Thameside Ecological Survey 2023



Essex Wildlife Trust

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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 2023. As part of the management plan for the site, it is required that breeding bird, rapid 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. Mucking Creek at High Tide.

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 Gate 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. 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 highest count of individual birds was **514** and **64** species were recorded across the reserve.

Barn owl	Long-tailed tit
Black headed gull	Magpie
Blackbird	Mallard
Blackcap	Mistle thrush
Blue tit	Moorhen
Canada goose	Mute swan
Carrion crow	Nightingale
Cetti's warbler	Pied wagtail
Chaffinch	Pochard
Chiffchaff	Red-legged partridge
Coal tit	Redshank
Coot	Reed bunting
Cormorant	Reed warbler
Corn bunting	Ring ouzel
Cuckoo	Ringneck parakeet
Dunnock	Robin
Egyptian goose	Rook
Gadwall	Sand martin
Goldfinch	Shelduck
Grasshopper warbler	Skylark
Great tit	Snipe
Great-crested grebe	song thrush
Green woodpecker	Starling
Greenfinch	Stonechat
Greylag goose	Swallow
House sparrow	Swift
Jackdaw	Tufted duck
Kestrel	Whitethroat
Kingfisher	Wood pigeon
Lesser whitethroat	Wren
Linnet	Yellow legged gull
Little grebe	Yellowhammer

Skylark numbers were slightly down this year. There were still good numbers in the Coronation Meadow but less in Lease Areas 5 and 6 which were included in the transect for a second year. There had been extensive works in those areas at the end of the 2022 breeding bird season which could have caused significant disturbance to late breeding animals. Significant amounts of habitat were removed including large portions of scrub which could also account for the slight drop in other species like corn bunting, stonechat and whitethroat.

Overall, the survey revealed **28 pairs of skylarks**, **3 pairs of corn bunting**, **4 pairs of nightingale**, **25 pairs of whitethroat** and **43 pairs of linnet** (potentially) among others. The nightingale settled more in the adjacent Stanford Warren Nature Reserve this year, with 7 singing males recorded along the short transect. A single pair of **grasshopper warbler** successfully bred this year with the fledglings spotted in the Coronation Meadow in early July. Additionally, a single **ring ouzel** was picked up during the first visit which was a new record for Thameside. This animal was likely using the reserve as a pitstop on its way further north to the Cairngorms where they breed. A second bird was observed later in the year during a WeBS count (possibly the same bird migrating south again).

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**, **hobby** and even an **Osprey**. Sadly, there were no sightings of the **long-eared owl** and fewer sightings of the **barn** and **short-eared** owl. It is likely to be linked the removal of habitat on the larger lease areas. There have been several sightings of **marsh harrier** both over the mudflats at Thameside and in the reedbeds of Stanford Warren. **Red kites** have been seen sporadically throughout the year and the **peregrine falcons** successfully bred on the crane gantry again.

The 2022/2023 winter saw good numbers of **lapwing** using the meadows and regular sightings of **redwing** and **fieldfare**. There were also records of **grey** and **golden plover** on the mud as well as a **red-throated diver** in the estuary. There are also increasing sightings of **raven** in the area.

The Autumn migration brought sightings of species such as **whinchat** and **wheatear**. By mid-September bird numbers on the mudflats had begun to increase including sightings of **greenshank**, **bar-tailed godwit, great white egret, spoonbill** and **green sandpiper** as well as bolstered numbers of our resident species such as **avocet, dunlin** and **redshank**.



Plate 2. Skylark



Figure 1. BBS transect map.



Figure 2. Estimated number of pairs based on specific behaviour (territorial singing, nest building etc).

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 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 four survey areas were the Thames Slope Field, Summer Pasture, Coronation Meadow and Gobians Field. 2023 was the fourth survey completed in the coronation meadow and so we continue to see annual trends developing in that data. 2023 was the second year that the Summer Pasture and Thames Slope were surveyed and the first year Gobians field 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 Bee Orchid Betony Bird's-foot Trefoil Black Knapweed Bugle Burnet-saxifrage Common Spotted Orchid Cowslip Yellow Rattle Cuckoo Flower Devil's-bit Scabious Field Scabious Goat's-beard Grass Vetchling Green-winged Orchid Harebell Lady's Bedstraw Meadow Vetchling Meadowsweet Milkwort sp. **Ox-eye Daisy** Pepper Saxifrage Pignut Ragged Robin **Red Clover Salad Burnet Selfheal** Tormentil

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, 19 out of the 20 stops had at least one of these species. The most abundant from the list were **yellow rattle, goat's-beard** and **black knapweed.** The herb ratio in the Coronation Meadow remained largely the same across the transect. With the average herb coverage being around 47%. (Herb in this case means any broadleaf flowering plant).

The Summer Pasture once again displayed a much lower level of diversity but continued to support good numbers of species of moths and butterflies such as **small skipper**, **meadow brown**, **small heath**, **brown argus** and **cinnabar moth**.

The newly surveyed Gobians Field showed good potential, where 12 of the 20 stops had at least one positive indicator species. The most abundant from the list were **ox-eye daisy**, **betony** and **bird's-foot trefoil**.



Figure 3. RGA data for Coronation Meadow 2020-2023



Figure 4. RGA data for Thames Slope Field 2022-2023



Figure 5. RGA data for the Summer Pasture 2022-2023

Orchids

While carrying out our Rapid Grassland Assessments and general maintenance of the reserve, we counted any orchid spikes spotted. This was the third year we were able to do this and we observed similar numbers of all species of orchid found on site with two exceptions.

Two spikes of **green winged orchids** were found at the bottom of the Summer Pasture and in the Picnic Area at the Centre. This is a new species for the reserve and has not been recorded in the past. It is possible that this species has remained dormant since the EWT assumed management of the reserve and it has taken the past 12 years for the symbiotic relationship that orchids share with fungi to establish and allow the plant to flower. We will continue to monitor the spread of this species in the coming years.

We were able to count record numbers of **pyramidal orchids** this year having carried out our first Rapid Grassland Assessment in Gobians Field. During the survey we counted an incredible 1,104 spikes!



Figure 6. Number of orchid spikes counted across site



Plate 3. Green-winged 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 with between two and three transects per month between April and August where we recorded any species of butterfly that was observed while walking the transect. The surveys were only 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 veined white
- 8. Holly blue
- 9. Large skipper
- 10. Large white
- 11. Marbled white
- 12. Meadow brown

- 13. Orange tip
- 14. Painted lady
- 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



Figure 7. UKBMS transect map

In previous years, butterfly transects were walked once a month however in 2023 we were able to increase the number of surveys carried out to two or three per month and as such include our data in the national UKBMS recording programme. In order to keep our data comparable, the total counts for each species in 2023 are not cumulative from each transect carried out per month but the highest count of each species.

A total of **926** butterflies and **24** species were recorded across the season. The most commonly observed species were the **gatekeeper**, **meadow brown** and **Essex/small skipper**. The latter are difficult to differentiate in the field and are therefore listed together by the UKBMS. **wall brown** and **small heath** still appeared throughout the year but in slightly lower numbers. Other species such as **brown argus**, **holly blue** and **marbled white** all appeared in greater numbers than in 2022.



Figure 8. Butterfly numbers between 2021 and 2023



Figure 9. Comparison between numbers of each species between 2022 and 2023

Reptiles

Overall reptiles appeared to have a better year than 2022 based on the total number of sightings of animals. Though we still had particularly warm spells, we didn't experience the same intense heat of 2022. This meant that reptiles were using our refugia for longer and were therefore easier to detect.

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.

as always, the most abundant species were slow worms and common lizards followed by adders and finally grass snake which are notoriously elusive across the reserve. Interestingly, the majority of recordings of grass snake were juvenile animals which indicates that this species is breeding on site even if they are difficult to survey!



Figure 10. Number of reptiles across site broken down by species

Adder Identification

Adders are the UKs only venomous reptile and Thameside has a good population of these fascinating animals. We began taking photographs of adders to use their distinctive zig-zag pattern and head markings to differentiate between animals as each snake's pattern acts as a fingerprint with each one being unique to the individual. This year we were able to identify 15 individual snakes that were seen across the reserve in our four survey areas. These photographs will be stored and used next year to cross reference against any new animals that are seen.



Plate 4. Individual adders photographed throughout the survey season each showing a unique pattern

Newts

Great-crested newts (GCN) were a new addition to the survey schedule for 2023 as we wanted to establish the presence/absence of GCN and whether they were using any of our ponds and water ways to breed. GCN are a protected species and as such the ranger team was assisted by the Lead Reserves Ecologist who holds a licence to survey these large amphibians.

The last GCN survey was carried out in 2006 long before the EWT began managing the site. Newts were found to be using three pools and one ditch across the site: Mucking Pond, Deep Pond, Rookery Pond and Gobians Ditch. The results revealed that Thameside was supporting a medium sized population and was deemed to be a significant site for this species.

Sadly, with changes in personnel, shifting priorities and an ever-evolving site, this data was left by the wayside and GCN were not surveyed for since. Many of the above ponds were suspected to have fallen out of favourable conditions with lots of vegetation encroachment.

The Four water bodies that had previously been identified to be supporting GCN were visited on five separate occasions between April and June. Newts were surveyed for using two different techniques: torching and bottle trapping. Torching involves shining bright torches into the water at night and searching for GCN swimming in the water. This is a good way to establish presence or absence however it's very difficult to get an idea of population size. For this purpose, bottle traps were used and placed out overnight. These traps are a simple design whereby the top quarter of a 2L bottle is cut off and then inverted and put back into the rest of the bottle creating a funnel. A bamboo cane is then put through the pieces so that they are held together, and the cane is forced into the bank of the pond with the bottle being submerged under water leaving an air pocket at the top of the trap allowing the newts to breathe until the traps are checked in the morning.

GCN were recorded in two of the four water bodies surveyed: Mucking Pond and Deep Pond (Table 1 and Table 2). No GCN were recorded in Rookery Pond or Gobian's Ditch (Table 3). The maximum count of adult GCN in Mucking Pond and Deep Pond was eight and six respectively (Table 1 and Table 2). Based upon a scoring system applied for selection of SSSIs, this constitutes a small (<10 individuals) GCN population in each pond. However, as the maximum count for each of the two ponds was attained on the same night (12th June 2023), and therefore, all GCN were different individuals, this constitutes a good population (10-100 individuals) when the two ponds are considered together. Three juvenile (approx. 6-week old larvae) GCN were recorded in Deep Pond on 22nd June 2023 (Table 2), confirming breeding status within that pond. Small populations of smooth newt *Lissotriton vulgaris* were also recorded in Mucking Pond and Deep Pond, and breeding by this species was confirmed in both ponds by presence of larvae (Table 1 and Table 2).

Other notable species captured by the bottle-traps and identified in Mucking Pond were water scorpion *Nepa cinerea* and great diving beetle *Dysticus marginalis*, and in Deep Pond, emperor dragonfly *Anax imperator* nymph and great diving beetle.

Table 1. Counts of great crested newt and smooth newt at Mucking Pond, Thameside Nature Discovery Park during the 2023 survey. Survey method used was bottle-trapping.

Date	Min. air	Wind	Rain	No.	(Great c	rest	ed newt			Smooth newt				
	temp (°C)	(kmph)	(Y/N)	traps	М	F	٦	otal ad.	Juv	М	F	٦	otal ad.	Juv	
13/04/2023	5	NR	N	20	0		0	0	0	1		0	1	0	
03/05/2023	8	10	N	20	0		2	2	0	0		1	1	0	
18/05/2023	12	5	N	20	1		2	3	0	0		0	0	0	
12/06/2023	15	10	N	20	3		5	8	0	0		1	1	1	
22/06/2023	15	5		20	2		1	3	0	0		1	1	0	

Table 2. Counts of great crested newt and smooth newt at Deep Pond, Thameside Nature Discovery Park during the 2023 survey. Survey method used was bottle-trapping.

Date	Min. air		Great c	rest	ed newt		Smooth newt						
	temp (°C)	(kmph)	(Y/N)	traps	М	M F Total ad.		otal ad.	Juv	Juv M		Total ad.	Juv
13/04/2023	5	NR	N	20	1		2	3	0	0	0	0	0
03/05/2023	8	10	N	20	1		0	1	0	0	6	6	0
18/05/2023	12	5	N	20	1		4	5	0	0	1	1	0
12/06/2023	15	10	N	15	C)	6	6	0	0	5	5	0
22/06/2023	15	5	N	15	C		3	3	3	0	0	0	10

Table 3. Counts of great crested newt and smooth newt at Rookery Pond and Gobian's Ditch, Thameside Nature Discovery Park during the 2023 survey. Survey method used was bottle-trapping.

Date/Pond	Min. air	Wind	Rain	No. traps		Gr	eat c	rest	ed newt		Smooth newt				
	temp (°C)	(kmph)	(Y/N)			М	F		otal ad.	Juv	М	F	Total ad.	Juv	
Rookery Pond															
13/04/2023	5	NR		N	20	0		0	0	0	0	0	0	0	
Gobian's Ditch															
12/06/2023	15	10		N	20	0		0	0	0	0	0	0	0	
22/06/2023	15	5		N	20	0		0	0	0	0	0	0	0	

A low population (<10 individuals) of GCN were recorded in Mucking Pond and Deep Pond. No GCN were recorded in Rookery Pond or Gobian's Ditch. A previous survey of the ponds in 2006 carried-out by Adrian Bayley, recorded a maximum of six GCN in Mucking Pond and six in Deep Pond over five survey visits between 27th April 2006 and 7th June 2006 using pond nets. The maximum counts during the 2006 survey using bottle-traps were two GCN in both of these ponds. Therefore, the current GCN population size within these two ponds is similar to that in 2006, but it is unknown whether the population remained stable in the intervening years. However, the 2006 survey also recorded a maximum of one GCN in Rookery Pond and a maximum of six in Gobian's Ditch using nocturnal torching methods (zero recorded using bottle-traps in both water bodies). Given the small numbers throughout the 2006 survey, it seems unlikely that Rookery Pond and Gobian's Ditch were used by GCN for breeding at this time, so no GCN breeding ponds appear to have been lost at TNDP between 2006 and 2023.

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Plate 6. Poplar hawk moth



Plate 5. Oak eggar moth

conch 11. Coronet

12. Crambid snout

Moths

and species diversity.

1. Brightline brown

4. Clouded border

6. Common grass

veneer 7. Common rustic

5. Common footman

8. Common wainscot

9. Common Wave

10. Common yellow

eye 2. Brindle sp.

3. Cinnabar

- 15. Dark strawberry

tortrix

16. Dingy dowd

- 13. Cream-spot tiger 14. Cyclamen tortrix

- moth

22. Hummingbird hawk 23. Japanese bean

21. Gypsy

2023 was the second year moth species variety was recorded and saw a slight decrease in individuals

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.

Moths were identified using a range of methods including field guides and ID apps. Once the moths

17. Dingy footman

18. Flame shoulder

19. Fulvous clothes

20. Green carpet

were identified they were released in areas of long grass to protect them from predation.

The trap was then checked in the morning and the results recorded.

Two trapping sessions were carried out and both on clear nights.

A total of 49 species were recorded and 150 individuals observed.

- webworm
- 24. Jersey tiger
- 25. Large yellow underwing
- 26. Lesser broadbordered yellow underwing
- 27. Lime-speck pug
- 28. London dowd
- 29. Marbled minor

32. Orange swift

33. Pied smudge

- 30. Oak eggar
- 31. Oak processionary

- 34. Poplar hawk
- 35. Riband wave
- 36. Saltern ear
- 37. Setaceous Hebrew character
- 38. Shuttle shaped dart
- 39. Southern wainscot
- 40. Spectacle
- 41. Stored grain
- 43. Swallow prominent
- 44. Treble lines
- 45. Triangle marked roller
- 46. Turnip
- 47. Vines rustic
- 48. White banded
- toothed carpet
- 49. White point









Bats

Bats have not been surveyed at Thameside since 2017 where **6** species were recorded in total: **common pipistrelle**, **soprano pipistrelle**, **Nasthusius' pipistrelle**, **Daubenton's**, **Natterer's** and **noctule**.

A new transect was set up that began and ended on Crown Green with a complete circuit of the lake where several potential roost sites have been identified. The first transect was carried out in July when sunset was at approximately 21:20. It was recommended that the survey began 30 minutes before sunset however it became apparent that this was too early for our needs as no bats were detected until much later in the survey.

The conditions for the survey were like many of the others where clear dry nights were chosen. 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.

We had much more success in 2023 and we recorded **6** species and **31** individuals along the transect: **common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, Natterer's, noctule** and **serotine.** 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.



Figure 11. Bat transect map

Site



