Thameside Ecological Survey 2024

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Introduction

This document has been written to give a brief overview of the ecological surveys that were carried out at Thameside Nature Discovery Park in 2024. As part of the management plan for the site, it is required that breeding bird, grassland and butterfly surveys be carried out annually to provide a snapshot of the health of the reserve as these species are good indicators of habitat condition.

In addition to these mandatory surveys other groups have also been studied to provide a broader picture of what can be found on the reserve. This includes surveys for reptiles, bats, great crested newts and moths.

The surveys followed industry best practice methods which will be described in more detail in their respective sections.

Note that some surveys do not require certain species to be recorded and so they are not included in the raw data. That does not mean that the species is absent from the site but that it is not relevant to the survey.

Plate 1. Yellow rattle growing in the Coronation Meadow

Birds

Breeding bird surveys were conducted on site during the main breeding season. Two visits were made, the first or early visit in April and the second late visit in late May. The same transect was walked from the NDC along Mucking Creek, down through the Summer Pasture out towards Golden Gates Lake and East Tilbury. It then ran from the EDL power station and cut across the top of the main landfill site and back up to the NDC. This year, we carried out a second transect to include more of the site. The new transect began in "Back of Sandpit" and followed its northern boundary before heading north towards the cranes along the river and then returning south to the starting point. The surveys were carried out from 6:30am – 9:30am. During the survey, all birds (excluding juveniles) that were seen or heard and their distance from the transect were recorded. The two transects were carried out on separate days.

The highest count of individual birds on the main transect was **1090** and **59** species were recorded across the reserve.

Blackbird
Blackcap
Black-headed gull
Blue tit
Canada goose
Carrion Crow
Cetti's warbler
Chaffinch
Chiffchaff
Common gull
Coot
Cormorant
Corn bunting
Cuckoo
Dunnock
Goldfinch
Grasshopper warbler
Great tit
Great-crested grebe
Great-spotted woodpecker
Green woodpecker
Greenfinch
Greylag goose
House Sparrow
Jackdaw
Jay
Lesser whitethroat
Linnet
Little egret
Little grebe
Long-tailed tit
Magpie
Mallard
Mistle thrush
Moorhen
Mute swan
Nightingale
Pheasant
Pochard
Red-legged partridge
Redshank
Reed warbler
Ring-neck parakeet
Robin
Rook
Sand martin
Shelduck
shoveler
Skylark
Song thrush
Starling
Stonechat
Swallow
Swift
Teal
Tufted duck
Whitethroat
Wood Pigeon
Wren

The Sandpit transect is significantly shorter than the main Thameside transect however it still presented good species diversity and good numbers, especially for species associated with scrub and reedbeds such as whitethroat, grasshopper warbler, sedge warbler and reed warbler. The highest count of individual birds was **425** and **51** species were recorded.

Grasshopper warbler	Jay	Black-headed gull
Nightingale	Marsh harrier	Reed warbler
Wren	Greylag goose	Magpie
Whitethroat	Coot	White-fronted goose
Wood pigeon	Shelduck	Common gull
Chiffchaff	Gadwall	Swift
Blackbird	Pochard	lesser whitethroat
Blackcap	Shoveler	Buzzard
Cetti's warbler	Little grebe	Reed warbler
Pheasant	Robin	Cormorant
Ringneck Parakeet	Great-crested grebe	Collard dove
Cuckoo	Dunnock	House sparrow
Great tit	Long-tailed tit	Canada goose
Sedge warbler	Goldfinch	Mute swan
Song thrush	Linnet	Oyster catcher
kestrel	Carrion Crow	Corn bunting
Blue tit	Skylark	Red-legged partridge

Skylark numbers increased this year with good numbers across the site. The Coronation Meadow supporting approximately 10 animals, but the increase was really focused in Lease Areas 5 and 6. The ongoing works in these areas seemed to have less impact however, it is unclear as to whether they were breeding on this part of the transect due to the grass cutting taking place. Other species such as blackcap, chiffchaff, reed warbler, whitethroat and Cetti's warbler all saw an increase in numbers on the main transect. These numbers were then further bolstered by the addition of the Sandpit transect.

Overall, the surveys recorded **33 skylarks** on the main transect and **15** on sandpit**, 2 corn bunting** on the main transect and **1** on sandpit**, 35 whitethroat** on the main transect and **32** on sandpit and **19 linnet** on the main transect and **10** on sandpit among others. **Nightingale** numbers were lower again this year and were largely absent from Stanford Warren also with only **2** singing males being recorded across both Thameside transects. Two additional singing males were heard outside of the survey calling in Thousand Orchid Meadow. A single pair of **grasshopper warbler** were recorded in the Coronation Meadow again this year and **4** more birds were picked up on the Sandpit transect. **12 sedge warbler** and a **marsh harrier** were recorded on the Sandpit transect which will help inform us how best to manage these areas as they eventually come under EWT management. The surveys once again picked up **3 cuckoo** on the main transect in roughly the same places as previous years which would indicate that these are the same animals returning to their known territory year on year. An additional bird was recorded on the Sandpit transect which we will monitor in following years to see if the bird returns to the same location.

As always there are birds using the reserve that are not picked up on our surveys. There have been regular sightings of several species of raptor including **kestrel**, **buzzard, marsh harrier, hobby** and even a **ring-tail hen harrier** which remained on site for a few weeks, hunting along the sea wall and over the meadows. There are still low numbers of owl sightings on the site likely to be linked the removal of habitat on the larger lease areas. However, there have been occasional sightings of **barn** and **short-eared owl** over the Summer Pasture and Coronation Meadow with the latter being bolstered in the autumn by migratory birds. It appears these animals have settled more in Back of

Sandpit. **Red kites** have been seen sporadically throughout the year and the **peregrine falcons** successfully bred on the crane gantry again.

The 2024 Autumn migration began at the end of August and saw a sudden influx of species such as **whinchat** and **wheatear** on the meadows plus **common, black, sandwich** and **arctic terns, arctic** and **pomarine skuas** and **kittiwake** out on the estuary.

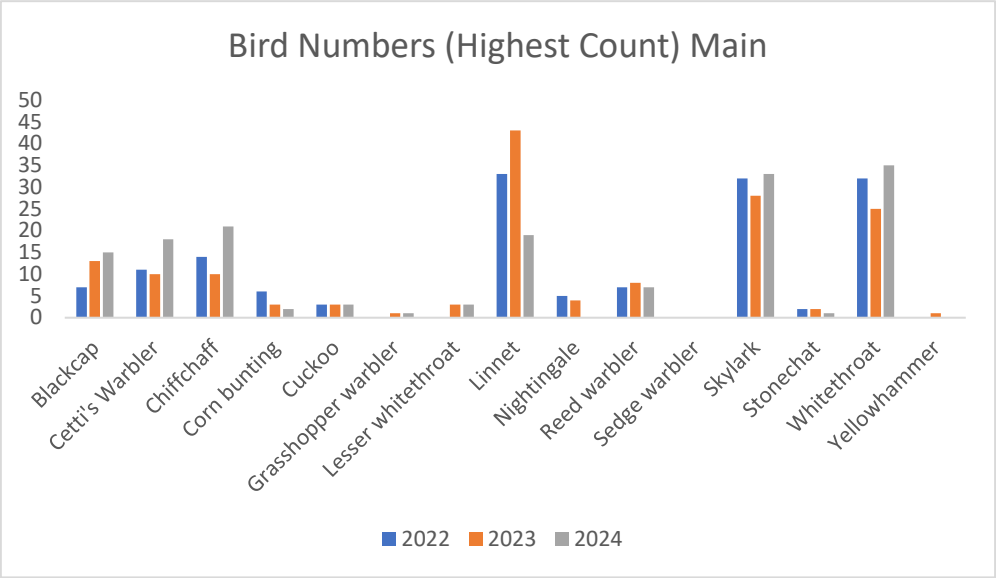

Figure 1. Highest count of bird species between 2022 and 2024 for the main transect

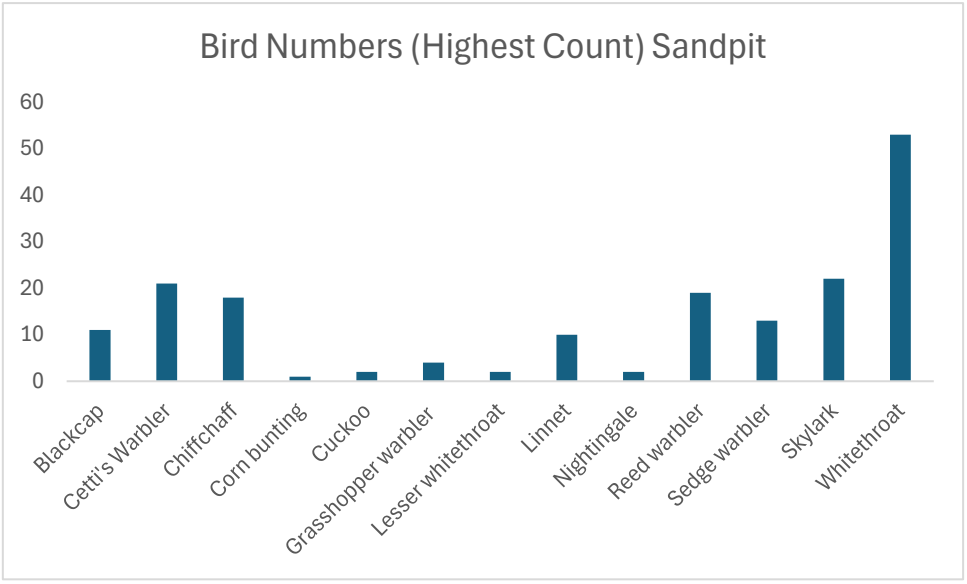

Figure 2. Highest count of individual birds on the Sandpit Transect for 2024

Grassland and Meadows

Four surveys were conducted on the reserve over the course of the season using the Rapid Grassland Assessment (RGA) method. An RGA is not as in-depth as a traditional botanical survey but provides a snapshot of the health of the grasslands. The site was divided up into sections (in this case by fields) and 20 points were plotted in a "W" shape through each field. At each stop data was collected about the length of the sward, the percentage cover of herbs, bare ground and scrub cover. As well as this, the presence of a list of positive and negative indicator species were recorded which were used to help determine the health of the field being surveyed.

The survey areas were the Thames Slope Field, Summer Pasture (North and South), Coronation Meadow and Thousand Orchid (Gobian's Field). 2024 was the fifth survey completed in the coronation meadow and so we continue to see annual trends developing in that data. 2024 was the third year that the Summer Pasture and Thames Slope were surveyed and the second year Thousand Orchid was surveyed.

The below list of positive indicators remained the same as previous years as they are good indicators of healthy neutral grassland. Species present on site have been highlighted in **bold**.

Agrimony	Cuckoo Flower	Meadowsweet
Bee Orchid	Devil's-bit Scabious	Milkwort sp.
Betony	**Field Scabious**	**Ox-eye Daisy**
Bird's-foot Trefoil	**Goat's-beard**	Pepper Saxifrage
Black Knapweed	**Grass Vetchling**	Pignut
Bugle	**Green-winged**	**Ragged Robin**
Burnet-saxifrage	**Orchid**	**Red Clover**
Common Spotted	Harebell	**Salad Burnet**
Orchid	**Lady's Bedstraw**	**Selfheal**
Cowslip	**Meadow Vetchling**	Tormentil
Yellow Rattle		

At each stopping point on the transect the surveyor would scan the surrounding area and mark yes or no as to whether any of these species were present. The threshold for a floristically healthy field is that at least 50% of the stops have one or more positive indicators.

In the Coronation Meadow, which is our most floristically diverse field, all 20 stops had at least one of these species. The most abundant from the list were **yellow rattle, ox-eye daisy** and **grass vetchling.** The herb ratio in the Coronation Meadow remained largely the same across the transect. With the average herb coverage being around 52% which was a 5% increase from 2023.

The Summer Pasture was divided into two separate surveys this year (north and south). Summer Pasture North displayed a much lower level of diversity with 22% herb cover but continued to support good numbers of species of moths and butterflies such as **small/Essex skipper**, **meadow brown, small heath, Marbled White** and **cinnabar moth**. Summer Pasture South was much more botanically diverse with 43% herb coverage with five positive indicator species recorded across the twenty stops.

Thousand Orchid was surveyed for the second year and showed similar results to that of 2023, where 13 of the 20 stops had at least one positive indicator species. The most abundant from the list were **ox-eye daisy**, **betony** and **agrimony**.

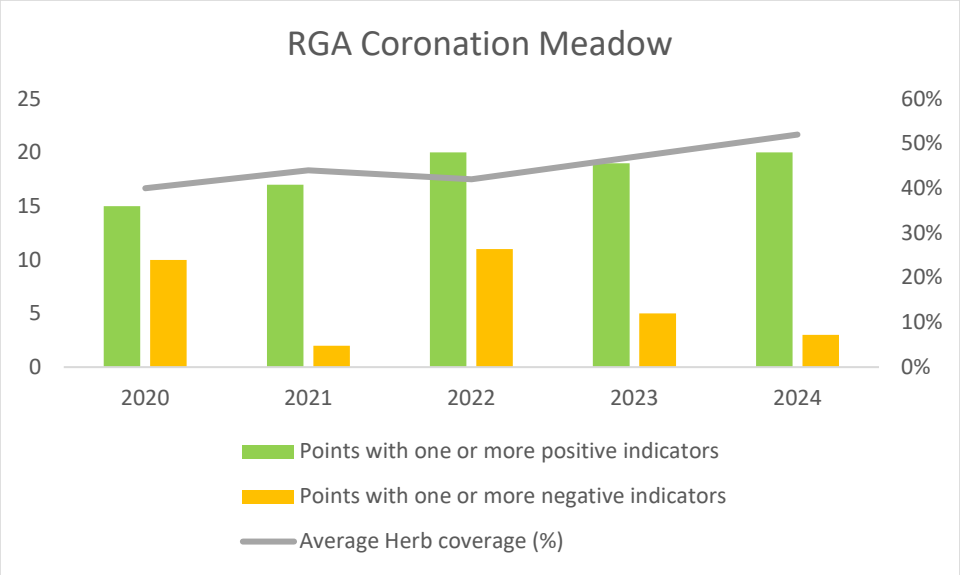

Figure 3. RGA data for Coronation Meadow 2020-2024

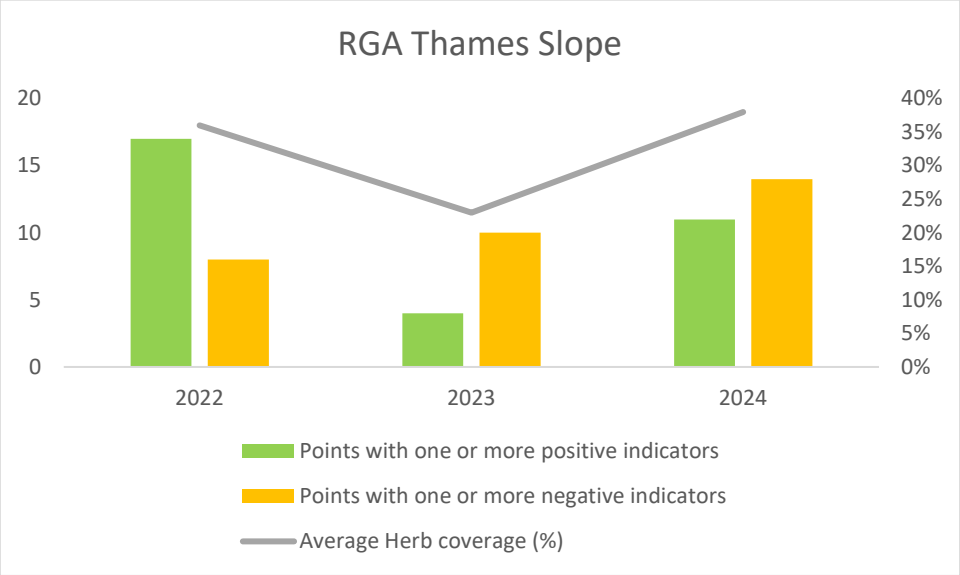

Figure 4. RGA data for Thames Slope 2022-2024

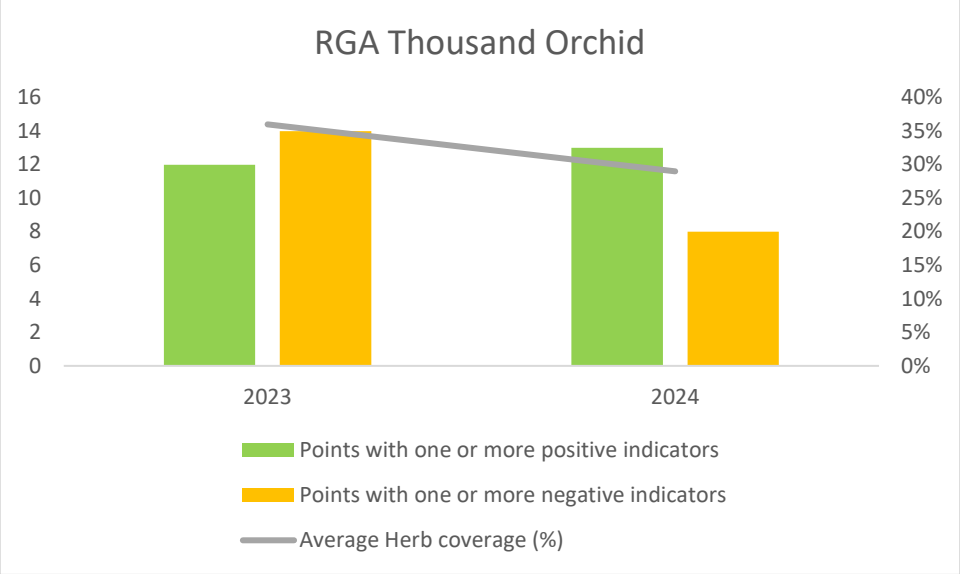

Figure 5. RGA data for Thousand Orchid 2023-2024

Orchids

2024 was the fourth year in which we recorded numbers of orchids across the site. In previous years, these counts were carried out sporadically as work was carried out across the reserve and during Rapid Grassland Assessments. However, the results collected from the 2023 surveys indicated that a more systematic approach was required. Anecdotal sightings were still recorded but we also carried out dedicated orchid counts in our meadows to ensure that a more accurate understanding of numbers was established.

Green winged orchids were found in the same locations as in 2023 though their numbers increased slightly from two spikes to five. The species was first recorded in 2023, but its distribution was unclear. It was our hope that this species would be recorded in other parts of the site during the dedicated counts though this was not the case.

Once again, we reported record numbers of **pyramidal orchids** across the site, but numbers were concentrated to the south of the site in the appropriately named Thousand Orchid Meadow where over 4,000 spikes were counted. It was noted that the range of this species extended beyond EWT's current lease into areas still managed by Enovert.

Bee orchids are known to grow in certain areas of the site though once again, our dedicated orchid counts revealed a much wider distribution. 289 spikes were recorded, most of which were found in the Coronation Meadow and Thames Slope.

Finally, 3 spikes of **common spotted orchid** were recorded in the area immediately adjacent to the Nature Discovery Centre.

Plate 2. Pyramidal orchids growing amongst ox-eye daisies in Thousand Orchid

Butterflies

Butterflies were recorded using the standard UKBMS methodology which is similar in structure to that of the breeding bird survey whereby a transect was set up and then divided into sections. We divided the transect up using natural changes in habitat or fabricated changes across the site such as boundaries between fields etc.

The surveys were more regular this year and we tried to complete a survey every week between April and August where we recorded any species of butterfly that was observed while walking the transect. The surveys were ideally carried out in suitable weather conditions i.e., light wind, warm temperatures and no rain and at appropriate times of day (between 11am and 3pm).

The list below shows the species that were observed throughout the survey season

1. Brimstone
2. Brown argus
3. Comma
4. Common blue
5. Essex skipper
6. Gatekeeper
7. Green hairstreak
8. Green veined white
9. Holly blue
10. Large skipper
11. Large white
12. Marbled white
13. Meadow brown
14. Orange tip
15. Peacock
16. Red admiral
17. Ringlet
18. Small copper
19. Small heath
20. Small skipper
21. Small tortoiseshell
22. Small white
23. Speckled wood
24. Wall brown

In previous years, butterfly transects were walked once a month however in 2024 we were able to increase this to weekly which is in line with UKBMS methodology. We also extended the transect to include Back of Sandpit and Thousand Orchid. To keep our data comparable, the total counts for each species in 2024 are not cumulative from each transect carried out per month but the highest count of each species.

The sum of the highest counts of all species was **996** butterflies and a total of **24** species were recorded across the season. Despite the total number of butterflies being slightly higher than 2023, the was a negative trend in the numbers of several species. It is thought that the exceptionally cold and wet spring had a significant impact on all invertebrate numbers.

The most commonly observed species were the **Essex/Small skipper**, **meadow brown** and **marbled white**. The **wall brown** and **small heath** appeared in higher numbers than in 2023 whereas other species such as **brown argus**, **holly blue** and **gatekeeper** all appeared in significantly fewer numbers than in 2023. **Green hairstreak** were recorded for the first time this year. It's likely that this species has always been present but due to the limited number of counts carried out in previous years, they have remained undetected as they have a relatively short flight window.

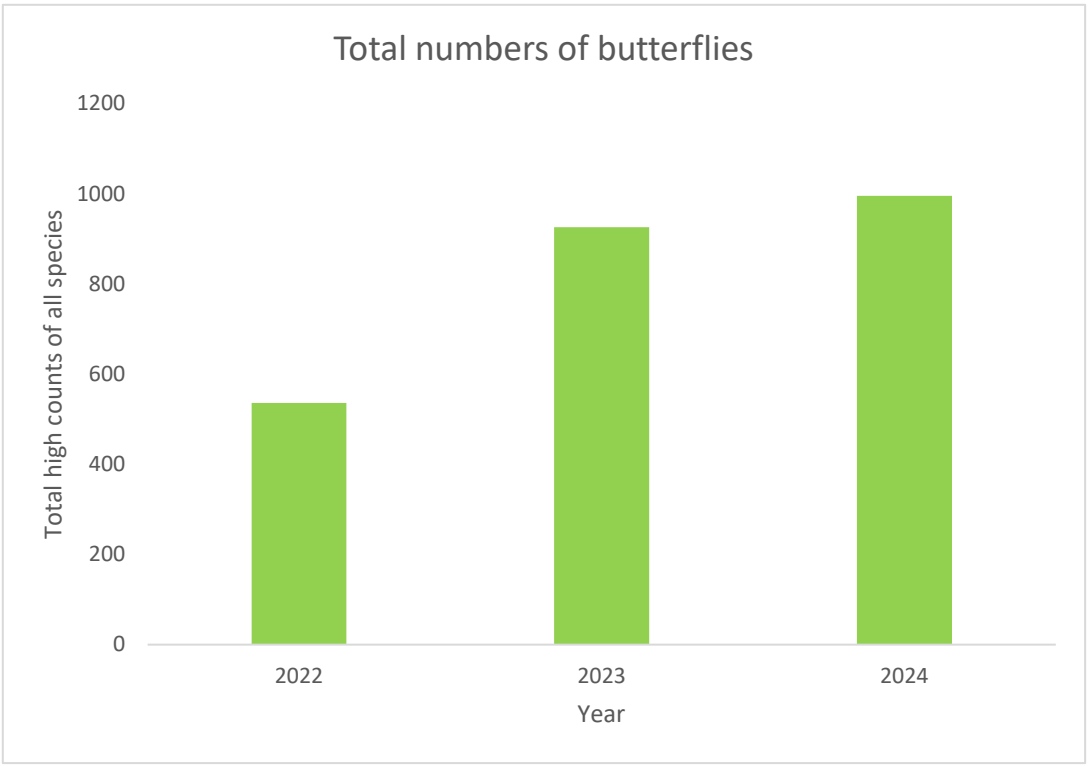

Figure 6. Total numbers of butterflies counted across site 2022-2024

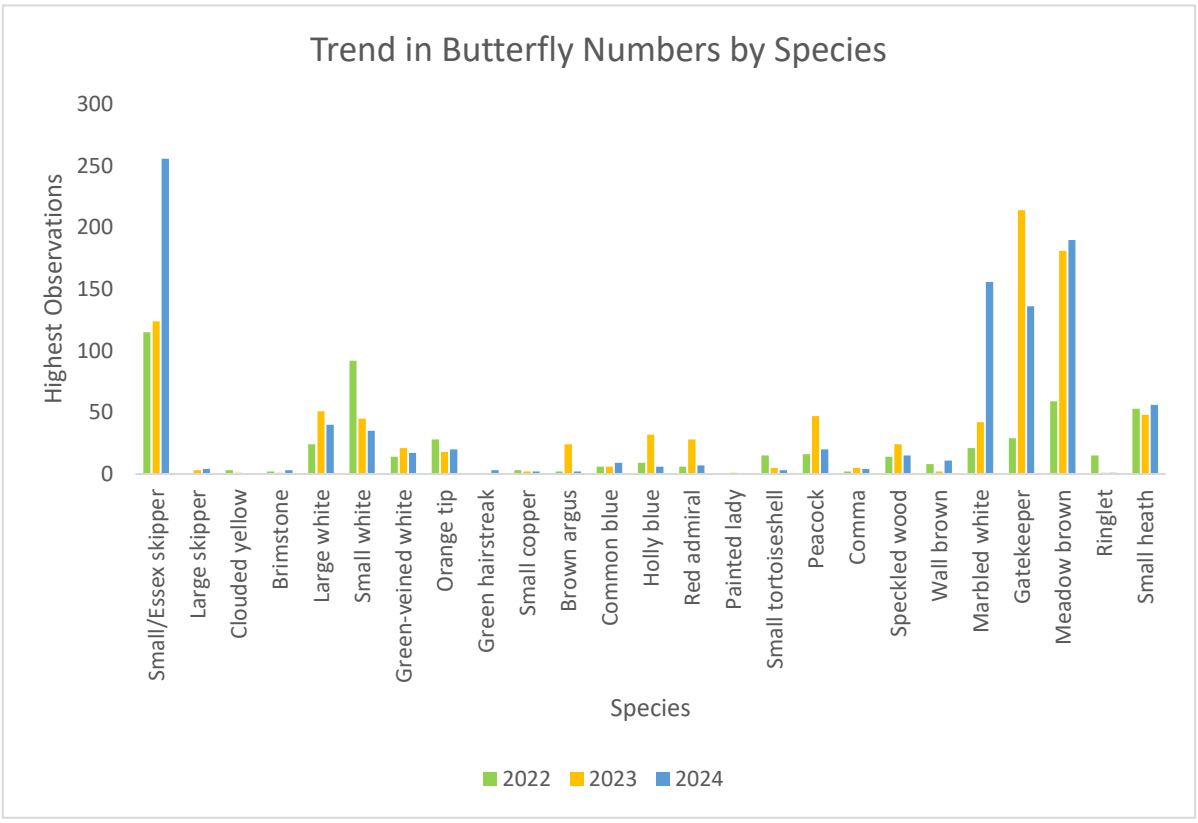

Figure 7. Trend in butterfly numbers by species 2022-2024

Reptiles

Reptile numbers were slightly up from 2023 based on the total number of sightings of animals increasing from 97 to 114 records.

Corrugated bitumen sheets and corrugated tin sheets were put out across the site in March and allowed to 'bed in' for a month before the surveys began.

Surveys were carried out monthly from April – June and in September and October. It is standard practice not to include July and August simply because the refugia warm up to quickly and the reptiles move off into the undergrowth far earlier in the day which could result in inaccurate data.

Ideally surveys were carried out on mild days with broken cloud and little to no wind. The best temperature for surveying is between 10 and 18 degrees as this is when reptiles are more likely to use refugia to thermoregulate.

The trend in abundance remains the same, with slow worms being the most recorded, followed by common lizard, adder and finally grass snake. The latter seem to be concentrated in the northern end of the Summer Pasture and the Wilder Learning Area which would suggest that this is where these animals are breeding. There are two ponds in this area plus the creek which would provide great habitat for them.

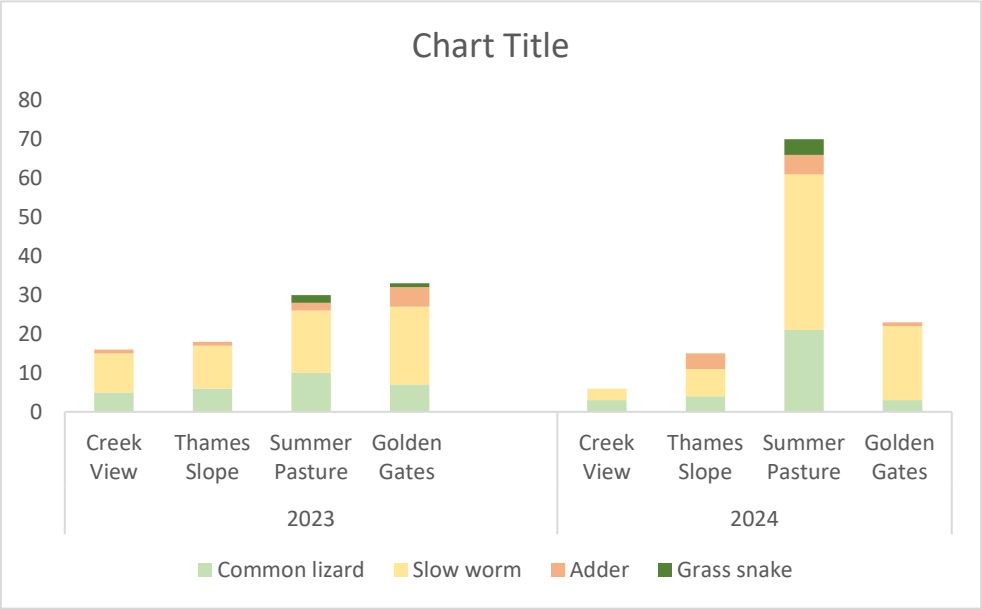

Figure 8. Number of reptiles across site broken down by species 2023-2024

Adder Identification

We continued to document any sightings of adder across the site and took photographs of them to attempt to identify individuals. These photos were cross referenced with images captured in 2023 to see if any of the same animals were being picked up year on year. 17 individual snakes were recorded, two of which were matched with individuals spotted the previous year! Interestingly, these two animals were spotted very close to where they were previously seen which would suggest that adders return to the same areas to breed and hunt year on year.

Plate 4. Adders observed across site in 2024

The images below show how the diamond pattern on adders can be used to identify individuals. The pattern is much like a fingerprint and so is unique to each individual. The first set of photographs were taken of a male snake in 2023 and 2024 respectively. Though the colour varies between the two images, the rather irregular shapes of this animal's pattern are quite distinctive which made it easier to match. The colour variation occurs when the animal sheds it's skin where colour and pattern become sharper when the animal is freshly shed as seen in the 2024 photograph.

Plate 6. Observation 1: Male with distinctive broken pattern observed on the Golden Gates trail 2023/2024

Plate 7. Observation 2: Male with thick patterning observed in Summer Pasture (North) 2023/2024

Newts

Great crested newts were a “one off” addition to the survey schedule of 2023 as these animals had not been surveyed for since 2007. As such, a series of surveys were carried out at several ponds and waterways across the site revealing a reasonable size population in two ponds and an absence in a ditch and pond where they had previously been established. As we had been able to get an idea of population size and distribution, we decided not to carry out any formal GCN surveys in 2024.

GCN are still present and doing well in the ponds they were found in previously, with adults still being seen throughout the year.

It is likely that GCN won’t be surveyed for again until 2026.

Moths

2024 was the third year moth species variety was recorded and saw another slight decrease in individuals and species diversity.

Most of these species are nocturnal and were recorded after a trap was set up. The others are day flying moths and were recorded incidentally while working on site or surveying for other species such as butterflies etc. We used a Heath Trap using a low light actinic bulb which was placed in the Wilder Learning Area and left on overnight. Egg boxes were placed in the trap to provide places for captured moths to roost. The trap was then checked in the morning and the results recorded.

A total of **36** species were recorded and **124** individuals observed.

1. Brightline brown eye
2. Cinnabar
3. Clouded border
4. Common footman
5. Common grass veneer
6. Common rustic
7. Common wainscot
8. Common Wave
9. Common yellow conch
10. Coronet
11. Crambid snout moth
12. Dingy dowd
13. Dingy footman
14. Fiery clearwing
15. Flame shoulder
16. Green carpet
17. Gypsy
18. Hummingbird hawk
19. Jersey tiger
20. Large yellow underwing
21. Lesser broad-bordered yellow underwing
22. Lime-speck pug
23. Orange swift
24. Riband wave
25. Saltern ear
26. Setaceous Hebrew character
27. Shuttle shaped dart
28. Spectacle
29. Stored grain
30. Straw underwing
31. Swallow prominent
32. Treble lines
33. Triangle marked roller
34. Vines rustic
35. White banded toothed carpet
36. White point

While managing an invasive plant species on site, the ranger team caught a glimpse of a fiery clearwing which is a UK Biodiversity Action Plan priority and a red list species in the UK. This moth was once limited to a small population in North Kent but appear to have spread across the river to Essex and have established along the south coast. The adults favour mallow flowers as a nectar source but lay their eggs on their larval food plant, curly dock.

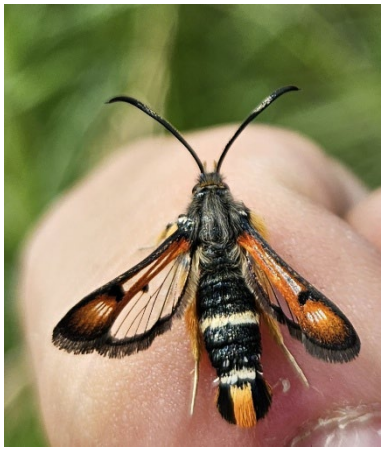

Plate 8. Fiery clearwing in Summer Pasture (South)

Bats

4 species were recorded in total: **common pipistrelle**, **soprano pipistrelle**, **Daubenton's** and **noctule** which showed a slight decrease in species diversity from 2023.

The transect began and ended on Crown Green with a complete circuit of the lake where several potential roost sites have been identified. The survey was carried out in August when sunset was at approximately 20:05.

Conditions on the evening of the survey were not ideal but we decided to continue anyway and were surprised with the number of individuals we recorded especially common pipistrelles of which we recorded over 20 along the transect! A variety of different detectors were used to ID the bats. A traditional detector which only gave out the frequency of the echo location was used along with an ID chart as well as a more modern plug-in detector which works in conjunction with an app called the EchoMeter. The EchoMeter provides real-time identification as well as an amplified playback setting which allows surveyors to hear the bat's echo location calls while they walk the transect.

The most common species were **common pipistrelle** and **noctule**. This year, animals were detected on Crown Green at the beginning of the transect, along the railway line and around three quarters of Golden Gates Lake. The northeastern edge of the lake had no recordings as the path leads further away from the water and therefore less suitable for feeding.

Despite the overcast and drizzly conditions, we were able to detect even more bats than previous years. It is possible that, as the rain was sporadic, it was causing disturbance to large numbers of invertebrates which in turn drew the bats out of their roost to feed during the dry intervals.

Invertebrates

Thameside forms part of the Thames Terrace landscape which is nationally important for invertebrates. As such, the ranger team decided to start surveying for invertebrates to get an idea of the diversity of species that use the grassland and scrub across the site. Largely, this involved sweep netting in various habitats, and placing specimens in pots to identify. Much of this work could be completed in the field however, there were some occasions where a specimen needed to be taken and identified and later released where it was caught.

This survey method was less about collecting data on the number of individuals that we found but rather how the Thameside invertebrate assemblage is divided based on their order. It was revealed that the most abundant order was **Hemiptera** (true bugs) followed by, **Araneae** (spiders), **Diptera** (flies) and **Coleoptera** (beetles).

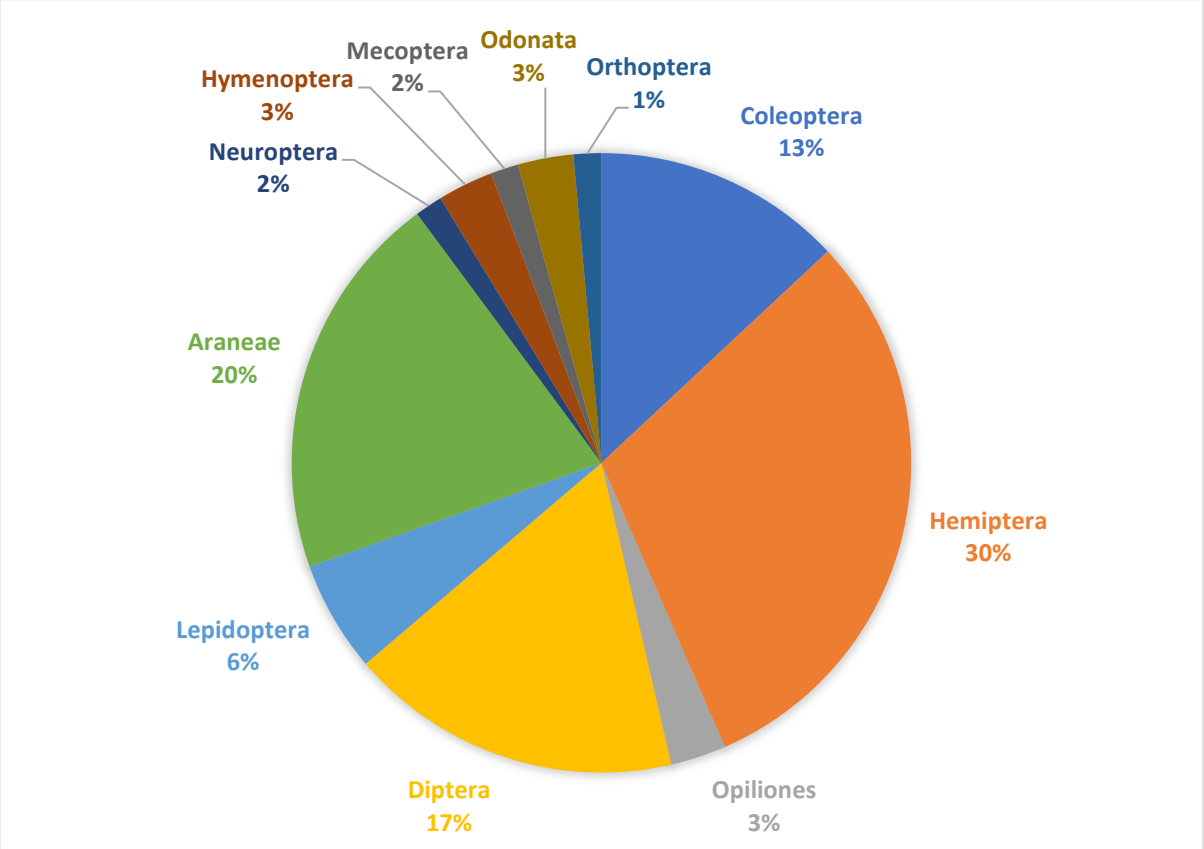

Figure 9. Breakdown of invertebrate assemblage by scientific order

This survey was an incredibly valuable as a way of visualising how the invertebrate assemblage is weighted however, we were unable to commit fully to carrying out regular surveys throughout the season in 2024. As such it is unclear as to whether this is a true representation of the weighting of invertebrates at Thameside. In 2025 it is our hope to increase the number of surveys we can carry out which should hopefully give us a better understanding of invertebrate diversity.

Site maps and Transects

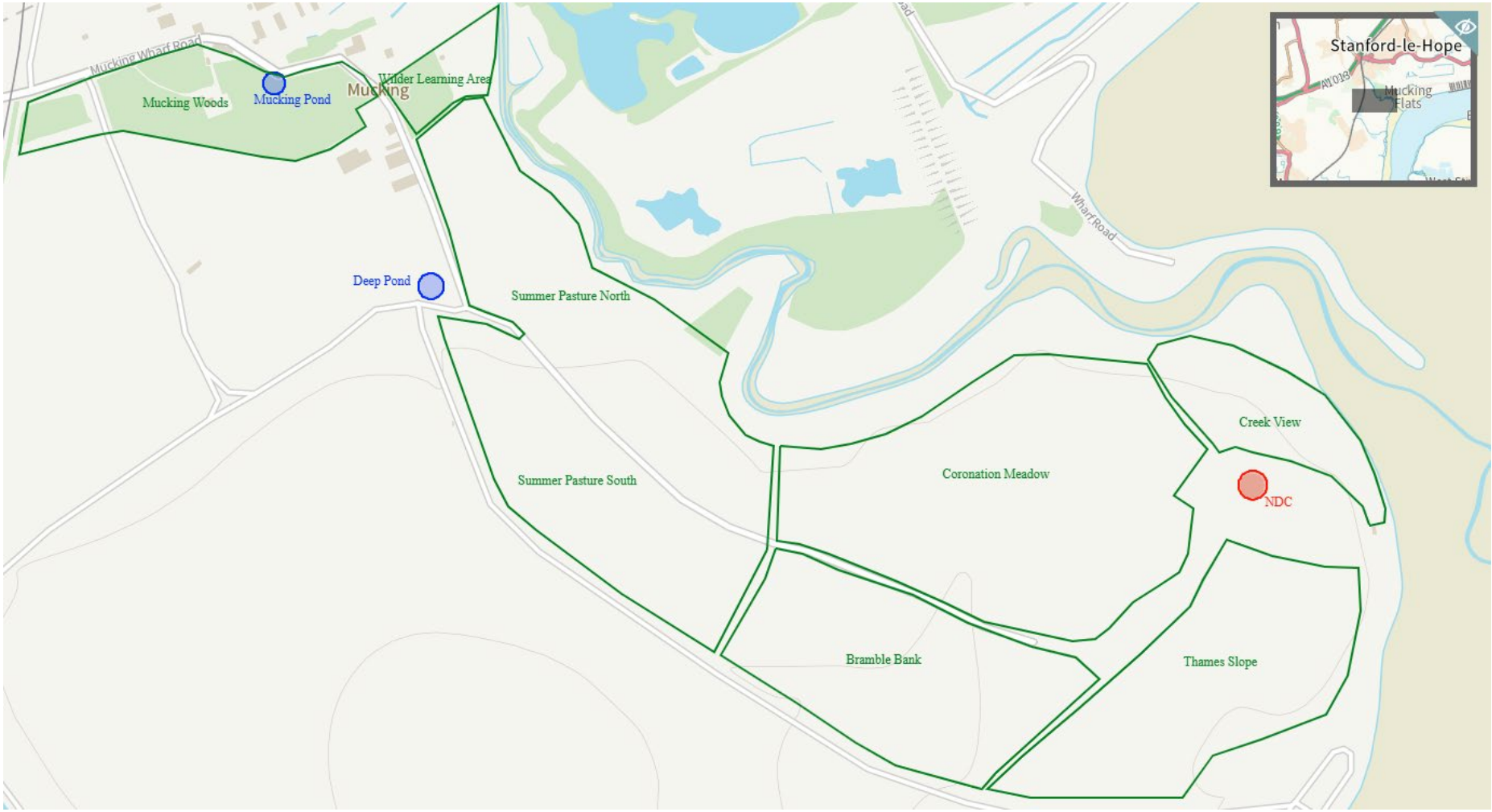

Figure 10. Map of the north site

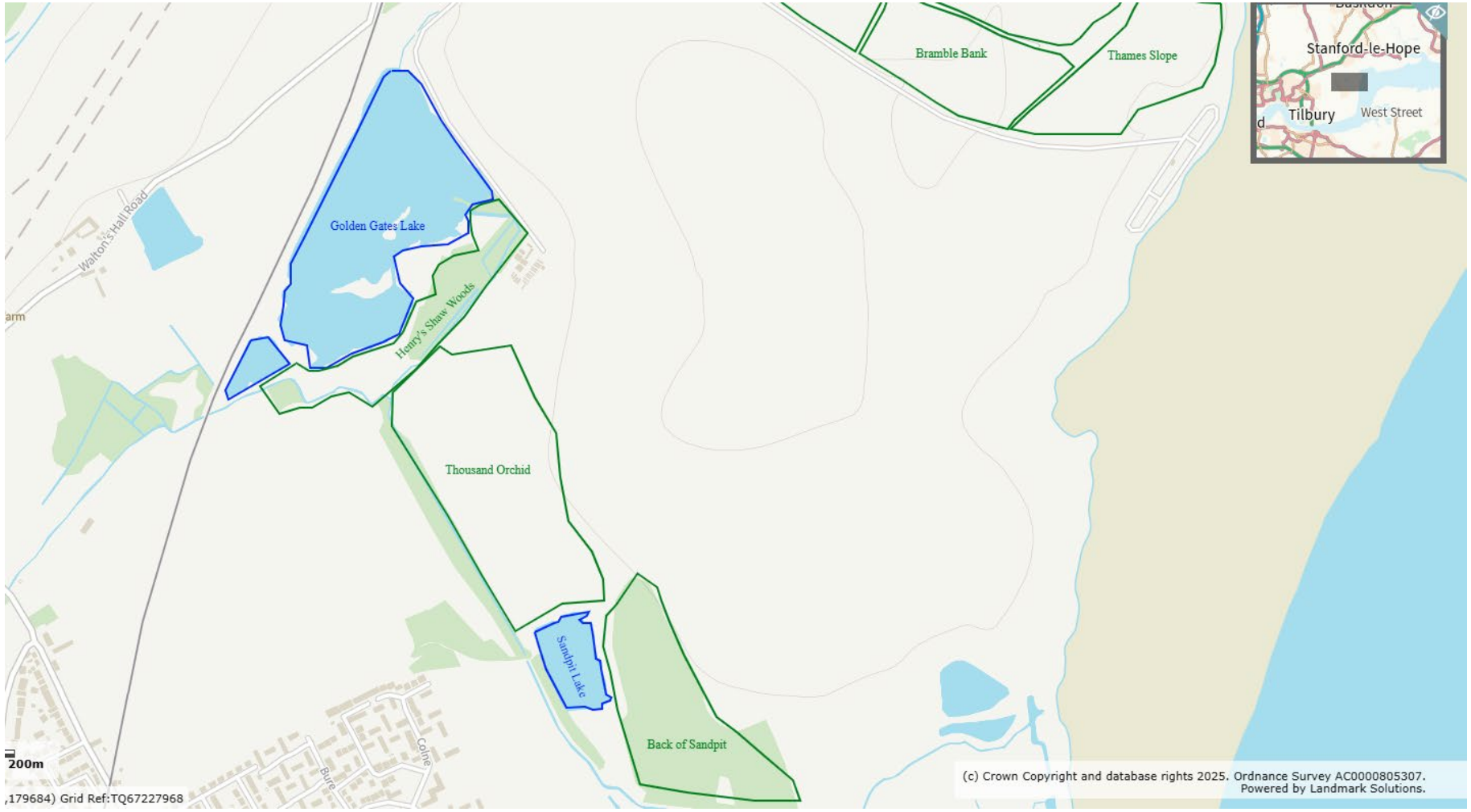

Figure 11. Map of the south site

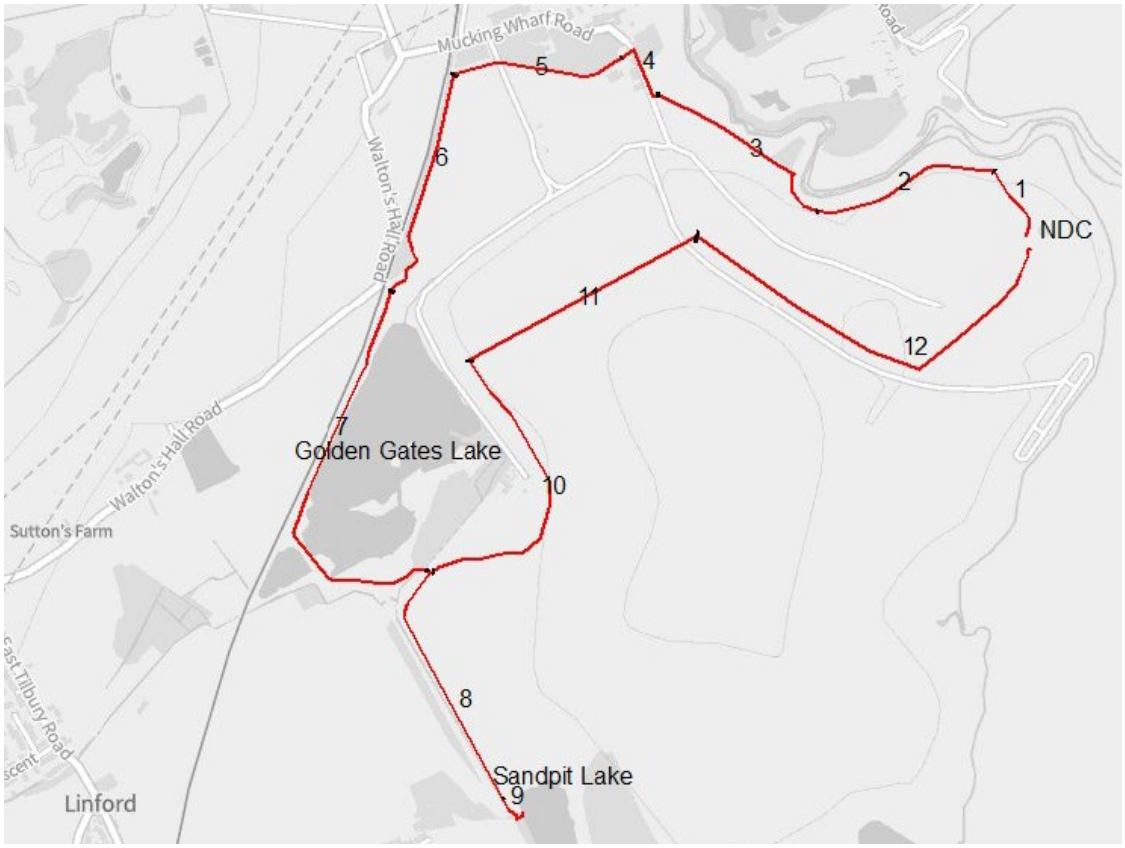

Figure 12. BBS transect (Main)

Figure 13. BBS transect (Sandpit)

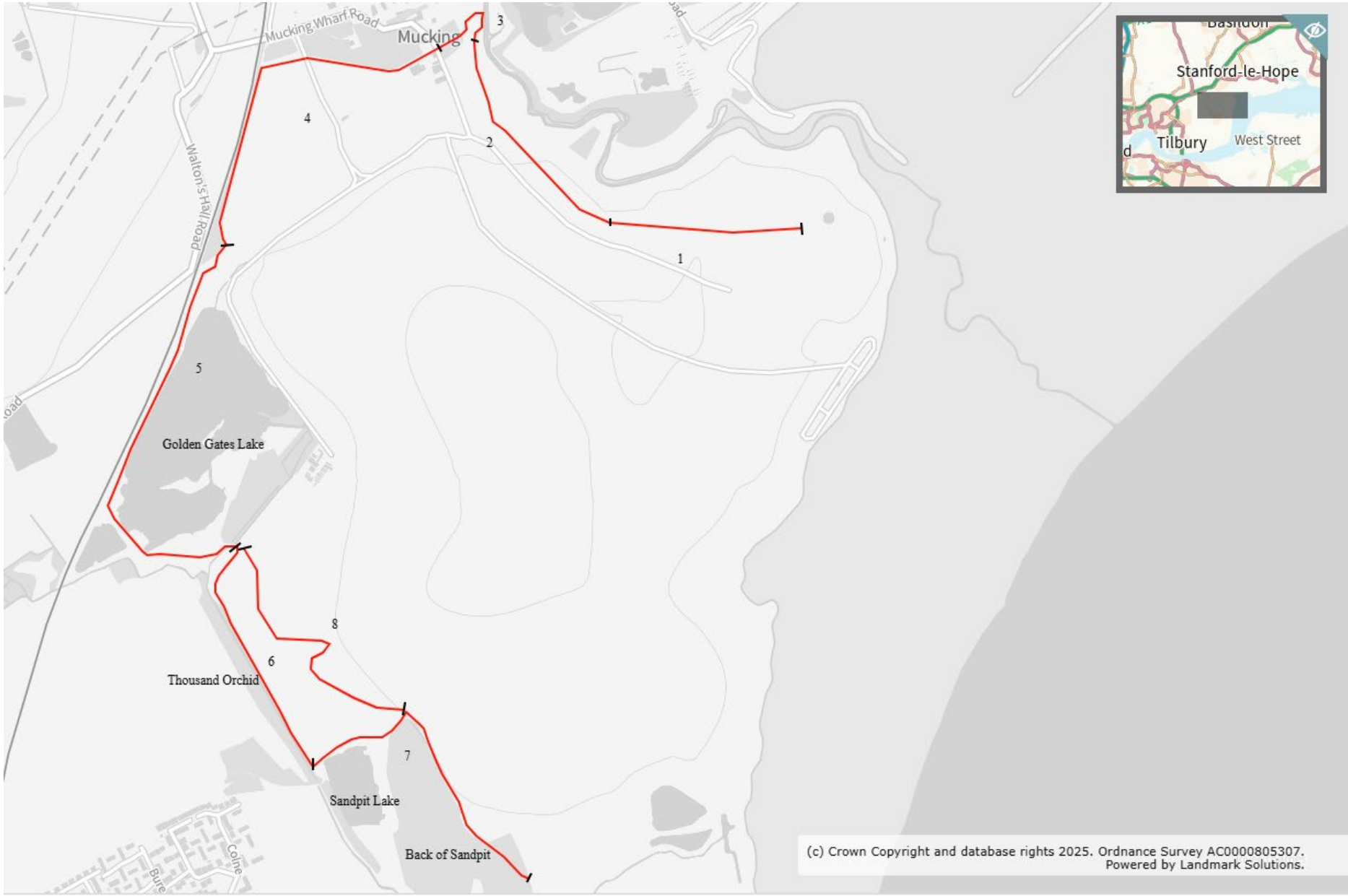

Figure 15. UKBMS Transect