MOTT MACDONALD

Parkway - King's Lynn

Reptile survey report

8 January 2020

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Contents

Tables

Executive summary

Mott MacDonald Ltd was commissioned by the Borough Council of King's Lynn and West Norfolk to conduct reptile surveys on several land parcels bordering the Gaywood and Fairstead estates in King's Lynn. All reptiles are protected under the Wildlife and Countryside Act 1981 (as amended). Two species of reptile have been discovered at the project site, viviparous lizards (*Zootoca vivipara*) and grass snakes (*Natrix Helvetica*). Both were discovered through the use of the artificial refugia.. The Proposed Scheme will cause the loss of a large area of unimproved grassland interlaced with scattered scrub. This will result in the loss of ideal foraging habitat, brumation sites and breeding sites. To mitigate for the loss of habitat, the most effective technique by far is translocation. Translocation is the process whereby all or a high majority of a population is moved from location to another. To further mitigate against the loss of habitat, the recipient site Sugar Fen SSSI will be subject to targeted improvements with the aim of increasing the habitat suitability for reptiles. This work will be completed in partnership with the Norfolk Reptile and Amphibian Group (NARG).

1 Introduction

1.1 Background

Mott MacDonald Ltd was commissioned by the Borough Council of King's Lynn and West Norfolk to conduct ecological surveys 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.

1.2 Description of proposed scheme

The Proposed Scheme includes several main features, the first is a road bridge that will form a connection to the site from the south east corner, running north – south (Sections 5 & 6, Appendices: Figure A.1). This will enter the site and connect to the eastern housing section (Section 3, Appendices: Figure A.1). This section of housing will be connected via a link road to another area of housing (Section 1, Appendices: Figure A.1).

1.3 Legislation

All reptiles are protected under the Wildlife and Countryside Act 1981 (as amended), this legislation makes it an offence to:

- Intentionally kill or,
- Intentionally injure any reptile.

Rare reptiles (smooth snake and sand lizard) also receive legal protection under the Conservation of Habitats and Species Regulations 2010. In combination with the Wildlife and Countryside Act 1981 (as amended), these two pieces of legislation make it an offence to:

- Capture,
- Disturb,
- Damage or obstruct a place of shelter,
- Intentionally kill or,
- Intentionally injure any rare reptile.

2 Methodology

2.1 Desk study

A desk study was undertaken to inform the field survey work, over the survey area (Appendices: Figure A.1). This aided in the placement of the transects of refugia mats. A habitat assessment was conducted, and key areas were highlighted. Section 3 (Appendices: Figure A.1) proved to be comprised of highly suitable habitat, where as other areas of the project site such as section 1 (Appendices: Figure A.1), did not. This is evident in the placement of the transects.

2.2 Field Survey

2.2.1 Survey area

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 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. The survey area for reptile surveys was confined to within the area of the Proposed Scheme. This was due to several reasons; firstly, reptiles have a limited home range, the surrounding habitat is either suboptimal (give example) or built up, residential areas of dense housing. The site is bounded by a railway track on the southern edge. Although railway tracks are often favoured basking sites for reptiles, safety requirements meant that access was not available. The habitat to the south of the railway (outside of the proposed development site), is also suboptimal, including agricultural land and an area of industrial estate, with very small pockets of tall ruderal habitat. It was therefore deemed unnecessary to survey a wider area. These reasons, in combination mean that surveys outside of the Proposed Scheme's area were not required.

2.2.2 Methodology

The Proposed Scheme was subject to a series of reptile surveys following the Natural England Reptile Mitigation Guidelines (Natural England Technical Information Note TIN102, 2011). Roofing felt, cut into 0.5m^2, was the chosen material to create the refugia. These refugia were placed in transects along habitat edges that demonstrate suitable qualities. The mats were placed in transects of 10 or 20 mats, with 8m - 16m between each mat. The guidelines recommend that a minimum of 30 mats per site with a density of 100/ha in suitable habitat, if feasible (Natural England Technical Information Note TIN102). Due to the density of the scrub habitat and the availability of suitable edge habitat, an overall density of 14 mats per hectare was achieved. After the initial placement of the mats they were left for 3 weeks to 'bed-down'. Surveys began on the 20th of April 2019 and concluded on the 19th of September 2019. In total, 20 surveys were completed throughout the 2019 season. The number of surveys was increased from seven to 20 due to reptiles being discovered within the initial set of seven surveys.

On the day of each visit, the weather conditions were carefully monitored and assessed, to determine the most appropriate time of day to conduct the survey. In order to conduct a reptile survey, the weather conditions must be suitable. Surveys are conducted between 07:00 and 18:00, on the condition that the weather parameters meet the following: air temperature must be between 10 and 20 degrees Celsius; wind is none to moderate strength and no precipitation. This typically coincided with the early morning. Details of the weather conditions can be found in Appendix B: Table 1.

Each transect was walked by either one or two ecologists. Upon approaching, the top of the refugia was visually assessed as reptiles can often bask on the top as well as underneath. Each refuge was lifted from one corner and the area underneath was inspected for reptiles. If a reptile was found, the life stage, gender and species was recorded, as well as the location. The transects were walked in an order that would minimise biases caused by the surveying effort or temporal variables. However, to avoid disturbing potentially basking reptiles, no refugia were walked past without being inspected. For example, transect 3 could only be walked north to south, if it was walked south to north, this would cause the surveyor to walk past (in close proximity) the entire transect, potentially disturbing basking reptiles (Appendix A; Figures: Figure A.1 and Figure A.2).

2.3 Limitations

During the 2019 surveying period at Gaywood there were several limitations.

Two of the transects were in site sections one and seven (Appendix A; Figure A.1) which are adjacent to one another. During the initial laying of the mats the playground was in use by large numbers of young children, some of whom were later stopped when caught removing mats. Upon returning to complete the first of the initial seven surveys, it was noted that the majority of those two transects (comprising of 30 mats) had been either destroyed or moved.

To mitigate against this small set-back the mats in good condition (still serviceable) or those unaffected were replaced along the transects and the number of remaining mats was noted. Mats that were destroyed were removed from the survey.

Further limitations during the surveying season include strong late spring/early summer growth of herbaceous perennial or biennial plants lifting several reptile mats, rendering them ineffective. Due to the small number of mats effected the survey was not discounted. The mats were repositioned, or the offending vegetation was lightly managed; for example, simply pushing it aside. During late summer when the vegetation was well established three mats were lost to the undergrowth

Management of the access tracks along the western and northern edges of section four (Appendix A; Figure A.1) led to the destruction of 30 mats in two transects between surveys 19 and 20 (Appendix A; Figure A.3). As a result, only transects 1,2,5 and 6 (Appendix A; Figure A.2) could be surveyed for the final reptile survey site visit.

3 Results

3.1 Summary

Two species of reptile have been found to be present at the project site, viviparous lizards and grass snakes. Both were discovered through the use of the artificial refugia. Predominantly the individuals were adults, both males and females. On two occasions a juvenile lizard was discovered under the same refugia mat, this was likely to be the same individual. It is therefore confirmed that the viviparous lizard population is a breeding population, and highly likely that the grass snake population is breeding also.

3.2 Population size classification

On any single survey at the project site the number of lizards or grass snakes did not exceed 5. Therefore, it can be concluded that the population size class is small for both species, as per Table 9 in the Natural England Reptile Mitigation Guidelines (2011).

The table below outlines the species (if any) that were discovered during each survey conducted at the Project Site (Appendix A: Figure A.6). These results were used to determine the population size classification for each of the present species. The population size was used to inform the surveying effort required for the translocation, see section 3.1.

Table 1 Successful surveys from the 2019 surveying season and the species found

Survey	Reptile found	Co-ordinates	Species	Frequency	Gender	Life stage
3	Y	52.747562, 0.4266630	Common lizard	1	Female	Adult
4	Y	52.7472113, 0.4254124	Common lizard	1	Unknown	Adult
7	Y	52.7474869, 0.4269698	Grass snake	1	Unknown	Adult
8	Y	52.747547, 0.426933 and 52.746954, 0.426657	Grass snake	2	Both	Adult
9	Y	52.747087, 0.426321 and 52.747067, 0.426433	Grass snake	2	Both	Adult
12	Y	52.747688, 0.426555	Common Lizard	1	Unknown	Sub-adult
17	Y	52.747789, 0.428285	Common Lizard	1	Unknown	Juvenile
18	Y	52.747789, 0.428285	Common Lizard	1	Unknown	Juvenile
19	Y	52.749398, 0.425487	Grass snake	1	Unknown	Adult

Source: Mott MacDonald field surveys 2019.

3.3 Minimum survey effort for translocation

To calculate the population, size the formulae presented by Natural England in the Natural England Technical Information Note (2011) was used. This gave species values for each of the reptile species present. As per the guidelines the highest species value for the site was chosen (25 for Grass snakes).

The formula is as follows: Species score x (Site size + either population size class or Habitat Suitability Assessment)

For the Project Site: Minimum survey effort (days) = 25 x (0.8 + 0.2)

Therefore, a minimum of 25 days must be used for the capture effort to translocate the reptiles. However, this can be extended at the discretion of a suitability qualified ecologist, to mediate against any constrains that arise. Those days where surveys cannot occur due to weather conditions are not counted towards the 25-day minimum. Once the minimum number of days have been competed (including those additional days if required by an ecologist) surveys must show 5 consecutive days of ideal survey conditions that do not yield the capture or sighting of a reptile.

4 Recommendations

4.1 Mitigation and enhancement

Due to the highly isolated habitat that will be lost and the very high quality of that habitat, a staged cut-back and displacement exercise is not an applicable technique as a means of mitigation. The surrounding habitat is less suited to reptiles and is of a smaller area. To mitigate for the loss of habitat, the most effective technique by far is translocation.

4.1.1 Translocation

Translocation is the process whereby all or a high majority of a population is moved from location to another. To complete this at the Project Site, the first action is to install reptile fencing around the perimeter of the site to prevent reptile from outside of the project site area moving in after the capture efforts. This will involve a small machine on the back of a tractor unit such as a rotary ditcher or AFT trencher to excavate a channel. This channel will bury the fence preventing reptiles re-entering under the fence. Within the survey area a high density of refugia (felt mats or corrugated iron sheets) will need to be placed (between 500 and 1000 per hectare). Once the fence and refugia have been in place for two weeks, the surveys can begin. Under ideal weather conditions, suitably qualified ecologists will be able to check refugia and capture any reptiles. These reptiles must then be carefully moved from the Project Site to the receptor site and released in an ideal location. A minimum of 25 survey days must occur, with more required until no reptiles have been captured or observed for five consecutive days. The capture and relocation process must take place between March and October, although ideally between April and September.

4.1.2 Consultation

Initial discussions have been held with the Norfolk Amphibian and Reptile Group (NARG) to discuss options for potential receptor sites. From these discussions a suitable site has been identified. This is Sugar Fen, owned by the Pott Row allotment Trust, near Pott Row, approximately 5km to the east of the Proposed Scheme. As a SSSI, Sugar Fen will provide a stable, protected home for the displaced reptiles. Sugar Fen is one of three separate sites designated under a collective SSSI, the other two sites are Derby Fen and Leziate Fen.

4.1.3 Translocation proposal for Gaywood Parkway

The current population of reptiles is relatively well known by the NARG as they were translocated there as part of the mitigation when a Tesco's store was constructed in King's Lynn. The site currently has the capacity to support more reptiles, although it is recommended that some further habitat restoration is undertaken. Restorative action will further increase the site's carrying capacity for reptiles. Providing more suitable habitat will maintain a buffer against inter and intra-annual variations that have the potential to influence the mortality of the reptile population. For example, a site with more hibernation sites will be better equipped to support reptiles during colder-than-average winters; in comparison to a 'do-nothing' approach towards the receptor site. Restorative actions will include the creation of more hibernation sites and refugia and will therefore be able to support the increased reptile population. Increasing the habitat suitability (through careful management) will reduce the impact of phenomena such as changing seasonal food availability.

To improve the habitat further, it is recommended that Sugar Fen is subject to gorse clearance on rotation to maintain areas of tussock-rich grassland. This is best implemented on a 15-year rotation.

Brash piles and log piles should be created from the Gorse cutting, opposed to the traditional cut-and-burn technique. Where applicable, grassy areas that are not grazed can be mowing (helping to prevent succession to woody scrub) and the cuttings should be used to create potential egg-laying sites for the newly introduced grass snakes. This would require the grass cuttings to be collected and piled in an appropriate location. Sugar Fen is grazed by horses as part of conservation grazing; this can be utilized to maintain varying sward height with rotational grazing, reducing the need for mechanical methods. However, grazing pressure should be light at most, to avoid degrading the habitat from over-grazing.

Table 2 Translocation actions and timing summary

Action	Time frame and details for 2020
Reptile fence installation	Must be completed before the start of the capture-surveys. The survey season runs from **March to October 2020.** The fence would be best installed before March. However, the receptor site must be in a suitable state to receive the reptiles before translocating begins.
Refugia mat placement	Can be done at any time but needs to **be at least two weeks before** the trapping/capture begins. This is best done simultaneously with or after the fencing is installed, to avoid refugia being in the way of ground investigation or other site activities.
Capture surveys and translocation	Can begin from **March 1st, 2020 and will take 30 days minimum.** However, it is **more effective to begin April 1st, 2020.** Once no reptiles have been discovered **for 5 consecutive days** the site can be considered clear. Further information can be found in the recommendations section and Appendix C. Reptiles that are captured must be moved to the receptor site as soon as possible to minimise stress.

5 Conclusions

The Proposed Scheme at Gaywood will involve the loss of several areas of habitat that used by two reptile species, namely grass snake and viviparous lizards.

The populations of reptiles are isolated, as the habitats to be lost to the Proposed Scheme are isolated, being surrounded by either sub-optimal or completely unsuitable habitats e.g. agriculture, residential areas and industrial. This, and the size of the areas to be lost, means they cannot be displaced. It is recommended that the reptiles be translocated to mitigate the effects of the disruption caused and loss of habitat.

To further mitigate against the loss of habitat, the recipient site Sugar Fen SSSI will be subject to targeted improvements with the aim of increasing the habitat suitability for reptiles. This work will be completed in partnership with the Norfolk Reptile and Amphibian Group (NARG).

Appendices

A. Figures

A.1 The approximate redline boundary broken into sections

A.2 Each of the separate transects of reptile survey mats, consisting of either 10 or 20 mats.

A.3 Two transects (three and four shown in pink) that were destroyed due to maintenance of the ditch access.

A.4 The refugia mats that were not found during summer surveys due to vegetation growth, shown in red.

A.5 The proximity of Sugar Fen (Pott Row) to the site of the Proposed Scheme.

A.6 The location of reptiles discovered at the Project Site.

B. Tables

Table 3 Weather conditions recorded for each of the 20 reptile surveys conducted at Parkway, Gaywood.

Survey	Date	Temperature	Wind	Cloud cover	Rain
1	20.04.19	15	7mph (W)	Partial	None
2	06.05.19				None
3	31.05.19	17	8mph (SW)	Partial	None
4	06.06.19	19	2-3mph (NE)	Partial	None
5	07.06.19	8	11mph (SSW)	50%+	None
6	14.06.19	16	12mph (S)	Cloudy 85%	Very light and brief
7	02.07.19	13	9mph (NNW)	Partial	None
8	03.07.19	18	8mph (SE)	Partial	None
9	04.07.19	22	10mph (SE)	<15%	None
10	24.07.19	18	6-8mph (S)	85%+	None
11	02.08.19	17	4-6mph	50%	None
12	06.08.19	21	as above	30%	None
13	07.08.19	19	3-6mph	90%+	None
14	08.08.19	18	none	40%	None
15	13.08.19	17	11 mph (W)	Partial	None
16	14.08.19	18	12 (SSW)	Partial	None
17	15.08.19	18	17 mph (W)	Partial	None
18	16.08.19	18	14 mph (SSW)	None	None
19	20.08.19	16	10 mph W	None	None
20	19.09.19	12	7mph (W)	Partial	None

Source: Mott MacDonald field surveys 2019.

C. Technical note to inform clearance actions

Technical Note

Project:	Gaywood - Parkway		
Our reference:	-	**Your reference:**	
Prepared by:	J. Collins	**Date:**	12/2019
Approved by:	J. Fookes	**Checked by:**	S. Allen
Subject:	Clearance during reptile translocation period		

Introduction

Introduction

This technical note addresses a question raised by the client. Outlined within are criteria that must be adhered to reduce as far as practicable, the risk of harming a reptile. Reptiles are protected by the legislation presented in section 1.2. The question broadly inquired as to whether vegetation clearance could occur during the trapping stage of the translocation process. Further details can be found in the reptile report under section 4.2.

Legislation

All reptiles are protected under the Wildlife and Countryside Act 1981 (as amended), this legislation makes it an offence to:

- Intentionally kill or,
- Intentionally injure any reptile.

Rare reptiles (smooth snake and sand lizard) also receive legal protection under the Conservation of Habitats and Species Regulations 2010. In combination with the Wildlife and Countryside Act 1981 (as amended), these two pieces of legislation make it an offence to:

- Capture,
- Disturb,
- Damage or obstruct a place of shelter,
- Intentionally kill or,
- Intentionally injure any rare reptile.

Clearance criteria

In general, yes clearance can occur during the trapping phase of the translocation process. However, the following points must be adhered to:

- Hand tools are to be used e.g. petrol strimmer.
- All clearance is to be done under a watching brief with a suitably qualified ecologist.
- The cut height must be at least 150mm.
- Trees to be felled must be done so onto a cleared area.
- Any hauling (felled trees) must be done so over a cleared route.
- All clearance is done so at the discretion of the supervising ecologist.
- Before the translocation process is complete optimal habitat areas cannot be cleared.
- Clearance cannot remove more than 1/3 of the habitat before the translocation process is complete.
- Where possible clearance must facilitate the movement of reptiles towards ideal habitat opposed to sub-optimal/hostile habitat such as urban areas.

Additional information

To help inform the strategy, below are several points that may help the client decide how they would like to proceed.

- Reptile fencing could be used to break up the area into smaller sections, although this would incur additional fees in several ways; more fencing is required to be hired, installation must be done under the watch of a suitably qualified ecologist.
- Clearance could be postponed until the translocation process is completed – this has the benefit that heavier machinery can be used.

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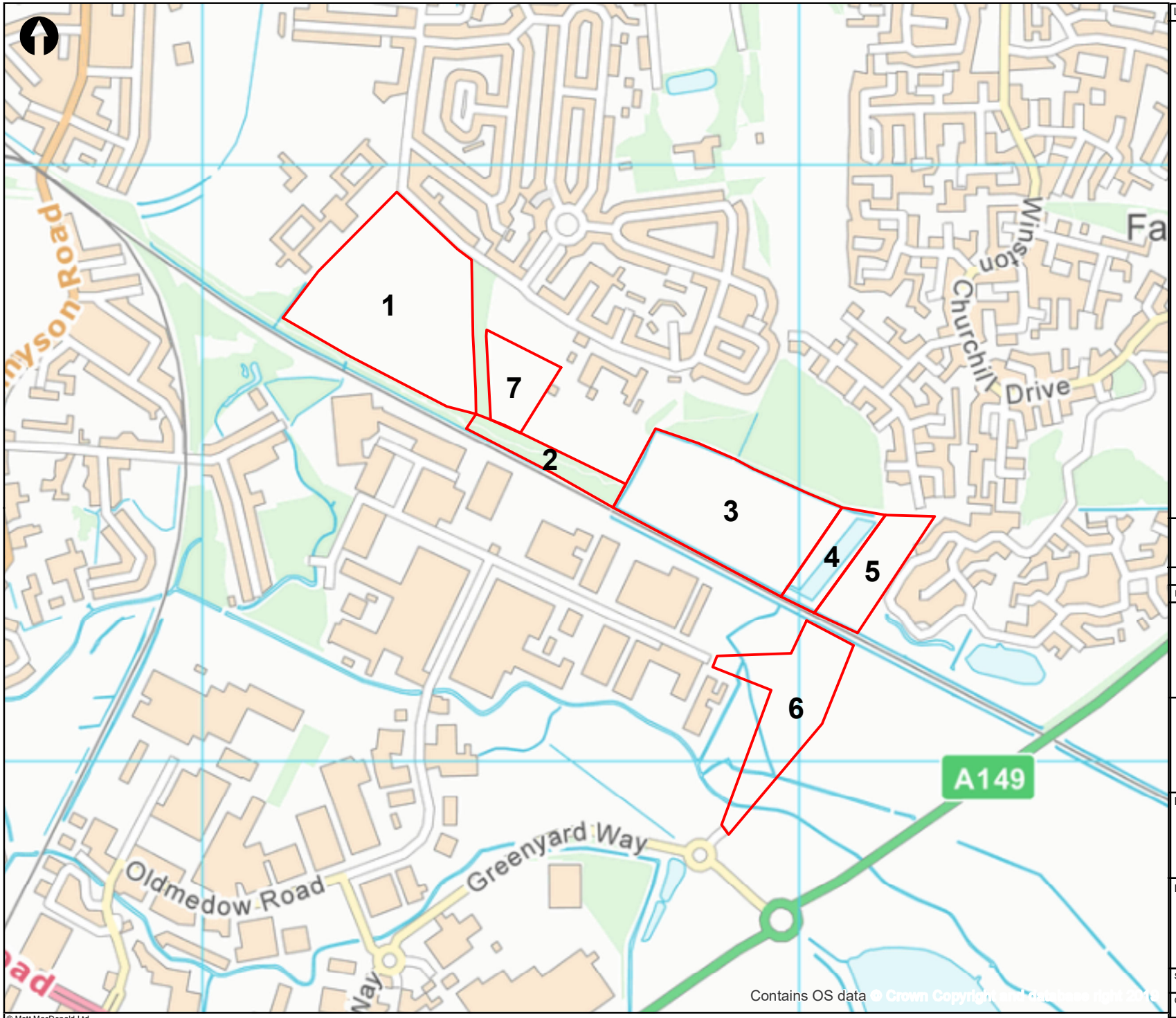

Legend

Site sections

Meters

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Rev	Date	Description	Drawn	Ch'k'd	App'd
P1	03/05/2019	First Issue	JC	SA	JF

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Project Title

Parkway, King's Lynn

Drawing Title

Site sections at Parkway - King's Lynn

Scale	MM Project No.	Status
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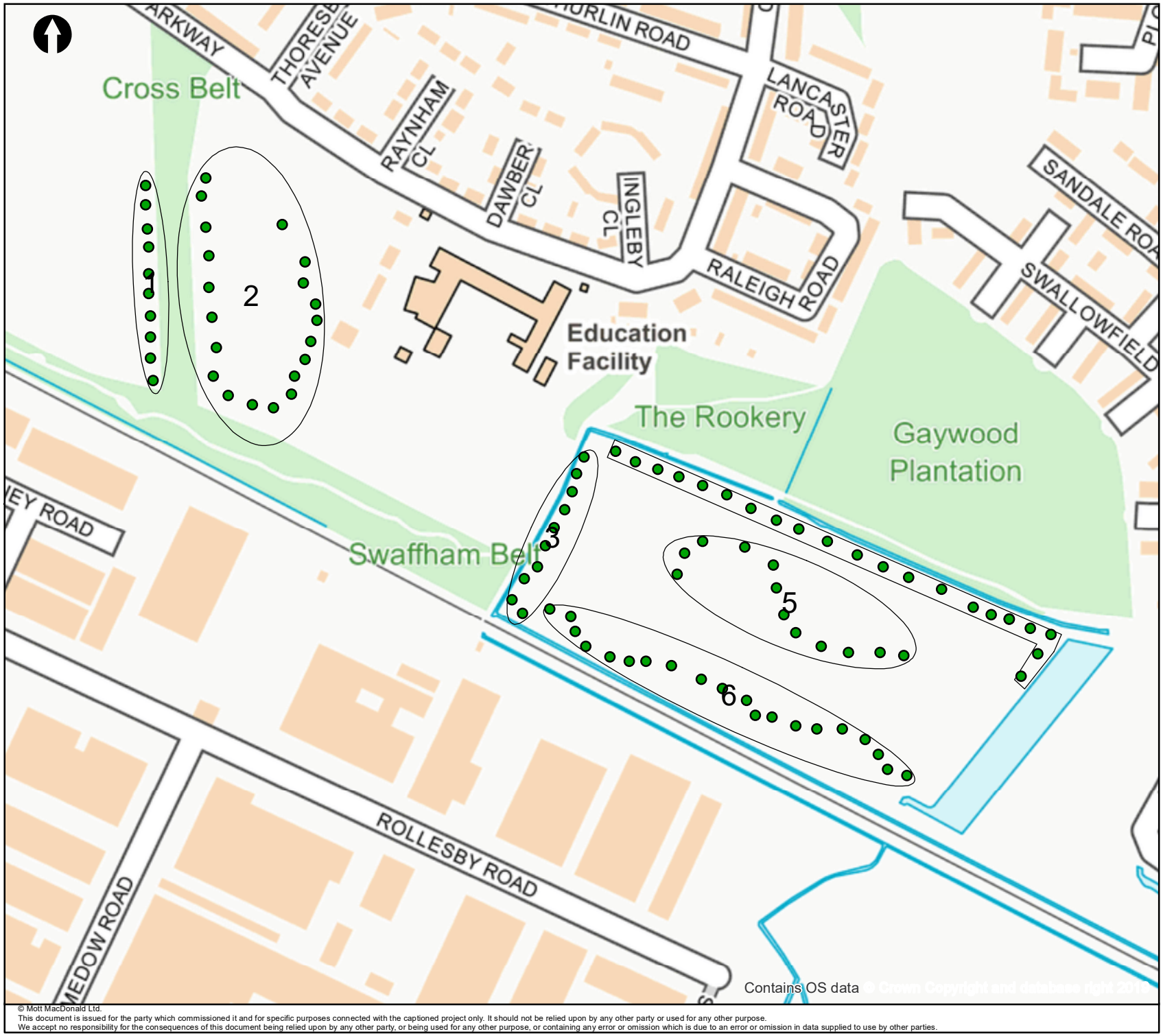
GIS File: Reptiles master

Drawing No. 407004-MMD-00-DR-EN-0002 Rev 0



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Rev	Date	Description	Drawn	Ch'k'd	App'd
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Project Title
Parkway, King's Lynn

Drawing Title
Reptile refugia mat transects

Scale	MM Project No.	Status
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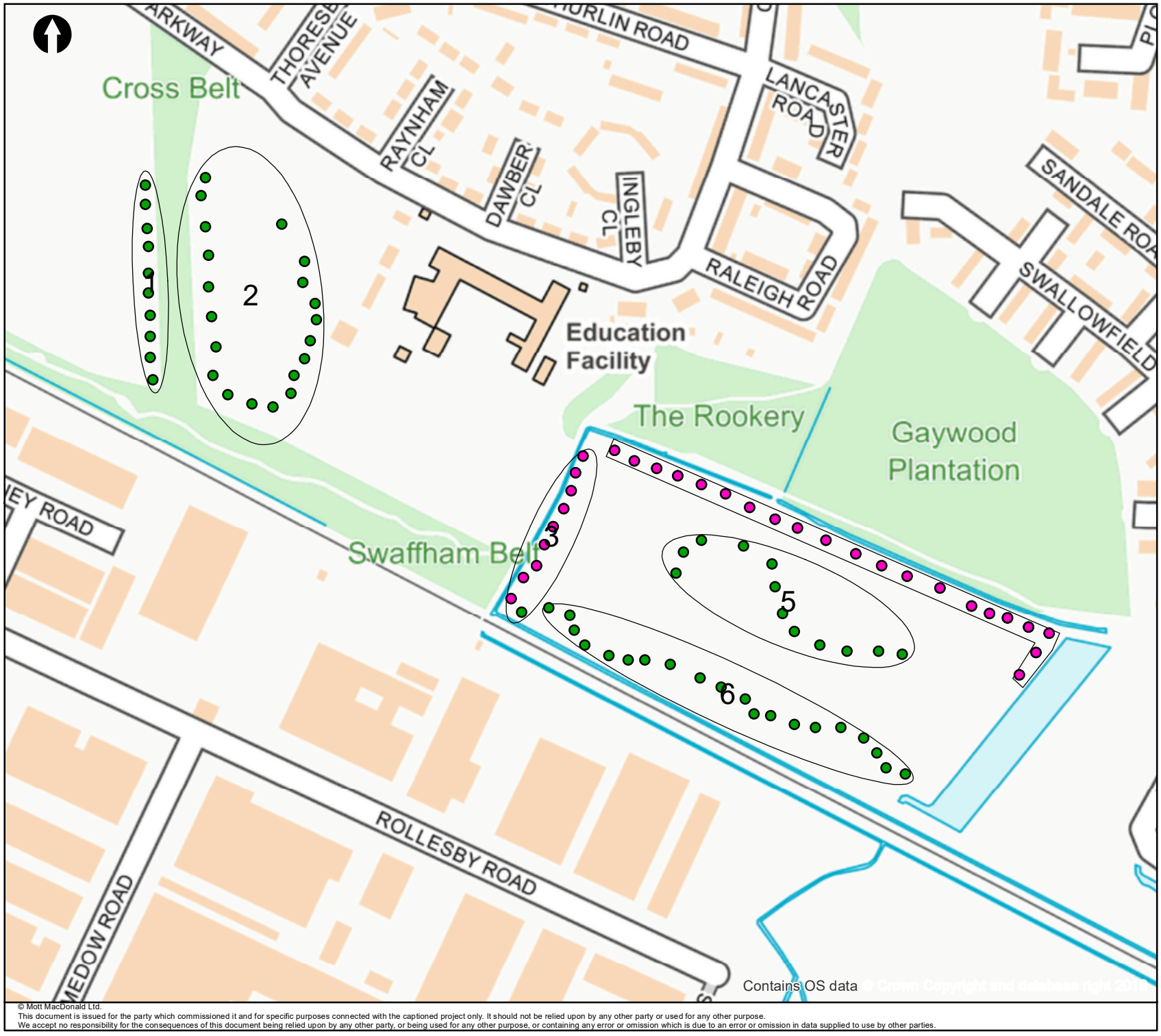
GIS File: Reptiles transects

Drawing No.: 407004-MMD-00-DR-EN-0002 Rev 0



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Project Title
Parkway, King's Lynn

Drawing Title
Reptile refugia mats damaged by mowing

Scale	MM Project No.	Status
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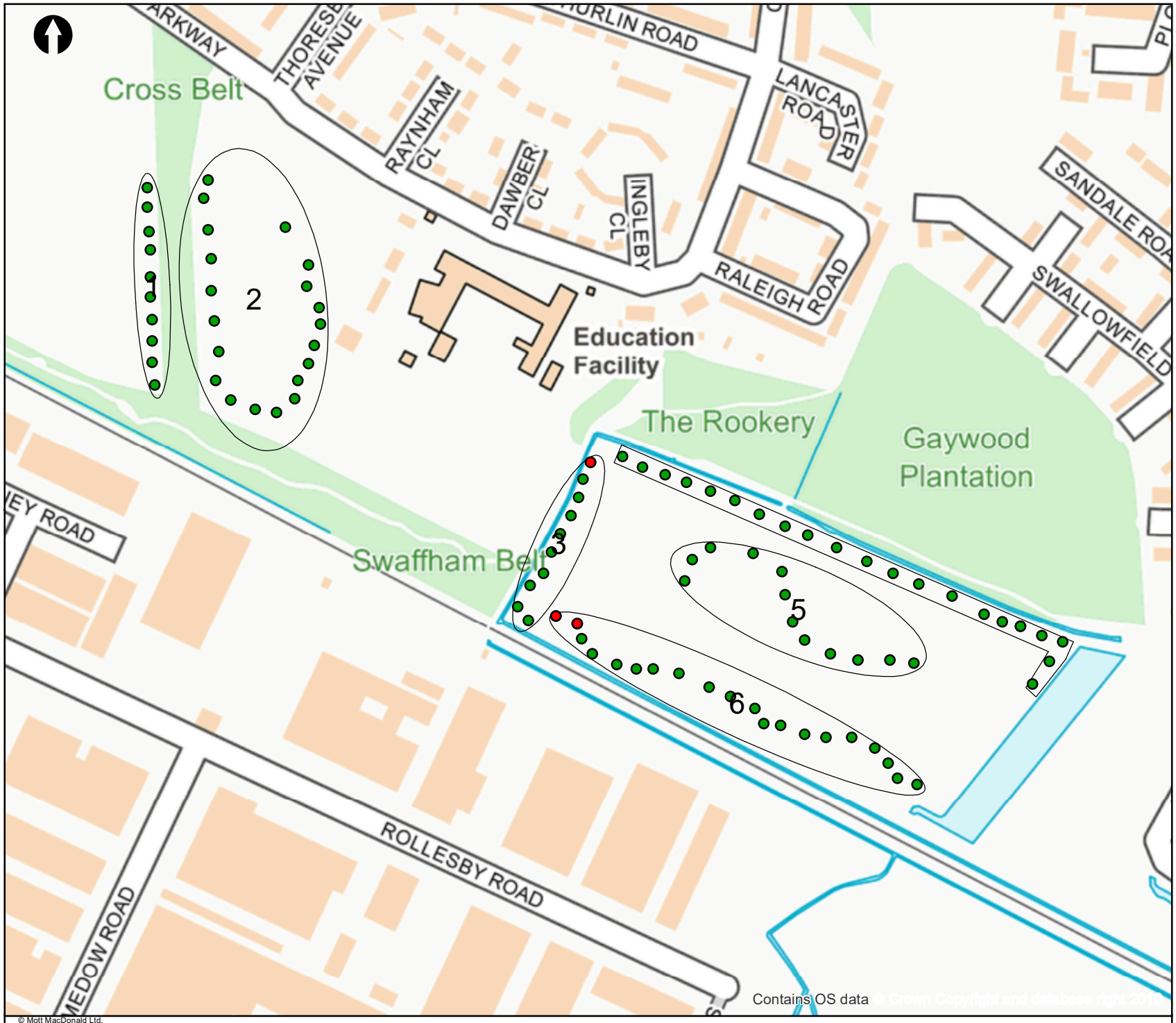
GIS File: Reptiles transects

Drawing No.: 407004-MMD-00-DR-EN-0002 Rev 0



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Project Title
Parkway, King's Lynn

Drawing Title
Reptile refugia mats lost to vegetation grov

Scale	MM Project No.	Status
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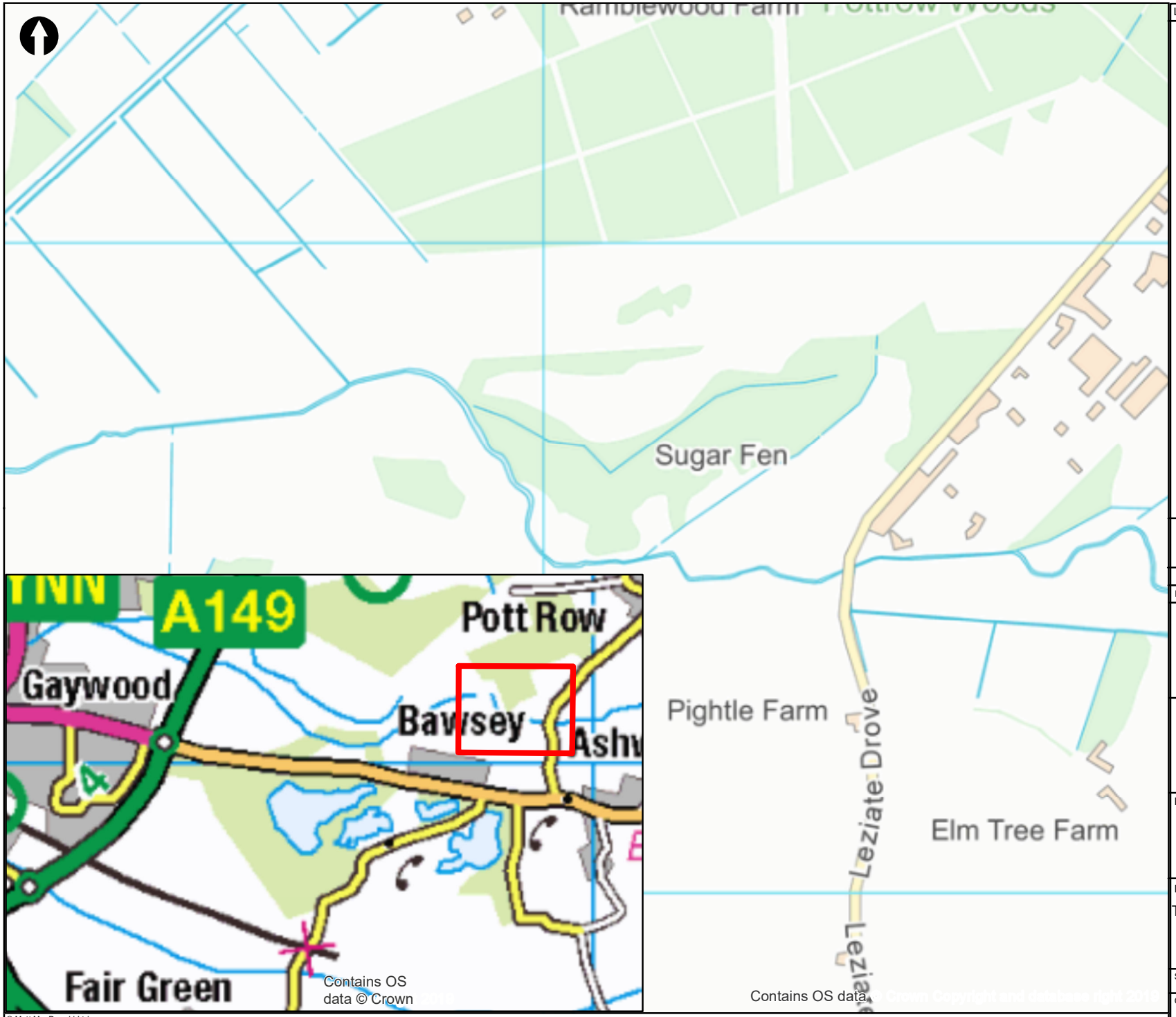
GIS File: Reptiles transects

Drawing No.: 407004-MMD-00-DR-EN-0002 Rev 0



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Project Title
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Drawing Title
Translocation receptor site for Parkway's reptiles.

Scale	MM Project No.	Status
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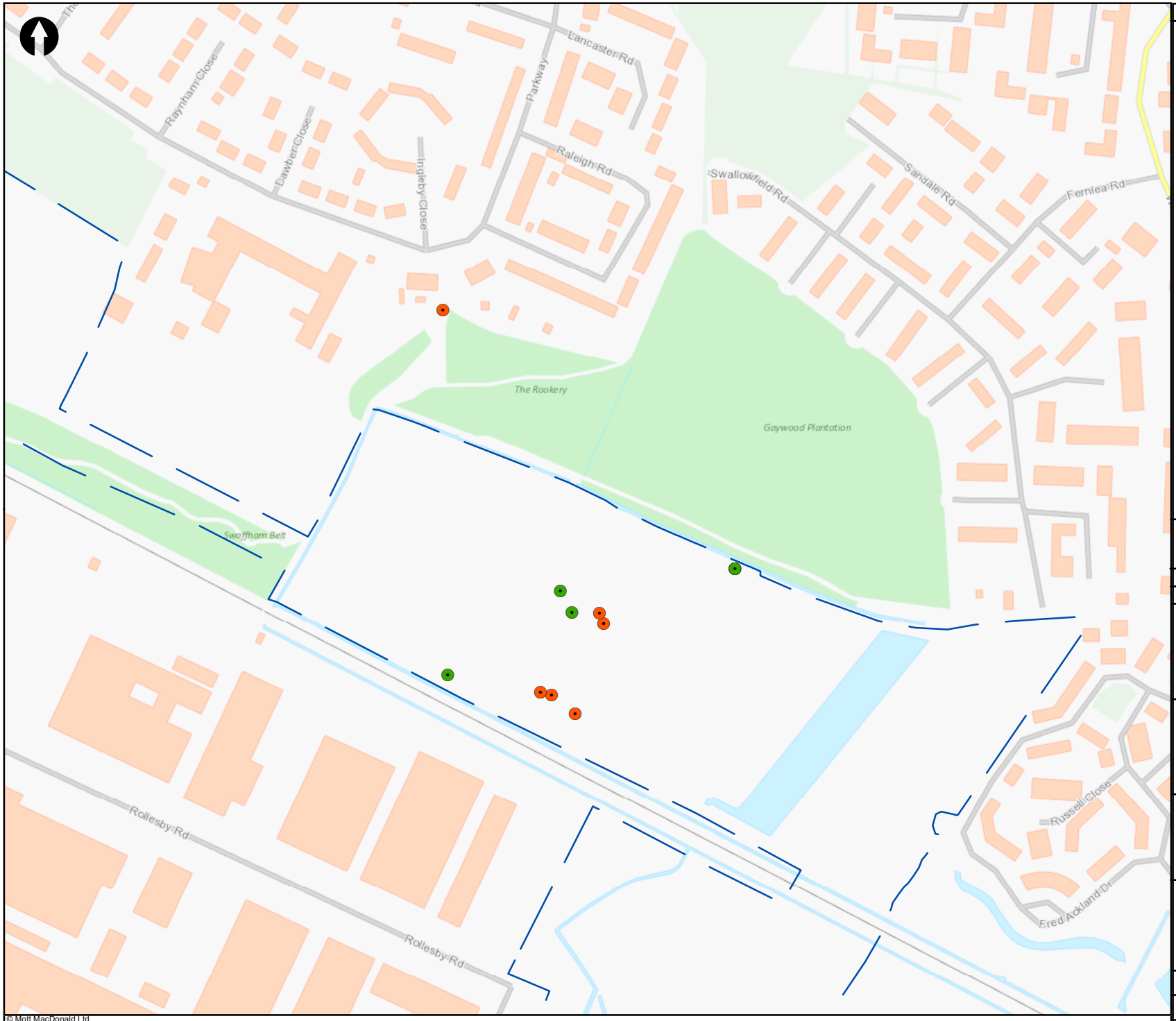
GIS File: Sugar fen

Drawing No. 407004-MMD-00-DR-EN-0002 Rev 0



Legend

- Potential Scheme Boundary
- Common Lizard
- Grass Snake

Metres
0 25 50 75 100

Rev	Date	Description	Drawn	Ch'k'd	App'd
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Project Title

Gaywood Sites, King's Lynn

Drawing Title

The location of reptiles discovered at the Project Site

Scale	MM Project No.	Status
1:3,500	407004	INF

GIS File: Reptile_Points_Template

Drawing No. 407004-MMD-00-DR-EN-0008 Rev 0