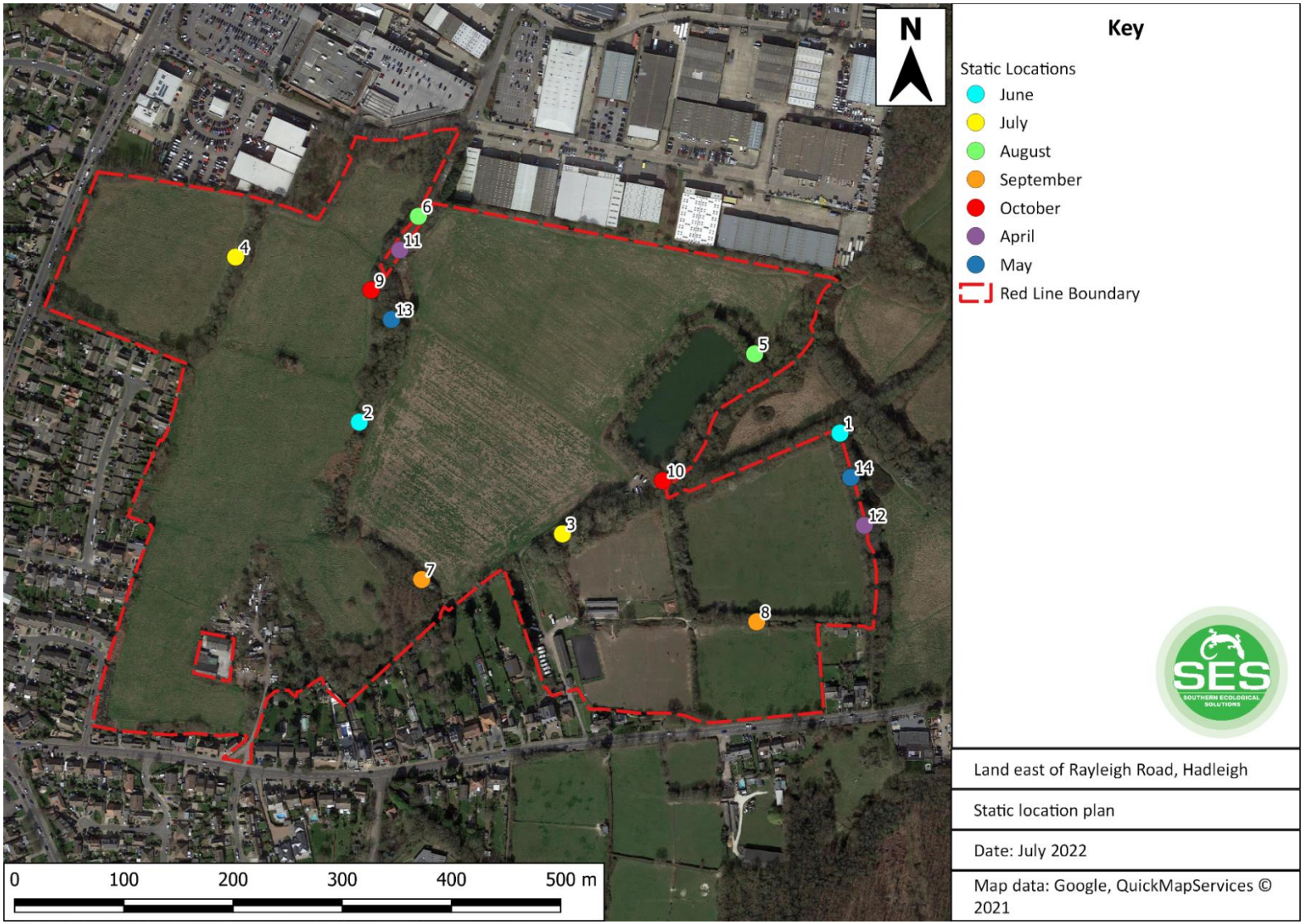
*Appendix 6h – Static Detector Locations*




*Appendix 6i – Activity Transect Survey Results and Heat Maps*

*June 2020*

**Table A7.2: Summary of June 2020 bat transect results.**

| Date | Survey type | Survey timings | Weather | Route Direction |
|---|---|---|---|---|
| 24/06/2020 | June dusk transect | Start/Sunset: 21:20<br>Finish: 23:20 | 20$^{o}$C<br>0% Cloud<br>3 Beaufort | Anti-clockwise |
| **Time** | **Comments** | | | |
| 21:20-21:25 | | | | |
| 21:25-21:30 | | | | |
| 21:30-21:35 | 4x Soprano pipistrelle | | | |
| 21:35-21:40 | | | | |
| 21:40-21:45 | 1x Soprano pipistrelle | | | |
| 21:45 – 21:50 | | | | |
| 21:50 – 21:55 | | | | |
| 21:55 – 22:00 | 1x Soprano pipistrelle | | | |
| 22:00 – 22:05 | | | | |
| 22:05 – 22:10 | 1x Common pipistrelle, 1x Soprano pipistrelle | | | |
| 22:10 – 22:15 | 4x Soprano pipistrelle | | | |
| 22:15 – 22:20 | 2x Common pipistrelle, 1x Soprano pipistrelle, 1x Daubenton's bat | | | |
| 22:20 – 22:25 | 2x Common pipistrelle | | | |
| 22:25 – 22:30 | 2x Common pipistrelle | | | |
| 22:30 – 22:35 | 3x Common pipistrelle, 1x *Myotis sp.* Daubenton's bat | | | |
| 22:35 – 22:40 | 3x Common pipistrelle | | | |
| 22:40 – 22:45 | | | | |
| 22:45 – 22:50 | | | | |
| 22:50 – 22:55 | | | | |
| 22:55 – 23:00 | 1x Noctule | | | |
| 23:00 – 23:05 | 2x Common pipistrelle | | | |
| 22:05 – 23:10 | 2x Common pipistrelle | | | |
| 23:10 – 23:15 | | | | |
| 23:15 – 23:20 | 4x Common pipistrelle, 2x Soprano pipistrelle, 1x Noctule, 1x Daubenton's bat | | | |

*July 2020*

**Table A7.3: Summary of July 2020 bat transect results.**

| Date | Survey type | Survey timings | Weather | Route Direction |
|---|---|---|---|---|
| 21/07/2020 | July dusk transect | Start/Sunset: 21:02<br>Finish: 23:07 | 19°C<br>20% Cloud<br>0 Beaufort | Clockwise |
| **Time** | **Comments** | | | |
| 21:02 – 21:07 | | | | |
| 21:07 – 21:12 | | | | |
| 21:12 – 21:17 | | | | |
| 21:17 – 21:22 | | | | |
| 21:22 - 21:27 | | | | |
| 21:27 – 21:32 | | | | |
| 21:32 – 21:37 | 1x Soprano pipistrelle | | | |
| 21:37 – 21:42 | | | | |
| 21:42 – 21:47 | 1x Common pipistrelle, 1x Soprano pipistrelle | | | |
| 21:47 – 21:52 | 2x Common pipistrelle, 2x Soprano pipistrelle | | | |
| 21:52 – 21:57 | 1x Soprano pipistrelle | | | |
| 21:57 – 22:02 | | | | |
| 22:02 – 22:07 | 2x Daubenton's bat | | | |
| 22:07 – 22:12 | 2x Common pipistrelle, 1x Noctule | | | |
| 22:12 – 22:17 | 1x Common pipistrelle, 4x Soprano pipistrelle | | | |
| 22:17 – 22:22 | 1x Soprano pipistrelle | | | |
| 22:22 – 22:27 | 2x Soprano pipistrelle, 1x Daubenton's bat | | | |
| 22:27 – 22:32 | 1x Common pipistrelle, 4x Soprano pipistrelle | | | |
| 22:32 – 22:37 | 2x Soprano pipistrelle, 1x *Nyctalus sp.* | | | |
| 22:37 – 22:42 | 2x Common pipistrelle, 4x Soprano pipistrelle | | | |
| 22:42 – 22:47 | 5x Common pipistrelle, 4x Soprano pipistrelle | | | |
| 22:47 – 22:52 | 3x Common pipistrelle, 2x Soprano pipistrelle, 2x Brown long-eared bat | | | |
| 22:52 – 22:57 | 1x Soprano pipistrelle | | | |
| 22:57 – 23:02 | 1x Soprano pipistrelle | | | |
| 23:02 – 23:07 | 2x Soprano pipistrelle | | | |

*August 2020*

**Table A7.4: Summary of August 2020 bat transect results.**

| Date | Survey type | Survey timings | Weather | Route Direction |
|---|---|---|---|---|
| 06/08/2020 | August dusk transect | Start/Sunset: 19:56<br>Finish: 22:04 | 19°C<br>90% Cloud<br>1 Beaufort | Anti-Clockwise |
| **Time** | **Comments** | | | |
| 19:56 – 20:01 | | | | |
| 20:01 – 20:05 | | | | |
| 20:05 – 20:10 | | | | |
| 20:10 – 20:21 | 1x Soprano pipistrelle | | | |
| 20:21 – 20:26 | 2x Common pipistrelle | | | |
| 20:26 – 20:29 | | | | |
| 20:29 – 20:34 | 2x Soprano pipistrelle | | | |
| 20:36 – 20:41 | 1x Common pipistrelle, 2x Soprano pipistrelle | | | |
| 20:41 – 20:46 | 2x Common pipistrelle, 1x Daubenton's bat | | | |
| 20:46 – 20:52 | 1x Common pipistrelle | | | |
| 20:52 – 20:57 | 1x Soprano pipistrelle | | | |
| 20:57 – 21:04 | 1x Common pipistrelle, 2x Daubenton's bat | | | |
| 21:04 – 21:09 | 1x Noctule | | | |
| 21:09 – 21:16 | 6x Common pipistrelle | | | |
| 21:16 – 21:21 | 1x Common pipistrelle, 2x Brown long-eared bat | | | |
| 21:21 – 21:46 | 1x Noctule, 1x Daubenton's bat | | | |
| 21:46 – 21:51 | | | | |
| 21:51 – 22:04 | | | | |

*September 2020*

**Table A7.5: Summary of September 2020 dusk bat transect results.**

| Date | Survey type | Survey timings | Weather | Route Direction |
|---|---|---|---|---|
| 22/09/2020 | September dusk transect | Start/Sunset: 18:55<br>Finish: 20:55 | 20°C<br>30% Cloud<br>2 Beaufort | Clockwise |
| **Time** | **Comments** | | | |
| 18:55 – 19:00 | | | | |
| 19:00 – 19:05 | | | | |
| 19:05 – 19:10 | | | | |
| 19:10 – 19:15 | 1x Common pipistrelle | | | |
| 19:15 – 19:20 | 1x Soprano pipistrelle | | | |
| 19:20 – 19:25 | 1x Soprano pipistrelle | | | |
| 19:25 – 19:30 | 2x Common pipistrelle | | | |
| 19:30 – 19:35 | 1x Soprano pipistrelle | | | |
| 19:35 – 19:40 | | | | |
| 19:40 – 19:45 | | | | |
| 19:45 – 19:50 | 1x Common pipistrelle | | | |
| 19:50 – 19:55 | | | | |
| 19:55 – 20:00 | 1x Common pipistrelle | | | |
| 20:00 – 20:05 | 2x Common pipistrelle | | | |
| 20:05 – 20:10 | | | | |
| 20:10 – 20:15 | | | | |
| 20:15 – 20:20 | | | | |
| 20:20 – 20:25 | 2x Common pipistrelle | | | |
| 20:25 – 20:30 | | | | |
| 20:30 – 20:35 | 1x Common pipistrelle | | | |
| 20:35 – 20:40 | 2x Common pipistrelle | | | |
| 20:40 – 20:45 | 1x Common pipistrelle | | | |
| 20:45 – 20:50 | 2x Common pipistrelle | | | |
| 20:50 – 20:55 | 1x Common pipistrelle | | | |

**Table A7.6: Summary of September 2020 dawn bat transect results.**

| Date | Survey type | Survey timings | Weather | Route Direction |
|---|---|---|---|---|
| 23/09/2020 | September dawn transect | Start/Sunset: 04:46<br>Finish: 06:46 | 16°C<br>100% Cloud<br>0 Beaufort | Anti-Clockwise |

| Time | Comments |
|---|---|
| 04:46 – 04:51 | 2x Common pipistrelle |
| 04:51 – 04:56 | 1x Common pipistrelle |
| 04:56 – 05:01 | |
| 05:01 – 05:06 | 1x Common pipistrelle |
| 05:06 – 05:11 | |
| 05:11 – 05:16 | |
| 05:16 – 05:21 | 1x Common pipistrelle |
| 05:21 – 05:26 | 1x Common pipistrelle |
| 05:26 – 05:31 | 1x Common pipistrelle, 1x Soprano pipistrelle |
| 05:31 – 05:36 | 2x Common pipistrelle |
| 05:36 – 05:41 | |
| 05:41 – 05:46 | 1x Common pipistrelle |
| 05:46 – 05:51 | 1x Common pipistrelle |
| 05:51 – 05:56 | 1x Common pipistrelle, 1x Soprano pipistrelle |
| 05:56 – 06:01 | |
| 06:01 – 06:06 | |
| 06:06 – 06:11 | |
| 06:11 – 06:16 | |
| 06:16 – 06:21 | |
| 06:21 – 06:26 | |
| 06:26 – 06:31 | |
| 06:31 – 06:36 | |
| 06:36 – 06:41 | |
| 06:41 – 06:46 | |

*October 2020*

**Table A7.7: Summary of October 2020 bat transect results.**

| Date | Survey type | Survey timings | Weather | Route Direction |
|---|---|---|---|---|
| 22/10/2020 | October dusk transect | Start/Sunset: 17:52<br>Finish: 19:52 | 14°C<br>75% Cloud<br>1 Beaufort | Clockwise |
| **Time** | **Comments** | | | |
| 17:52 – 18:05 | | | | |
| 18:05 – 18:10 | | | | |
| 18:10 – 18:24 | | | | |
| 18:24 – 18:29 | | | | |
| 18:29 – 18:36 | | | | |
| 18:36 – 18:45 | 1x Common pipistrelle | | | |
| 18:45 – 18:50 | 1x Common pipistrelle | | | |
| 18:50 – 18:55 | | | | |
| 18:55 – 19:00 | | | | |
| 19:00 – 19:05 | | | | |
| 19:05 – 19:13 | | | | |
| 19:13 – 19:29 | 1x Common pipistrelle, 1x Soprano pipistrelle | | | |
| 19:29 – 19:34 | | | | |
| 19:34 – 19:40 | | | | |
| 19:40 – 19:47 | | | | |
| 19:47 – 19:52 | | | | |

*April 2021*

**Table A7.8: Summary of April 2021 bat transect results.**

| Date | Survey type | Survey timings | Weather | Route Direction |
|---|---|---|---|---|
| 27/04/2021 | April dusk transect | Start/Sunset: 21:15<br>Finish: 22:30 | 10°C<br>70% Cloud<br>2 Beaufort | Clockwise |
| **Time** | **Comments** | | | |
| 20:15-20:20 | | | | |
| 20:20-20:25 | | | | |
| 20:30-20:35 | | | | |
| 20:35-20:40 | 1x Common pipistrelle | | | |
| 20:40-20:45 | | | | |
| 20:45 – 20:50 | 1x Common pipistrelle | | | |
| 20:50 – 20:55 | 2x Common pipistrelle | | | |
| 20:55 – 21:00 | | | | |
| 21:00 – 21:05 | | | | |
| 21:05 – 21:10 | 1x Daubentons bat | | | |
| 21:10 – 21:15 | | | | |
| 21:15 – 21:20 | 1x Daubentons bat | | | |
| 21:20 – 21:25 | | | | |
| 21:25 – 21:30 | 2x Daubentons bat | | | |
| 21:30 – 21:35 | 1x Common pipistrelle | | | |
| 21:35 – 21:40 | 4x Common pipistrelle, 1x Soprano pipistrelle, 1x *Myotis sp.* 1x Daubenton's bat | | | |
| 21:40 – 21:45 | 1x Common pipistrelle | | | |
| 21:45 – 21:50 | | | | |
| 21:50 – 21:55 | | | | |
| 21:55 – 22:00 | | | | |
| 22:00 – 22:05 | 2x Soprano pipistrelle, 4x *Myotis sp* | | | |
| 22:05 – 22:10 | 4x *Myotis sp* | | | |
| 22:10 – 22:15 | | | | |
| 22:15 – 22:20 | 2x Soprano pipistrelle | | | |
| 22:20 – 22:25 | 2x Soprano pipistrelle | | | |
| 22:25 – 22:30 | | | | |

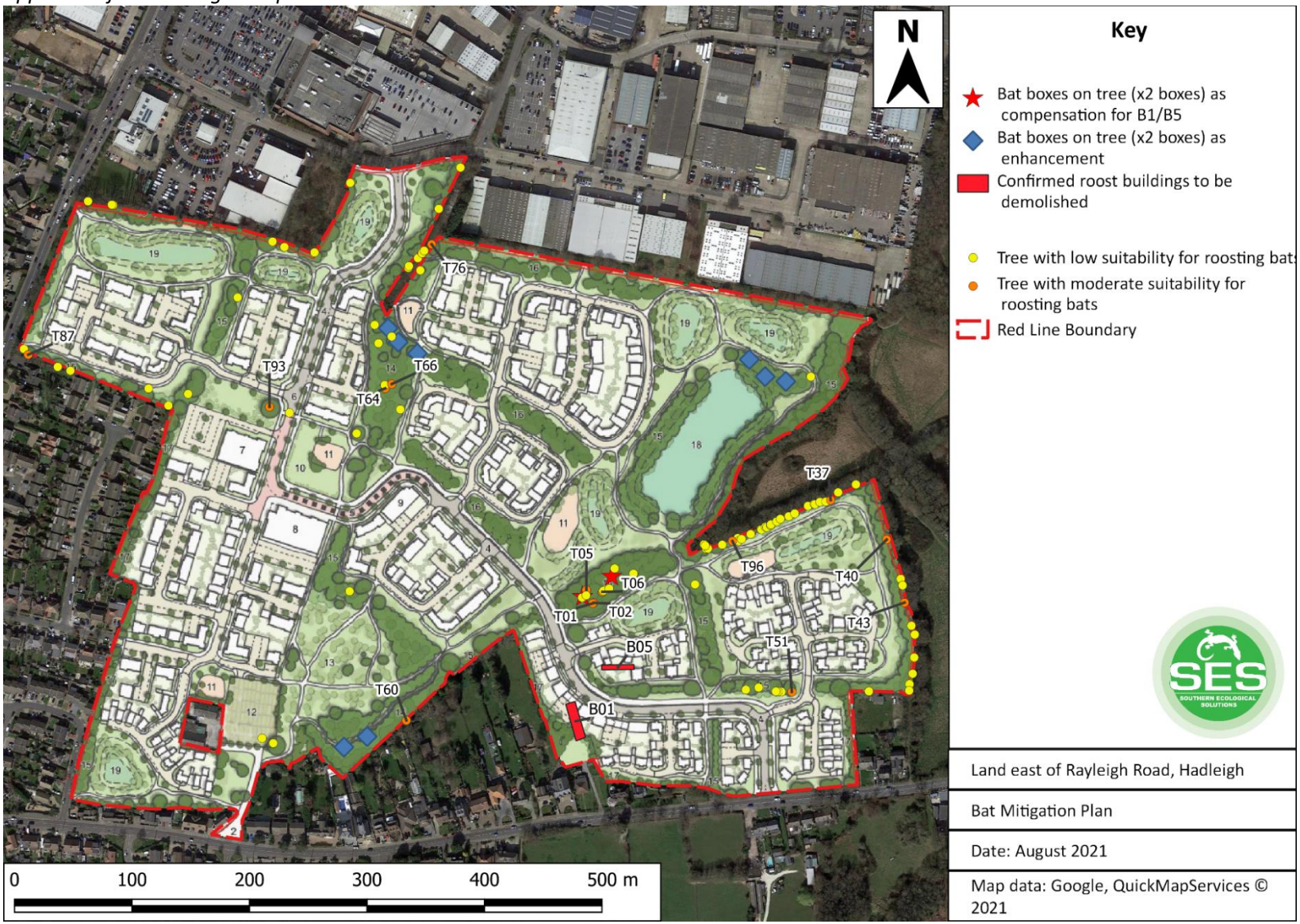
*May 2021*

**Table A7.9: Summary of May 2021 bat transect results.**

| Date | Survey type | Survey timings | Weather | Route Direction |
|---|---|---|---|---|
| 20/05/2021 | May dusk transect | Start/Sunset: 20:51<br>Finish: 22:51 | 12°C<br>90% Cloud<br>4 Beaufort | Clockwise |
| **Time** | **Comments** | | | |
| 20:50-20:55 | | | | |
| 20:55-21:00 | | | | |
| 21:00-21:05 | | | | |
| 21:05-21:10 | | | | |
| 21:10-21:15 | | | | |
| 21:15 – 21:20 | | | | |
| 21:20 – 21:25 | 1x Soprano pipistrelle | | | |
| 21:25 – 21:30 | | | | |
| 21:30 – 21:35 | | | | |
| 21:35 – 21:40 | 1x Soprano pipistrelle | | | |
| 21:40 – 21:45 | | | | |
| 21:45 – 21:50 | 1x Soprano pipistrelle, 1x Barbastelle | | | |
| 21:50 – 21:55 | | | | |
| 21:55 – 22:00 | 6x Soprano pipistrelle, 6x Common pipistrelle | | | |
| 22:00 – 22:05 | | | | |
| 22:05 – 22:10 | 6x Common pipistrelle, 7x Soprano pipistrelle, 1x Daubentons bat | | | |
| 22:10 – 22:15 | 1x Soprano pipistrelle, 4x Daubentons bat | | | |
| 22:15 – 22:20 | 11x Soprano pipistrelle, 1x Daubentons bat | | | |
| 22:20 – 22:25 | 2x Common pipistrelle | | | |
| 22:25 – 22:30 | | | | |
| 22:30 – 22:35 | 1x Common pipistrelle | | | |
| 22:35 – 22:40 | 1x Soprano pipistrelle | | | |
| 22:40 – 22:45 | | | | |
| 22:45 – 22:50 | | | | |
| 22:50 – 22:55 | | | | |

*Bat Activity Hotspots*

*Appendix 6j – Bat mitigation plan*



## Appendix 7: Wintering Bird Survey Results

*Appendix 7a – WIntering Bird Survey Results and Weather Conditions*

**Table A8.1: Status of wintering birds within the site.**

| Species | BoCC | S. 41 | V1 | V2 | Comments |
|---|---|---|---|---|---|
| Fieldfare *Turdus pilaris* | **Red** | | 1 | 10 | Foraging in the paddocks and surrounding hedgerows. |
| Herring gull *Larus argentatus* | **Red** | ✓ | 1 | 14 | Foraging and shelter within the fields. |
| House Sparrow *Passer domesticus* | **Red** | ✓ | 1 | 4 | Low numbers within areas of scrub adjacent to residential development. |
| Starling *Sturnus vulgaris* | **Red** | ✓ | 2 | 1 | |
| Black-headed gull *Chroicocephalus ridibundus* | **Amber** | | 1 | 5 | Flying over site and present on the lake |
| Dunnock *Prunella modularis* | **Amber** | ✓ | 5 | 6 | Associated with the hedgerows and scrub across the site. |
| Lesser black-backed gull *Larus fuscus* | **Amber** | | 0 | 2 | |
| Mallard *Anas platyrhynchos* | **Amber** | | 3 | 3 | Foraging and sheltering on the lake. |
| Wren *Troglodytes troglodytes* | **Amber** | | 0 | 1 | |
| Redwing *Turdus iliacus* | **Amber** | | 1 | 25 | Foraging in the paddocks and surrounding hedgerows. |
| Song thrush *Turdus philomelos* | **Amber** | ✓ | 2 | 1 | |
| Woodpigeon *Columba palumbus* | **Amber** | | 1 | 20 | |
| Blackbird *Turdus merula* | **Green** | | 10 | 4 | |
| Blue tit *Cyanistes caeruleus* | **Green** | | 3 | 8 | |
| Buzzard *Buteo buteo* | **Green** | | 1 | 1 | Hunting over site |
| Carrion crow *Corvus corone* | **Green** | | 7 | 2 | |
| Chaffinch *Fringilla coelebs* | **Green** | | 1 | 2 | |
| Chiffchaff *Phylloscopus collybita* | **Green** | | 0 | 1 | |
| Cormorant *Phalacrocorax carbo* | **Green** | | 0 | 2 | Hunting in the lake. |
| Coal tit *Periparus ater* | **Green** | | 0 | 1 | |
| Coot *Fulica atra* | **Green** | | 2 | 1 | Foraging and sheltering on the lake. |
| Great tit *Parus major* | **Green** | | 3 | 4 | |
| Great spotted woodpecker *Dendrocopus major* | **Green** | | 1 | 0 | |
| Grey heron *Ardea cinerea* | **Green** | | 0 | 1 | Hunting in the lake. |
| Jay *Garrulus glandarius* | **Green** | | 2 | 2 | Foraging on site. |
| Magpie *Pica pica* | **Green** | | 3 | 3 | |
| Moorhen *Gallinula chloropus* | **Green** | | 1 | 0 | Foraging and sheltering on the lake. |
| Pied wagtail *Motacilla alba* | **Green** | | 0 | 1 | |

| Species | BoCC | S. 41 | V1 | V2 | Comments |
|---|---|---|---|---|---|
| Robin *Erithacus rubecula* | **Green** | | 5 | 6 | |
| Pheasant *Phasianus colchicus* | **Introduced** | | 0 | 1 | |

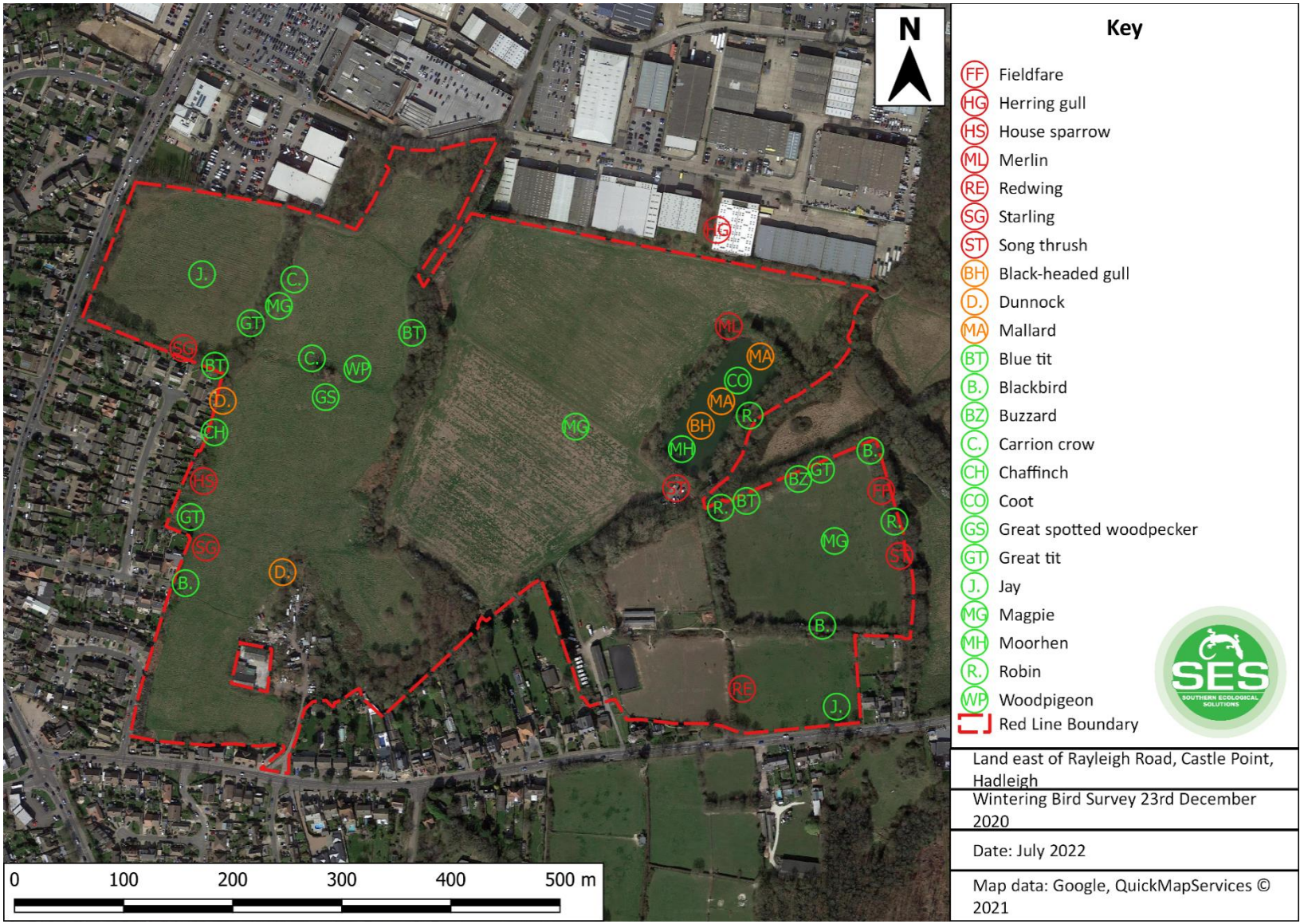
Red rows are BOCC red-list, Amber rows are BoCC amber-list, Green rows are BoCC green-list.
BoCC: Birds of Conservation Concern as defined and listed in Eaton *et al.,* (2021)

**Table A8.2: Summary of wintering bird survey visit dates and weather conditions.**

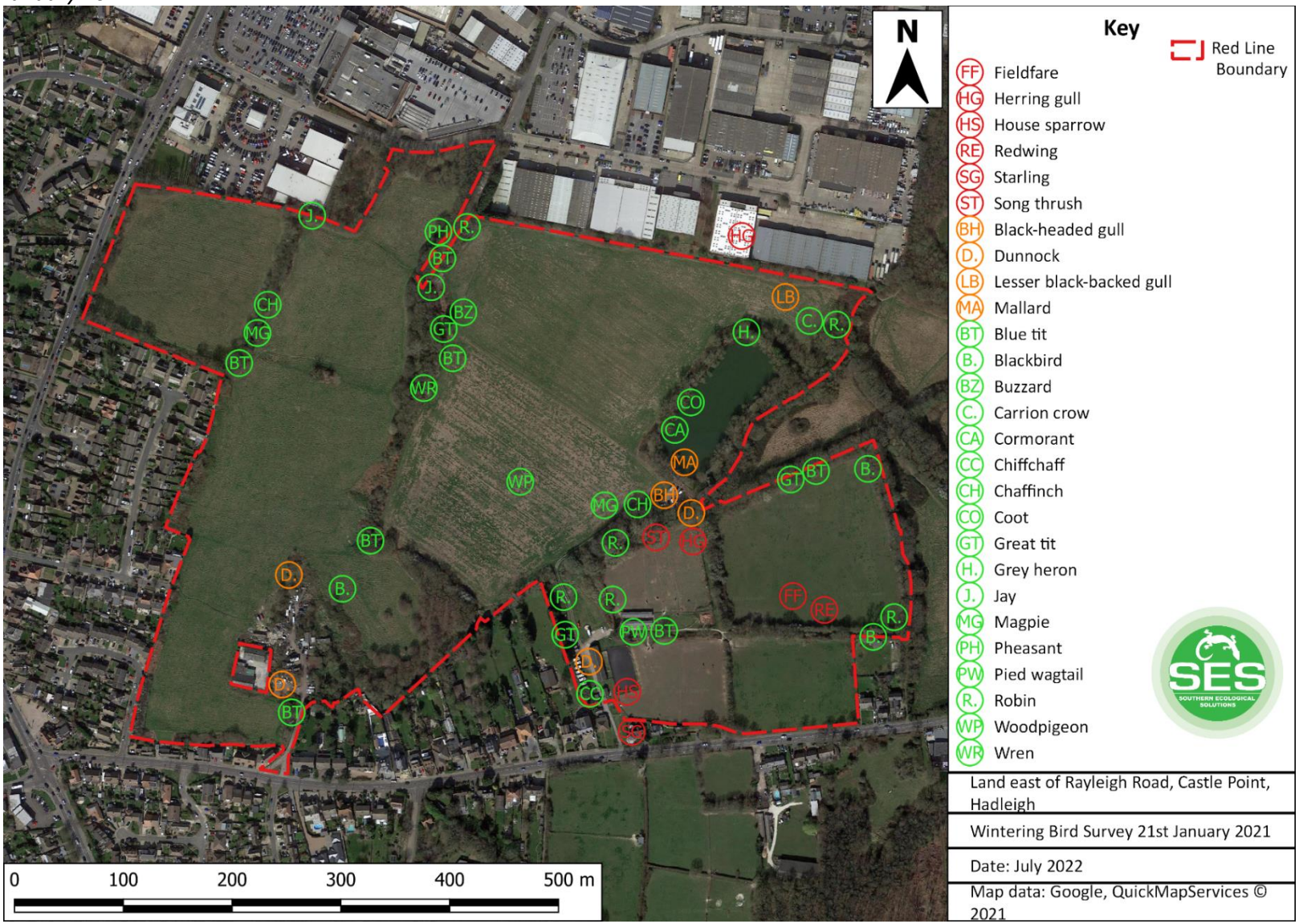
| Visit | Date | Survey Conditions |
|---|---|---|
| 1 | 23/12/2020 | Fair: 11°C (average), little precipitation, 2 wind, cloud 8/8, good visibility. |
| 2 | 21/01/2021 | Fair: 6°C (average), no precipitation, 4 wind, cloud 1/8, good visibility. |

*Appendix 7c – Wintering Bird Survey Maps*

*December 2020*



*January 2021*



## Appendix 8: Breeding Bird Survey Results

*Appendix 8a – Breeding Bird Survey Results and Weather Conditions*

**Table A9.1: Status of breeding birds within the site.**

| Species | BoCC | S. 41 | V1 | V2 | V3 | V4 | Status |
|---|---|---|---|---|---|---|---|
| Herring gull *Larus argentatus* | Red | ✓ | 1 | 0 | 2 | 1 | Foraging on the site |
| House Sparrow *Passer domesticus* | Red | ✓ | 5 | 16 | 10 | 14 | Small colony adjacent to site and foraging in boundary hedgerows and scrub |
| Common linnet *Linaria cannabina* | Red | ✓ | 1 | 0 | 6 | 0 | Foraging on the site |
| Starling *Sturnus vulgaris* | Red | ✓ | 2 | 0 | 4 | 7 | Pairs in housing adjacent to site; foraging within site |
| Willow tit *Poecile montanus* | Red | ✓ | 0 | 0 | 0 | 3 | Foraging on the site |
| Woodcock *Scolopax rusticola* | Red | | 0 | 1 | 0 | 0 | Foraging on the site |
| House martin *Delichon urbicum* | Red | | 0 | 1 | 0 | 0 | Foraging over the site. |
| Greenfinch *Chloris chloris* | Red | | 0 | 0 | 2 | 1 | Possible breeding - 1 territory |
| Song thrush *Turdus philomelos* | Amber | ✓ | 1 | 2 | 1 | 0 | Probable breeding – 1 territory |
| Black-headed gull *Chroicocephalus ridibundus* | Amber | | 0 | 0 | 1 | 0 | Flying over site |
| Dunnock *Prunella modularis* | Amber | ✓ | 7 | 2 | 4 | 1 | Probable breeding – 2 territories |
| Green sandpiper *Tringa ochropus* | Amber | | 1 | 2 | 0 | 0 | Foraging on site. |
| Kestrel *Falco tinnunculus* | Amber | ✓ | 0 | 1 | 0 | 2 | Hunting over site |
| Lesser black-backed gull *Larus fuscus* | Amber | | 0 | 0 | 0 | 1 | Flying over the site |
| Mallard *Anas platyrhynchos* | Amber | | 3 | 0 | 4 | 0 | Probable breeding – 2 territories |
| Stock dove *Columba oenas* | Amber | | 0 | 2 | 0 | 0 | Flying over the site |
| Moorhen *Gallinula chloropus* | Amber | | 2 | 0 | 0 | 0 | Foraging on site. |
| Woodpigeon Columba palumbus | Amber | | 1 | 1 | 0 | 0 | Foraging on the site |
| Blackbird *Turdus merula* | Green | | 8 | 3 | 2 | 4 | Probable breeding – 2 territories |
| Blackcap *Sylvia atricapilla* | Green | | 2 | 1 | 5 | 4 | Probable breeding - 1 territory |
| Blue tit *Cyanistes caeruleus* | Green | | 15 | 2 | 14 | 8 | Probable breeding - 3 territories |
| Carrion crow *Corvus corone* | Green | | 3 | 0 | 2 | 0 | Foraging on site |
| Chaffinch *Fringilla coelebs* | Green | | 1 | 0 | 1 | 0 | Foraging on site |
| Chiffchaff *Phylloscopus collybita* | Green | | 2 | 0 | 4 | 5 | Probable breeding - 1 territory |
| Coot *Fulica atra* | Green | | 0 | 0 | 3 | 1 | Probable breeding - 1 territory |
| Feral pigeon *Columba livia* | Green | | 1 | 0 | 0 | 1 | Flying over the site |
| Goldfinch *Carduelis carduelis* | Green | | 4 | 2 | 2 | 2 | Probable breeding – 2 territories |
| Great tit *Parus major* | Green | | 4 | 0 | 5 | 1 | Probable breeding - 1 territory |
| Great spotted woodpecker *Dendrocopus major* | Green | | 2 | 0 | 0 | 0 | Probable breeding - 1 territory |
| Jackdaw *Corvus monedula* | Green | | 0 | 0 | 1 | 1 | Foraging within the site |
| Jay *Garrulus glandarius* | Green | | 1 | 0 | 3 | 0 | Foraging within the site |
| Long-tailed tit *Aegithalos caudatus* | Green | | 5 | 4 | 5 | 4 | Possible breeding - 2 territories |

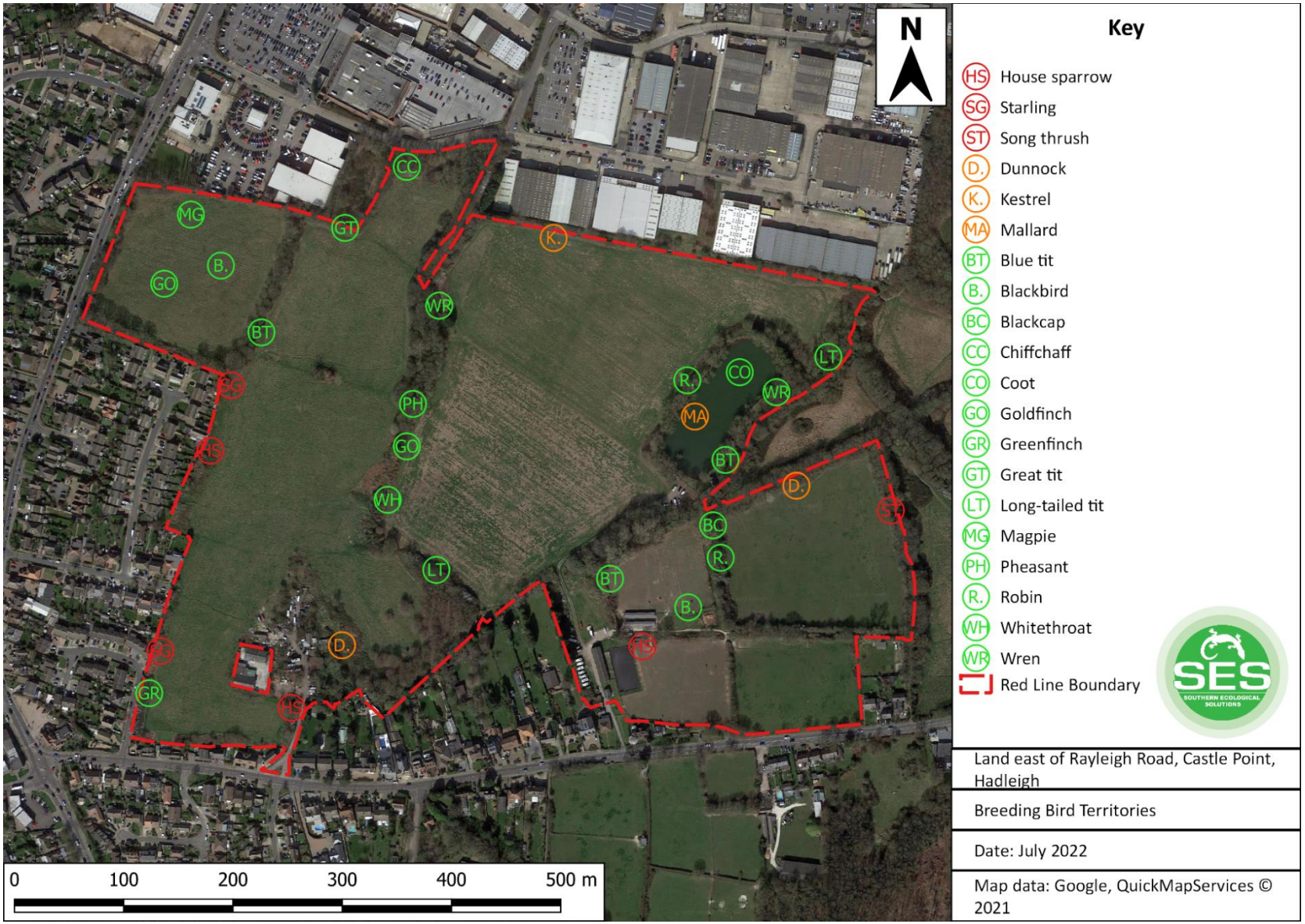
| Species | BoCC | S. 41 | V1 | V2 | V3 | V4 | Status |
|---|---|---|---|---|---|---|---|
| Magpie *Pica pica* | **Green** | | 6 | 14 | 3 | 0 | Possible breeding – 1 territory |
| Pied wagtail *Motacilla alba* | **Green** | | 0 | 0 | 0 | 1 | Foraging on the site |
| Reed warbler *Acrocephalus scirpaceus* | **Green** | | 0 | 0 | 0 | 1 | Foraging on the site. |
| Robin *Erithacus rubecula* | **Green** | | 3 | 1 | 8 | 5 | Probable breeding - 2 territories |
| Swallow *Hirundo rustica* | **Green** | | 2 | 2 | 1 | 0 | Pairs in housing adjacent to site; foraging within site |
| Whitethroat *Sylvia communis* | **Green** | | 3 | 0 | 0 | 0 | Possible breeding - 1 territory |
| Woodpigeon *Columba palumbus* | **Green** | | 1 | 1 | 0 | 0 | Foraging on the site |
| Wren *Troglodytes troglodytes* | **Green** | | 5 | 1 | 5 | 3 | Probable breeding - 2 territories |
| Little owl *Athene noctua* | **Introduced** | | 1 | 0 | 0 | 0 | Hunting over the site |
| Pheasant *Phasianus colchicus* | **Introduced** | | 1 | 0 | 0 | 1 | Possible breeding - 1 territory |

I Introduced
N/A Not assessed
Red rows are BOCC red-list, Amber rows are BoCC amber-list, Green rows are BoCC green-list, NA rows are non-native species.
BoCC: Birds of Conservation Concern as defined and listed in Eaton *et al.,* (2021)

**Table A9.2: Summary of breeding bird survey visit dates and weather conditions.**

| Visit | Date | Survey Conditions |
|---|---|---|
| 1 | 17/06/2020 | Good: 18°C (average), no precipitation, 1 wind, cloud 3/8, good visibility. |
| 2 | 02/07/2020 | Good: 18°C (average), no precipitation, 2 wind, cloud 5/8, good visibility. |
| 3 | 13/04/2021 | Good: 3°C (average), no precipitation, 1 wind, cloud 2/8, good visibility. |
| 4 | 17/05/2021 | Good: 11°C (average), no precipitation, 2 wind, cloud 8/8, good visibility. |

*Appendix 8b – Breeding Bird Survey Territory Map*



**Appendix 9: Great Crested Newt Survey Results**

*Appendix 9a – Locations of Ponds within 500m of the Site*

*Appendix 9b – HSI Survey Results*

**Table A9.1: Detailed HSI survey results.**

| Pond no. | 1 | | 4 | |
|---|---|---|---|---|
| | **Result** | **Score** | **Result** | **Score** |
| 1-Location | Zone A | 1 | A | 1 |
| 2-Pond area | 6720m$^2$ | 0.8 | 140m$^2$ | 0.3 |
| 3- Permanence | Never Dries | 0.9 | Dries Annually | 0.1 |
| 4-Water quality | Good | 1 | Good | 1 |
| 5- Shade | 80% | 0.6 | 100% | 0.2 |
| 6- Waterfowl | Minor | 0.67 | Absent | 1 |
| 7- Fish | Major | 0 | Absent | 1 |
| 8- Pond count | 4 | 0.72 | 5 | 0.75 |
| 9- Terrestrial habitat | Good | 1 | Good | 1 |
| 10- Macrophytes | 20% | 0.5 | 10% | 0.4 |
| HSI Score | 0.50 | | 0.53 | |
| Pond suitability | **Below Average** | | **Below Average** | |
| Distance from the site | onsite | | 310m south | |

*Appendix 9c – eDNA Survey Results (June 2020)*

Pond 1

Client: Josey Travell,
Southern Ecological Solutions

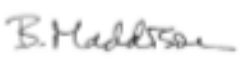
ADAS
Spring Lodge
172 Chester Road
Helsby
WA6 0AR

Tel: 01159 516747
Email: Helen.Rees@adas.co.uk

www.adas.uk

| | | |
|---|---|---|
| Sample ID: 2020-1725 | Condition on Receipt: Low Sediment | Volume: Passed |
| Client Identifier: Pond 1 Rayleigh Road | Description: pond water samples in preservative | |
| Date of Receipt: 02/07/2020 | Material Tested: eDNA from pond water samples | |

| Determinant | Result | Method | Date of Analysis |
|---|---|---|---|
| Inhibition Control[†] | 2 of 2 | Real Time PCR | 16/07/2020 |
| Degradation Control[‡] | Within Limits | Real Time PCR | 16/07/2020 |
| Great Crested Newt* | 0 of 12 (GCN negative) | Real Time PCR | 16/07/2020 |
| Negative PCR Control (Nuclease Free Water) | 0 of 4 | Real Time PCR | As above for GCN |
| Positive PCR Control (GCN DNA $10^{-4}$ ng/µL)[¥] | 4 of 4 | Real Time PCR | As above for GCN |

| | | | |
|---|---|---|---|
| Report Prepared by: | Dr Helen Rees | Report Issued by: | Dr Ben Maddison |
| Signed: |  | Signed: |  |
| Position: | Director: Biotechnology | Position: | MD: Biotechnology |
| Date of preparation: | 16/07/2020 | Date of issue: | 16/07/2020 |

*eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.*

** If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

*† Recorded as the number of positive replicate reactions at expected $C_t$ value. If the expected $C_t$ value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.*

*‡ No degradation is expected within time frame of kit preparation, sample collection and analysis.*

*¥ Additional positive controls ($10^{-1}$, $10^{-2}$, $10^{-3}$ ng/µL) are also routinely run, results not shown here.*

Pond 4

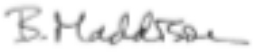
Client: Darren Denmede,
Southern Ecological Solutions

ADAS
Spring Lodge
172 Chester Road
Helsby
WA6 0AR

Tel: 01159 516747
Email: Helen.Rees@adas.co.uk

www.adas.uk

| | | |
|---|---|---|
| Sample ID: 2020-1336 | Condition on Receipt: High Sediment | Volume: Passed |
| Client Identifier: Pond 4 Raleigh Road | Description: pond water samples in preservative | |
| Date of Receipt: 02/07/2020 | Material Tested: eDNA from pond water samples | |

| Determinant | Result | Method | Date of Analysis |
|---|---|---|---|
| Inhibition Control[†] | 0 of 2 | Real Time PCR | 16/07/2020 |
| Degradation Control[‡] | Evidence of degradation or residual inhibition | Real Time PCR | 16/07/2020 |
| Great Crested Newt* | Indeterminate | Real Time PCR | 16/07/2020 |
| Negative PCR Control (Nuclease Free Water) | 0 of 4 | Real Time PCR | As above for GCN |
| Positive PCR Control (GCN DNA $10^{-4}$ ng/µL)* | 4 of 4 | Real Time PCR | As above for GCN |
| Report Prepared by: | Dr Helen Rees | Report Issued by: | Dr Ben Maddison |
| Signed: |  | Signed: |  |
| Position: | Director: Biotechnology | Position: | MD: Biotechnology |
| Date of preparation: | 16/07/2020 | Date of issue: | 16/07/2020 |

*eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.*

** If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

*† Recorded as the number of positive replicate reactions at expected $C_t$ value. If the expected $C_t$ value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.*

*‡ No degradation is expected within time frame of kit preparation, sample collection and analysis.*

**Additional positive controls ($10^{-3}$, $10^{-5}$, $10^{-6}$ ng/µL) are also routinely run, results not shown here.*

*Appendix 9d – eDNA Survey Results (April 2021)*

Pond 4

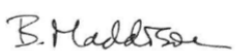
Client: Laura Bennett,
SES Eco

ADAS
Spring Lodge
172 Chester Road
Helsby
WA6 0AR

Tel: 01159 516747
Email: Helen.Rees@adas.co.uk

www.adas.uk

| | | |
|---|---|---|
| Sample ID: ADAS-1282 | Condition on Receipt: Low Sediment | Volume: Passed |
| Client Identifier: Pond 4 Hadleigh | Description: pond water samples in preservative | |
| Date of Receipt: 29/04/2021 | Material Tested: eDNA from pond water samples | |

| **Determinant** | **Result** | **Method** | **Date of Analysis** |
|---|---|---|---|
| Inhibition Control[†] | 0 of 2 | Real Time PCR | 11/05/2021 |
| Degradation Control[§] | Within Limits | Real Time PCR | 11/05/2021 |
| Great Crested Newt* | 0 of 12 (GCN negative) | Real Time PCR | 11/05/2021 |
| Negative PCR Control (Nuclease Free Water) | 0 of 4 | Real Time PCR | As above for GCN |
| Positive PCR Control (GCN DNA $10^{-4}$ ng/µL)[#] | 4 of 4 | Real Time PCR | As above for GCN |
| Report Prepared by: | Dr Helen Rees | Report Issued by: | Dr Ben Maddison |
| Signed: |  | Signed: |  |
| Position: | Director: Biotechnology | Position: | MD: Biotechnology |
| Date of preparation: | 11/05/2021 | Date of issue: | 11/05/2021 |

*eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.*

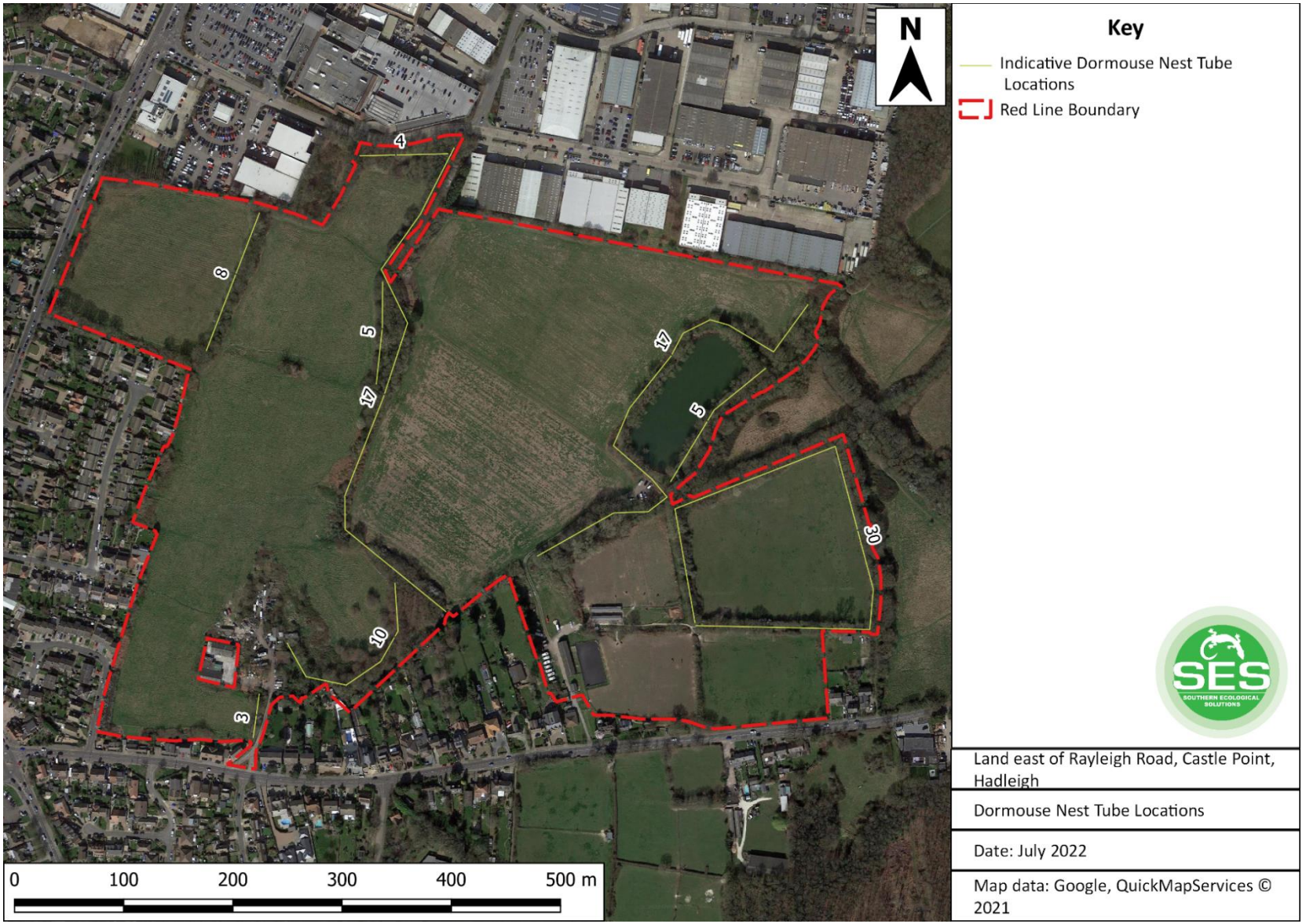
** If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

*[†] Recorded as the number of positive replicate reactions at expected $C_t$ value. If the expected $C_t$ value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.*

*[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.*

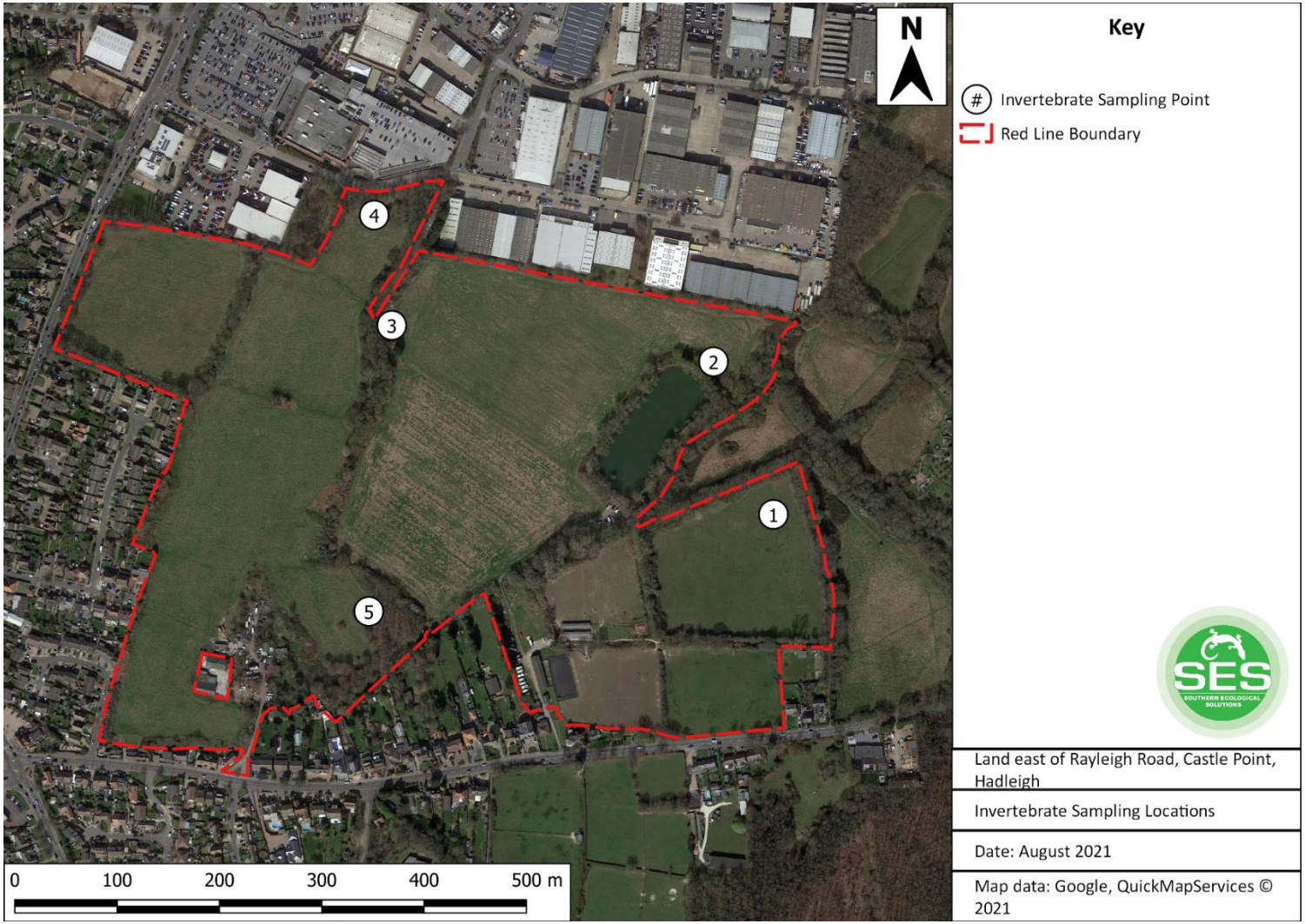
*[#]Additional positive controls ($10^{-1}$, $10^{-2}$, $10^{-3}$ ng/µL) are also routinely run, results not shown here.*

**Appendix 10. Dormouse Nest Tube Location Plan**



**Appendix 11: Invertebrate Survey Results**

*Appendix 11a – Locations of Invertebrate Sampling Stations*



*Appendix 11b – Combined survey information from 2020 and 2021*

**Table A12.1: Detailed species survey data.**

| Higher taxon | Family | Species | Sampling stations | | | | |
|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 |
| Mollusca | Discidae | *Discus rotundatus* | | | | | X |
| Mollusca | Helicidae | *Cornu aspersum* | | | | | X |
| Mollusca | Helicidae | *Monacha cantiana* | | | | | X |
| Mollusca | Zonitidae | *Oxychilus alliarius* | | | | X | X |
| Molluscs | Helicidae | *Cepaea hortensis* | | | | | X |
| Isopoda | Armadillidae | *Armadillidium vulgare* | | | | | X |
| Isopoda | Oniscidae | *Oniscus asellus* | | | | | X |
| Isopoda | Philosciidae | *Philoscia muscorum* | | | | | X |
| Isopoda | Platyarthridae | *Platyarthrus hoffmannseggii* | | | X | | |
| Isopoda | Porcellionidae | *Porcellio scaber* | | | | | X |
| Arachnida – Araneae | Araneidae | *Araneus diadematus* | X | X | | | X |
| Arachnida – Araneae | Araneidae | *Araniella cucurbitina* | | | | | X |
| Arachnida – Araneae | Clubionidae | *Cheiracanthium erraticum* | | X | | | |
| Arachnida – Araneae | Clubionidae | *Clubiona comta* | | | | X | |
| Arachnida – Araneae | Gnaphosidae | *Zelotes latreillei* | | | | X | |
| Arachnida – Araneae | Linyphiidae | *Diplostyla concolor* | | X | | | |
| Arachnida – Araneae | Linyphiidae | *Dismodicus bifrons* | | X | | | |
| Arachnida – Araneae | Linyphiidae | *Erigone atra* | | | X | | |
| Arachnida – Araneae | Linyphiidae | *Erigone dentipalpis* | | X | | | |
| Arachnida – Araneae | Linyphiidae | *Lepthyphantes tenuis* | | X | | | |
| Arachnida – Araneae | Linyphiidae | *Lepthyphantes zimmermanni* | | X | | | |
| Arachnida – Araneae | Linyphiidae | *Linyphia hortensis* | | X | | | |
| Arachnida – Araneae | Linyphiidae | *Neriene peltata* | | X | | | |
| Arachnida – Araneae | Linyphiidae | *Tenuiphantes mengei* | | | | | X |
| Arachnida – Araneae | Linyphiidae | *Tenuiphantes tenuis* | | X | | | |
| Arachnida – Araneae | Lycosidae | *Alopecosa pulverulenta* | | | | | X |
| Arachnida – Araneae | Lycosidae | *Trochosa terricola* | | X | | | |
| Arachnida – Araneae | Nemastomatidae | *Nemastoma bimaculatum* | | | X | | |
| Arachnida – Araneae | Phalangiidae | *Mitopus morio* | | X | | | |
| Arachnida – Araneae | Phalangiidae | *Opilio saxatilis* | | | | | X |
| Arachnida – Araneae | Phalangiidae | *Phalangium opilio* | | | | | X |
| Arachnida – Araneae | Phalangiidae | *Platybunus triangularis* | | X | | | |
| Arachnida – Araneae | Philodromidae | *Philodromus aureolus* | | | | | X |
| Arachnida – Araneae | Philodromidae | *Tibellus oblongus* | | X | | | |
| Arachnida – Araneae | Pisauridae | *Pisaura mirabilis* | | | X | | |
| Arachnida – Araneae | Salticidae | *Euophrys frontalis* | | | | | X |
| Arachnida – Araneae | Salticidae | *Heliophanus cupreus* | | | X | | |
| Arachnida – Araneae | Salticidae | *Heliophanus flavipes* | X | | | | |
| Arachnida – Araneae | Tetragnathidae | *Metellina mengei* | | | X | | |
| Arachnida – Araneae | Theridiidae | *Enoplognatha ovata* | X | | | X | X |
| Arachnida – Araneae | Thomisidae | *Xysticus cristatus* | | | | | X |
| Arachnida – Araneae | Zoridae | *Zora spinimana* | | X | | | |
| Coleoptera | Anthicidae | *Anthicus antherinus* | | | | X | |
| Coleoptera | Apidae | *Anthophora plumipes* | | | | | X |
| Coleoptera | Apionidae | *Ceratapion gibbirostre* | | | | X | |
| Coleoptera | Apionidae | *Ceratapion onopordi* | | | | X | |
| Coleoptera | Apionidae | *Eutrichapion ervi* | | X | | | |

| Higher taxon | Family | Species | Sampling stations | | | | |
|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 |
| Coleoptera | Apionidae | *Ischnopterapion loti* | | | | | X |
| Coleoptera | Apionidae | *Protapion apricans* | | | | | X |
| Coleoptera | Cantharidae | *Cantharis nigra* | | | | X | |
| Coleoptera | Cantharidae | *Rhagonycha fulva* | | X | | | X |
| Coleoptera | Carabidae | *Amara convexior* | | | | | X |
| Coleoptera | Carabidae | *Badister bullatus* | | X | | | |
| Coleoptera | Carabidae | *Demetrias atricapillus* | | X | | | |
| Coleoptera | Carabidae | *Harpalus affinis* | | X | | | |
| Coleoptera | Carabidae | *Harpalus rufipes* | | | | | X |
| Coleoptera | Carabidae | *Microlestes maurus* | | | | | X |
| Coleoptera | Carabidae | *Nebria brevicollis* | | X | | | |
| Coleoptera | Carabidae | *Notiophilus biguttatus* | X | X | | | X |
| Coleoptera | Carabidae | *Paradromius linearis* | | | | X | |
| Coleoptera | Carabidae | *Philorhizus melanocephalus* | | | | X | |
| Coleoptera | Carabidae | *Pterostichus madidus* | | X | | | |
| Coleoptera | Carabidae | *Pterostichus melanarius* | | X | | | |
| Coleoptera | Carabidae | *Pterostichus nigrita* | | | X | | |
| Coleoptera | Cerambycidae | *Agapanthia villosoviridescens* | | X | | | |
| Coleoptera | Cerambycidae | *Clytus arietis* | | | | X | |
| Coleoptera | Chrysomelidae | *Altica lythri* | | | | X | |
| Coleoptera | Chrysomelidae | *Bruchus loti* | X | | | | X |
| Coleoptera | Chrysomelidae | *Bruchus rufipes* | | | | | X |
| Coleoptera | Chrysomelidae | *Cassida rubiginosa* | | | | | X |
| Coleoptera | Chrysomelidae | *Longitarsus dorsalis* | | | | X | |
| Coleoptera | Chrysomelidae | *Longitarsus pratensis* | | | | X | |
| Coleoptera | Chrysomelidae | *Phaedon tumidulus* | | | | | X |
| Coleoptera | Chrysomelidae | *Phyllotreta atra* | | X | | | |
| Coleoptera | Chrysomelidae | *Sphaeroderma testaceum* | | | | | X |
| Coleoptera | Coccinellidae | *Adalia bipunctata* | | X | | X | X |
| Coleoptera | Coccinellidae | *Coccinella septempunctata* | | | | X | |
| Coleoptera | Coccinellidae | *Coccinella undecimpunctata* | | | | X | |
| Coleoptera | Coccinellidae | *Harmonia axyridis* | | | | | X |
| Coleoptera | Coccinellidae | *Rhyzobius litura* | | X | | | |
| Coleoptera | Coccinellidae | *Subcoccinella vigintiquattuorpunctata* | | X | | | |
| Coleoptera | Coccinellidae | *Tytthaspis sedecimpunctata* | | | | | X |
| Coleoptera | Curculionidae | *Ceutorhynchus erysimi* | | X | | | |
| Coleoptera | Curculionidae | *Hypera nigrirostris* | | | | | X |
| Coleoptera | Curculionidae | *Hypera postica* | | | X | | |
| Coleoptera | Curculionidae | *Phyllobius virideaeris* | | | | X | |
| Coleoptera | Curculionidae | *Sitona hispidulus* | | | | X | |
| Coleoptera | Curculionidae | *Sitona humeralis* | | | X | | |
| Coleoptera | Curculionidae | *Sitona lineatus* | | | | X | |
| Coleoptera | Curculionidae | *Sitona puncticollis* | | | X | | |
| Coleoptera | Curculionidae | *Sitona suturalis* | X | | | | |
| Coleoptera | Curculionidae | *Trichosirocalus troglodytes* | | | | | X |
| Coleoptera | Elateridae | *Agriotes lineatus* | | X | | | X |
| Coleoptera | Elateridae | *Agriotes sputator* | | | | | X |
| Coleoptera | Elateridae | *Athous haemorrhoidalis* | | | | X | X |
| Coleoptera | Elateridae | *Kibunea minuta* | | X | | | |
| Coleoptera | Latridiidae | *Corticarina minuta* | | | X | | |

| Higher taxon | Family | Species | Sampling stations | | | | |
|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 |
| Coleoptera | Malachiidae | *Malachius bipustulatus* | | X | | X | X |
| Coleoptera | Mordellidae | *Mordellistena neuwaldeggiana* | | X | | | |
| Coleoptera | Oedemeridae | *Oedemera lurida* | X | X | | | |
| Coleoptera | Oedemeridae | *Oedemera nobilis* | X | X | X | X | X |
| Coleoptera | Silphidae | *Nicrophorus vespillo* | | | | | X |
| Coleoptera | Silphidae | *Silpha atrata* | | X | | | |
| Coleoptera | Staphylinidae | *Drusilla canaliculata* | | X | | | |
| Coleoptera | Staphylinidae | *Gyrohypnus fracticornis* | | X | | | |
| Coleoptera | Staphylinidae | *Ischnosoma splendidum* | | | | | X |
| Coleoptera | Staphylinidae | *Metopsia clypeata* | | | | | X |
| Coleoptera | Staphylinidae | *Mocyta fungi* | | X | | | |
| Coleoptera | Staphylinidae | *Quedius semiobscurus* | | X | | | |
| Coleoptera | Staphylinidae | *Sepedophilus nigripennis* | | | | X | |
| Coleoptera | Staphylinidae | *Stenus aceris* | | | X | | |
| Coleoptera | Staphylinidae | *Stenus ossium* | | X | | | |
| Coleoptera | Staphylinidae | *Tachyporus atriceps* | | X | | | |
| Coleoptera | Staphylinidae | *Tachyporus dispar* | | | X | | |
| Coleoptera | Staphylinidae | *Tachyporus hypnorum* | | | | X | |
| Coleoptera | Staphylinidae | *Tachyporus pusillus* | | | X | | |
| Coleoptera | Staphylinidae | *Tachyporus solutus* | | | X | | |
| Coleoptera | Tenebrionidae | *Lagria hirta* | X | | | X | |
| Dermaptera | Forficulidae | *Forficula auricularia* | | | | | X |
| Diptera | Asilidae | *Dioctria atricapilla* | X | X | | | X |
| Diptera | Asilidae | *Dioctria baumhaueri* | | | | | X |
| Diptera | Asilidae | *Dioctria rufipes* | | X | | | X |
| Diptera | Asilidae | *Leptogaster cylindrica* | X | | | X | |
| Diptera | Bibionidae | *Bibio marci* | X | X | | | |
| Diptera | Bibionidae | *Dilophus febrilis* | X | | | | |
| Diptera | Bombylidae | *Bombylius major* | | X | | | |
| Diptera | Calliphoridae | *Calliphora vicina* | | | | | X |
| Diptera | Calliphoridae | *Lucilia caesar* | | | | | X |
| Diptera | Chloropidae | *Elachiptera cornuta* | | | | X | |
| Diptera | Conopidae | *Conops quadrifasciatus* | | | | X | |
| Diptera | Conopidae | *Myopa buccata* | | | | | X |
| Diptera | Conopidae | *Sicus ferrugineus* | X | X | | | |
| Diptera | Dolichopodidae | *Dolichopus festivus* | | X | | | |
| Diptera | Dolichopodidae | *Dolichopus griseipennis* | | X | | | |
| Diptera | Dolichopodidae | *Hercostomus cupreus* | | X | | | |
| Diptera | Empididae | *Empis aestiva* | | X | | | |
| Diptera | Empididae | *Empis livida* | X | X | | | |
| Diptera | Empididae | *Empis nigripes* | | X | | | |
| Diptera | Hybotidae | *Platypalpus annulipes* | | | | | X |
| Diptera | Lauxaniidae | *Tricholauxania praeusta* | | X | | | |
| Diptera | Lonchopteridae | *Lonchoptera lutea* | | | X | | |
| Diptera | Muscidae | *Coenosia tigrina* | | | | | X |
| Diptera | Muscidae | *Helina evecta* | | | | | X |
| Diptera | Rhagionidae | *Chrysopilus cristatus* | | X | | | |
| Diptera | Rhagionidae | *Rhagio scolopaceus* | | X | | | |
| Diptera | Rhinophoridae | *Paykullia maculata* | | | | X | |
| Diptera | Sarcophagidae | *Brachicoma devia* | | | | | X |
| Diptera | Scathophagidae | *Scathophaga stercoraria* | | | X | | |

| Higher taxon | Family | Species | Sampling stations | | | | |
|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 |
| Diptera | Sepsidae | *Sepsis fulgens* | | | | | X |
| Diptera | Stratiomyidae | *Beris chalybata* | | X | | | |
| Diptera | Stratiomyidae | *Chloromyia formosa* | X | X | | | |
| Diptera | Stratiomyidae | *Chorisops tibialis* | | X | | | |
| Diptera | Stratiomyidae | *Sargus bipunctatus* | | X | | | |
| Diptera | Syrphdiae | *Helophilus pendulus* | | | X | | |
| Diptera | Syrphidae | *Cheilosia albitarsis* | | | | X | X |
| Diptera | Syrphidae | *Cheilosia bergenstammi* | | | | X | |
| Diptera | Syrphidae | *Cheilosia variabilis* | | X | | | |
| Diptera | Syrphidae | *Epistrophe eligans* | | X | | | |
| Diptera | Syrphidae | *Episyrphus balteatus* | | X | | X | X |
| Diptera | Syrphidae | *Eristalinus sepulchralis* | | X | | | |
| Diptera | Syrphidae | *Eristalis arbustorum* | X | | X | | X |
| Diptera | Syrphidae | *Eristalis intricarius* | | | | | X |
| Diptera | Syrphidae | *Eristalis nemorum* | | | X | | X |
| Diptera | Syrphidae | *Eristalis pertinax* | | X | | | |
| Diptera | Syrphidae | *Eristalis tenax* | | X | | X | X |
| Diptera | Syrphidae | *Eupeodes luniger* | | | | X | |
| Diptera | Syrphidae | *Melanostoma mellinum* | | | | X | |
| Diptera | Syrphidae | *Merodon equestris* | X | | | | |
| Diptera | Syrphidae | *Neoascia tenur* | | | | X | X |
| Diptera | Syrphidae | *Platycheirus albimanus* | | X | | | |
| Diptera | Syrphidae | *Platycheirus clypeatus* | X | X | | | |
| Diptera | Syrphidae | *Platycheirus manicatus* | | | X | | |
| Diptera | Syrphidae | *Sphaerophoria scripta* | | X | | | |
| Diptera | Syrphidae | *Syritta pipiens* | X | X | X | X | X |
| Diptera | Syrphidae | *Syrphus ribesii* | | X | | | |
| Diptera | Syrphidae | *Volucella pellucens* | | X | | | |
| Diptera | Syrphidae | *Volucella zonaria* | | | | | X |
| Diptera | Tabanidae | *Haematopota pluvialis* | | X | | | |
| Diptera | Tephritidae | *Tephritis cometa* | | X | | | |
| Diptera | Tephritidae | *Tephritis formosa* | | X | | | |
| Diptera | Tephritidae | *Urophora cardui* | X | X | | | |
| Diptera | Tipulidae | *Limonia nubeculosa* | | X | | | X |
| Diptera | Tipulidae | *Nephrotoma flavescens* | | | | | X |
| Diptera | Tipulidae | *Tipula fascipennis* | | X | | | |
| Diptera | Tipulidae | *Tipula oleracea* | | X | | | |
| Hemiptera - Heteroptera | Acanthosomatidae | *Elasmucha grisea* | X | | | X | X |
| Hemiptera - Heteroptera | Coreidae | *Coriomeris denticulatus* | X | | | | |
| Hemiptera - Heteroptera | Lygaediae | *Cymus melanocephalus* | | | | X | |
| Hemiptera - Heteroptera | Lygaediae | *Heterogaster urticae* | | | X | | X |
| Hemiptera - Heteroptera | Miridae | *Apolygus lucorum* | | | | | X |
| Hemiptera - Heteroptera | Miridae | *Calocoris norvegicus* | | X | | | X |
| Hemiptera - Heteroptera | Miridae | *Capsus ater* | | | X | | X |
| Hemiptera - Heteroptera | Miridae | *Closterotomus norwegicus* | X | X | X | X | X |
| Hemiptera - Heteroptera | Miridae | *Deraeocoris ruber* | | | | X | |
| Hemiptera - Heteroptera | Miridae | *Leptopterna dolabrata* | | X | | | |
| Hemiptera - Heteroptera | Miridae | *Liocoris tripustulatus* | | | | X | |
| Hemiptera - Heteroptera | Miridae | *Lygocoris pabulinus* | | | | X | X |
| Hemiptera - Heteroptera | Miridae | *Lygus rugulipennis* | | | | X | X |
| Hemiptera - Heteroptera | Miridae | *Notostira elongata* | | | | | X |

| Higher taxon | Family | Species | Sampling stations | | | | |
|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 |
| Hemiptera - Heteroptera | Miridae | *Pithanus maerkelii* | X | X | | | |
| Hemiptera - Heteroptera | Miridae | *Stenodema calcarata* | | | | X | |
| Hemiptera - Heteroptera | Nabidae | *Nabis flavomarginatus* | X | | | | |
| Hemiptera - Heteroptera | Pentatomidae | *Dolycoris baccarum* | | | | X | X |
| Hemiptera - Heteroptera | Pentatomidae | *Eurydema oleracea* | X | | | | |
| Hemiptera - Heteroptera | Pentatomidae | *Palomena prasina* | | X | | | X |
| Hemiptera - Heteroptera | Pentatomidae | *Pentatoma rufipes* | | | | X | X |
| Hemiptera - Heteroptera | Pentatomidae | *Podops inuncta* | X | | | | |
| Hemiptera - Heteroptera | Pentatomidae | *Troilus luridus* | | X | | | |
| Hemiptera: Auchenorrhyncha | Aphrophoridae | *Aphrophora alni* | | X | | | |
| Hemiptera: Auchenorrhyncha | Aphrophoridae | *Neophilaenus lineatus* | | X | | | |
| Hemiptera: Auchenorrhyncha | Aphrophoridae | *Philaenus spumarius* | | X | | | |
| Hemiptera: Auchenorrhyncha | Cicadellidae | *Cicadella viridis* | | X | | | |
| Hemiptera: Auchenorrhyncha | Cicadellidae | *Eupteryx urticae* | X | | | | |
| Hemiptera: Auchenorrhyncha | Cicadellidae | *Euscelis incisus* | | | X | | |
| Hemiptera: Auchenorrhyncha | Cicadellidae | *Zyginidia scutellaris* | | X | | | |
| Hemiptera: Auchenorrhyncha | Delphacidae | *Javesella pellucida* | | X | | | |
| Hemiptera: Auchenorrhyncha | Delphacidae | *Stenocranus minutus* | | | | X | |
| Hemiptera: Heteroptera | Acanthosomatidae | *Acanthosoma haemorrhoidale* | | | | | X |
| Hemiptera: Heteroptera | Anthocoridae | *Anthocoris confusus* | | | | X | |
| Hemiptera: Heteroptera | Coreidae | *Coreus marginatus* | | X | | | |
| Hemiptera: Heteroptera | Lygaeidae | *Nysius huttoni* | | | | X | |
| Hemiptera: Heteroptera | Miridae | *Deraeocoris lutescens* | | X | | | |
| Hemiptera: Heteroptera | Miridae | *Stenodema laevigata* | | | | X | |
| Hemiptera: Heteroptera | Nabidae | *Himacerus mirmicoides* | | | | | X |
| Hemiptera: Heteroptera | Nabidae | *Nabis ferus* | | X | | X | |
| Hemiptera: Heteroptera | Pentatomidae | *Aelia acuminata* | X | | | | |
| Hemiptera: Heteroptera | Rhopalidae | *Corizus hyoscyami* | | | | X | |
| Hemiptera: Heteroptera | Rhopalidae | *Rhopalus subrufus* | | X | | | |
| Hemiptera: Heteroptera | Tingidae | *Tingis cardui* | | X | | | X |
| Hymenoptera | Andrenidae | *Andrena dorsata* | | | | X | |
| Hymenoptera | Andrenidae | *Andrena flavipes* | | | | | X |
| Hymenoptera | Andrenidae | *Andrena fulva* | | | | | X |
| Hymenoptera | Andrenidae | *Andrena praecox* | | | | | X |
| Hymenoptera | Apidae | *Bombus hortorum* | | | X | X | |
| Hymenoptera | Apidae | *Bombus hypnorum* | | X | | | X |
| Hymenoptera | Apidae | *Bombus lapidarius* | X | | | | |
| Hymenoptera | Apidae | *Bombus pascuorum* | X | X | X | X | |
| Hymenoptera | Apidae | *Bombus sylvarum* | X | | | | |
| Hymenoptera | Apidae | *Bombus terrestris* | X | | | | |
| Hymenoptera | Apidae | *Colletes similis* | | | | X | |
| Hymenoptera | Apidae | *Halictus rubicundus* | | | | X | |
| Hymenoptera | Apidae | *Halictus tumulorum* | | | | X | X |
| Hymenoptera | Apidae | *Nomada goodeniana* | X | | | | |
| Hymenoptera | Chrysididae | *Chrysis ignita* | | | | X | |

| Higher taxon | Family | Species | Sampling stations | | | | |
|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 |
| Hymenoptera | Colletidae | *Hylaeus communis* | | X | | | |
| Hymenoptera | Crabronidae | *Cerceris rybyensis* | X | | | | |
| Hymenoptera | Crabronidae | *Ectemnius continuus* | | | | | X |
| Hymenoptera | Formicidae | *Formica fusca* | | | | X | |
| Hymenoptera | Formicidae | *Lasius niger* | X | | X | | X |
| Hymenoptera | Formicidae | *Myrmica scabrinodis* | | X | | | |
| Hymenoptera | Halictidae | *Lasioglossum leucopus* | X | | | X | |
| Hymenoptera | Halictinae | *Lasioglossum calceatum* | X | | | | |
| Hymenoptera | Megachilidae | *Megachile versicolor* | | X | | | X |
| Hymenoptera | Vespidae | *Gymnomerus laevipes* | | X | | | |
| Hymenoptera | Vespidae | *Vespula vulgaris* | X | | | X | |
| Lepidoptera | Arctiidae | *Tyria jacobaeae* | X | X | | | X |
| Lepidoptera | Hesperidae | *Thymelicus sylvestris* | X | | | | X |
| Lepidoptera | Hesperiidae | *Ochlodes faunus* | | | | | X |
| Lepidoptera | Hesperiidae | *Thymelicus lineola* | X | | | | X |
| Lepidoptera | Lepidoptera | *Aphantopus hyperantus* | X | X | | X | X |
| Lepidoptera | Lycaednidae | *Polyommatus icarus* | | X | | | |
| Lepidoptera | Lycaenidae | *Lycaena phlaeas* | | X | | X | X |
| Lepidoptera | Nymphalidae | *Aglais io* | | | | X | |
| Lepidoptera | Nymphalidae | *Inachis io* | X | | | | X |
| Lepidoptera | Nymphalidae | *Vanessa atalanta* | | X | | | |
| Lepidoptera | Pieridae | *Colias croceus* | X | | | | |
| Lepidoptera | Pieridae | *Pieris brassicae* | | | X | | |
| Lepidoptera | Satyridae | *Coenonympha pamphilus* | X | | | | X |
| Lepidoptera | Satyridae | *Maniola jurtina* | X | X | | | |
| Lepidoptera | Satyridae | *Melanargia galathea* | | | | | X |
| Lepidoptera | Satyridae | *Pararge aegeria* | | | X | | |
| Lepidoptera | Satyridae | *Pyronia tithonus* | | X | | | |
| Lepidoptera | Nymphalidae | *Polygonia c-album* | X | | | | |
| Mecoptera | Panorpidae | *Panorpa communis* | | X | | | |
| Neuroptera | Chrysopidae | *Hemerobius humulinus* | | X | | | |
| Orthoptera | Acrididae | *Chorthippus brunneus* | | | | X | X |
| Orthoptera | Acrididae | *Chorthippus parallelus* | | X | | | |
| Orthoptera | Conocephalidae | *Conocephalus fuscus* | | X | | | |
| Orthoptera | Meconematodae | *Meconema thalassinum* | | | X | | |
| Orthoptera | Phaneropteridae | *Leptophyes punctatissima* | | | | | X |
| Orthoptera | Tetrigidae | *Tetrix undulata* | | X | | | |
| Orthoptera | Tettigoniidae | *Metrioptera roeselii* | | X | | | X |

**Appendix 12: Reptile Survey Results**

*Appendix 12a – Reptile Refugia Location Plan*

*Appendix 12b – Reptile Survey Results*

**Table A13.1: Detailed reptile survey results.**

| Visit No. | Date | Temperature (°C) | Cloud (%) | Wind (Beaufort) | Precipitation | Species | Location |
|---|---|---|---|---|---|---|---|
| 1 | 22/07/2020 | 16 | 60 | 1 | 0 | 2 x female common lizard<br>5 x female slow worm | Grassland habitats – Field Compartments 1, 2 & 3. |
| 2 | 29/07/2020 | 18 | 0 | 1 | 0 | 1 x male common lizard<br>3 x slow worm (1 female, 2 male) | Grassland habitats – Field Compartment 1 |
| 3 | 03/08/2020 | 18 | 0 | 0 | 0 | 2 x slow worm (1 male, 1 juvenile) | Grassland habitats – Field Compartments 1 & 2. |
| 4 | 05/08/2020 | 18 | 0 | 1 | 0 | 2 x slow worm (1 male, 1 juvenile) | Grassland habitats - Field Compartment 1 |
| 5 | 17/08/2020 | 17 | 10 | 1 | 0 | 5 x slow worm (3 female, 2 male) | Grassland habitats - Field Compartments 1 & 2. |
| 6 | 29/08/2020 | 15 | 80 | 0 | 0 | 2 x female common lizard | Grassland habitats - Field Compartment 1 |
| 7 | 23/09/2020 | 17 | 100 | 1 | 0 | 2 x female common lizard | Grassland habitats - Field Compartment 2 |

**Appendix 13: Habitat Creation and Management Summary**

Specific detail to be provided within the LEMP, below is a guide to establish feature habitats.

**Scrub grassland**

- The seed mix (EM10 or similar) will be sown in late spring or autumn

- The grassland will be mown regularly throughout the first year of establishment to a height of 40-60mm to control annual weeds and help maintain balance between faster growing grasses and slower developing wildflowers.

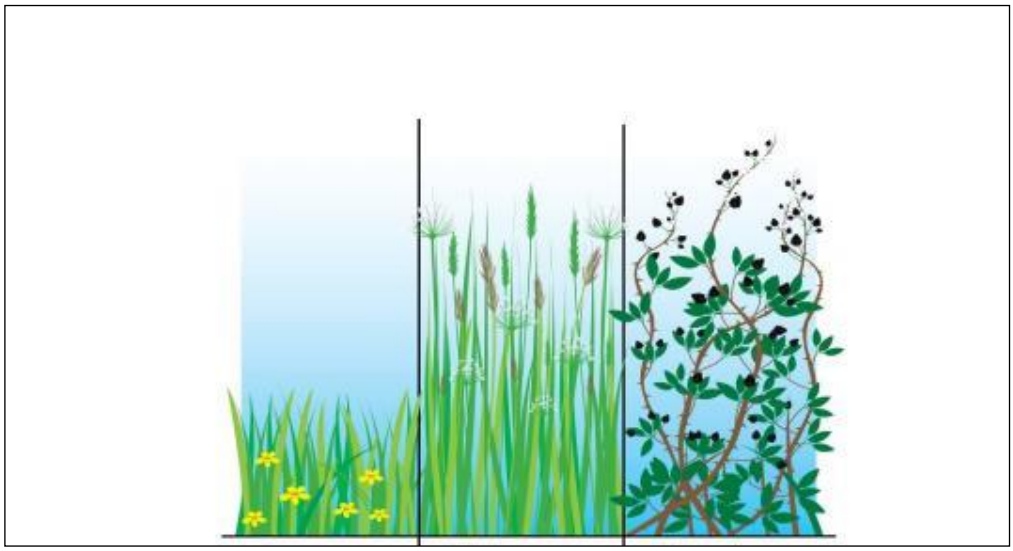
- Post-establishment, tussock grassland areas will be cut on a 3 year rotation, with no more than a third of the total habitat resource or two hectares (whichever is smaller) cut in any one year (Edgar, Foster & Baker 2010). This will ensure continuous provision of longer-sward grassland suitable for reptiles and attractive to invertebrate species. Cutting of tussock grassland areas will be undertaken during the winter period of reptile inactivity from November to February when individuals will be concentrated within scrub, roots and purpose-built hibernacula refuge habitats, to minimise risk of harm. Arisings will be collected and used to form compost piles located close to reptile hibernacula, to provide egg-laying site for grass snake in the spring.

- Natural features that develop such as ant hills will be retained and not destroyed as they create valuable micro habitats for animals and plants.

- This regime will create a biodiverse grass sward and in turn provide a valuable habitat for invertebrates, foraging bats, badgers and breeding and over wintering birds coupled with nesting habitat provided within the built development and biodiversity building which complement the provision of this habitat.

- Islands of species rich scrub will be planted with November – February. These islands will be mapped and a maximum extent of scrub encroachment will be established with managed with the aim of creating a gradient of scrub/ tall herbs to grassland of varied ages (see figure below). This will be achieved through 5 year rotational cuts (dictated by ground conditions). These cuts will be outside of nesting bird season March to August (inclusive)

Scrub grading to tall ruderal and grassland



**Meadow grassland**

- Wildflower grassland will be created using Emorsgate Seeds mixture EM3 (or similar suitable mix) with an increased proportion of yellow rattle versus the standard mix, as this mix is suitable where precise soil and site characteristics have not been established before sowing.

- Identified areas will be sown in September. Prior to sowing, any existing vegetation will be tightly cut, clippings will be removed, and the area scarified with a harrow to reveal bare soil. Spot spraying of all competitive weeds such as for thistle *Cirsium sp.* and ragwort *Jacobaea vulgaris* will also be undertaken before seed is sown.

- Yellow rattle Rhinanthus minor will be seeded along with the meadow mix as this is a parasite on and reduces grass; thus its inclusion in the planting mix should help to aid the establishment of wildflowers which may otherwise be outcompeted by fast growing grasses (English Nature/Wildlife Trusts, 1999). Yellow rattle will be sourced from a reputable supplier (see Supplier List on www.floralocale.org).

- In year 1 the grassland will be maintained to a height of 200mm between May and July. This will be above the height of the yellow rattle, allowing time for this species to set seed with the intention of achieving blanket coverage of the meadow within 5 years. In July, the grassland will be cut short to <20mm (short cuttings will dry out quickly so will not smother seedlings).

- In year 2, weeds which have grown back from the seed bank will be topped via a main cut to 150mm during mid-summer, with a final cut to <20mm undertaken in mid-October. The latter will replicate aftermath grazing as in traditional hay meadow management (English Nature/Wildlife Trusts, 1999). Arisings will be removed and used to form compost heaps adjacent to reptile hibernacula.

- In years 1 and 2 the wildflower meadow will be protected from disturbance by restricting access with temporary barrier fencing and signage.

- Year 3 will follow the same pattern as year 2. If the winter has been warm and dry, an additional spring cut to <20mm may be necessary to remove early growth that could swamp wildflowers later in the year; the need for this measure will be determined by the on-site ECoW.

- Throughout the first 3 years of establishment, the ECoW will undertake a yearly 'snagging' visit during late spring to highlight any challenges to successful establishment such as weed problems. Additional spot spraying/ pulling is likely to be required on an ongoing basis. Spot spraying is most effective and will be undertaken in April to early May. A detailed review will be carried out in year 4 and plans adjusted accordingly with the repetition of year 3 actions. If good coverage of yellow rattle has not been achieved across the wildflower meadow area, additional seeds will be sown in autumn of year 4 following the short October cut.

- Throughout and beyond establishment, timing of the main summer cut will be varied year on year to maximise the structural and species diversity of the sward, alternating between early cuts (in July) to later cuts (in August to September). A rotational cutting regime will be followed whereby no more than one third of the total wildflower meadow habitat resource is cut at any one time.

- It is predicted that wildflowers will spread into surrounding grassland as the habitat matures.

**Wet grassland**

Areas of wet grassland will be sown with EM8 / 4 (or similar). Management as per meadow grassland.

**Broadleaved Woodland**

- Native woody species will be planted explicitly not in straight lines with centres every 2-3m. Species will be native mimicking that of the lowland deciduous woodland onsite with the intention of creating a multi story woodland. A thorny shelter belt will be planted to provide protection from excess recreational pressure.

- Planting should occur between November – March, preferably in November after the first frost. A dibber should be used to plant bare root trees with suitable rabbit and deer browsing guards. Spot spraying of competitive vegetation should occur in the spring. Large scale failures should be replaced but failures on a smaller scale should be tolerated as this could provide more diverse, varied woodland.

- Woodland should be thinned on a 7 year rotation with dead wood.

**Orchard**

*Orchard management*

- An orchard will be planted with species of local provenance. Due to modern day farming methods and how we source fruit; orchards within the UK have been uneconomic and thus have suffered major declines since the 1950's. Orchards managed in a low intensity manner produce a rich biodiverse habitat.

*Orchard Trees*

- For orchard biodiversity to flourish a variety of trees of varying age are required. Fruit trees are generally, although not necessarily, short-lived trees compared to other hardwood species. This means that they

begin to produce veteran tree features such as hollow trunks, rot holes, split bark, tears, lightning strikes and sap runs relatively quickly. Because of the wide tree spacing in orchards compared to woodland, the dead and decaying wood is usually in open, sunny locations. These conditions create good habitat for insects and other invertebrate species which depend on decaying wood habitats.

*Management Requirements*

- As in parkland or wood pasture sites, careful management of the trees is necessary to maintain older individual ones. Dead and decaying branches should not be removed unless they interfere with necessary operations or are unsafe. Large cut branches, fallen dead wood or remains of old trees should be left on site. Planned replanting over time and adequate aftercare of new fruit trees is also required to ensure the long term future of the orchard.

- The abundance of climbers such as bramble and ivy should be controlled to allow plants and animals that need higher light levels or warmth to survive.

- Any tree health problems need to be assessed on a case by case basis. The application of chemicals to control pests and diseases should be minimised, and their use should be the exception rather than the rule.

*Orchard Floor Management*

- The grasses at the base of the orchard floor should be cut in late summer and again in the September/ October. Grass arising should be removed to rather than left in situ to prevent soil nutrients building up and therefore favouring competitive species at the expense of a varied sward. Further cuts may be needed should scrub come a problem. A network of mown paths should be maintained to allow people to enjoy and forage from the orchard.

- Many species of bumblebee, solitary bee and other insects may be present in an orchard. Wild bees play an important role during the blossom period when they help to pollinate the orchard trees. They are particularly helpful as they are active in colder conditions and forage for longer than honey bees. Many bee species use pollen and nectar from flowers in the orchard grassland and tall herb areas as well as fruit blossom on the trees. Members of the daisy family (such as ox-eye daisy *Leucanthemum vulgare*), hogweed *Heracleum sphondylium* and other umbellifers and legumes (clovers, vetches and trefoils) are particularly important food sources.

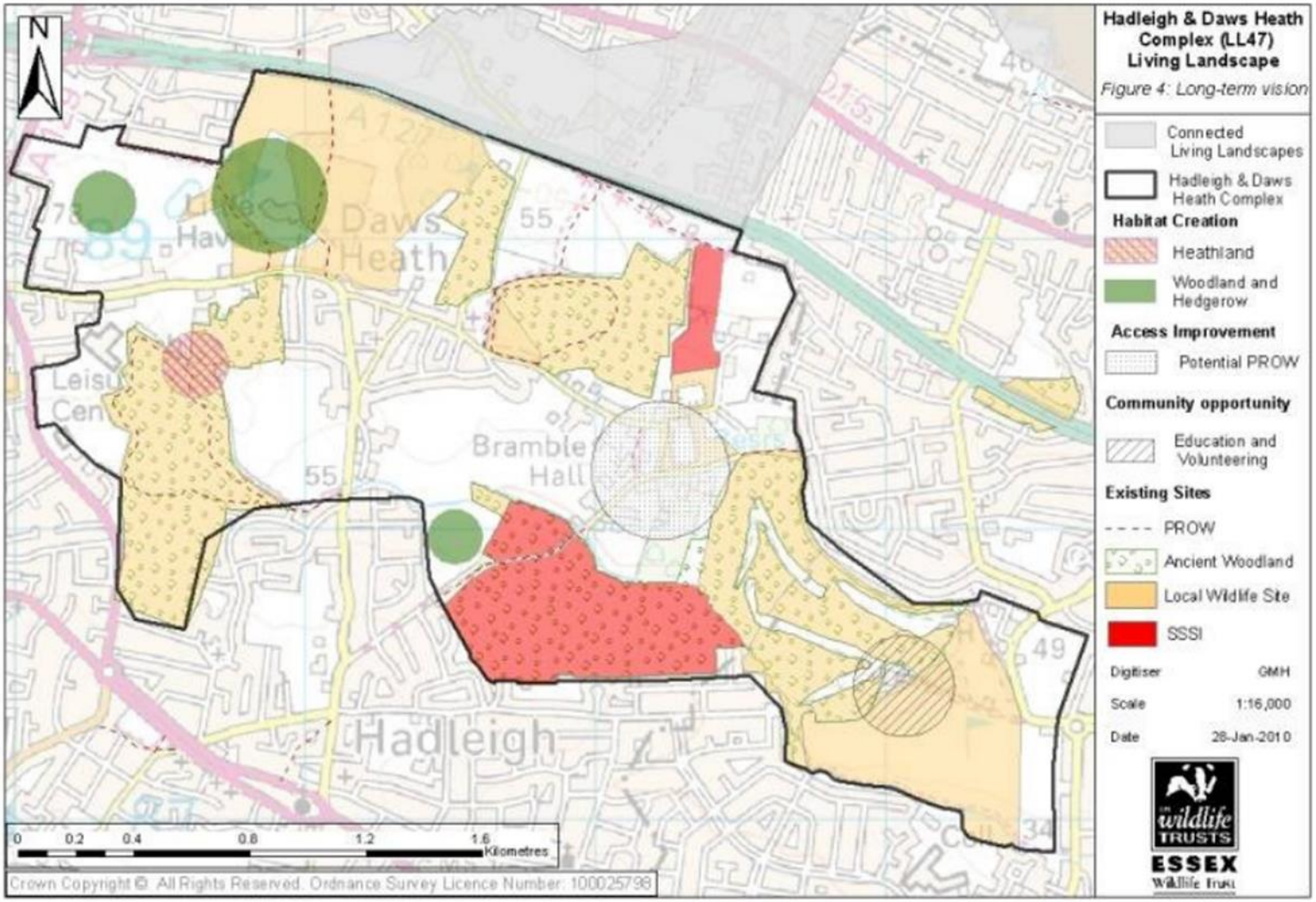
**Hedgerows**

- The site has been master planned to retain key hedgerows where possible. Existing hedgerows will be ‘gapped up’ where necessary to ensure that no gaps are presented larger than 10% of the hedgerow. Planting of whips with rabbit guards will be undertaken from November – February. Fruiting species will also be used to gap up hedgerows providing a valuable late season food source for many species. New hedgerows will be species rich (10 species including fruiting varieties see Appendix 5 for suggested planting list) with at least one standard tree per 50m. Retained and created hedgerows will be maintained in a low intensity manner meaning that cutting is carried out on 2-3 year rotation this will allow the development of hedge that is diverse in structure and prevent tall and woody ‘leggy’ hedges developing. This structure will allow a greater yield of fruit, nuts and seeds to be produced

which in turn will benefit many species including farmland birds. The transition between hedgerow and grassland habitats will have a buffer of 2m (minimum of 1m) to reduce 'edge' effect and also provide a greater habitat mosaic. This buffer will consist of grasses and tall ruderal vegetation.

- Rotational cutting should take place outside of bird nesting season, as a guide March – August. If this is not possible it may be appropriate on occasion to cut hedgerows within bird nesting season after an ecologist has declared the area in question to be free from nesting birds.

**Appendix 14: Hadleigh and Daws Heath Complex Living Landscape Long-Term Vision**



## Appendix 15: Badger Survey Results

**Table A16.1: Summary of badger monitoring surveys results – July/August 2020**

| Sett/Date | 22.07.2020 | 27.07.2020 | 29.07.2020 | 03.08.2020 | 05.08.2020 | 12.08.2020 | 17.08.2020 | Classification |
|---|---|---|---|---|---|---|---|---|
| **Sett 1 (1-4)** | N/A | NA | NA | NA | NA | NA | NA | NA |
| **Sett 2 (1-10)** | N/A | NA | NA | NA | NA | NA | NA | NA |
| **Sett 3 (1-6)** | N/A | NA | NA | NA | NA | NA | NA | NA |
| **Sett 4 (1-2)** | N/A | NA | NA | NA | NA | NA | NA | NA |
| **Sett 5 (1-2)** | N/A | NA | NA | NA | NA | NA | NA | NA |
| **Sett 6 (1-3)** | N/A | NA | NA | NA | NA | NA | NA | NA |
| **Sett 7 (1)** | N/A | A | A | NA | NA | A | A | A (outlier) |
| **Sett 7 (2-4)** | N/A | NA | NA | NA | NA | NA | NA | NA |
| **Sett 8 (1-7, 9-14, 16-17, 19-26, 28-28, 40)** | N/A | NA | NA | NA | NA | NA | NA | NA |
| **Sett 8 (8, 18, 27, 39, 41)** | N/A | NA | A (S) | NA | NA | NA | NA | A (main) |
| **Sett 8 (8, 15, 39)** | N/A | NA | NA | NA | NA | A (S) | NA | A (main) |
| **Sett 8 (8, 9, 44)** | N/A | NA | NA | NA | NA | NA | A (S) | A (main) |
| **Sett 9 (1-3)** | N/A | NA | NA | NA | NA | NA | NA | NA |
| **Sett 10 (1, 3, 5)** | N/A | NA | NA | NA | NA | NA | NA | NA |
| **Sett 10 (2)** | N/A | NA | A | NA | NA | NA | NA | A (subsidiary) |
| **Sett 10 (4)** | N/A | A | NA | A(S) | A | A(S) | NA | A (subsidiary) |
| **Sett 11 (1-3)** | N/A | NA | NA | NA | NA | NA | NA | NA |
| **Sett 12 (1-2)** | N/A | NA | NA | NA | NA | NA | NA | NA |
| **Sett 13 (1)** | Identified post monitoring period – Considered Active | | | | | | | |

*Key: A = Active; NA=No Activity; F=Footprint; S=Sticks Pushed Down; R=Rabbit; V = Fox; and B=Bedding*

*Blue = Active; White = Inactive*

**Table A16.2: Summary of badger scoping surveys results – April 2021**

| Sett number | Number of entrances | Sett type | Notes |
|---|---|---|---|
| 1 | 4 | Outlier | All entrances filled with leaf litter (disused) |
| 2 | 10 | Old disused subsidiary | All entrances filled with leaf litter (disused) |
| 3 | 6 | Old disused subsidiary | All entrances filled with leaf litter (disused) |
| 4 | 2 | Outlier | All entrances filled with leaf litter (disused) |
| 5 | 2 | Outlier | All entrances filled with leaf litter (disused) |
| 6 | 3 | Outlier | All entrances filled with leaf litter (disused) |
| 7 | 4 | Outlier | Entrances 2, 3 &4 filled with leaf litter (partially used); entrance 1 had fresh spoil and badger fur in entrance (well used) |
| 8 | 43 | Main | Flags gone on most of the holes so no numbers.<br>33 holes were free from debris and had fresh spoil (well used). Of these, 11 showed signs of recent use such as fresh bedding and badger hairs. The other 10 entrances were filled with leaf litter (partially used) |
| 9 | 3 | Outlier | All entrances filled with leaf litter (disused) |
| 10 | 5 | Subsidiary | Entrances 1,2,& 5 filled with leaf litter (partially used); entrances 2 & 4 had fresh spoil and badger fur was found in entrance 4 (well used) |
| 11 | 3 | Outlier | All entrances filled with leaf litter (disused) |
| 12 | 2 | Outlier | Both entrances filled with leaf litter (disused) |
| 13 | 2 | Outlier | Both entrances had fresh spoil (well used) |

*Appendix 15c – Badger Sett Location Plan*