annually in the UK.

Eaton *et al.* (2015) created colour-coded lists of birds to focus conservation on those species requiring prioritised conservation actions – 'Birds of a Conservation Concern'. On site there were;

- 23 Green List Birds of a Conservation Concern.
- Seven Amber List Birds of a Conservation Concern.
- Four Red List Birds of a Conservation Concern.

Range restriction is not an issue that concerns either of the four Red List species nor either of the seven Amber List species. They are all widespread in England (RSPB Handbook, 2018).

## 3.2 Species and Community Score

**Table 5: Gaywood breeding birds community score index**

| Category score | A | B | C | D | E | Index score |
|---|---|---|---|---|---|---|
| Number of species | 0 | 0 | 0 | 0 | 16 | |
| Total score | 0 | 0 | 0 | 0 | 16 | 16 |

**Table 6: Species present in the Survey Area and the evidence for their breeding status.**

| Species | Breeding status | Evidence | Conservation status UK |
|---|---|---|---|
| Blackbird | Confirmed | Adults entering or leaving nest site or adults seen incubating. | Green |
| Black cap | Possible | Singing male in suitable breeding habitat. | Green |

| Species | Breeding status | Evidence | Conservation status UK |
|---|---|---|---|
| Blue tit | Probable | Agitated behaviour or calls suggesting probable presence of nest or young nearby | Green |
| Brambling | Unlikely | 0-2 breeding UK pairs pa. | Green |
| Carrion crow | Possible | Observed in suitable nesting habitat. | Green |
| Chaffinch | Probable | Permanent territory presumed through registration of territorial behaviour (song etc.) from many individuals on one day. | Green |
| Common chiffchaff | Probable | Permanent territory presumed through registration of territorial behaviour (song etc.) from many individuals on one day. | Green |
| Coal tit | Probable | Permanent territory presumed through registration of territorial behaviour (song etc.) from many individuals on one day. | Green |
| Collard dove | Confirmed | Used nest or eggshells | Green |
| Common gull | Confirmed | Observed in suitable nesting habitat<br>.<br>Adults entering or leaving nest site or adults seen incubating.<br><br>*Nests on roof of buildings adjacent to site; observed during building inspections. | Amber |
| Dunnock | Confirmed | Adult carrying faecal sac or food for young | Amber |
| Goldcrest | Possible | Observed in suitable nesting habitat. | Green |
| Great tit | Probable | Permanent territory presumed through registration of territorial behaviour (song etc.) from many individuals on one day. | Green |
| Green finch | Possible | Singing male in suitable breeding habitat. | Green |
| Green woodpecker | Possible | Observed in suitable nesting habitat. | Green |
| House sparrow | Probable | Pair observed in suitable nesting habitat.<br>Permanent territory presumed through registration of territorial behaviour (song etc.) from many individuals on one day. | Red |
| Jackdaw | Probable | Nest building or excavation. (Nesting material) | Green |
| Jay | Possible | Observed in suitable nesting habitat. | Green |
| Kestrel | Unknown | Observed once briefly. | Amber |
| Lesser black-backed gull | Unlikely | Observed in flight over industrial estate to the south. | Amber |
| Long-tailed tit | Possible | Observed in suitable nesting habitat. | Green |
| Magpie | Confirmed | Nest building or excavation. (Nesting material)<br>Recently fledged young. | Green |
| Mistle thrush | Possible | Observed in suitable nesting habitat. | Red |
| Reed bunting | Possible | Observed in suitable nesting habitat. | Amber |

| Species | Breeding status | Evidence | Conservation status UK |
|---|---|---|---|
| Robin | Probable | Agitated behaviour or calls suggesting probable presence of nest or young nearby | Green |
| Rook | Possible | Observed in suitable nesting habitat. | Green |
| Song thrust | Possible | Observed in suitable nesting habitat. | Red |
| Starling | Possible | Observed in suitable nesting habitat. | Red |
| Tawny owl | Probably | Pair observed in suitable nesting habitat.<br>Courtship and display | Amber |
| Tree creeper | Possible | Observed in suitable nesting habitat. | Green |
| White throat | Possible | Observed in suitable nesting habitat. | Green |
| Willow warbler | Possible | Observed in suitable nesting habitat. | Amber |
| Wood pigeon | Probable | Nest building or excavation. | Green |
| Wren | Probable | Agitated behaviour or calls suggesting probable presence of nest or young nearby | Green |

Source: Mott MacDonald Field Surveys, 2019. RSPB, 2019. Sharrock, 1974.

## 3.3 Spatial Distribution, Breeding status and Conservation Importance

### 3.3.1 Spatial Distribution

The results from the GIS spatial analysis (Appendices; Appendix A: Figure A.5) show the species richness across the project site. From this, it is apparent that no particular area holds an especially rich bird community relative to other areas of the project site.

### 3.3.2 Breeding Status

#### Confirmed Breeding Species

Of the five confirmed breeding species, three are Green List species (Table 8) and two are Amber List; common gull (*Larus canus*) and dunnock (*Prunella modularis*). These species are associated with scrub, woodland, urban/suburban and hedgerow habitats.

**Table 8: Green List species with a confirmed breeding status**

| Species | UK Conservation Status |
|---|---|
| Blackbird | Green |
| Collard Dove | Green |
| Magpie | Green |

Source: Mott MacDonald field surveys, 2019.

**Table 9: Amber List species with a confirmed breeding status**

| Species | UK Conservation Status |
|---|---|
| Common gull | Amber |
| Dunnock | Amber |

Source: Mott MacDonald field surveys, 2019.

#### Probable Breeding Species

Multiple pairs of house sparrow (*Passer domesticus*) (Red List) were recorded on each of the three visits. They are likely to be nesting in the houses directly adjacent to the project site. The project site will provide foraging opportunities in the form of seeds, as well as invertebrate prey

items, which is particularly important during the breeding season as food items for their offspring. This species is associated with urban environments and hedgerow habitats, as well as scrub.

One Amber List species, tawny owl, was noted on site and found to be displaying behaviour indicative of breeding. A pair were heard and seen on site during a dusk emergence survey for bats. The pair were vocalising to one another and observed in suitable breeding habitat.

Seven Green List species (Chaffinch, Common chiffchaff, Coal tit, Great tit, Jackdaw, Robin, Wood pigeon and Wren) were identified with evidence that they are '*probably*' breeding at the project site. These species are predominantly associated with woodland, hedgerow and scrub, with one species also being associated with wooded grassland.

#### Possible Breeding species

Multiple pairs of starlings (*Sturnus vulgaris*) were observed on each of the three visits to the project site. Nesting sites are likely to be located within the housing estate to the north of Section 7 (south of the current playing area on Parkway), Section 2 (Swaffham belt) and Section 1 (grassland east of King's Lynn Academy) (Appendices; Appendix A: Figure A.4). The majority of the sightings were located along the northern road and on the short grass of the park area. This short grassland/parkland habitat is an important foraging resource for starlings. Both song and Mistle thrush (*Turdus philomelos* and *Turdus viscivorus*, respectively) were identified at the project site. Both species are associated with scrub, woodland and hedgerow habitats.

Four willow warblers (*Phylloscopus trochilus*) were noted on the project site, in the eastern scrub and wetland area, west of the Anglian Water reservoir (Section 3, Appendices; Appendix A; Figure A.5). The sighting was brief; however, the habitat was suitable for breeding. This species is associated with woodland, grassland and heathland. Additionally, it can be found in urban and suburban areas.

Nine Green List species were found to have evidence that placed them in the 'possible' breeding category (Carrion crow, Goldcrest, Green finch, Green woodpecker, Jay, Long-tailed tit, Rook, Tree creeper and White throat). Details can be found in Table 6, in section 3.2. These species are associated with the following habitats: scrub, grassland, woodland, hedgerows, urban and suburban as well as (loosely) wetland and upland habitats.

### 3.3.3 Conservation Importance

#### Species Richness and Breeding Bird Community Importance

Total species richness for the project site was taken to be the total number of observed species, including those not from the Breeding Bird surveys, but excluding game birds, species spotted outside of the typical breeding season and those without a positive identification, species richness; (n= 34). Table 5, in section 3.2, shows the calculated community index score for the project site. An index score of 16 places the community in the category of local importance (Table 4, section 2.3.2).

## 3.4 Limitations

A sparrow hawk was potentially present during the second breeding bird site visit, although a positive identification was not made due to a brief passing glace at the specimen.

# 4 Impacts, Mitigation, Compensation and Enhancement

## 4.1 Potential Impacts

The potential impacts on breeding birds at the project site, if the project reaches completion include, but are not limited to the following; direct mortality, habitat loss (foraging and nesting) and fragmentation, as well as degradation/increased disturbance (lighting, housing unnatural planting). The effects of these potential impacts include, but again are not limited to; reduced species abundance, reduced species richness, reduced reproductive success, lost breeding/nesting sites, changes and/or losses to territories.

### Habitat Clearance

Removal of habitat (vegetation and ground clearance) will be required as part of the proposed construction. If this takes place during the breeding season (typically March to August) (Natural England, 2015) the impact on breeding birds is likely to be certain. Without implementing mitigation (avoidance) there would be a risk of breaching legislation, by contravening one of the points outlined in section 1.3. By, for example; killing or injuring a wild bird(s) and/or an egg(s) or damaging/destroying a nest(s).

### Species Losses

The development may impact upon and potentially contribute to the localised loss or displacement of relatively small numbers of birds including notable species i.e. species of principle importance for the purpose of conserving biodiversity in England (Section 41) and local biodiversity action plan species. The impact on breeding birds is likely to be certain and significant at the local scale because of the limited presence of woodland/scrub mosaic in the wider local area.

## 4.2 Construction

### Vegetation Clearance

Where ground clearance and vegetation removal is planned, this should be undertaken between September and February to minimise the risk of disturbing breeding birds and hence committing an offence under the Wildlife and Countryside Act 1981 (as amended). Where ground clearance and vegetation removal is unavoidably planned during the breeding bird season, the area to be cleared must be checked for nesting birds by a suitably experienced ecologist in the 48-hour period immediately prior to clearance and removal. Where nesting birds are located, a species-specific no works zone will be established by a suitably experienced ecologist that will remain in place until the nest is no longer active.

## 4.3 Operation

### Disturbance

The presence of people and dogs is known to adversely impact birds (Enderby, 2014). However, there is little or no evidence regarding the effectiveness of mitigation measures to avoid or minimise adverse impacts of recreational use on the biodiversity of woodland and forest (Marzano & Dandy, 2012). Off-site compensation should be considered in order to achieve the no net loss aim of the National Planning Policy Framework, 2019 (NPPF). This off-

site compensation should be specifically designed to support breeding bird populations, especially those present at the Project Site. This can be achieved by following the advice outlined in sections 4.4, 4.5 and 4.6.

## 4.4 Scrub habitat

In order to minimise the establishment time, if practicable, any existing mature scrub to be removed should be incorporated into the planned landscaping and replanted. Where this is not feasible, planting of new scrub plants should be undertaken. To increase the extent and enhance existing scrub, gaps should be filled and connectivity between scrub patches increased where practicable. It is recommended that planting should be made up of a mix of typical scrub species sourced in accordance with Herbert *et al*. (1999). Herbert *et al* (1999) broadly suggest that local stock grown from seeds harvested within the defined seed stock region should be used to re-plant and replace within that same region.

The guidance outlined above has been specifically designed/chosen to facilitate the mitigation of the negative impacts on breeding birds by targeting the ecological receptors that are crucial to supporting breeding birds. Scrub habitat is vital in its role for nesting sites.

## 4.5 Reedbeds

The project site is host to a BAP UK priority habitat; common reed beds. These reed beds will be lost without the appropriate mitigation. The reedbeds will be required to be moved and/or altered in order to allow for the proposed development. Reedbeds are a type of wetland which are dominated by tall stand of common reed (*Phragmites australis*). They grow on ground that is waterlogged for at least the majority of the year. Several of the species present at the project site are associated with reed bed habitats; water vole, reed bunting, white throat and starling are all either projected species or species with a special conservation concern. The reed beds present at the Project Site will provide valuable foraging habitat as well as shelter and nesting m

Where habitat is to be retained, restored or improved as part of the mitigation efforts, reed beds must be incorporated into the design. Reed beds can be transplanted by digging the rhizome bed out in sections at least 1m^2 and placing them in a correctly prepared area of set-aside. This area needs to be waterlogged for the majority of the year. This habitat are would benefit from wet ditches created with a rotary ditcher. The methodology outlined by the Sussex Wildlife Trust 'How to Create and Manage Reedbed' should be used to inform the Construction Environmental Management Plan (Sussex Wildlife Trust, 2013) and any method statements required at the construction phase.

## 4.6 Nest boxes

Mitigation in the form of nest boxes will offset and therefore compensate for the loss of breeding habitat. Not all species present at the project site will benefit from nest boxes being put in place, consequently, nest boxes alone will not provide adequate mitigation. Mitigation methods have varying levels of efficacy and this should be considered at the carious design stages. Those species present at the project site that would benefit from nest boxes are listed below:

- Blackbird
- Blue tit
- Chaffinch
- Coal tit
- Dunnock

- Great tit
- Green woodpecker
- House sparrow
- Robin
- Song Thrush
- Starling
- Tawny owl
- Wren

The best box type will need to vary to suit the specific needs of different bird species. Each will need to be erected with the guidance of a suitably qualified ecologist or ornithologist. Five different kinds of nest box would be applicable. However, based upon the number of some species, i.e. tawny owls, it would not be strictly necessary to erect all different types.

# 5 Conclusion

The Proposed Scheme at Gaywood, King's Lynn is home to a locally important community of breeding birds with several Red list species and several Amber list species present. The proposed housing development, bridge and accompanying roads will likely contribute to a local loss and displacement of all those species within the red line boundary.

Most effects will be felt during the construction phase(s), resulting in habitat loss leading to displacement, fragmentation and severance. These effects would continue to be felt in the future, although any habitat creation associated with the scheme should assist in reducing the overall effects.

Mitigation methods outlined in the report will act towards reducing the magnitude of the outlined effects. Habitat creation should be included as part of the Proposed Scheme, within the development where possible. The landscaping would contribute to the biodiversity off-setting that should be incorporated into the scheme, with the aim of upholding the principle of biodiversity net gain (European Commission, 2019). This cannot be achieved at the project site alone due to the drastic change in landscape and land use. Therefore, off-site provision of landscaping/habitat creation will be pivotal when aiming to achieve no net loss.

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# Appendices

A. Figures **Error! Bookmark not defined.**

# A. Figures

## A.1 Site location and study area

## A.2 Transect routes

## A.3 Point count locations

## A.4 Site sections

## A.5 Species richness

## A.6 Abundance

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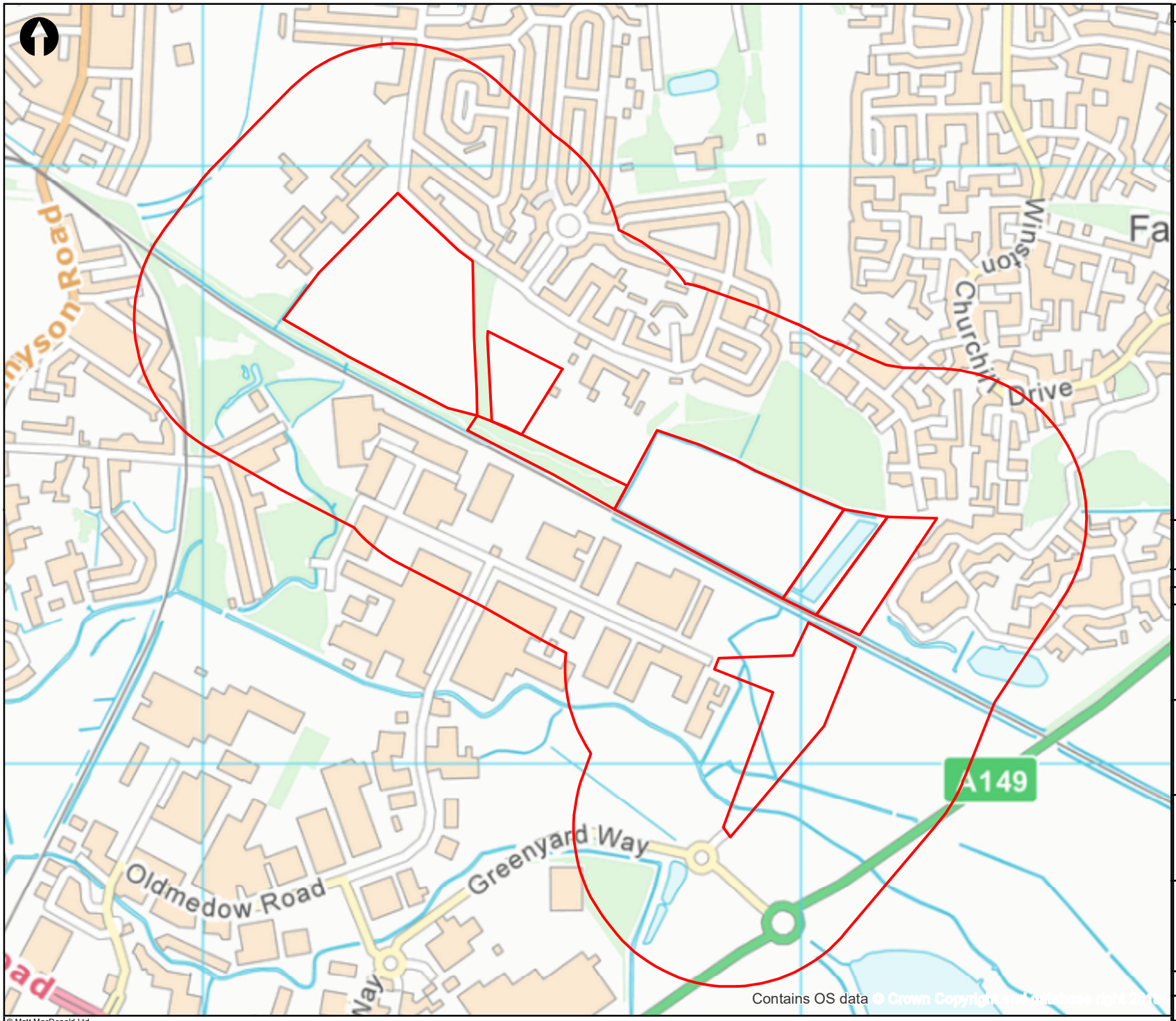


Legend

- Site_sections_Buffer1
- Site_sections

0 250 500

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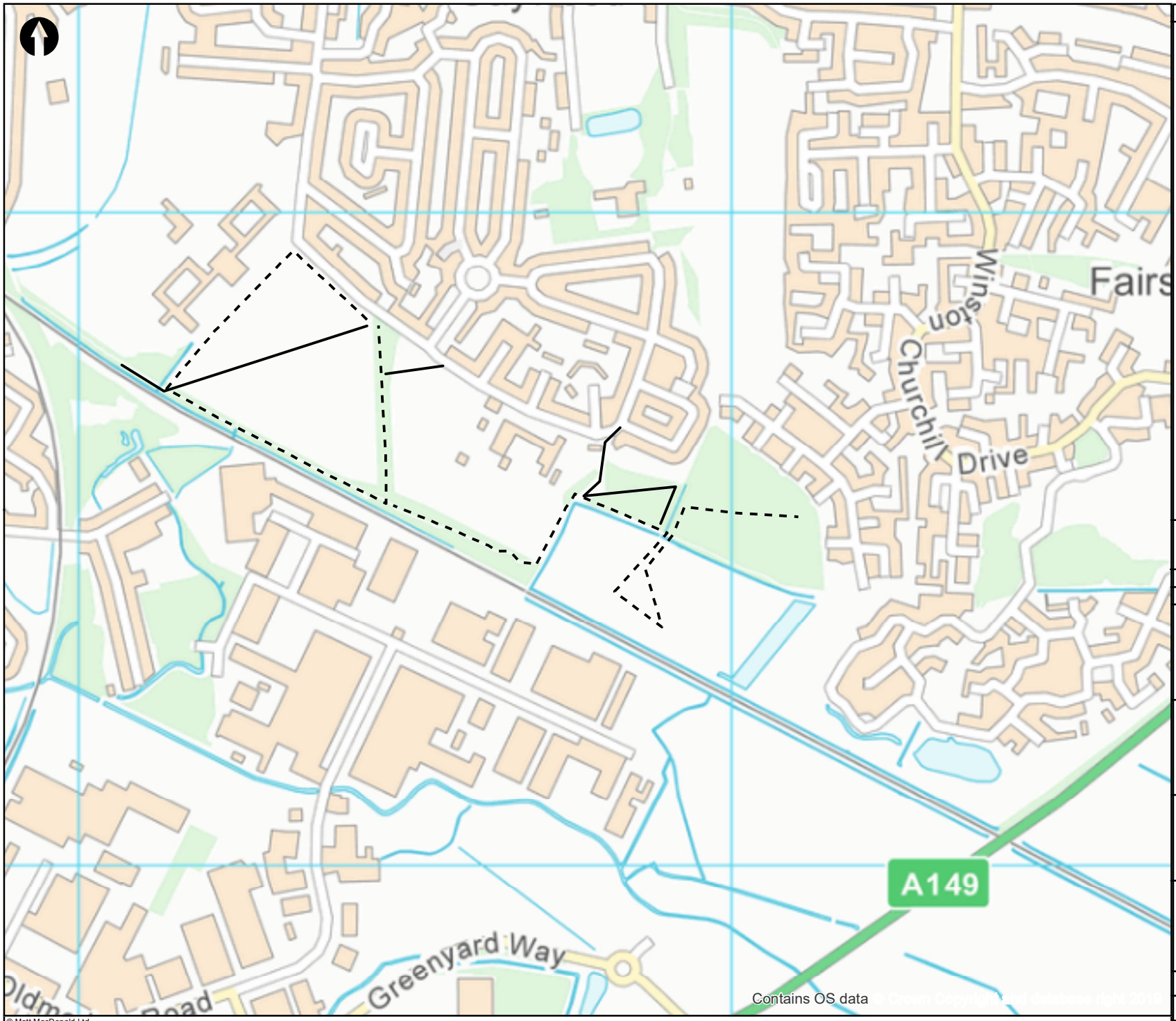


Legend

Additional walking routes.

Transect

0 250 500

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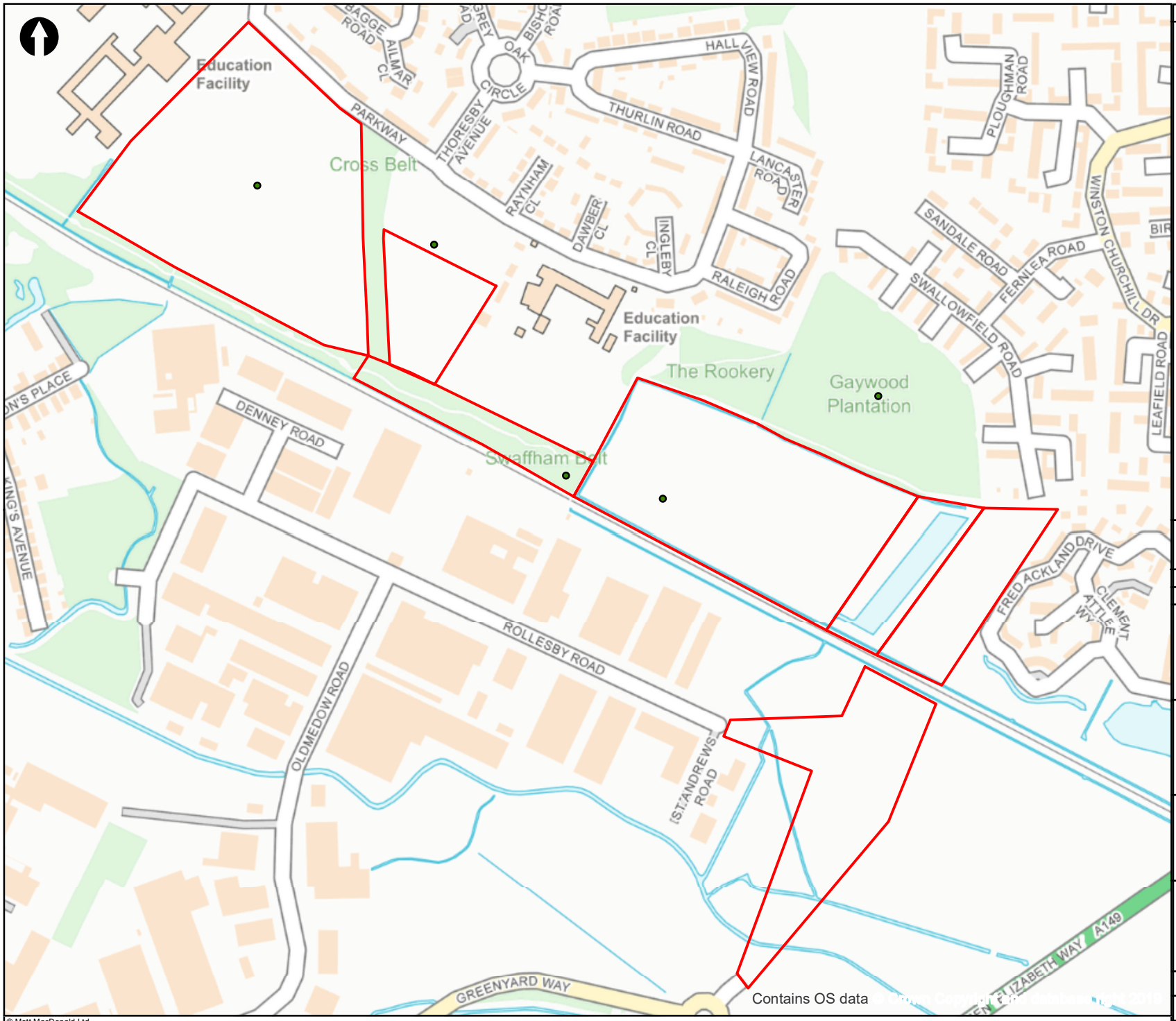


Legend

- Point_Count
- Site_sections

0 250

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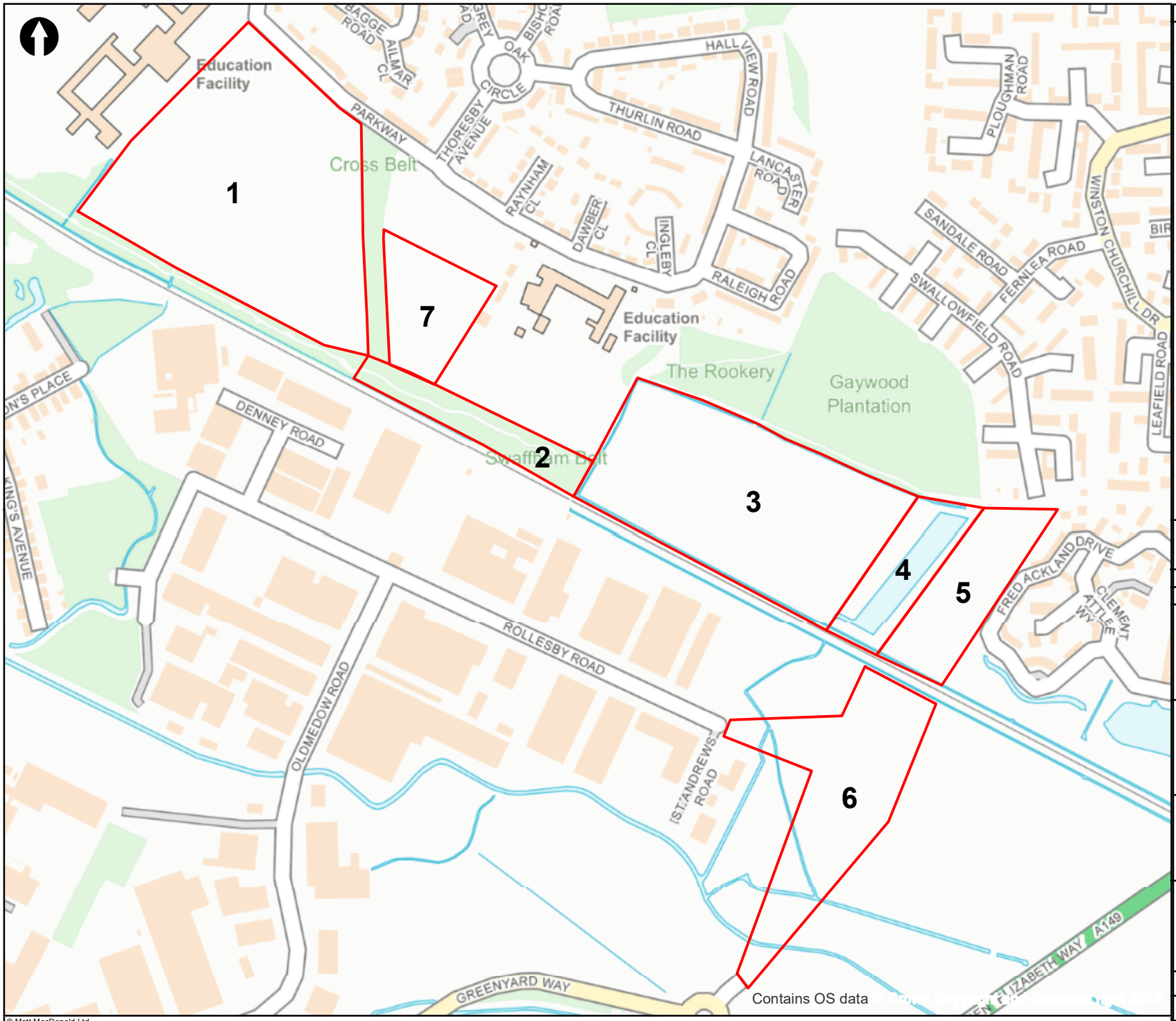


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Site_sections

0 250

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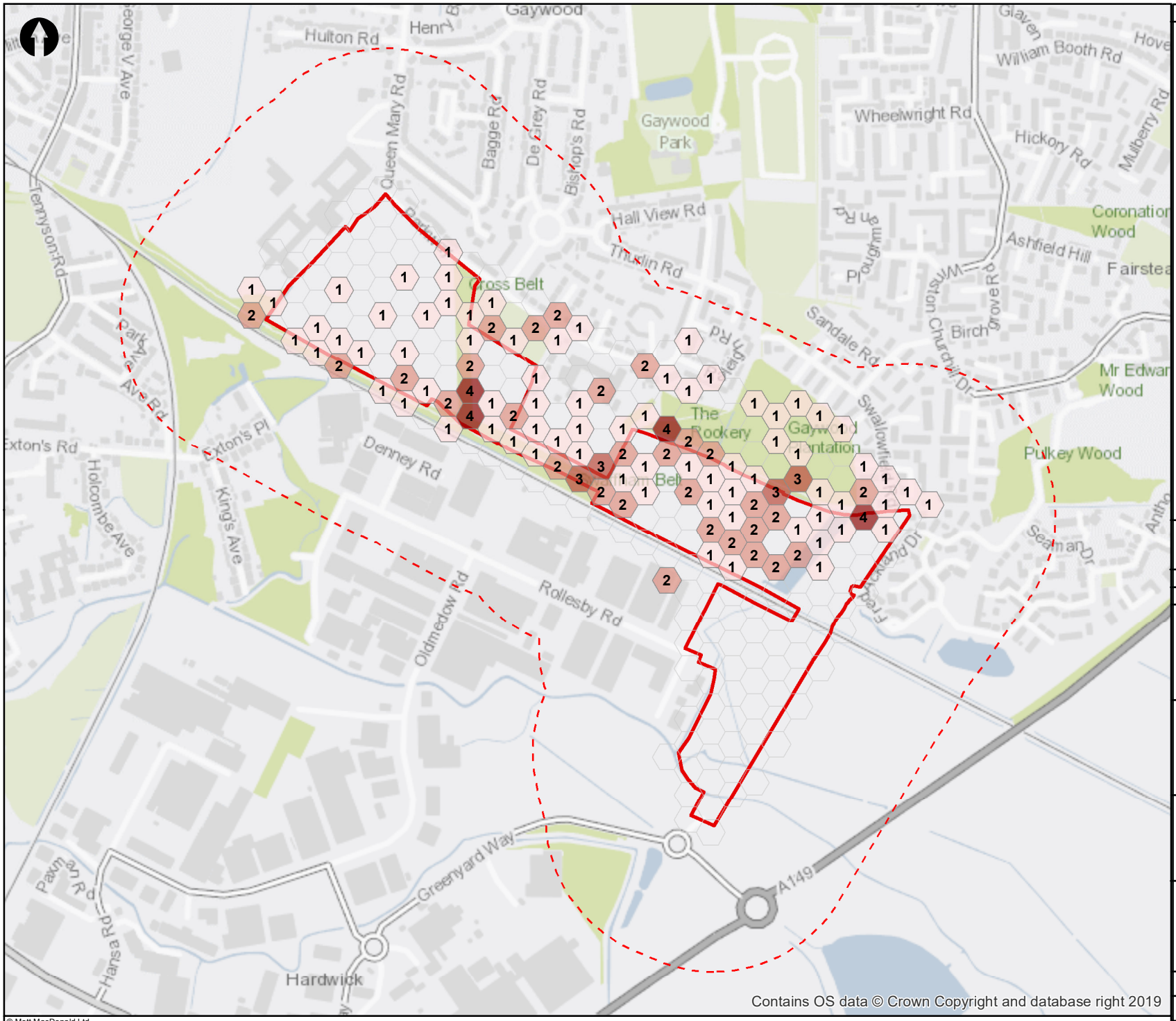


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Legend

Redline Boundary

250m buffer of Redline Boundary

**Species Richness**

1

2

3

4

0 100 200 300 400 Meters

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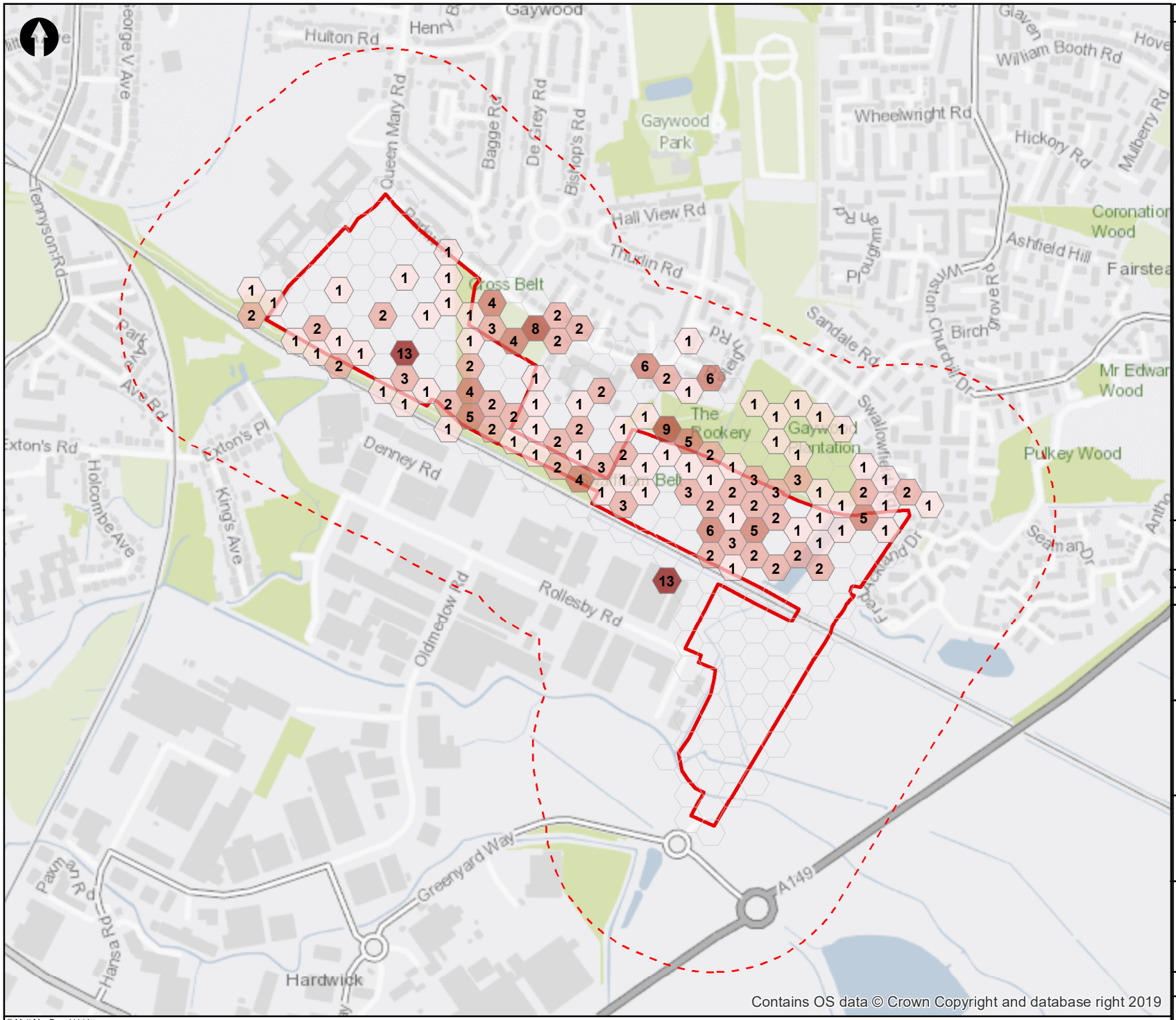


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Legend

Redline Boundary

250m buffer of Redline Boundary

**Abundance**

- 1
- 2 - 3
- 4 - 6
- 7 - 9
- 10 - 13

Meters: 0, 100, 200, 300, 400

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