GATWICK AIRPORT

Nightingale (*Luscinia megarhynchos*) © Penny Green

ANNUAL BIODIVERSITY REVIEW 2021

Our annual report summarising biodiversity work at Gatwick Airport and progress with the Biodiversity Benchmark Award

(Abridged version)

Authored by Rachel Bicker, Biodiversity Advisor (Gatwick Airport Ltd)
February 2022

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ACKNOWLEDGEMENTS

We would like to thank everyone who has contributed their time and effort toward the Biodiversity Action Plan in 2021, including:

- Our biological recorders Vince Massimo, Peter Townend, Tom Forward, Jeremy Cheesman, Nick Aplin, Laurie Jackson, Morgan Lucy, Jeremy Charman, Ryan Mitchell, Scotty Dodd, Jacob Everitt, Ian Barnard, Martyn Cooke, Lucy Groves, Sam Buckland and Jon Middleton for their valuable time
- The Sussex Biodiversity Record Centre for their help with data collation, in particular Lois Mayhew for providing the latest species breakdown for Gatwick, and to Dr Richard Comont for assistance with the FIT counts analysis
- The Gatwick Greenspace Partnership Project Officer Tom Simpson and Volunteer Reserve Managers; Harry Smith, Chris Lowe, Phil Turner, Robert Healey and Lewis Thornhill for their consistent habitat management efforts
- Gatwick Construction Ltd, Birdstrike Management Ltd, Glendale Landscape Services, Roots Upwards Ltd and Synergy TJ Ltd for their continued support of the Biodiversity Action Plan.

[1] – INTRODUCTION

[A] – SUMMARY

2021 began with continued significant impacts from Covid-19 on the aviation and tourism industries, with Gatwick Airport's passenger numbers remaining low. For the majority of the year COVID-19 restrictions remained in place and as a result volunteer numbers were limited with many people either shielding, isolating, or remaining cautious about gathering in groups.

The weather during the 2021 ecology field season was especially challenging, with the first half being particularly cool and cloudy. Although the majority of ecology surveys were successfully completed, species presence and numbers may have been skewed by the suppression of invertebrate activity on cooler days.

Despite these limitations, considerable progress was made against Gatwick's Biodiversity Action Plan during 2021, with habitat actions and ecological survey efforts almost returning to pre-pandemic levels. The consistent hard work and dedication from the Gatwick Greenspace Partnership Volunteer Reserve Mangers allowed us to achieve the majority of our biodiversity targets by using Covid-safe working practices, which paved the way for larger corporate volunteer groups to return. Community engagement work steadily returned through a combination of online events with larger groups and in-person events with restricted numbers of people later in the year.

[B] – YEAR HIGHLIGHTS

- Retained The Wildlife Trust's **Biodiversity Benchmark Award** for the **7th year** in a row (audited and awarded in April 2021)
- Recovering activities from the COVID-19 pandemic with the **Gatwick Greenspace Partnership**:
  - Consistent completion of habitat management tasks by **Volunteer Reserve Managers**
  - Resuming staff volunteering days for Gatwick Airport Ltd and local businesses
  - Engagement with new community groups on road verge management for wildflowers
  - Resuming outdoor engagement with local schools
  - Continued **nature and wellbeing** sessions for Gatwick Airport Ltd staff
- A total of **22 out of 25 (88%) of the ecology surveys** were successfully completed, and three (12%) surveys were missed. This is despite a very challenging year in regards to poor weather conditions
- A total of **76 out of 89 (85.4%) habitat actions** were successfully completed and 13 (14.6%) were missed or postponed until 2022

- New and notable species found on the sites in 2021 included Alder Kitten Moth *Furcula bicuspis* (Nationally Scarce), Slender-horned Leatherbug *Ceraleptus lividus* (Nationally Scarce), Ox-eye Daisy Lacebug *Catoplatus fabricii* (Notable B), Red-tipped Clearwing *Synanthedon formicaeformis*, Small-flowered Buttercup *Ranunculus parviflorus* and the fungus ***Inocybe semifulva*** which is a new species to the UK
- Confirmed breeding activity of Great Crested Newt *Triturus cristatus* (European protected species) after many years of absence from the Land East Pond 7
- Two Nightingale *Luscinia megarhynchos* (BoCC red-list) territories confirmed for the second year running. Both males were captured and measured by licenced bird ringers. The control (ringed) male was confirmed to have been originally captured at the Knepp Estate during August 2020
- An increase in abundance of positive indicator wildflower species and a confirmed sighting of a female Long-horned Bee *Eucera longicornis* foraging on Gatwick's wildflower road verge network
- Gatwick Airport awarded a category award at the Vinci Environment Awards for establishing wildflower road verges
- First conservation 'cut-and-collect' of Westfield Stream grassland completed.

The next audit for the Biodiversity Benchmark Award for 2021 is due in February 2022.

[C] – WILDLIFE HIGHLIGHTS

Grass Snake *Natrix helvetica* displaying defensive 'hooding' behaviour. Land East © Tom Forward

Weasel *Mustela nivalis* with successfully captured small mammal prey, Scrub West of Brockley (Browning Strike Force HD Pro X trail camera) © Rachel Bicker

Nightingale *Luscinia megarhyncos* recovery with ring.
North West Zone © Penny Green

Spring breeding bird survey, April 2021. North West Zone © Rachel Bicker

Eyed Hawk-moth *Smerinthus ocellata* caterpillar, Goat Meadow © Tom Simpson

Alder Kitten *Furcula bicuspis*, Rolls Field
© Rachel Bicker

Red-tipped Clearwing *Synanthedon formicaeformis* © Rachel Bicker

A species of green/pool frog, ***Pelophylax*** sp. by an airside pond
© Christopher Neve

Long-horned Bee *Eucera longicornis* male foraging on Bird's-foot Trefoil.
North West Zone © Rachel Bicker

Inocybe semifulva a species of fungus new to the UK © Nick Aplin

Ox-eye Daisy Lacebug *Catoplatus fabricii* © Rachel Bicker

Small-flowered Buttercup *Ranunculus parviflorus* on North Perimeter Verge 4 © Rachel Bicker

[D] – WEATHER SUMMARY 2021

Late winter

January began with a spell of generally cold weather, which became milder and more unsettled from the 10th. It then turned colder between the 22nd and 25th, then mild and wet during the closing days of the month. Sunshine levels were very low overall. February saw a week of wintry weather from the 7th with eastern coastal counties of England affected by snow, particularly across the south-east. The latter half of the month was decidedly milder becoming more settled as time went on.

Spring

March began mostly settled but cold. From the 9th onwards it turned milder, unsettled and windy. The second half of the month was again mostly settled, although with periods of rain from 23rd to 28th. The month then ended very warm. April also began settled, then turning very cold. A notable feature throughout the month was the number of air frosts. Sudden heavy snow fall occurred locally on the morning of the 12th which initially settled but then melted as temperatures rose later in the day. Daytime temperatures recovered from the middle of the month, but it was cold and showery in the closing days. Overall, it was an unusually cold, dry, yet very sunny month. The start of May was unseasonably cold with a string of frosts during in the first week. It was briefly warmer around the 9th but with frequent, often heavy rain. The final few days of the month saw the weather finally settle down, with little rain and more warmth and sunshine. There was below average sunshine and above average rainfall for the month, making it the wettest on record in recent history. The mean temperature for May was provisionally 1.3 °C below the 1981-2010 long-term average, making it the coldest May since 1996.

Summer

The first half of June was largely dry and warm. It was less settled during the second half, with fluctuating temperatures and numerous episodes of rain or heavy showers. Some days were very cool for the time of year, but the mean temperature was above the long-term average. Rainfall was over double the average for much of the south-east. The first twelve days of July were mostly unsettled, with spells of heavy rain and temperatures mostly lower than average. Conditions became warmer by mid-month with unbroken sunshine and temperatures around 30°C for a week. The final week was much more unsettled once again, with temperatures back to near average and frequent showery rain. The majority of August was broadly unsettled, with daytime temperatures mostly lower than average. The second half was slightly warmer and drier, but overall, it was a very overcast month with much lower-than-average sunshine.

Autumn and early winter

September was reasonably settled with outbreaks of rain at times. It was rather warm, especially from the 5th to the 8th. A marked change came about on the 27th, with more unsettled and notably cooler conditions for the last few days of the month. Mean monthly temperatures were well above average and with rainfall and sunshine near average. The mean temperature for September was provisionally 2.1°C above the 1981-2010 long-term average, making this the equal third warmest September in a series from 1884. October was generally unsettled, wet and warmer than average. November was mild, becoming colder towards the end of the month, with only limited amounts of rainfall. Only during the last week of the month was the weather truly unsettled, a period which included the first named storm of the season (Storm Arwen). December began chilly and unsettled, but turned mild, and remained cloudy for the majority of the month with much lower-than-average sunshine. Storm Barra caused flooding and fallen trees early on in the month. Only very few overnight frosts were recorded, and rainfall was broadly near average.

References:

https://www.metoffice.gov.uk/research/climate/maps-and-data/summaries/index

https://weatherspark.com/h/y/147867/2021/Historical-Weather-during-2021-at-London-Gatwick-Airport-United-Kingdom

British Wildlife Volumes 32.4 – 33.3 2021

[2] – SPECIES REVIEW

[A] – INTRODUCTION

Authored by Rachel Bicker, Biodiversity Advisor for Gatwick Airport Ltd

The following section provides a summary of our species monitoring for the past year within the biodiversity areas. These areas are made up of two distinct sites; the North West Zone (NWZ), where the River Mole emerges north of the runway, and the Land East of the Railway Line (LERL). Aerial maps are provided in Section 6 (page 89) of this report.

Along with data collated via the structured ecological surveys, casual wildlife records are also collected each year from individuals using the iRecord and BirdTrack biological recording platforms. This data is then shared with the Sussex Biodiversity Record Centre (SxBRC). Summary tables of protected and 'notable species' for different wildlife groups have been compiled with assistance from the SxBRC. Notable species are those which currently have an official conservation designation, are uncommon, or have some ecological significance in the local area.

Certain species groups have been adopted as Biodiversity Performance Indicators (BPIs) by Gatwick to show continual biodiversity protection and enhancement. Our next five-year review 2018-2023 (to be published in early 2024) will provide a summary of our progress against all of our baseline BPIs.

http://www.birdtrack.net

https://www.brc.ac.uk/irecord/

[B] – BIOLOGICAL RECORDS SUMMARY

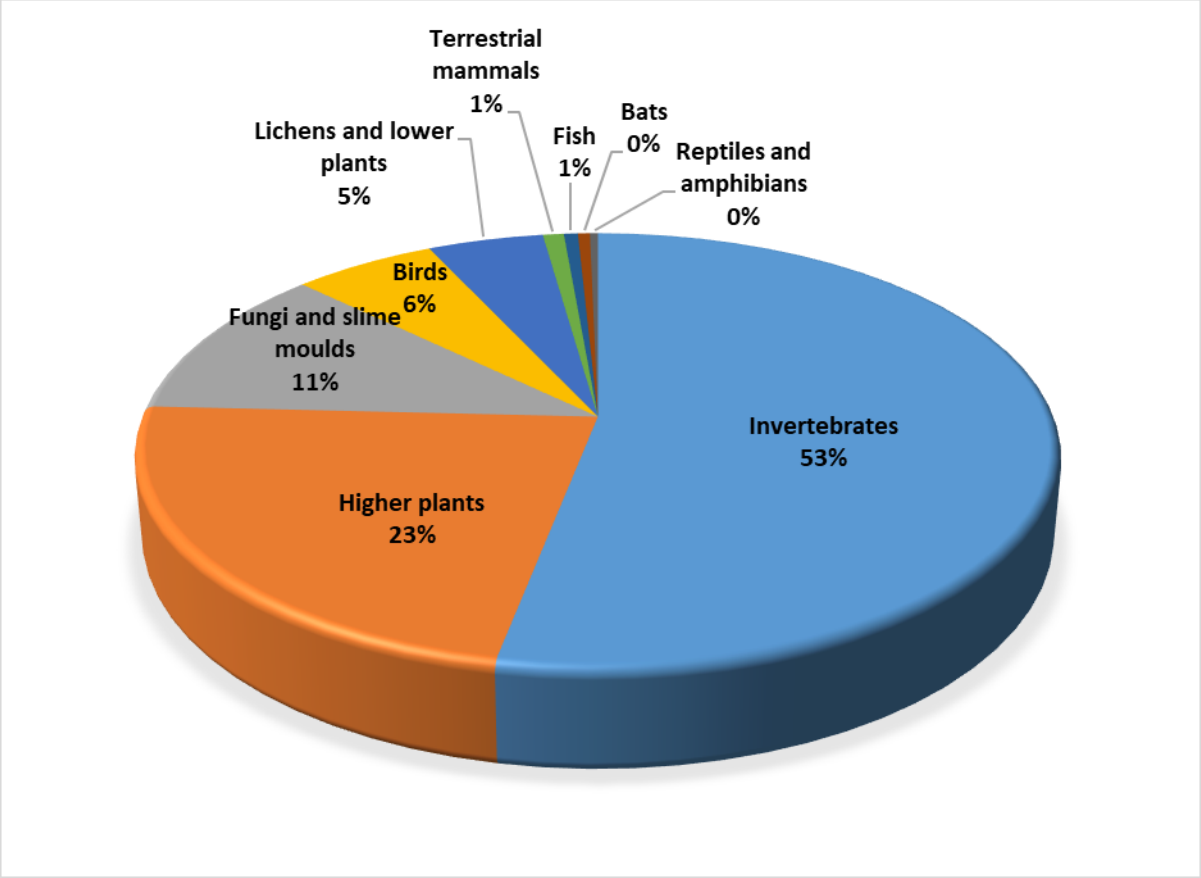
Below is the latest summary extract from the SxBRC, showing the wildlife statistics for our sites. By the end of 2021, a total of **2490 species** were recorded in and around Gatwick's biodiversity areas. The summary extract includes a small buffer of 0.25km to the airport boundary. This is to compensate for mobile species which can be recorded near or on the airport boundary.

Table 2. Biological record statistics for Gatwick Airport to date

Statistic	No.
Total Records	35570
Total Species	**2490**
**Section 41 species	76
Records to 2012	11673
Records from 2012 to 2020	23898

**Rare and threatened species listed under Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act 2006.

Figure 1. Species group breakdown for all Gatwick Airport records as of 2021.



[C] – SPECIES GROUPS

AMPHIBIANS

Methods of detection for recording amphibians have included refugia checks, regular evening torch light surveys of ponds and casual records of spawn. Four amphibian torching surveys were successfully completed for seven ponds during 2021.

Common Toad *Bufo bufo*, Westfield Stream © Rachel Bicker

LERL Pond 3 is our most popular pond for breeding Common Toad *Bufo bufo*, with a record number of 145 counted during a survey in 2020. In 2021, a count of 51 individuals meant that surveyors likely just missed the peak evening of breeding season. Only three adult Common Frog *Rana temporaria* were seen in this pond in 2021, but 125 clumps of frogspawn were noted.

Great Crested Newt *Triturus cristatus* egg, Pond 7 © Rachel Bicker

Smooth Newt *Lissotriton vulgaris* and Palmate Newt *Lissotriton helveticus* are both typically recorded in very high numbers (100+) in LERL Pond 4, which happens to be our smallest amphibian pond at around 9m x 18m.

A record of breeding Great Crested Newt (GCN) *Triturus cristatus* was made at a different pond this year; Pond 7 contained eggs laid on both Water Mint *Mentha aquatica* and Floating Sweet-grass *Glyceria fluitans*. Records of GCN have been occasionally made here in past decades, but no records of breeding have been confirmed to our knowledge. The Charlwood Park ponds historically have the highest numbers of GCN. This year the highest count occurred in Charlwood Park Pond 2 during the final survey in May, with 20 individuals counted.

Table 3. Peak counts of GCN and other amphibian species through four torch light surveys during 2021.

Pond name	GCN Total	GCN Eggs	Smooth/Palmate Newts	Common Frog	Common Toad
LERL Pond 3	2	Y	10	3	51
LERL Pond 4	5	N	105	1	15
LERL Pond 7	0	Y	2	Spawn/ tadpoles	0
Charlwood Park Pond 1	15	Y	3	2	0
Charlwood Park Pond 2	20	Y	5	Spawn	0
Scotty's Pond	0	N	6	spawn	1
Roll's Farm Pond	0	N	1	Spawn/ tadpoles	0

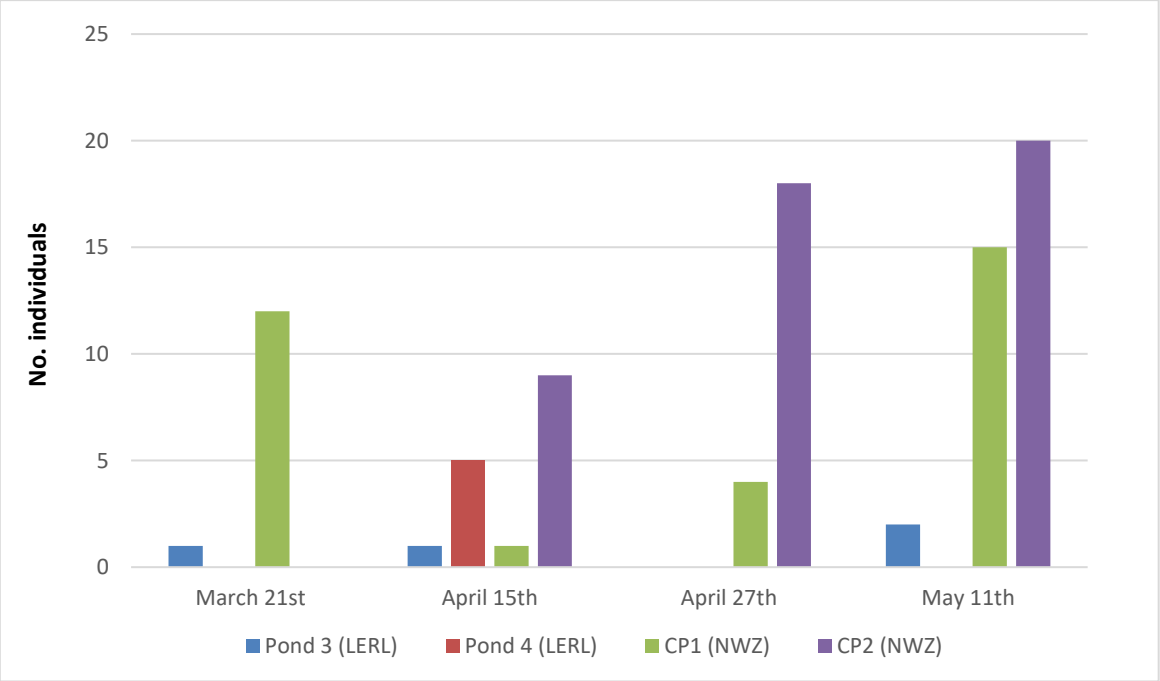


Figure 2. GCN torching survey results in four sessions during 2021.

There can be a marked difference of GCN totals between the ponds at different times of the year. In early spring, GCN are beginning to reach their breeding ponds, which they may travel up to 500m or more to reach. The distance travelled is most likely affected by quality of habitat and hibernation features nearby. Another change as the season progresses is the coverage of

the surface by floating vegetation such as duckweed, sweetgrass and lily species, making the torchlight survey method more challenging.

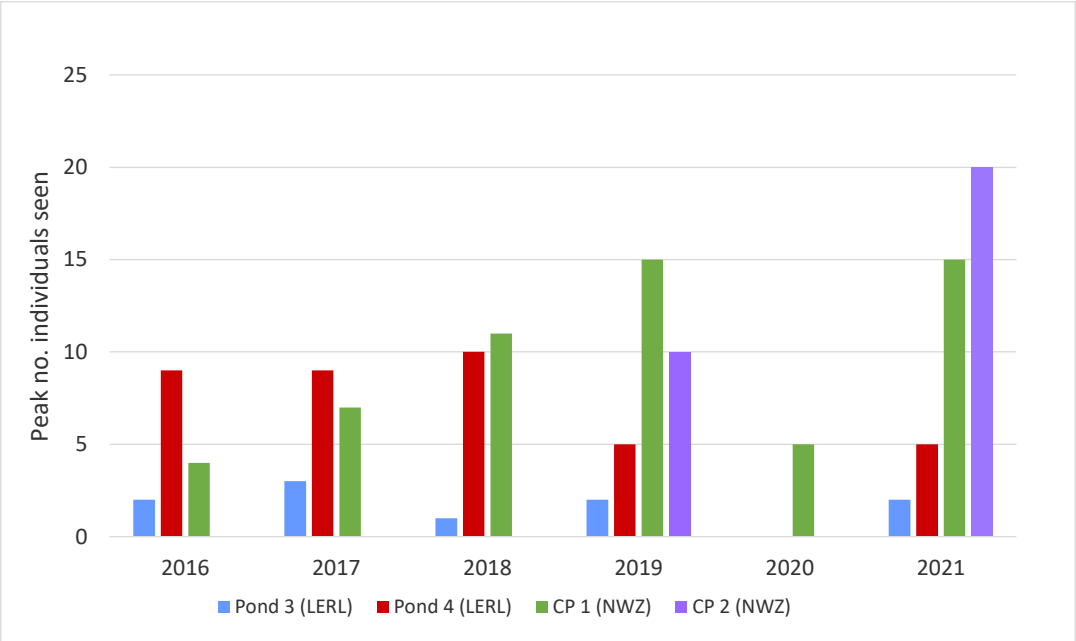


Figure 3. Great Crested Newt peak counts 2016 – 2021.

The detection of GCN at Charlwood Park ponds has improved over the years, with habitat clearance works around the banks allowing better access for torching, reduced levels of duckweed *Lemna* sp. covering the surface, and an increase in available aquatic vegetation for egg-laying by newts. In contrast with this, Pond 4 has become more challenging with denser floating vegetation at the surface, reducing the open water areas for torching. Further habitat work effort should be directed at this pond in the near future by digging out of the root mats of Reed Sweet Grass *Glyceria maxima* and reducing silt through slubbing out.

A visit to the NWZ by members of the Sussex Amphibian and Reptile Group during May 2021 was undertaken to view the population of Green/Water Frogs *Pelophylax* sp. along the River Mole. Photographs were taken of external features, however this check was still inconclusive due to subtle differences between two species: Marsh and Pool frogs. Opportunities to identify this population of frogs to species-level will be undertaken if new guidance becomes available in future.

BATS

Box checks

Soprano Pipistrelle *Pipistrellus pygmaeus* © Rachel Bicker

In 2021 restrictions were still in place by Natural England, IUCN and the Bat Conservation Trust to prevent close contact conservation work during the COVID-19 pandemic, to avoid the risk of human-to-bat transmission of SARS-CoV-2 through environmental exposure, or potentially via direct contact through handling. Restrictions were eventually lifted in August 2021, but strict protocols remained in place such as the wearing of masks, gloves and to continue practicing good hygiene between box checks. Due to the lateness in the season that restrictions were lifted, it wasn't possible to arrange for the licenced handler to complete annual box checks within the 2021 period. As a result, this work is planned for 2022.

Activity surveys

Extract of report by Laurie Jackson

Bat transects have been walked at the airport since 2005 with annual monitoring in place since 2014, which alternates between the LERL, NWZ and the River Mole corridor. The aim of this survey is to gather data on the use of the site by bats in order to monitor against previous transects along this route, undertaken in 2005, 2015 and 2018. The transect surveys are designed to provide a representative sample of bat activity during the main bat activity season (May to September), and an indication of species diversity at the site.

Four bat transects were undertaken along the River Mole (Transect A) route between June 7th and September 1st 2021, as part of annual biodiversity monitoring at Gatwick Airport.

Summary of results

Four species of bats were recorded during the bat transect survey: a *Myotis* bat species (most likely Brandt's Bat *Myotis brandtii* or Whiskered Bat *Myotis mystacinus*, Noctule *Nyctalus noctula*, Common Pipistrelle *Pipistrellus pipistrellus* and Soprano Pipistrelle *Pipistrellus pygmaeus*. Between 29 and 57 bat passes is broadly comparable with previous surveys of this transect, with a peak number of 81 passes during 2018.

Common Pipistrelle continued to be the most frequently recorded species, accounting for between 88% and 100% of the calls recorded during a transect. A maximum of three individuals were recorded foraging together, with activity focused in areas with greater woody cover and generally avoiding the most open habitat. Common Pipistrelles forage for a range of insects, with Diptera from families including mosquitoes, gnats and midges (the majority of which are aquatic during the larval stage) forming an important part of their diet.

Soprano Pipistrelles are considered to prefer riparian habitats, feeding on similar prey to the Common Pipistrelle. Although they were recorded during all four transects, Soprano Pipistrelle numbers continued to be relatively low when compared to Common Pipistrelle numbers.

Myotis sp. bats were recorded in low numbers during two of the transects, in common with the August 2005, June 2018 and September 2018 surveys. These were considered most likely to be Brandt's Bat and/or Whiskered Bat: whilst in practice the two species can be separated in the hand, the similarity of their echolocation calls mean this is not possible with a bat detector.

Noctule was recoded in low numbers during two of the transects. This species was seen in low numbers during the June 2015 transect and has also been recorded commuting and foraging over the floodplain of the River Mole during other bat transects at the airport. Noctules are big bats that tend to hunt in open habitats, including over standing and running water, for a range of insects including Diptera (true flies), but also Coleoptera (beetles) and Lepidoptera (moths).

Two species previously recorded along this transect in 2018, were not recorded in 2021: Serotine *Eptesicus serotinus* and a long-eared bat (most likely Brown Long-eared Bat *Plecotus auratus*), the latter of which echolocation calls are notoriously quiet, which can result in them being undetected during surveys with bat detectors.

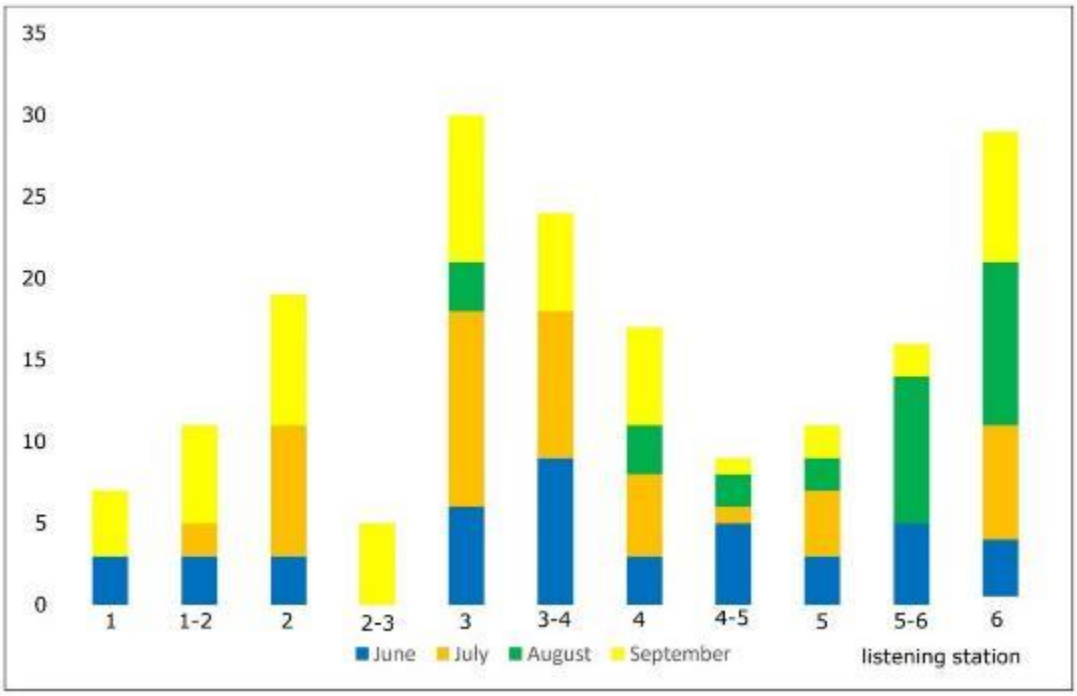


Figure 4. Stacked bar graph of number of bat passes during the 2021 transect survey.

Activity was well distributed along the transect route, although was higher in areas of higher woody cover. The corridor of woody habitat along with the River Mole and balancing ponds providing suitable foraging areas for bats. Management of the site to encourage good conditions for a range of insects including beetles, flies and moths, which are important prey species for bats, should benefit bats and other insectivorous species.

Table 4. Last year recorded for all bat species: activity surveys, box checks and casual records

Common Name	Species Name	NWZ	LERL	Airfield/other Gatwick area
Bechstein's Bat	*Myotis bechsteinii*	2017	2014	2019
Brandt's Bat	*Myotis brandtii*	-	2011	2019
Brown Long-eared Bat	*Plecotus auritus*	2017	2016	2019
Common Pipistrelle	*Pipistrellus pipistrellus*	2021	2017	2020
Daubenton's Bat	*Myotis daubentonii*	2017	2005	2012
Leisler's Bat	*Nyctalus leisleri*	2019	-	2016
Nathusius's Pipistrelle	*Pipistrellus nathusii*	2017	-	2019
Natterer's Bat	*Myotis nattereri*	2019	2010	2017
Noctule Bat	*Nyctalus noctula*	2021	2019	2019
Serotine	*Eptesicus serotinus*	2017	2017	2019
Soprano Pipistrelle	*Pipistrellus pygmaeus*	2021	2019	-
Whiskered Bat	*Myotis mystacinus*	2019	-	2019

Breeding bird territory mapping survey

Extract of report by Tom Forward

Tom Forward surveying birds along the River Mole floodplain meadow ©Rachel Bicker

In 2021 the methodology for breeding bird surveys was altered to a more intensive territory-mapping approach, more closely aligned with the Common Bird Census method. This has resulted in an increased number of visits to each site (from two during early and late summer, now up to six evenly spread through the breeding season) and a detailed review of the nesting habits for many notable species, typically those of conservation concern. The Birds of Conservation Concern (BoCC) species referred to in the following section are those listed within the 4th review published in 2015. A new review (BOCC5) was recently published during December 2021, which will be used in future reports.

The surveys and mapping activities were undertaken by ecologist Tom Forward, with species counts logged by Rachel Bicker using the BirdTrack app. This survey was undertaken with the aims of identifying breeding status and distribution of Red and Amber listed species (BoCC4, 2015) in the areas managed for biodiversity at Gatwick Airport, specifically the LERL and NWZ. Six survey visits were conducted in each area between March and June 2021 under suitable conditions, following the Common Bird Census methodology. An estimate of the number territories was generated for each bird species of conservation concern. Territory maps are featured within in Section 6 of this report.

LERL survey results

61 species were recorded during the survey of this site, 44 species were identified as breeding. Six red listed birds out of nine recorded during the survey, were assessed to be breeding in the

LERL; **Grey Wagtail** *Motacilla cinerea*, **Marsh Tit** *Poecile palustris*, **Mistle Thrush** *Turdus viscivorus*, **Song Thrush** *Turdus philomelos* and tree nesting **Starlings** *Sturnus vulgaris* were listed as confirmed, and **House Sparrow** *Passer domesticus* as probable. Song Thrush (11) had the most territories. The House Sparrow colony is just outside the survey area in the Crawley Sewage Treatment Works, so it was harder to get make an assessment due to lack of access to this site. It is however likely that this is a breeding colony. Six amber listed birds out of 11 recorded during the survey, were assessed to be confirmed breeding including **Bullfinch** *Pyrrhula pyrrhula*, **Dunnock** *Prunella modularis*, **Mallard** *Anas platyrhynchos*, **Reed Bunting** *Emberiza schoeniclus*, **Stock Dove** *Columba oenas*, and **Tawny Owl** *Strix aluco,* with Dunnock registering the most territories.

Marsh Tits are experiencing significant declines across their UK range, and it is encouraging that at least one territory remains in Upper Picketts Wood and the scrub interface with Goat Meadow. During the survey, one Marsh Tit was recorded in Horleyland Wood, but this was considered to be a wandering foraging individual, as opposed to a territorial breeding bird. According to Broughton (2015), Marsh Tits have a preference for unmanaged structurally complex woodland, where they typically nest in cavities low down in living trees (box adoption is very low) and require seed-rich tall herb layer at the woodland edge, along rides and glades, to provide a year-round food supply.

Table 5. Total number of BoCC recorded in LERL

Total no. bird species recorded, 2021 CBC survey, LERL	**61**
Red listed species	9
Amber listed species	11
Green listed species	41
Total no. species recorded as breeding LERL	**44**
Probable or confirmed breeding amber	6
Probable or confirmed breeding red	6
Total breeding BoCC species	**12**

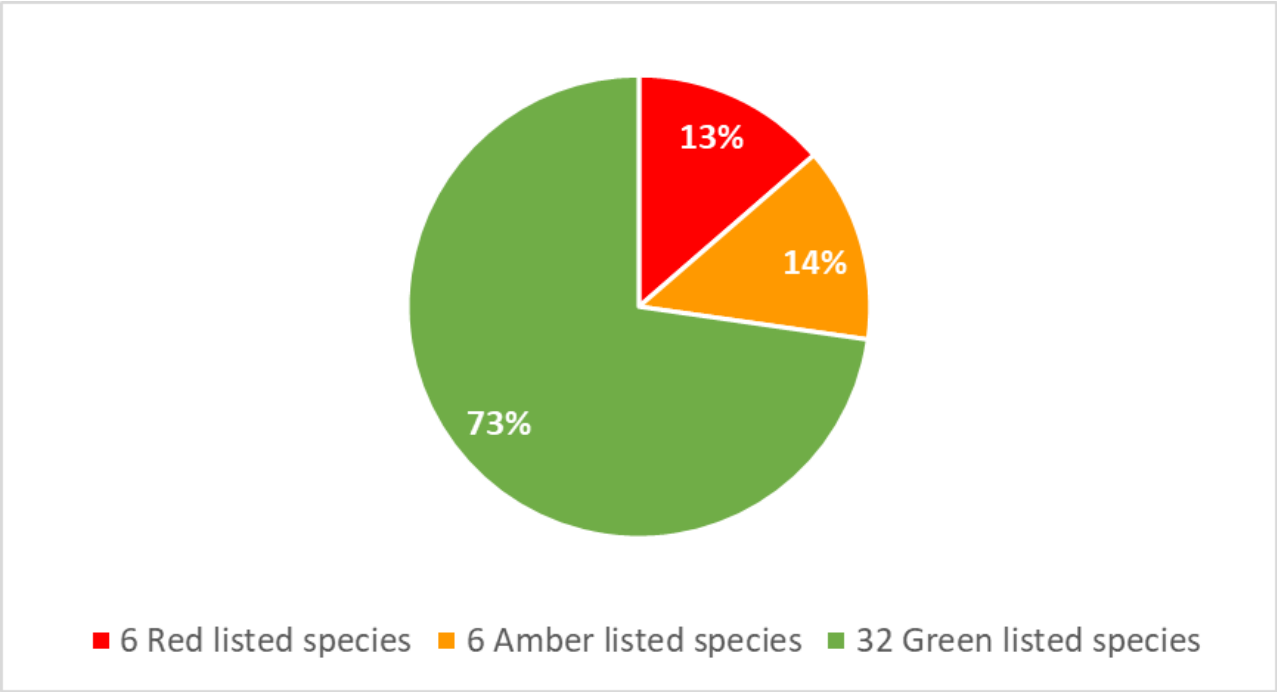


Figure 5. Chart showing proportions of species of conservation concern recorded during LERL breeding bird survey 2021 out of a total of 44 breeding species.

NWZ survey results

63 species were recorded during the survey of this site, 43 species were identified as breeding. Five red listed birds out of 9 recorded during the survey, were assessed to be confirmed breeders including Linnet *Linaria cannabina*, Nightingale *Luscinia megarhynchos*, Song Thrush, and Mistle Thrush registering as probable, while Grey Wagtail scored only as a possible. Song Thrush (10) had the most territories. Six amber listed birds out of 14 recorded during the survey, were assessed to be confirmed breeding including Bullfinch, Dunnock, Mallard, Reed Bunting, Stock Dove, and Tawny Owl, with Dunnock (10) and Reed Bunting (6) registering the most territories.

Four Schedule 1 species were recorded. Fieldfare and Redwing are winter visitors only to southern England, and as such are not significant in the context of this breeding survey. Firecrests *Regulus ignicapilla* have only recently become established as regular breeding birds in the UK, and with only one record of a lone singing male in Brockley Wood, a first for this site, it was assessed to be a wandering bird and not to be breeding. Kingfisher *Alcedo atthis* regularly occurs on this section of the River Mole, however, it was assessed to be using this site for foraging rather than nesting, as the riverbanks along this section of river are deemed unsuitable.

Arguably the presence of two Nightingale territories for the duration of the breeding season is the most significant record for the NWZ. Ringing data gathered in 2021 revealed that the good quality habitat available at Gatwick has attracted a new male bird to set up a territory, up from only one territory in 2019. This individual was previously ringed at the Knepp Rewilding project

(now a regional stronghold for the species), and hints at the important contribution of Gatwick's biodiversity areas to a local and regional network of quality wildlife sites that can support the recovery of this species against a backdrop of steep national decline. The southeast is now considered to be particularly important for Nightingales which have seen a dramatic range contraction towards this region.

Table 6. Total number of BoCC recorded in NWZ.

Total no. bird species recorded, 2021 CBC survey, NWZ	**63**
Red listed species	9
Amber listed species	14
Green listed species	40
Total no. species recorded as breeding NWZ	**43**
Probable or confirmed breeding amber	6
Probable or confirmed breeding red	5
Total breeding BoCC species	**11**

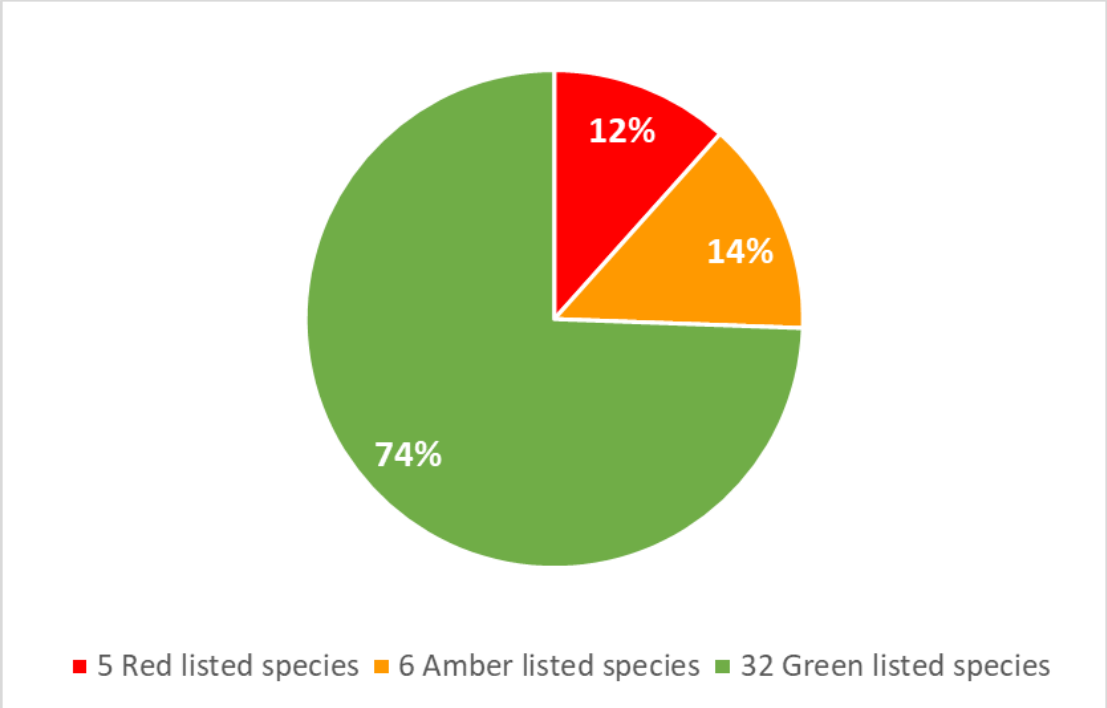


Figure 6. Chart showing proportions of species of conservation concern recorded during NWZ breeding bird survey 2021 out of a total of 43 breeding species.

Both sites

The assemblage of breeding bird species is considered to be typical of the type of woodland and lowland scrub present at both sites. According to the Fuller species richness evaluation criteria, both sites fall into the category of local importance (between 25 – 49 breeding species), where LERL = 44 and NWZ = 43. Across both survey sites, seven of the species recorded are Species of Principle Importance (Section 41) under the Natural Environment and Rural Communities Act 2006 (as amended), including Bullfinch, Dunnock and Reed Bunting. One territory of Mistle Thrush was found at each site. According to British Trust for Ornithology (BTO), this species is undergoing a long-term decline as a breeding bird. It favours large trees at woodland edges to nest in, and short grassland for foraging on invertebrates and supplementing with berries during Autumn and Winter. Thorny vegetation communities that include Bramble *Rubus fructicosus* agg., Dog and Field Rose *Rosa* spp. and Blackthorn *Prunus spinosa*, are ideal nesting habitats for this species, but may be used by several other listed species such as Bullfinch, Dunnock, and Song Thrush. Therefore, any management plans should aim to allow for a proportion of the biodiversity sites to have this vegetation community available. Where safe to do so, leaving standing deadwood is very important for cavity-nesting species such as Starling, Stock Dove and Tawny Owl. The ponds, lagoons, Gatwick Stream, and River Mole corridor are managed in such a way as to discourage breeding and large aggregations of waterfowl on the grounds of aerodrome safeguarding, and as such the assemblage of breeding wetland birds was low as expected.

It is recommended that targeted annual surveys are conducted for Nightingale in NWZ, and a repeat breeding bird survey is carried out in no more than 5 years' time in the biodiversity areas.

Winter bird surveys

Rachel Bicker & Tom Forward

North West Zone – 15/12/2021

Woodcock *Scolopax rusticola* - RSPB

There was no sign of the usual Black Redstart by the Boeing Hangar at the beginning of the transect (although it was later seen after the survey had ended while returning to the cars). Passing the old outgrown hedgerows revealed Song Thrush, a small flock of Redwing and a calling Dunnock. A pair of Grey Wagtail flew low emitting flight calls and a Kestrel hovered near the airfield boundary. A group of six Herring Gull passed low overhead, heading north; an unusual occurrence for this part of the site.

Directly south of Brockley Wood, the hedgerow running south with its line of mature oaks hosted a mixed flock of Blue Tit, Great Tit and Long-tailed Tit. At the base of the grass slope the scrub is very dense in places, with areas actively kept open by volunteer scything work. Song Thrush were rustling and seeping within the vegetation and a lone Woodcock took off over the hedgerow.

Immediately after the first bend of the River Mole by the edge of the channel, a Moorhen moved through the reeds and a lone Reed Bunting and Wren called. A Green Woodpecker emitted its alarm as it took off from short grass area higher up on the floodplain, flying west over the river. A Buzzard was heard from the line of mature trees over on the opposite side of the river. Further along the floodplain, opposite Brockley Wood, three Water Rail were emitting their squeals within the reed beds.

The scrub west of Brockley Wood contains a shifting mosaic of woody and herbaceous vegetation, with regenerating stands of willow and thorn around open areas of short grassland recently scythed by volunteers. Two Fieldfare took off as we approached. At least two Bullfinch were heard within the Blackthorn, along with a noisy group of Redwing. Further into Brockley

Wood, a group of over 20 **Woodpigeon** were spooked and took flight, and **Nuthatch** could be heard regularly calling. The north of Brockley Wood was relatively quiet, but a **Goldcrest** and **Coal Tit** were both heard.

On the floodplain north of Brockley Wood, a pair of **Mallard** were resting on the river immediately before the bend at the culvert. After the bend, a pair of interacting **Sparrowhawk** caused some consternation amongst the alarm-calling **Blue Tit** and **Goldfinch**. Continuing north and east along the River Mole grasslands, **Great Spotted Woodpecker** called from the far side of the river within the woodland corridor. A **Jay** crossed the floodplain over to the environment bund and two **Mistle Thrush**, our first for the winter, were giving their rattling alarm.

Another two **Water Rail** were squealing from deep within the reed beds. Toward the River Mole steeping stones, **Dunnock** was heard in the thick mature scrub, and a **Bullfinch** flashing its characteristically white rump. Two **Stock Dove** headed upstream in the opposite direction. Shortly after, several tit alarm calls alerted us to another **Sparrowhawk** flying low along the environment bund. At the final point of the transect were four loudly calling **Ring-necked Parakeets** in tall, mature trees with large dead branches. The most ubiquitous species today were **Woodpigeon**, **Robin**, **Dunnock, Blue Tit** and **Song Thrush.**

In total, 40 species were recorded which is a new record for our NWZ winter bird survey.

Table 7. NWZ winter bird survey Red and Amber listed species.

Common name	Taxon name	Transect 1	Transect 2	Listed
Bullfinch	*Pyrrhula pyrrhula*	5	6	A
Dunnock	*Prunella modularis*	8	9	A
Fieldfare	*Turdus pilaris*	2	-	R
Grey Wagtail	*Motacilla cinerea*	2	-	A
Herring Gull	*Larus argentatus*	6	(Fly over)	R
Kestrel	*Falco tinnunculus*	1	-	A
Mallard	*Anas platyrhynchos*	2	2	A
Moorhen	*Gallinula chloropus*	2	-	A
Redwing	*Turdus iliacus*	16	4	R
Reed Bunting	*Emberiza schoeniculus*	1	-	A
Rook	*Corvus frugilegus*	1	-	A
Song Thrush	*Turdus philomelos*	9	8	A
Sparrowhawk	*Accipiter nisus*	1	2	A
Starling	*Sturnus vulgaris*	2	3	R
Stock Dove	*Columba oenas*	-	2	A
Woodcock	*Scolopax rusticola*	1	-	R
Woodpigeon	*Columba palumbus*	26	16	A
Wren	*Troglodytes troglodytes*	9	7	A

Land East of the Railway Line – 14/12/2021

Marsh Tit *Poecile palustris* – RSPB

At the entrance of Rolls Field, a Dunnock called from brambles and a lone Chaffinch flew into the line of mature trees; an unusual record on this part of the site. A large flock of over 100 Starling flew low overhead, heading west to the trees in the Gatwick Stream Flood Attenuation. Redwing called continuously as they moved along Rolls Field boundary, with groups of Wood Pigeon and Jackdaw in the edge of Rolls Copse to the south. Rounding the northern edge of the copse, Blackbird and Robin rapidly alarm calling potentially indicated an avian predator; whatever it was moved off and the alarms quickly died down. Further along and crossing the footbridge two Tree Creeper called and were seen in the copse.

Entering the flood attenuation site, a group of 20 Herring Gull flew overhead and a single Buzzard flapped past, harried on by a small group of Carrion Crow. A large group of over 200 Black-headed Gull flew low around the boundary of the sewage works, settling on the roof then moving down to the open lagoons. A pair of Grey Wagtail were noted in the usual area, close to the flow control system. A group of nine Common Snipe took flight in the west of the flood attenuation, settling again toward the south. Two Siskin flew toward Rolls Field and a lone Reed Bunting called from a dense stand of young willow. Meadow Pipit are a regular occurrence on this site, but only three were seen.

Into Upper Picketts Wood three Goldcrest called from a towering patch of rose scrub understory. Robin and Wren were calling ubiquitously, and several Wood Pigeon in pairs took flight from the canopy. Two Marsh Tit could be heard toward the eastern edge of the wood bordering Goat Meadow. The meadow itself was relatively quiet with Blue Tit and Great Tit moving along the southern edge.

Lower Picketts Wood glade presented us with the first Bullfinch for the day, and two Jay were squabbling nearby. A lone Rook flying low over the glade was an unusual record for this part of the site. More centrally in the wood, Great Spotted Woodpecker called and a mixed flock

moved through containing **Coal Tit**, **Marsh Tit**, **Nuthatch**, **Goldcrest**, **Long-tailed Tit** and **Treecreeper**. A group of 8 **Redwing** also passed through moving north.

Song Thrush were more numerous around the Woodland Strip, and another lone **Bullfinch** called. Two **Chaffinch** were heard in their regular spot before the main amphibian pond and a **Dunnock** near the electricity substation.

Horleyland Wood presented a large flock of **Long-tailed Tits**, some 20 or so individuals foraging very low down in the understory. A lone warbler foraging close by gave us good enough views to determine an incredibly quiet **Chiffchaff**. A single **Lesser Redpoll** flew low over the wood, a species we are increasingly noticing on both sites. **Blue Tit**, **Great Tit**, **Black-headed Gull**, **Starling**, **Carrion Crow**, **Jackdaw** and **Redwing** all occurred in the highest abundances on this day.

40 species recorded in total is a new record for our LERL winter survey

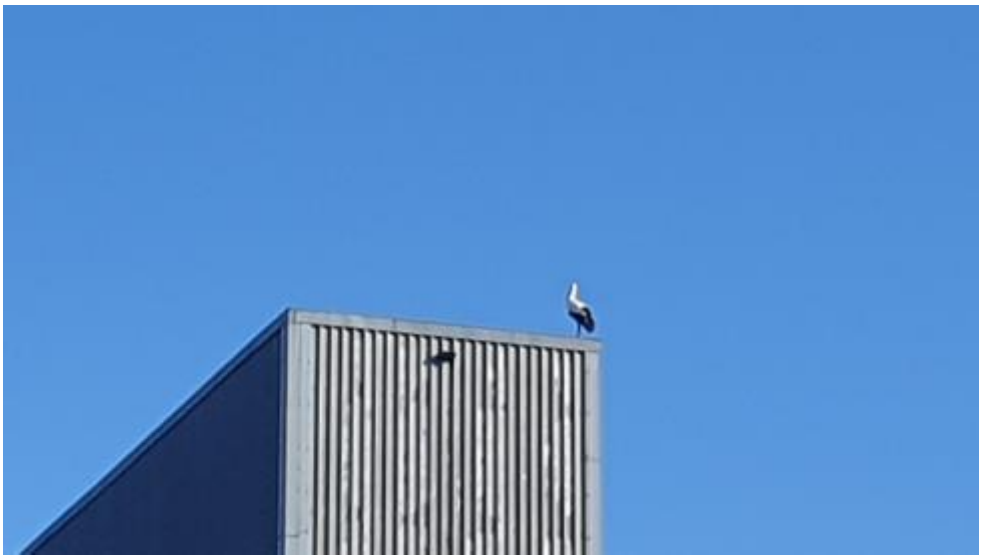
Table 8. LERL winter bird survey Red and Amber listed species counts.

Common name	Taxon name	Transect 1	Transect 2	Listed
Black-headed Gull*	*Chroicocephalus ridibundus*	-	205	A
Bullfinch	*Pyrrhula pyrrhula*	5	-	A
Dunnock	*Prunella modularis*	2	4	A
Grey Wagtail	*Motacilla cinerea*	-	2	A
Herring Gull**	*Larus argentatus*	-	20	R
Lesser Redpoll	*Acanthis cabaret*	1	-	R
Mallard	*Anas platyrhynchos*	2	4	A
Marsh Tit	*Poecile palustris*	1	2	R
Meadow Pipit	*Anthus pratensis*	-	3	A
Moorhen	*Gallinula chloropus*	2	-	A
Redwing	*Turdus iliacus*	12	55	R
Reed Bunting	*Emberiza schoeniculus*	-	1	A
Rook	*Corvus frugilegus*	2	-	A
Snipe	*Gallinago gallinago*	-	8	A
Song Thrush	*Turdus philomelos*	4	3	R
Starling	*Sturnus vulgaris*	-	100	R
Woodpigeon	*Columba palumbus*	4	11	A
Wren	*Troglodytes troglodytes*	4	9	A

*Low flying NW over sewage works. Roost on treatment plant roof feeding in sewage lagoon
**Fly over

Casual records

An unusual sighting was made of a White Stork *Ciconia ciconia* on the Virgin Hangar, off Larkin's Road during early April 2021. This is the second sighting of this species at the airport, previously seen by the Gatwick Greenspace Project Officer in summer of 2020 along the River Mole. The local Herring Gulls were not pleased with the new bird on the block, and it was soon pushed on. The sighting was shared with the White Stork Project Officer, who also happens to be one of our regular reptile surveyors for the biodiversity project.



White Stork *Ciconia ciconia* on the Virgin Hangar, April 2021 © Rachel Bicker

BTO bird ringing

Wheatear *Oenanthe oenanthe*. North West Zone © Rachel Bicker

Several trial sessions of bird ringing were carried out by visiting ornithologist Jon Middleton during 2021, within the restricted access areas of the North West Zone. Initially these sessions were targeting Black Redstart *Phoenicurus ochruros* and the two previously noted singing Nightingales *Luscinia megarhynchos*. Later in the year we expanded our efforts to two ringing sessions for autumn migrants. The main ringing site was made up of raised earth bunds, woodland edge, a scrub ecotone graduating into the River Mole floodplain grassland and reed beds. Paths created by ecological surveying transects and glades from our habitat management works have lent themselves well as 'ringing rides' in three secluded yet convenient locations.

The first Nightingale to be caught at Gatwick was during May by Jon Middleton, using an electronic lure (song of the Nightingale). It was an adult male bird with a brood patch, which indicates breeding condition, however we are unable to determine from this if it was successfully breeding. A week later, visiting ecologists Penny and Dave Green from the Knepp Wildland Project were also able to trap the second singing male, which was known to already be wearing a ring. Excitingly this was confirmed to be a recovery, and as suspected was found to have been ringed at the Knepp Estate during August 2020. It was determined as a juvenile at that time, making this bird a year old upon its retrap. The team at Knepp have been conducting ringing at their site since 2015, with an overall total just shy of 10,000 birds. It is rare to recover 'ringed' birds and out of the 67 Nightingales they have ringed to date at Knepp, only two have been recovered (the other individual was from nearby Capel in Surrey, also during 2021). The Knepp/Gatwick Nightingale (named 'Dave' by the surveyors) received a brief mention during the BTO Conference 2021 in a talk by Penny Green and Tony Davis, titled 'Symphonious Spring: Rewilding and birds at Knepp Wildland'.

A total of 30 birds of 14 species have been ringed at Gatwick Airport to date. We feel this site would lend itself well to being a Constant Effort Site (CES) for a willing group of qualified local bird ringers. If anyone was interested in taking on this site, then they can contact the author directly rachel.bicker@gatwickairport.com.

Table 9. Gatwick ringed bird species list 2021

Common name	Taxon name	Count
Black Redstart	*Phoenicurus ochruros*	1
Blackbird	*Turdus merula*	1
Blackcap	*Sylvia atricapilla*	2
Blue Tit	*Cyanistes caeruleus*	4
Chiffchaff	*Phylloscopus collybita*	4
Goldfinch	*Carduelis carduelis*	2
Lesser Whitethroat	*Curruca curruca*	2
Long-tailed Tit	*Aegithalos caudatus*	2
Nightingale	*Luscinia megarhynchos*	1 (+1 retrap)
Reed Warbler	*Acrocephalus scirpaceus*	2
Robin	*Erithacus rubecula*	1
Wheatear	*Oenanthe oenanthe*	1
Whitethroat	*Curruca communis*	6
Wren	*Troglodytes troglodytes*	1

A © Rachel Bicker

B © Penny Green

Two Nightingale *Luscinia megarhynchos,* trapped and ringed in NWZ during summer 2021

Bird A was our first to be ringed at Gatwick by ornithologist Jon Middleton in May 2021
Bird B was recovered by ecologists Penny and Dave Green in June 2021, having been originally ringed at Knepp Wildland in August 2020

BOTANY

Road verges wildflower assessment

Extract of report by Laurie Jackson

Pyramidal Orchids *Ophrys apifera* flowering in June on the Gatwick Way verge ©Rachel Bicker

In 2019 a project was proposed to amend the existing maintenance regimes of some of the road verges within the estate at Gatwick Airport, with the aim of increasing their native wildflower diversity, and their functional role in supporting foraging and movement of species and species groups such as wild pollinators. The road verges considered as part of this assessment are not included within the existing Biodiversity Action Plan but are instead considered additional commitments towards biodiversity. The road verges under assessment are shown on Map 4.

The aim of the survey in 2021 was to gather botanical data to measure changes in species composition and abundance when compared to the baseline data gathered in August 2019. An additional road verge was added to the project in 2020, and as such 20 road verges were assessed. An expanded list of 14 positive and 11 negative species/species groups was used as part of the assessment, based on the importance of each species as a component of grassland, but also functionally as a foraging resource for wild pollinators. Two visits were carried out in June covering all verges, then another two visits in August.

Summary of results

- The most significant result to date was the recording of three different species of orchids across nine of the verges: Common Spotted Orchid *Dactylorhiza fuchsia*, Bee Orchid *Ophrys apifera* and Pyramidal Orchid *Anacamptis pyramidalis*

- Positive indicators were recorded on all of the verges, and the mean of 7.4 species was an increase on 2019, indicating the potential this project has for increasing the wildlife value of this part of the estate
- The most frequently recorded positive indicators were Common Bird's-foot Trefoil *Lotus corniculatus*/Greater Bird's-foot-trefoil *Lotus pedunculatus* (19 verges), White Clover *Trifolium repens* (18 verges), and Common Cat's-ear *Hypochoeris radicata* and Common Ragwort *Jacobaea vulgaris* (16 verges each)
- The most frequently recorded negative indicators were Creeping Buttercup *Ranunculus repens* (18 verges), Bristly Oxtongue *Helminthotheca echioides* (17 verges) and Perennial Rye Grass *Lolium perenne* (15 verges).

The road verge management plan outlines management actions and enhancement measures, and it is recommended that monitoring of the road verges continue every two to three years, to assess change and adapt management as needed.

Laurie Jackson assessing H Car Park Verge 2 ©Rachel Bicker

Table 10. Average number of indicator species (across all assessed verges).

Mean scores	2019	2020	2021
No. positive indicators	5.16	5.19	7.4
No. negative indicators	5.05	6.38	6.4

Table 11. Botanical indicators recorded during the survey.

Species	Indicator type	No. of plots
Yarrow *Achillea millefolium*	Positive	15
Agrimony *Agrimonia eupatoria*/Fragrant Agrimony *Agrimonia procera*	Positive	1
False Oat-grass *Arrhenatherum elatius*	Negative	7
Common Knapweed *Centaurea nigra*	Positive	8
Creeping Thistle *Cirsium arvense*	Negative	14
Lady's Bedstraw *Galium verum*	Positive	2
Bristly Oxtongue *Helminthotheca echioides*	Negative	17
Yorkshire Fog *Holcus lanatus*	Negative	12
Common Cat's-ear *Hypochoeris radicata*	Positive	16
Common Ragwort *Jacobaea vulgaris*	Positive	16
Meadow Vetchling *Lathyrus pratensis*	Positive	5
Oxeye Daisy *Leucanthemum vulgare*	Positive	8
Perennial Ryegrass *Lolium perenne*	Negative	15
Common Bird's-foot Trefoil *Lotus corniculatus*/ Greater Bird's-foot-trefoil *Lotus pedunculatus*	Positive	19
Orchids: three species recorded	Positive	9
Greater Plantain *Plantago major*	Negative	12
Rough Meadow-grass *Poa trivialis*	Negative	11
Common Fleabane *Pulicaria dysenterica*	Positive	8
Meadow Buttercup *Ranunculus acris*	Positive	13
Creeping Buttercup *Ranunculus repens*	Negative	18
Docks *Rumex* sp. (excluding Common Sorrel *Rumex acetosa*): three species recorded	Negative	14
Red Clover *Trifolium pratense*	Positive	10
White Clover *Trifolium repens*	Positive	18
Common Nettle *Urtica dioica*	Negative	6

Table 12. Road verge rankings over three years.

Verge name	Positive indicators	2021 rank	2020 rank	2019 rank
Dog Kennel 1	13	1	2	1
Dog Kennel 2	12	2	3	2
North Perimeter 1	11	3	3	2
H car park 2	10	4	1	4
CSC1	9	5	5	5
North Perimeter 4	9	5	4	3
Pond F1	9	5	6	6
Ashdown 1	8	6	4	4
North Perimeter 2	8	6	4	7
North Perimeter 3	8	6	5	3
North Perimeter 5 (Monorail)	8	6	5	5
Cargo 1	7	7	8	7
CSC2	6	8	5	-
North Perimeter 6	6	8	4	6
H car park 1	5	9	5	8
Pond F2	5	9	4	5
Cargo 2	4	10	7	6
CSC roundabout	4	10	7	5
Gatwick Way 1	4	10	6	7
Ashdown 2	2	11	6	6

Small-flowered Buttercup *Ranunculus parviflorus* on NP Verge 4 ©Rachel Bicker

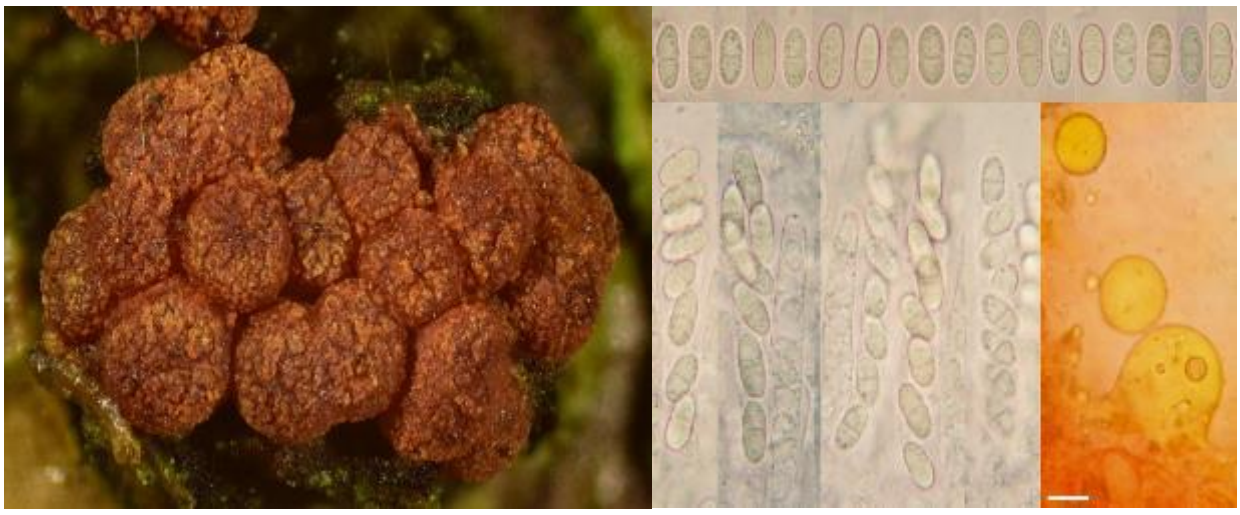
FUNGI

Report by Nick Aplin (Sussex Fungi Group)

Nick Aplin and the Sussex Fungi Group surveying the River Mole woodlands © Rachel Bicker

During March 2021 field mycologists in Sussex were inspired to survey their local patches. The following highlights are from surveys of Picketts Wood and Goat Meadow during this period.

The strikingly scaly, orange-red perithecia of ***Thyronectria ilicis*** bursting through the epidermis of Holly branches was recorded. This record is just the second British report of this beautiful species.



Thyronectria ilicis © Nick Aplin

Cosmospora stilbosporae was collected on Hornbeam branches at Picketts Wood. This record is the first British report of the species, which was confirmed through DNA analysis of the ITS

region. This species is associated with the dark spores of other fungi (in this case ***Stilbospora macrosporma***).

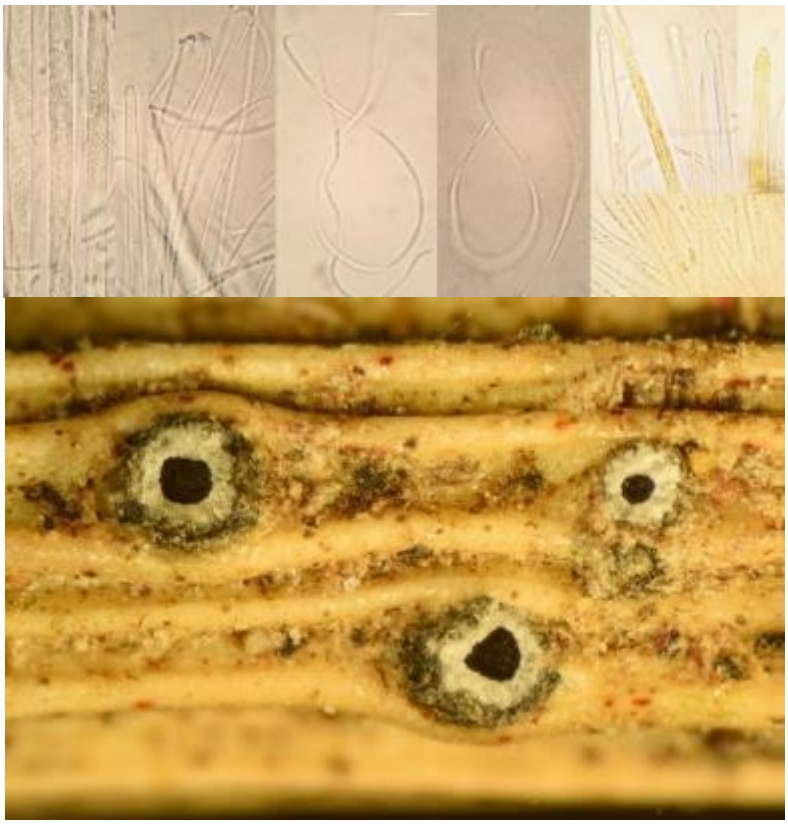
Cosmospora stilbosporae © Nick Aplin

Another notable record at Picketts Wood was ***Lophiostoma myriocarpa***, collected on a fallen, decorticated Ivy branch. This species apparently stains wood yellow and has only been recorded once before in Britain.

Lophiostoma myriocarpa © Nick Aplin

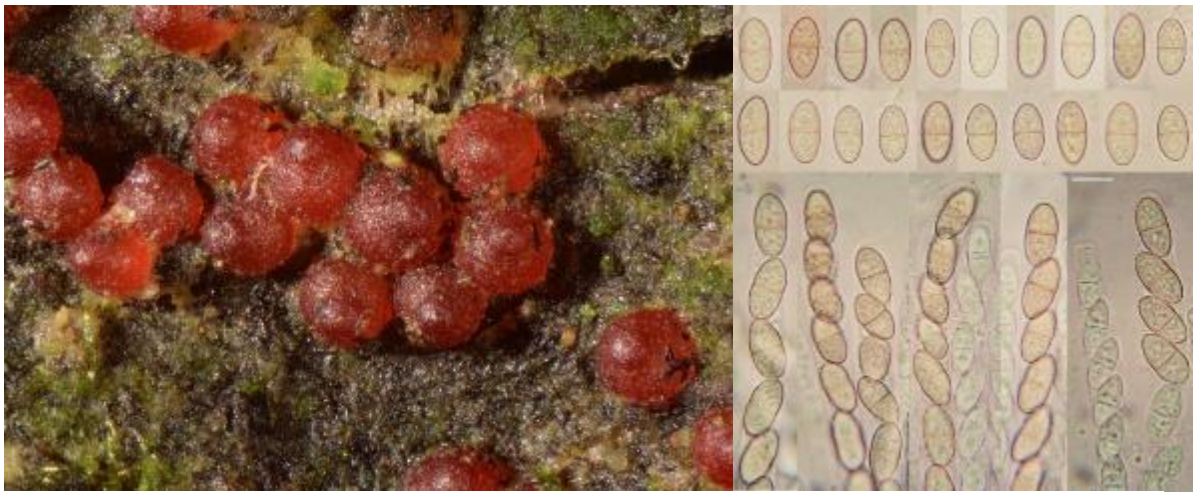
A *Stictis*-like species identified as ***Stictis elongatispora*** was collected at Goat Meadow on *Juncus* (rush) leaves. A DNA sequence produced from the collection matched culture sequences of

Eriospora leucostoma, and a synonymy of the two taxa (with the latter name taking priority) was proposed in the write-up of Sussex Spring Fungi Fortnight for the Field Mycology journal.



Eriospora leucostoma (*Stictis elongatispora*) © Nick Aplin

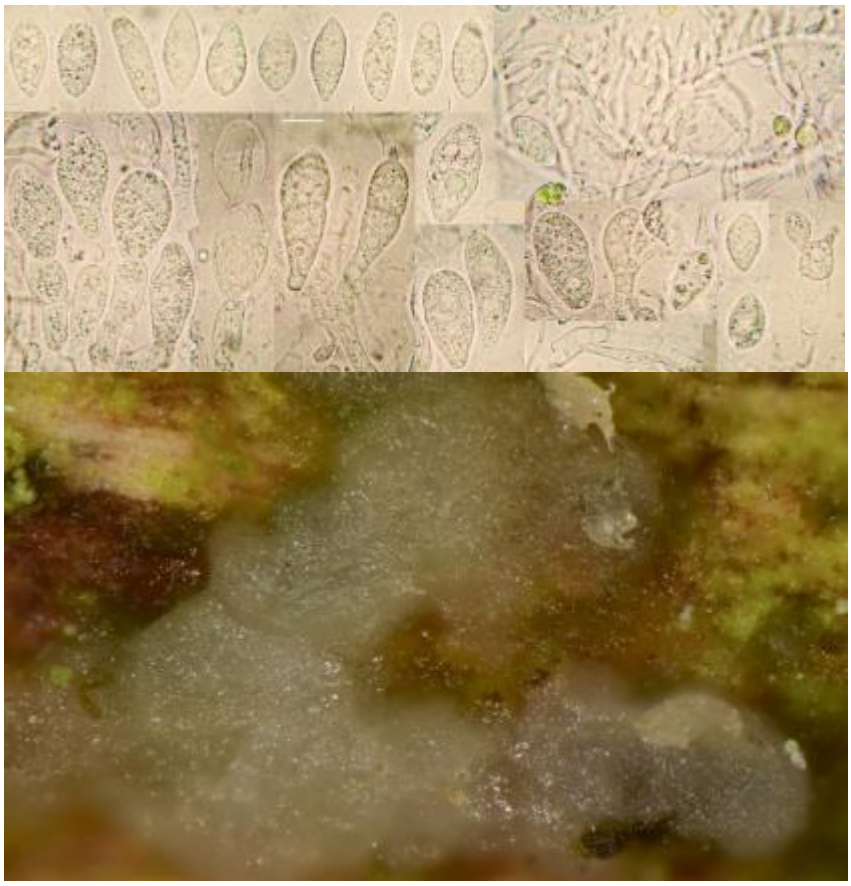
Several collections from Gatwick sites that were successfully PCR-tested (polymerase chain reaction, a method of analysing a short sequence of DNA or RNA), remained unidentified. The following three collections probably represent undescribed species and further data must be obtained before the species can be determined. Regardless, the DNA data will be submitted to public databases in order to contribute to the knowledge of these enigmatic species.



Cosmospora sp. © Nick Aplin

Macroconia sp. © Nick Aplin

The *Cosmospora* sp. was collected on Sycamore branches and differs from similar species by its large spores. The DNA sequence does not match well with any known species. The *Macroconia* sp. was collected on Horse Chestnut branches near the River Mole at Povey Cross. The DNA data show no clear match, though this species is known in other parts of Europe. We await its formal description before progressing.



Sirobasidium sp. © Nick Aplin

The above ***Sirobasidium*** sp. was collected on an *Ulmus* (elm) branch, associated with another fungus. Surprisingly the DNA sequence was strongly divergent from the only known British species in the genus, *S. brefeldianum* (known from the exact same habitat). These results indicate previously unknown genetic diversity in the group, possibly reflecting the recently discovered diversity in British elm trees.

Finally, on October 15th, a Sussex Fungus Group foray was held at the River Mole Woodlands and produced several notable records of mycorrhizal fungi, including ***Cortinarius largus***, ***Cortinarius subpurpurascens*** and an impressive display of dinnerplate sized ***Lactarius controversus***. However, one 'little brown job' was the star of the show; ***Inocybe semifulva*** was originally described from Nova Scotia, Canada and was previously unreported from Great Britain. Our collection was growing under *Tilia* (lime) trees, with which it's known to form a mutually-beneficial mycorrhizal relationship.

Inocybe semifulva © Nick Aplin

INVASIVE PLANT SPECIES

Himalayan Balsam *Impatiens glandulifera* continues to be the management priority for invasive species at Gatwick. Mapping of this and other invasive plant species is carried out on an annual basis, helping to guide management (currently a combination of spraying with glyphosate and pulling up the roots by hand).

Himalayan Balsam *Impatiens glandulifera* in flower

The Covid-19 pandemic led to disruption around the management of invasive species during 2020, as almost all works were cancelled except for one treatment late in the summer, which did not cover all areas. Disruption happened again in 2021 with problems around coordination of third-party contractor access to the sites and time constraints. The result has seen a proliferation in Himalayan Balsam abundance in localised areas, whereas other more sparsely populated areas have seen a successful reduction following on from volunteer hand-pulling.

As a result of the disruption to management in the past two years, a more detailed Himalayan Balsam management plan has been drawn up for 2022, focusing on the difficult to access areas being specifically visited prior to the spraying period in spring. Access routes have been planned and patches of dense dominating vegetation (such as Common Nettle, brambles and young Aspen) are being cleared in late winter (in advance of bird nesting season) to better facilitate access to the river's edge by spraying teams on foot. Opening up patches of these densely overgrown riverbanks is being seen as a biodiversity gain, benefitting the smaller, less competitive wildflower species. It is hoped this effort will get us back on track with a consistent management approach, allowing the population to be reduced to a level in future which is then manageable by hand.

Goat's Rue *Galega officinalis* is not currently a Schedule 9 species of the Wildlife and Countryside Act 1981, however it has been included within the London Invasive species Initiative (LISI) Species of Concern. Specifically, around Gatwick, it is particularly frequent on the Westfield Stream site (which feeds directly into the River Mole), where it has been largely left to proliferate unchecked. During 2021, a spot-spray treatment was successful in knocking back the majority of large plants and with minimum impact on the surrounding vegetation. This was followed up by an early autumn cut-and-collect, which may have further reduced growth in the open areas. Earlier spot-spray treatment of Goat's Rue is planned for 2022, targeting the regrowth and plants which were originally missed.

Duck Potato *Sagittaria latifolia* was identified in a small, localised patch on the River Mole, adjacent to Brockley Wood during 2020. Despite several checks during 2021 to identify this species for removal, it has not been relocated on the site. Checks will continue to be made for this invasive riverside species.

Positive management outcomes for 2021:

- Horleyland Wood: After years of consistent approach, Himalayan Balsam in the woodlands has now been managed without spot-spraying, instead volunteers hand pulling has been effective in controlling abundance
- River Mole northern and middle section: we continue to observe an overall reduction in the easily accessible parts of these sites, through the assistance of follow-up hand pulling of plants by volunteers
- Goat's Rue has now been well managed within the Westfield Stream site.

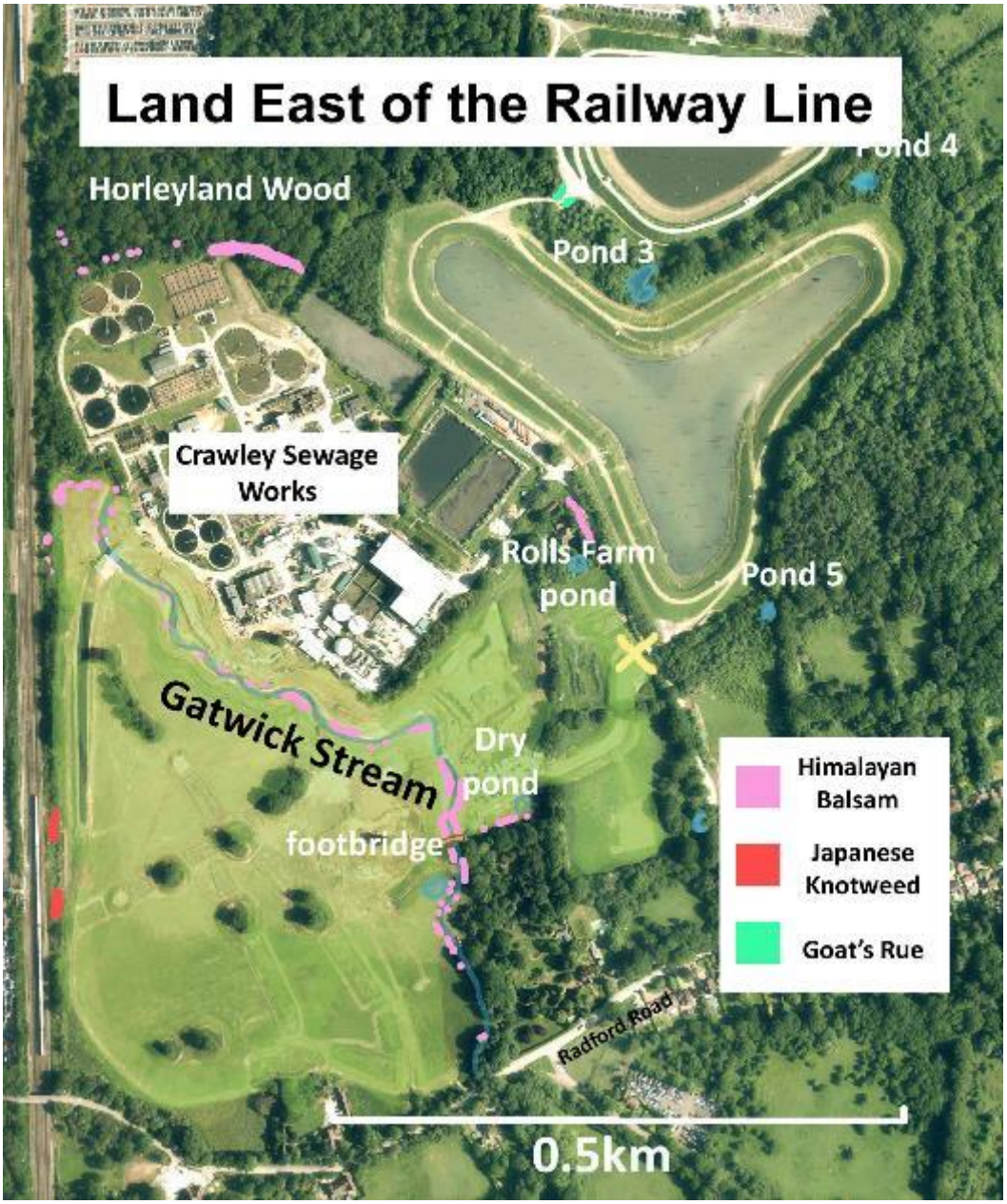


Figure 7. Land East of the Railway Line invasive species distribution September 2021.

Figure 8. North West Zone Himalayan Balsam mapped distribution September 2021.

Figure 9. Westfield Stream Goat's Rue distribution (adjacent to NWZ) prior to spraying works in late summer 2021.

INVERTEBRATES

Terrestrial Invertebrate survey

Extract of report by Scotty Dodd

Three invertebrate survey visits were made to Gatwick Airport NWZ, Surrey (TQ2540) on 7th May, 8th July and 25th August 2021. This is broadly a repeat of the first terrestrial invertebrate survey in 2014, which only involved two visits in May and June.

Scotty Dodd surveying in the North West Zone © Rachel Bicker

A general walkover survey of the site was initially undertaken to visually identify features and habitats with the potential to support scarce or protected invertebrates. Standard field techniques were employed to sample features of interest; a heavy-duty calico net to sweep grassland vegetation, a fine mesh butterfly net for spot netting of flying insects, a beating tray and stick to dislodge invertebrates from shrubs and branches and a suction sampler to vacuum invertebrates out of tussocks, crevices, and targeted host plants. The 2021 survey also employed a lightweight battery-operated suction sampler which increases the yield of small, often ground dwelling invertebrates, such as weevils (a suction sampler was not previously used in original 2014 survey). Hand searching of resources and visual observations of mobile insects were also employed.

Results

The summer of 2021 has been one of the worst on record for flying invertebrates. A cold and damp, cloudy May was followed by indifferent weather punctuated by all to brief warm and dry spells. A total of 458 species of invertebrate were recorded during the survey, five of which were UK BAP / S41 species.

- Brown Hairstreak *Thecla betulae* (Protected under Schedule 5 of the 1981 Wildlife and Countryside Act (for sale only))
- Small Heath *Coenonympha pamphilus*
- Blood Vein Moth *Timandra comae* (Research Only)
- Long-horned Bee *Eucera longicornis*
- Picture-winged Fly *Dorycera graminum*.

Table 13. A total of 26 (6%) species with a conservation designation recorded during the survey

Order	Species	Status
Araneae	*Araneus angulatus*	NS
Araneae	*Cercidia prominens*	NS
Araneae	*Trematocephalus cristatus*	NS
Araneae	*Ballus chalybeius*	NS
Araneae	*Episinus maculipes*	NS
Coleoptera	*Platystomos albinus*	[Nb]
Coleoptera	*Squamapion cineraceum*	[Na]
Coleoptera	*Phyllotreta punctulata*	NS
Coleoptera	*Glocianus punctiger*	[Nb]
Coleoptera	*Microrhagus pygmaeus*	[RDB 3]
Dictyoptera	*Ectobius lapponicus*	NS
Diptera	*Gymnosoma rotundatum*	[RDB 3], pNS
Diptera	*Acinia corniculata*	[RDB 1]
Diptera	*Merzomyia westermanni*	[N]
Diptera	*Tipula helvola*	[N]
Diptera	*Dorycera graminum*	pNS;pNT;S41 Priority Species
Hemiptera	*Trigonocranus emmeae*	[Nb]
Hemiptera	*Ceraleptus lividus*	NS
Hemiptera	*Megalonotus antennatus*	[Nb]
Hemiptera	*Catoplatus fabricii*	[Nb]
Hymenoptera	*Eucera longicornis*	[Na];S41 Priority Species
Hymenoptera	*Lasioglossum pauperatum*	[RDB 3]
Hymenoptera	*Melitta tricincta*	[Nb]
Lepidoptera	*Timandra comae*	S41 - research only
Lepidoptera	*Thecla betulae*	W&CA;S41 Priority Species;VU
Lepidoptera	*Coenonympha pamphilus*	NT;S41 Priority Species

Red Data Book category 1 (RDB 1) – Endangered
Red Data Book category 2 (RDB 2) - Vulnerable
Red Data Book category 3 (RDB 3) – Rare

Scarce invertebrates in Great Britain are assigned a conservation status category to indicate their current distribution. A hectad is an area 10 km x 10 km square, which relates to the British Ordnance Survey National Grid system. Nationally Rare (NR) species are those species known to occupy 1 to 15 hectads. The Nationally Scarce (NS) category are species known to occupy 16 to 100 hectads. The category is further broken down as follows:

- Nationally Scarce A (Na) are species currently (post 1970) known to exist in 30, or fewer, 10km squares
- Nationally Scarce B (Nb) are species currently known to exist in 31 to 100 10km squares

This was previously known as the Nationally Notable species system, which has since been superseded. Certain invertebrate groups are currently undergoing status revisions, along with an update of their current distributions, which means they may still be referred to under the old Nationally Notable system within the following section.

Long-horned Bee *Eucera longicornis* ©Rachel Bicker

26 (6%) species with a conservation designation were recorded, including the Nationally Scarce [Nb] leafhopper ***Trigonocranus emmeae,*** new to Surrey and the Ox-eye Daisy Lacebug *Catoplatus fabricii* a Nationally Scarce [Nb] species with only two post-1980 records in Surrey. Also, the Self-heal Weevil *Squamapion cineraceum*, a Nationally Scarce [Na] species with only two post-1980 records in Surrey at Mickleham and White Down. (Note: A small number of 'notable' species were omitted from the count as they are now very common in the region, but the IUCN reviews for the groups are pending).

Pantheon result:

A tephritid fly ***Merzomyia westermanni*** ©Rachel Bicker

Two Specific Assemblage Types (SATs) were found to be in Favourable condition by SSSI standards, with a further two SATs coming close to the threshold. Scrub edge and rich-flower resource were anticipated outcomes, given that the open habitats are largely managed as a flower-rich grassland / scrub mosaic at a woodland edge. Scrub edge only just passed the threshold of 11 with 12 associated species being recorded. In 2014 (albeit using the older ISIS 2010 predecessor to Pantheon) neither of these SATs was found to be in

Favourable condition, with scrub edge having 5 associated species and rich flower resource 9 associated species.

Management recommendations:

Ox-eye Daisy Lacebug *Catoplatus fabricii* ©Rachel Bicker

The survey data strongly suggests that ongoing management is having a positive effect for invertebrates. The scrub/grassland mosaic west of Brockley Wood is receiving both winter and patchwork summer cuts (often with volunteers and scythes) to suppress rank grass growth and diversify the sward, whilst crucially removing arisings. Meadow Vetchling *Lathyrus pratensis* is abundant, which is an essential foraging resource for many species, but most significantly the population of Long-horned Bees *Eucera longicornis* nesting in the adjacent clay bund. Scrub in this area is also being rotationally managed, with good examples of open grown Hawthorns and Willows etc, and additional features of interest such as log piles and brash piles have been added since the previous visit.

The clay wildflower bund appears to have a good balance of herb rich sward and bare ground patch habitats, particularly along the track. The cutting regime here requires some caution as it is essential that a proportion of key plant species, such as Knapweeds, Oxe-eye etc, are retained standing throughout the winter to allow for invertebrate life cycles to be completed, e.g. Picture-winged Flies (Tephritidae). Scattered, low-density scrub should be tolerated as it may be an important resource for the suspected root feeding leafhopper *Trigonocranus emmeae*. However, scrub should not be allowed to become locally dominant or large enough to create shading of bare ground

Slender-horned Leatherbug *Ceraleptus lividus* ©Rachel Bicker

resources. For small diameter scrub management tree-poppers are a recommended management tool over cutting and treating. Tree-poppering also creates small patches of bare ground.

Further thinning of the more mature scrub behind the bund (east and north) at the interface with Brockley Wood is recommended. Some thinning / glade creation has been done, but a more open mosaic would be better.

In Brockley Wood it is advised that standing and fallen dead and dying trees are left in situ wherever possible. Further investigation of the saproxylic invertebrate fauna is recommended and it would be a useful exercise for the site ecologists to identify and map any mature trees or features that might benefit from halo releasing to promote open growth. Continued work to create glades and scallop wood edges is recommended, creating a soft interface, or ecotone, with the more open grassland / scrub areas.

Vehicle ruts leading from Compost Field to Brockley Wood should be visually investigated during the winter months by the site ecologist/s for any evidence of Fairy Shrimp *Chirocephalus diaphanus*.

A fungus weevil ***Platystomos albinus*** ©Rachel Bicker

Flower-Insect Timed Counts

Authored by Rachel Bicker with analysis assistance by Richard Comont

Common Bird's-foot Trefoil and Common Daisy on NP Verge 5 © Rachel Bicker

Flower-Insect Timed Counts (FIT Counts) are simple systematic surveys collecting data on abundance of flower visitors and plant-pollinator interactions across a variety of habitats. They have been developed as part of a wider set of studies for a national Pollinator Monitoring Scheme (PoMS). This is run by the PoMS partnership, with the aim of encouraging a wide range of people to get involved in pollinator monitoring. To take part, recorders are asked to spend ten minutes counting all the insects that land on a particular flower species within a 50cm square, recording these to a broad species group (e.g. honey bees; bumblebees; hoverflies; other flies; etc). At Gatwick the survey methodology was applied to road verges during a botanical survey over two days in June 2021. Two patches were selected for each of the 20 road verges under the wildflower road verge monitoring regime (see Map 4 within Section 6, on page 93). During the surveys weather conditions were fair and calm, with temperatures ranging on average between 20 ^{o}C and 25^{o}C. All insects which were identifiable to species, including those recorded outside of the timed counts, were entered into iRecord. Analysis involved calculating average numbers of flowering species, insect groups and insect species across wildflower patches, and ranges are provided in the form of Standard Deviation (SD) and Standard Error (SE) scores.

Results

Out of the 20 road verges selected, 17 had adequate wildflower patches to be included within the FIT count survey, although some with only a single patch present. A total of 32 patch counts were made, the majority of which were dominated by Common Bird's-foot Trefoil *Lotus corniculatus*, but other flowering species present in the patch were also recorded. The official PoMS FIT methodology requires counts to be made only on a single species of plant, therefore

the data collected here was unfortunately not fully compatible with the scheme. We will ensure in any future surveys at Gatwick that the methodology matches up with the official recording scheme.

The mean number of flowering plant species within a surveyed patch is 3.31 (SD of 1.45, SE 0.26). Road verges with patches which scored highest for wildflower diversity were H Car Park Verge 2, Pond F Verge 1 and Dog Kennel Verge 1, each with a peak count of six flowering species per patch. Common Bird's-foot Trefoil (CBFT) was the most abundant of the flowering plants within patches selected across the verges, followed by White Clover *Trifolium repens* and Black Medic *Medicago lupulina*. The patches were largely selected by the surveyor for the presence of CBFT, therefore the species composition may differ from overall abundances of wildflowers across the entirety of the verge.

Table 14. 19 different plant species noted within patches during timed counts.

Common name	Species name
A small geranium	*Geranium sp.*
A small willowherb	*Epilobium sp.*
Bird's-foot Trefoil	*Lotus corniculatus*
Black Medic	*Medicago lupulina*
Chickweed sp.	*Cerastium/Stellaria* spp.
Common Daisy	*Bellis perennis*
Common Vetch	*Vicia sativa*
Creeping Buttercup	*Ranunculus repens*
Creeping Cinquefoil	*Potentilla reptans*
Germander Speedwell	*Veronica chamaedrys*
Hairy Tare	*Vicia hirsuta*
Hemlock Water-dropwort	*Oenanthe crocata*
Lesser Stitchwort	*Stellaria graminea*
Ox-eye Daisy	*Leucanthemum vulgare*
Ribwort plantain	*Plantago lanceolata*
Rough Hawkbit	*Leontodon hispidus*
Scarlet Pimpernel	*Anagallis arvensis*
Self-heal	*Prunella vulgaris*
White Clover	*Trifolium repens*

A total of 130 individual invertebrates of 41 species were recorded on the road verges, which includes those recorded outside of the FIT counts. Three of these were UK BAP / S41 species; Long-horned Bee *Eucera longicornis*, Small Heath Butterfly *Coenonympha pamphilus* and Cinnabar Moth *Tyria jacobaeae.*

Seven different pollinator groups were recorded during the FIT counts, with a mean of 1.9 groups per patch (SD 0.87, SE 0.16). A mean total of 4.06 insects were recorded within each patch (SD 2.37, SE 0.43) of 2.41 species (SD 1.24, SE 0.22). When comparing between patches

of different vegetation heights, the mean numbers of insects counted on the shorter patches came to 3.39 (SD 2.51, SE 0.50), whereas on the longer patches the mean count was 5.11 (SD 2.03, SE 0.68). This might indicate that the areas of longer vegetation generally attracted more insect activity. Broadly there was no difference between the types of species recorded on longer or shorter patches, with bumblebees dominating in both cases and other invertebrate groups only occurring in very low numbers.

Road verges which scored the highest for total insect counts were Dog Kennel Verges 1, 2, 3 and Pond F Verge 1, with peak totals of 9 insects in a patch. These are verges which were purposely left uncut for longer periods under the wildflower road verge management plan. Dog Kennel Verge 1 and Pond F Verge 1 were therefore joint highest for both wildflower species richness and insect numbers.

Long-horned Bee *Eucera longicornis* female feeding on Common Bird's-foot Trefoil. NP Verge 3 © Laurie Jackson

Including data obtained outside of the times counts, the most widespread and numerous species foraging on road verges during this survey period was Red-tailed Bumblebee *Bombus lapidarius* recorded on 13 out of 17 verges, followed by White/Buff-tailed Bumblebee *Bombus* sp. (the two species are grouped together as the workers are virtually indistinguishable) recorded on 10 verges, then Common Carder Bee *Bombus pascuorum* on five verges. The Grey-patched Mining Bee *Andrena nitida,* a species of solitary bee was recorded on three verges. Common Blue Butterfly *Polyommatus icarus* was recorded on seven verges, and Small Heath Butterfly *Coenonympha pamphilus* on four. Swollen-thighed Beetle *Oedemera nobilis* was the most frequently recorded beetle on five verges. White-legged Damselfly *Platycnemis pennipes* was the most frequently recorded species of Odonata, present on four verges close by to the River Mole.

A hoverfly ***Chrysotoxum festivum***, Dog Kennel Pond Verge 2 © Rachel Bicker

Table 15. A total of 41 macroinvertebrate species recorded on road verges in June 2021.

Taxon group	Taxon	Common name
Bee	*Andrena nitida*	Grey-patched Mining Bee
Bee	*Anthidium manicatum*	Wool Carder Bee
Bee	*Bombus lapidarius*	Red-tailed Bumblebee
Bee	*Bombus lucorum/terrestris*	White/Buff-tailed Bumblebee
Bee	*Bombus pascuorum*	Common Carder Bee
Bee	*Bombus pratorum*	Early Bumblebee
Bee	*Bombus vestalis*	Vestal Cuckoo Bee
Bee	*Eucera longicornis*	Long-horned Bee
Bee	*Osmia bicornis*	Red Mason Bee
Beetle	*Cantharis rustica*	a soldier beetle
Beetle	*Coccinella septempunctata*	7-spot Ladybird
Beetle	*Hoplia philanthus*	Welsh Chafer
Beetle	*Oedemera lurida*	a false blister beetle
Beetle	*Oedemera nobilis*	Swollen-thighed Beetle
Beetle	*Rutpela maculata*	a longhorn beetle
Beetle	*Stenurella melanura*	a longhorn beetle
Butterfly	*Aglais urticae*	Small Tortoiseshell
Butterfly	*Coenonympha pamphilus*	Small Heath
Butterfly	*Lycaena phlaeas*	Small Copper
Butterfly	*Maniola jurtina*	Meadow Brown
Butterfly	*Polyommatus icarus*	Common Blue
Dragonfly/Damselfly	*Calopteryx splendens*	Banded Demoiselle
Dragonfly/Damselfly	*Coenagrion puella*	Azure Damselfly
Dragonfly/Damselfly	*Enallagma cyathigerum*	Common Blue Damselfly
Dragonfly/Damselfly	*Ischnura elegans*	Blue-tailed Damselfly
Dragonfly/Damselfly	*Orthetrum cancellatum*	Black-tailed Skimmer
Dragonfly/Damselfly	*Platycnemis pennipes*	White-legged Damselfly
Moth	*Agrotis exclamationis*	Heart & Dart
Moth	*Camptogramma bilineata*	Yellow Shell
Moth	*Euclidia glyphica*	Burnet Companion
Moth	*Euclidia mi*	Mother Shipton
Moth	*Tyria jacobaeae*	Cinnabar
Spider	*Agelena labyrinthica*	Labyrinth Spider
True bug	*Coreus marginatus*	Dock Bug
True bug	*Corizus hyoscyami*	Cinnamon Bug
True bug	*Dolycoris baccarum*	Hairy Shieldbug
True fly	*Chrysotoxum festivum*	a hoverfly
True fly	*Episyrphus balteatus*	Marmalade Hoverfly
True fly	*Eristalis tenax*	Common Drone Fly
True fly	*Helophilus pendulus*	a hoverfly
True fly	*Merodon equestris*	Greater Bulb-Fly

White/Buff-tailed Bumblebee (*Bombus* sp.) on Common Bird's-foot Trefoil. Dog Kennel Verge 1 © Rachel Bicker

Grey-patched Mining Bee *Andrena nitida* on Hemlock Water-dropwort © Rachel Bicker

Butterflies

Peter Townend on the North West Zone grass bund, June 2021 ©Rachel Bicker

Two regular transects under the UK Butterfly Monitoring Scheme (UKBMS) have been monitored since 2018 with a hiatus during 2020 due to Covid-19. Our first transect is the North West Zone (NWZ), where the River Mole emerges north of the runway and the second is the Land East of the Railway Line (LERL). Peter Townend was our lead volunteer this season, with further help greatly received from Morgan Lucy for the mid-summer transect walks, and Vince Massimo who continues helping us with the data collation.

2021 saw an unusually cold period in late spring, with air frosts and snow showers in April, along with plenty of sunshine. The frosts continued well into May, with temperatures only averaging to more normal halfway through the month. Following this was a very wet period with frequent heavy showers. June began warm and settled, then became cool and rainy at times. July also had spells of heavy rain and showers, with temperatures mostly lower than average. Only in the latter half of July the temperatures built up to highs of 30^{o}C and unbroken sunshine for around a week. August was broadly unsettled, with daytime temperatures and sunshine levels mostly lower than average. September was reasonably settled and sunny, but with outbreaks of rain at times. The average recorded temperatures for our walks were 18.4 ^{o}C in NWZ and 17.9 ^{o}C in LERL. Average sunlight levels were 76.3% in NWZ and 79.1% in LERL. Out of the 26 weeks of walks, 23 were completed in the NWZ; weeks 2, 5, 13 were missed due to insufficient temperatures and sunlight. 22 weeks out of the 26 were completed in LERL; weeks 2, 5, 12 and 20 were missed, again due to challenging weather conditions and time constraints around surveyor availability. Some transects had to be walked with close to

borderline weather conditions, and on a couple of occasions the walks attempts were abandoned due to rain. It was an incredibly challenging summer in terms of meeting the minimum required survey conditions, and a total of 7 surveys missed out of 46 (84.8% completion of surveys) feels like a good effort.

Peacock *Aglais io* ©Vince Massimo

The total number of species for NWZ this year was 29, matching our highest total for this site. In contrast, 23 species at LERL is lower than our previous record count of 27 in 2019. Across both transects in 2021 we recorded a total of 30 species, out of the potential 32 recorded across the biodiversity sites since 2016.

Our butterfly season peaked for both transects during week 17 (our total count NWZ 545, LERL 266), with the numbers looking similar to previous years' peaks, though these typically occurred earlier in weeks 14-16. Numbers in the first half of summer seemed to be significantly down for all species. The total count for our main spring butterfly the Orange-tip *Anthocharis cardamines* was 43 in 2021 compared with 68 in 2019. Meadow Brown *Maniola jurtina*, Ringlet *Aphantopus hyperantus* and the three main white species were all seemingly impacted by the hard spring. Meadow Brown in 2019 peaked at 295 individuals in one day, whereas in 2021 the highest count was 166. The total count of Meadow Brown in 2019 was 1,230, and in 2021 it was 754.

Brown Argus *Aricia agestis* ©Rachel Bicker

Common Blue *Polyommatus icarus* numbers were down by a significant amount compared with 2019 (56 to 163) and Brown Argus *Aricia agestis* (7 to 16) in the NWZ. These species were missing from our Land East transect this year, although have only previously been recorded here in very low numbers.

Grizzled Skipper *Pyrgus malvae* ab. intermedia b ©Rachel Bicker

A likely White-letter Hairstreak *Satyrium w-albu*m was seen in the expected part of the glade at Lower Picketts Wood, LERL, but was too high-up to confirm and wasn't included in this year's tally.

At least three Grizzled Skipper *Pyrgus malvae* individuals were recorded on transect this year, two were of the aberrant form 'intermedia b' and seen on same day, for which we have photos. The following is the description of this form of genetic aberration, as given on the UK butterflies website: "The white markings of the upperside intermediate between the type and ab. taras. The white spots above the inner margin of the forewings are united into an oblong blotch and the discoidal spot is united with the next spot into another oblong blotch. Hindwings with a row of white marginal spots and one spot in the middle of the wing."

Conversely to other species, Marbled White *Melanargia galathea* had a bumper year in 2021 with a count of 59 individuals along the River Mole on a single day in week 15 (July 8th) and a total of 157 counted during the season, which easily beats our previous record of 77.

Our first sightings of Clouded Yellow *Colias croceus* occurred on July 14th outside of the walked transects. These two very fresh individuals seen on either side of the airport, one at the Westfield Stream site and the other at Gatwick Stream. This species was then recorded on NWZ transects this year in both week 17 (July 27th) and 19 (August 5th). It was a quieter year for Painted Lady *Vanessa cardui*, with numbers down across both transects.

Bill Downey, transect co-ordinator for Butterfly Conservation Surrey and South West London, provided the following communication, summarising some of his views on the 2021 field season:

"…most of the rarer species have done well or about par. It has been the commoner species whose numbers have been well down. Of course, the weather has not been favourable – but we can only expect more of this. It is clear that climate change is now beginning to have big impacts on butterflies – and of course other taxa. I think it highly likely the UK will lose some species in the next decade, but probably gain some too."

Clouded Yellow *Colias croceus* ©Rachel Bicker

Table 16. Last year recorded for all butterfly species (from 2012 to present day).

Common name	Scientific	NWZ	LERL
Brimstone	*Gonepteryx rhamni*	2021	2021
Brown Argus	*Aricia agestis*	2021	2019
Brown Hairstreak	*Thecla betulae*	2021	2021
Clouded Yellow	*Colias croceus*	2021	2021*
Comma	*Polygonia c-album*	2021	2021
Common Blue	*Polyommatus icarus*	2021	2021*
Dingy Skipper	*Erynnis tages*	2021	2016*
Essex Skipper	*Thymelicus lineola*	2021	2021
Gatekeeper	*Pyronia tithonus*	2021	2021
Green Hairstreak	*Callophrys rubi*	2021	-
Green-veined White	*Pieris napi*	2021	2021
Grizzled Skipper	*Pyrgus malvae*	2021	-
Holly Blue	*Celastrina argiolus*	2019	2020*
Large Skipper	*Ochlodes sylvanus*	2021	2021
Large White	*Pieris brassicae*	2021	2021
Marbled White	*Melanargia galathea*	2021	2020*
Meadow Brown	*Maniola jurtina*	2021	2021
Orange-tip	*Anthocharis cardamines*	2021	2021
Painted Lady	*Vanessa cardui*	2021	2021
Peacock	*Aglais io*	2021	2021
Purple Emperor	*Apatura iris*	2016*	-
Purple Hairstreak	*Favonius quercus*	2021	2021
Red Admiral	*Vanessa atalanta*	2021	2021
Ringlet	*Aphantopus hyperantus*	2021	2021
Silver-washed Fritillary	*Argynnis paphia*	2021	2021
Small Copper	*Lycaena phlaeas*	2021	2021
Small Heath	*Coenonympha pamphilus*	2021	2021
Small Skipper	*Thymelicus sylvestris*	2021	2021
Small Tortoiseshell	*Aglais urticae*	2021	2021
Small White	*Pieris rapae*	2021	2021
Speckled Wood	*Pararge aegeria*	2021	2021
White Admiral	*Limenitis camilla*	2017*	2021
White-letter Hairstreak	*Satyrium w-album*	2019*	2021*

*Recorded outside of timed survey or away from transect

Clearwing Moths

This day-flying group of moths contains many elusive species, rarely seen without the use of pheromone lures with which to attract the males. Many species are considered rare or scarce, and all are most certainly under recorded. A variety of pheromone lures targeting likely species in the locality were deployed by the Biodiversity Advisor, either using the plastic bucket trap, bagged in netting, and pegged around chest-height on vegetation, or laid on the ground in a patch of the target foodplant. Peak flight times in the year and times of the day were selected for the targeted species, focusing on areas of suitable habitat containing potential food plants. Of the 14 resident species of clearwing moth found in Britain, four have been recorded so far at Gatwick. In total three species were recorded during 2021, with the data entered into iRecord.

Red-tipped Clearwing *Synanthedon formicaeformis* ©Rachel Bicker

In July 2021, a new species for the airport list was detected at the Westfield Stream site, to the west of the North West Zone biodiversity area. Three Red-tipped Clearwing *Synanthedon formicaeformis* came to the FOR pheromone lure. One was caught and photographed, which turned out to be a rather worn specimen. All three had arrived within a few minutes of the pheromone being deployed on the targeted tree (a willow species with elongate leaves).

Six-belted Clearwing *Bembecia ichneumoniformis* ©Rachel Bicker

Six-belted Clearwing *Bembecia ichneumoniformis* was found in two new locations outside the biodiversity areas, using the API lure during July. The first was on the road verge at Dog Kennel Pond. The second site was Westfield Stream which borders the River Mole biodiversity area. Both these areas contain a very high abundance of Common Bird's-foot Trefoil *Lotus corniculatus.*

A single Red-belted Clearwing *Synanthedon myopaeformis* was recorded at the old Rolls Farm site in July, after deploying the MYO lure in the usual spot next to two very old apple trees. This species has been recorded here annually since 2019.

Next year we would like to make a concerted effort to re-find the Sallow Clearwing *Synanthedon flaviventris*, which was last detected in Goat Meadow during 2016. Adults of this species are apparently only detectable during even years, as it take two years to complete its life cycle. In 2020 a new pheromone lure became available for targeting the Lunar Hornet Moth *Sesia bembeciformis*, which is also associated with mature sallows, willows and possibly poplars. This species also has a two-year life cycle, therefore the adults might be more apparent in some years than others.

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Red-belted Clearwing *Synanthedon myopaeformis*
©Rachel Bicker

Table 17. Clearwing moth (Sesiidae) species recorded at Gatwick to date.

Common name	Taxon name	Area	Year first recorded	Year last recorded
Six-belted Clearwing	*Bembecia ichneumoniformis*	NWZ	2016	2021
Red-tipped Clearwing	*Synanthedon formicaeformis*	Westfield Stream	2021	2021
Red-belted Clearwing	*Synanthedon myopaeformis*	LERL	2019	2021
Sallow Clearwing	*Synanthedon flaviventris*	LERL	2016	2016

Nocturnal moths

Report by Jacob Everitt

Robinson moth trap in Goat Meadow, August 2021 © Rachel Bicker

The 2021 trapping season was a mixture of highs and lows dominated by the weather the British Isles received. England recorded its fifth wettest spring on record which had a huge impact on any species of insect which pupate in the ground. It is widely thought that many of the pupae will have simply rotted when emergence was imminent leading to a dramatic decline in many species. Pair this with a very cool spring overall, (1.0C below the 1991-2020 average) meant that whilst it was sunny by day the clear nights made it difficult for many species to emerge if they survived the water logging. This has reflected on quantity of moths throughout the trapping season with number well down on previous years. Of interest this has affected other species groups such as birds. The British Trust for Ornithology (BTO) datasets show that the both Blue and Great Tit numbers suffered directly due to their reliance on caterpillars to feed their young.

Once again four trapping sessions were conducted across the key sites at Gatwick, as well as an additional leaf mine survey which was the first time this has been conducted at the airport complex. The trapping sessions were again varied in terms of dates to ensure coverage of all the key areas at differing times of year.

Cydia amplana © Jacob Everitt

Alder Kitten *Furcula bicuspis* © Rachel Bicker

In total a measly 342 individual moths were caught of 127 species, comprising 55 micros and 72 macros. A poor year overall which was reflected across south-eastern England. Of particular note, this was still significantly better than 2018 which was the worst year of moth trapping on record. Interestingly species diversity was unusually low and has only been boosted somewhat by the leaf mine surveys. More worryingly however was the drastic decline in individual moths trapped. The highest species total in 2021 was Variegated Golden Tortrix *Archips xylosteana* with 59 individuals trapped. The highest number of individual macro species caught was Black Arches *Lymantria monacha* with just eight trapped. It will be interesting to see how the moths of all species fair in 2022 as production of adults last year is bound to have a lasting effect. Whilst numbers were low we did still manage to add 22 of new species taking the airport list to 353.

There were several highlights through the trapping season despite the low numbers, the first being the discovery of a population of the nationally scarce Alder Kitten *Furcula bicuspid*. We were fortunate to catch three of these stunning moths at Roll's Field on the 28th May. As the name suggests the larvae feed on Alder which is found in abundance in this area and should be managed with this moth in mind. Other highlights included the airports first ever record of Leopard Moth *Zeuzera pyrina* which is a fantastic looking species and whilst not of great rarity value they always impress moth recorders!

There was a dearth of common migrant species trapped during our trapping sessions with only three Diamond-back Moth *Plutella xylostella* trapped and a single Silver Y *Autographa gamma*. Following on from the good form of 2019, it was pleasing to see the migrant ***Cydia amplana*** once again increase with eight trapped on the 12th August. I suspect that this species will continue to grow in population

Leopard Moth *Zeuzera pyrina* © Rachel Bicker

each year. It is exciting to be at the very edge of their current northerly spread and will be interesting to monitor how there population grows in future surveys. It was however a surprise to not record Tree-lichen Beauty *Cryphia algae* or White-point *Mythimna albipuncta* this year both of which had been increasing locally recently and were trapped in 2019, perhaps they were genuine migrants rather than colonists from the London population.

Gypsy Moth *Lymantria dispar* © Jacob Everitt

There were two fantastic migrant records, both of which were trapped at Goat Meadow on the 12th August. Firstly was the Gem *Nycterosea obstipata* which is a migrant from the near continent. Whilst not the best-looking moth it is still a notable catch with only a handful of records in the county each year. The second migrant of interest was the huge male Gypsy Moth *Lymantria dispar* which came to a 2W LED light trap on the edge of the semi-mature woodland. This species is usually found within five miles of the coast as a migrant in Britain but is likely to establish as a breeding species in the near future due to climate change. There are now pheromones available for attracting this species and it will be trailed in the 2022 surveys effort across the sites.

2022 recommendations

It is imperative that the four moth trapping sessions are carried out across the complex again in 2022 to establish the effect the 2021 season has had on diversity. This year more so than ever is the time to check on the rarer species that we suspect to be breeding on site in light of the poor showing last year. The main focus should be once again on *Dasycera olivi*ella which I am confident is a breeding species, but at least one session should be used to target this national rarity.

Other areas which may be worthy of exploration are the re-assessment of the clearwings which can be found on site, with a particular focus on Sallow Clearwing *Synanthedon flaviventris* once more as this year it will fly once again. I would also like to suggest, as stated above, that we attempt to use a pheromone lure for Gypsy Moth *Lymantria dispar* in the latter part of the year. It will be interesting to see if the moth is established or if we are on the northern limit of its range.

Leaf-miner moths

Report by Jacob Everitt

The opportunity to look for leaf-mining species in the autumn gave some interesting results with the undoubted highlight being the discovery of ***Coleophora albitarsella*** which larvae feed on Ground Ivy *Glechoma hederacea*. It is a local species which is in steep decline across the county and has a very southern based distribution. I found evidence of feeding throughout the woodland at the River Mole site and finally managed to find a larval case after much searching. It would be very much worth search other areas of Ground Ivy across the complex to see how strong the population of this moth is.

The range of species which can be found by searching for larval feeding signs is large and I suggest we repeat this type of visit in the coming years. It also proves that the species is breeding on site which is important when carrying out any management works. The efforts this year very much scratched the surface and I very much look forward to expanding our understanding of the harder to record species which are waiting to be discovered.

Coleophora albitarsella larval case
© Jacob Everitt

I would like to take this opportunity to thank both
Rachel Bicker for her immense enthusiasm and help with mobilisation of traps and equipment as well as her willingness to learn about the moths trapped and also to Ian Barnard for assistance with trapping efforts throughout the year.

Land East of the Railway Line

Report by Tom Forward

The low lying and water-logged ground conditions after winter, mean that this site is typically slow to warm up with the first significant reptile activity expected in April. The advance of Spring 2021 was held up by a pro-longed cold weather system, with northerly winds dominating, and frequent morning frosts during April. A mixed summer season followed with some occasional hotter periods, though on average cooler and cloudier than the year before.

Despite the cold Spring, the first survey visit of the year on 31st March turned up the first ever March Grass Snake *Natrix helvetica* record since this survey began. What followed was an above average monthly peak count, with exceptional high counts in June and August, exceeding previous peak counts for these months by three and eight respectively. The August result was a surprise, a fourfold increase over the average, and can perhaps be explained by the active grassland management (late summer scythed hay-cut) in Goat Meadow, which created open, warmer, drier conditions more suitable for basking snakes. In previous years the vegetation has been significantly taller at this time of year, creating cooler sub-optimal conditions for basking reptiles. Adult, immature and neonate snakes were recorded across the survey, which is evidence of local breeding success. Back-to-back highest peak counts (2019 & 2021) for this site, suggests that perhaps the population is moving from 'stable' to 'increasing'. This may be in response to the favourable habitat management, particularly in areas prone to shading out through scrub encroachment in Goat Meadow and along the perimeter fence of the balancing pond.

Grass Snake *Natrix helvetica* displaying 'hooding' behaviour.
Land East © Tom Forward

At the height of the season (June), photographic evidence emerged on an Amphibian and Reptile Conservation Facebook group of a member of the public systematically lifting refugia at this site and handling snakes for photos. Contact was made with this person, who was willing to engage in a productive conversation about the nature of the site and the survey. He was

asked to cease unnecessarily disturbing the snakes at a critical point in their breeding season and to not interfere with the survey itself and potentially compromising the data. Being a local dog-walker he was also invited to engage with GGP-led volunteer tasks, if he was interested in reptile conservation.

Figure 10. Reptile presence heat map in LERL ©Tom Forward.

2022 recommendations

Annual cutting back and scalloping along the northern edges of the balancing pond perimeter fence, between November and February, is important to maintain this desirable 'edge habitat' favoured by the snakes.

Where Sallow (*Salix* sp.) stumps are grubbed out by volunteers in the Goat Meadow complex, ephemeral micro-ponds develop which can provide early-season breeding habitat for Common Frogs, which are an important prey item for Grass Snakes.

As well as the continuing good work maintaining the Goat Meadow grasslands, the glade on the western edge (TQ 29590 40382), formally a reliable location for snakes during the season, is now becoming too shaded, and could benefit from some winter clearing to open it up again. A mixed approach of coppicing, ringbarking of the small trees that are casting shade and cutting back of taller thatch near the hibernacula is recommended.

North West Zone (Westfield Stream and Gatwick Aviation Museum)

Report by Rachel Bicker

Westfield Stream site bordering the North West Zone, summer 2021 ©Sam Buckland

In 2020, post-construction project reptile surveys conducted by a third party were due to take place in the NWZ, covering the standard biodiversity project survey area. Rather than doubling up effort and risking excessive disturbance to the site, a plan was made to move our regular monitoring work into two adjacent areas to the NWZ; the Westfield Stream and the Gatwick Aviation Museum. The Covid-19 outbreak in 2020 resulted in the cancellation of all planned surveys, therefore 2021 was our first year of systematically surveying these areas of promising habitats. The majority of reptile refugia mats used here are now black corrugated bitumen roofing sheets, cut to 100cm x 50cm in size.

The Gatwick Aviation Museum is situated on a large parcel of land owned by a charitable trust, divided into two fields roughly 5ha each in size. The majority of the western field is mown consistently in summer, maintaining a short turf for amenity and charity events. Bordering the south of the site is an area (approx. 1.5ha) of tall rank vegetation left purposely to be wild, containing scrub, willows, a large shallow pond, and a series of wet scrapes. The eastern field is typically left long and cut once a year in mid-summer for silage. The site is accessible to our survey team with permission from the museum manager, and 20 mats were distributed here.

The Westfield Stream is an area of land owned by Gatwick Airport, immediately north-west of the airfield. It is set aside for water drainage purposes, with an open channel bisecting the site which drains into the River Mole to the east. Large stands of rush, thistle and dock species are mixed in with colonising Goat's Rue in the southern half of the site, which is largely clay and

semi-improved soils. The northern area contains areas of bare stony ground made up of pebbles and coarse aggregate and is diverse in low-growing wildflower species such as Common Bird's-foot Trefoil *Lotus corniculatus* and Ground Ivy *Glechoma hederacea*. The main Westfield Stream channel (taken out of underground culvert and constructed in 2015) is only narrow, within a wider flood terrace of broadly sloping banks, colonised by willows *Salix* sp. and Gorse *Ulex europaeus*. Excavations of spoil and rubble were retained at the edges of the site as low bunds and hibernacula, mixed in with logs and brash from past vegetation clearance. Much of the edges of the site and sloping areas are becoming dominated by Bramble *Rubus fruticosus*.

Three different colour forms of Grass Snake (*Natrix helvetica*); a darker individual on the left, the usual green-grey bottom centre, and brown-lateral lined in the top right ©Sam Buckland

The first official records of Grass Snake *Natrix helvetica* were made at the Gatwick Aviation Museum site in spring 2021. A peak count of 5 individuals was made in the Aviation Museum area during the June survey. A peak count of 3 at the Westfield Stream area also occurred during the June survey.

As is the case in the neighbouring NWZ biodiversity area, unusual colour forms are occasionally recorded from the Westfield Stream site. During a single reptile refugia check in June of 2020, a completely black (melanistic) individual was recorded along with the standard colour forms. During our 2021 surveys, another unusual form of 'striped' Grass Snake was recorded., with parallel copper-coloured lines running along the back.

Figure 11. Reptile presence heat map, showing respective activity at the Gatwick Aviation Museum (top section) and Westfield Stream (bottom section). ©Lucy Groves

2022 recommendations

It is important to continue with annual cut and collects, reducing the tall, dominant rank vegetation (docks and thistles) and maintaining open areas of short sward. The open areas in the northern block may however benefit from less intensive cutting to improve habitat connectivity across the site. Continuing with spot treatment of the invasive Goat's Rue plants will be highly effective earlier in the season while they are regrowing. In certain areas Bramble is beginning to overtake, particularly on the sloping banks which were previously open and colonised by low-growing grasses and wildflowers. These areas should be re-opened up by cutting them back hard on a rotational basis.

TERRESTRIAL MAMMALS

Tracking and trail camera monitoring

Trail camera mounted on a post, spring 2021 at the Gatwick Aviation Museum ©Rachel Bicker

Trail cameras are generally deployed around the sites all year round by the biodiversity advisor, with periods of focused effort where activities of particular mammal species are noticed, such as burrows and trails. Linear waterways are particularly good sites for monitoring, with many species using them as dispersal routes as well as water sources. Secluded areas which are not open to the public are also monitored in order to assess the levels of trespass and disturbance by dogs. Where footage of mammals and birds is good enough to determine the species, records are entered into iRecord. Examples of footage obtained during 2021 can be viewed here: Night at the Aviation Museum

Badger prints on the left, **Roe Deer** on the right. Gatwick Stream ©Rachel Bicker

American Mink

American Mink *Neovison vison* is a non-native invasive species of mustelid found around waterways. They are commonly seen along the River Mole corridor and the Gatwick Stream, as well as several of Gatwick's balancing ponds. Monitoring of American Mink through public reporting and trail cameras helps to inform our annual programme of trapping and humane killing. During spring, trail cameras successfully picked up on a single individual in investigating an old mink raft tied up on the River Mole. In total, four males were successfully trapped during late winter and early spring of 2021 on the rivers at both sites. Another individual was found deceased at the pumping station at Pond D, but cause of death was unknown as there were no clear injuries or barriers to its movement. For 2022, the surveyor and licenced pest controller has recommended using a MinkPolice device, which will send an automated message when a trap has been triggered. This would be particularly useful when deploying traps in remote or secure areas, to reduce the number of essential visits to the site.

Small Mammals

New attachable magnifying lenses have been trialled with the trail cameras, to achieve closer shots of small mammal species, while also capturing interesting interactions. On a single log pile in the Scrub West of Brockley Wood, Wood/Yellow-necked Mouse *Apodemus* sp., Pygmy Shrew *Sorex minutus* and Bank Vole *Myodes glareolus* were all recorded within the same evening. A Weasel *Mustela nivalis* is a rare sighting in person, so it was exciting to review footage of one passing by twice carrying freshly caught prey, possibly voles. This area in particular contains many different habitat niches and is rich in small mammals.

Weasel *Mustela nivalis* with successfully captured small mammal prey, Scrub West of Brockley Wood. Browning Strike Force HD Pro X trail camera ©Rachel Picker

Hazel Dormice

The practical guidance by the People's Trust for Endangered Species (PTES), based on the Disease Risk Analysis for Covid-19 continued to be followed for our 2021 Hazel Dormouse *Muscardinus avellanarius* box checks.

Jerry checking Dormouse boxes in Horleyland Wood ©Rachel Bicker

Monthly box checks recommenced from June through to October by licenced surveyors Laurie Jackson and Jeremy Cheesman. Despite consistent monthly checks of boxes each year, no further dormice have been seen at Gatwick since our confirmed records during both 2015 and 2016. Our survey data from the box checks, including occupancy by other small mammals, continues to be entered into the National Dormouse Monitoring Programme run by PTES.

Gatwick's ancient woodlands contain plentiful mature standing deadwood and potential nesting features in the canopy, which may explain the lack of dormouse activity in our boxes. It may also be that the population has dropped to such low levels that it is now very difficult to detect. Looking ahead, any lost and damaged nest boxes will instead be replaced with dormouse tubes deployed around woodland edges, coupled with additional trail camera monitoring in likely areas of dense thorny scrub, hedgerows, and woodland understory.

We would like to say a special thank you to Jerry Cheesman, our volunteer surveyor who has been checking our box transect for over 7 years, and is now moving on to other projects. Jerry has been an excellent teacher to myself and many volunteers, emphasising the welfare of all small mammals we handled and the importance of their safety through good biosecurity practices, especially during the pandemic.

Terrestrial mammals and the airside fenceline

Monitoring has continued of the airside security fenceline, regarding the movements of mammals to and from airside. Since the in-filling of several gaps underneath the fence, overall mammal activity seems to be reduced. However, both Badgers *Meles meles* and Red Foxes *Vulpes vulpes* are still regularly observed on the airfield and so are gaining access at certain points. Attempts were made by ecology surveyors during 2021 to determine the latrine locations of the Badger sett on the Fire Training Ground bund. Unfortunately, this effort effectively failed and it is still unknown whether this sett might be related to a nearby landside population. We will continue monitoring the airside sett using trail cameras through spring 2022 to determine whether this may be a breeding population.

Badger *Meles meles* at Fire Training Ground bund.
Browning Strike Force HD Pro X trail camera ©Rachel Bicker

[3] – COMMUNITY ENGAGEMENT

Authored by Tom Simpson, Gatwick Greenspace Partnership (GGP) Project Officer:

Cleo Alper (Sussex Wildlife Trust) introduces volunteers to an Eyed Hawk-moth caterpillar in Goat Meadow © Tom Simpson

Though Covid-19 continued to have an impact on community engagement, with the third national lockdown in the early part of 2021, we worked hard to connect local people to their environment and greenspaces online. Work continued behind the scenes with Sussex Wildlife Trust (SxWT)'s Business Development Manager to promote volunteering opportunities at Gatwick Airport for SxWT Business Members, and our covid-19 procedures allowed us to work safely within the guidelines and offer a safe return to volunteering for those that felt comfortable, while our Volunteer Reserve Managers continued socially distanced conservation volunteering.

[A] – CONSERVATION VOLUNTEERING AND HABITAT MANAGEMENT

Our dedicated Volunteer Reserve Managers (VRMs) have been giving time and energy to practical sessions, steadily over the last year, completing essential habitat management and helping to facilitate ongoing ecological surveys and our off-site community projects. Their continuous presence has helped us to keep events running ready for when corporate groups would like to return. In addition, their wider conservation experience, and knowledge of the Gatwick biodiversity sites has allowed progression of new habitat actions with improved impact and efficiency.

Activity during the first half of 2021 from January until June was dominated by VRMs, who put in 301.5 hours with only 81 additional hours from other volunteers. This included working with a group of volunteers from Manor Royal Business Improvement District and working with the Maidenbower Bee Wild community group on creating wildflower road verges. This has created an ongoing partnership between a community group, local councils and GGP.

In the final quarter of 2021, we received a marked increase in volunteers from security staff who were not required full time in airport operations. Gatwick Airport Ltd (GAL) promoted biodiversity volunteering as a priority activity for staff without full-time workload as the airport continued its recover from the COVID-19 pandemic. This has proved to be a very successful initiative, where a greater number of staff have got involved in biodiversity conservation efforts whilst being able to continue supporting the airport operations.

Gatwick Greenspace Partnership Volunteer Reserve Managers (VRMs) installing new Dormouse boxes for surveys in Lower Picketts Wood © Rachel Bicker

In July to December (inclusive) we logged 838.5 volunteer hours with 464.5 (55%) of those contributed by the VRMs. This was out of a total 1,221 hours of work throughout 2021 carried out by 287 volunteers. Overall, 766 hours (63%) were contributed by the VRMs this past year.

Throughout 2021 we hosted the following groups from GAL: Communications and Community Engagement, Environment Health and Safety, Sales and Operations, and Security. Groups external to GAL included Manor Royal, UK Power Networks, Nestle, Costains Ltd and we have formed an ongoing relationship with AirPartner Ltd, who are now regularly sending out volunteers. We have used a series of volunteering days with AirPartner Ltd, to encourage the organisation away from a mass tree planting initiative towards helping us to encourage natural regeneration of a field edge through ground disturbance, laying over of existing shrubs and protecting saplings.

We have delivered two Digital Detox days in the Gatwick Woodlands; a forest school style day for adults which involved fire lighting and whittling, and some practical conservation work towards Gatwick's Biodiversity Action plan.

All volunteer habitat management tasks at Gatwick Airport contribute toward the Biodiversity Action Plan targets and objectives, which are essential for retaining the Wildlife Trust Biodiversity Benchmark Award. These tasks have included:

- Controlling invasive species such as Himalayan Balsam and Bracken across the estate
- Grass cut and collect using scythes on Goat Meadow and the River Mole Grasslands
- Managing scrub and tree encroachment on grassland sites using our new tree poppers, mattocks and saws
- Systematically removing deer fencing from previously cut coups and planning the next cycle of coppice management
- Installing new dormouse boxes in Lower Picketts Wood.
- Litter and tree guard collection
- Clearing and managing ditches in Upper Picketts Wood to dry out footpaths while creating a variety of open water and bog habitats.

Digital Detox with GAL staff in Upper Picketts Wood © Tom Simpson

GAL Sales, Operations and Planning Team removing scrub in Goat Meadow © Tom Simpson

GAL volunteer managing willow in Goat Meadow © Tom Simpson

GAL Security Team in Horleyland Wood © Tom Simpson

GAL Security Team in the River Mole typha scrape © Tom Simpson

GAL Communications Team managing Himalayan Balsam in the River Mole
© Tom Simpson

Partnership with the Maidenbower Bee Wild Project

The reach of Gatwick's award-winning road verge project continues to have a positive impact on our work and through our partnerships. We began working with the Maidenbower Bee Wild group (MBW) in an advisory capacity in late 2020. In 2021 we have carried out two days of delivery with their volunteers. Working in partnership with Crawley Borough Council (CBC), West Sussex County Council (WSCC) and MBW, we identified, prepared and planted wildflowers on 3 community road verges, and, at the end of the summer assisted in the final cut and collect of these wildflower road verges. The cut grass was transported to Gatwick to replenish Grass Snake egg-laying heaps in the LERL.

The Maidenbower Bee Wild Project has expanded to become the Crawley Bee Wild Project. In partnership with GGP, we have inspired CBC to bring further verges into management within the Tilgate Estate in Crawley. The success of the Maidenbower and Gatwick projects has enabled GGP to facilitated new relationships between CBC, Plantlife and the biodiversity team at Gatwick Airport who are conducting botanical road verge monitoring. Looking forward to 2022, the aim will be to carry out further surveys on various park boundaries within Crawley with a view to converting these to wildflower rich spaces. GGP will continue support the project by carrying out wildlife recording days for local people.

Maidenbower Bee Wild Project volunteers © Tom Simpson

Furthermore, we presented these case studies along with Gatwick Airport's Wildflower Road Verge plans and explanatory video to our partners in the Manor Royal Business Improvement District (MRBID), as part of a consultation with CBC and landscape architects drawing up plans for a series of connected micro-parks across the estate. To improve the space for wildlife we have recommended implementing a wildflower road verge scheme across Manor Royal using these parks as hubs. This idea has been well received and, provisionally, CBC and MRBID have expressed interest in adopting wildflower verges on key sites across the area. We will continue to work with them to ensure this is possible.

[B] – EDUCATION, ACCESS AND COMMUNITY ENGAGEMENT

As with volunteering, education and community engagement had a slow start to 2021 due to Covid-19. Following the success of our online engagement in 2020, the Gatwick Greenspace Partnership continued to deliver online content throughout the early half of 2021.

Online

To help people connect with wildlife and improve their wellbeing while working from home, we prepared and delivered an online mindful birdwatching webinar. This was presented to two groups from the Southern Co-op, two from Gatwick Airport, and was featured as a break out room activity at the Manor Royal People Conference in June.

In March we presented a 'virtual tour' of Gatwick's biodiversity sites for students of the University of Sussex, in the form of an online meeting with an interactive presentation, including videos and a questions and answer session.

During the third lockdown, various online resources were collated around environmental education on school grounds or their local greenspaces. These resources were emailed to schools across our project area, providing opportunities to deliver outdoor education themselves, with wildlife themed activities to take learning outside. Hopefully this will lead to direct engagement when they are ready. In total theses resources were shared with 84 schools within the project area.

Further online educational videos were produced by the GGP team, including one of Gatwick Airport's project officer showing people at home how to measure the height of a tree. This and other videos can be found on the Sussex Wildlife Trust YouTube channel.

In person

We have run five well attended Gatwick Wildlife Rangers sessions. These have included carrying out kick sampling on the River Mole and pulling Himalayan balsam; activities inspired by the Community Eel Walks, hosted in partnership with the South East Rivers Trust. The Wildlife Rangers also had an excursion to Tilgate Park to learn about heathland management, continued to look after their Wildlife Garden and helped with uprooting and transplanting trees from a crowded copse, to give a boost of "wilding" to the corner of Rolls Field.

The benefits and legacy of Youth Rangers have been evidenced in an interview with Lewis Thornhill, which can be read in this article. Lewis is a former GGP Wildlife Ranger who progressed to the Youth Rangers before joining the Gatwick VRMs, supporting his studies in Countryside Management at Merrist Wood College.

In August 2021 we delivered our second ever Wild Wanderers BushCamp. Eight 12-16 year olds joined us for an immersive week in the woods, learning advanced forest school and wildlife surveying techniques, including small mammal trapping, using bat detectors and sweep netting. These are a few quotes from the group:

- "Bushcamp has inspired me to listen to any animal, even if I am doing something else like helping light the fire"

- “Bushcamp has inspired me to go into the woods more”
- “Bushcamp has encouraged me to learn more about bird calls”
- “It has inspired me to be more creative and engage in more activities with new friends”

Wildlife Rangers pulling Himalayan Balsam along the River Mole © Tom Simpson

GGP Youth Rangers have also linked in with Gatwick Airport’s Biodiversity Project by making use of coppice materials (a by-product of conservation management), harvested by Gatwick’s VRMs, they have been busy laying a hedge in our wildlife garden at Tilgate Park.

We have partnered with the South East Rivers Trust (SERT) twice to co-lead Community Eel Walks, two guided walks along the River Mole with a focus on the conservation and habitat requirements of the European eel.

We have run two evening events for the Crawley 5th Scout group, trapping and recording small mammals, and heading out under the cover of darkness with our bat detectors to see what we could find.

We delivered two days of events as part of the grand opening of Horsham District Councils Discovery Centre at Warnham Nature Reserve. One day included facilitating 48 children in discovering the amazing wildlife in Warnham’s ponds. The other event involved taking 10 of our regular Tilgate Wildlife Rangers plus some new attendees to explore this Horsham reserve and carry out some coppicing in the reed bed.

Community Eel Walk along the River Mole © Tom Simpson

Coming up in 2022

Following school grounds advice in 2021, we will be working with staff and volunteers at Maidenbower Junior School to restore their school pond. We will also be carrying out tree identification and mapping of natural regeneration, where a hedgerow planted by GGP more than five years ago has established well, with suckering trees spreading into an adjacent area left to be wild.

The Gatwick School has resumed a regular programme of forest school in the Gatwick Woodlands sites, facilitated by GGP.

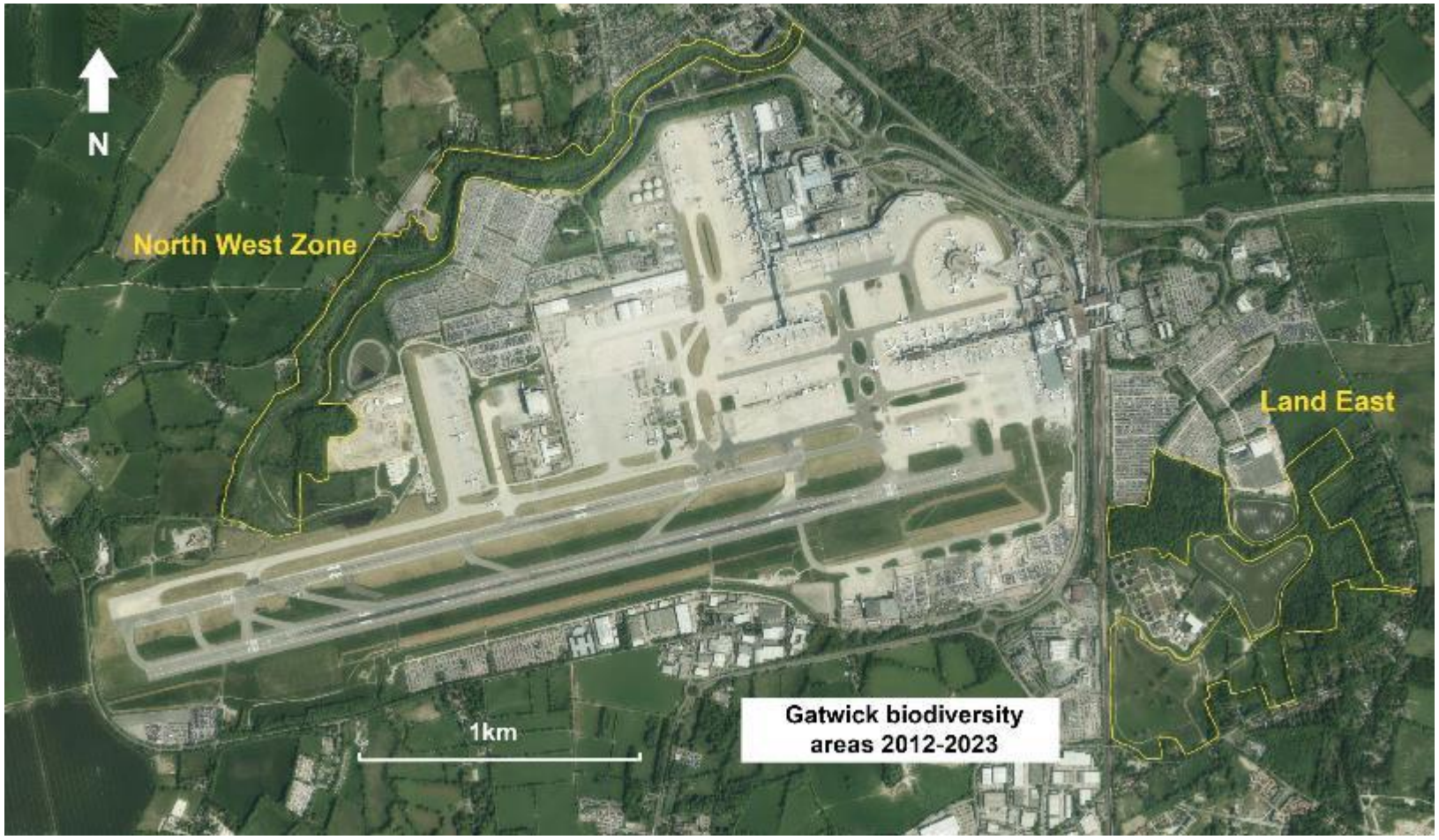
Gatwick volunteering continues with a busy schedule of conservation works into April. We are coordinating this delivery with the conservation schedule for Crawters Brook People's Park and our Digital Detox sessions. Spring and summer tasks are in high demand as many of the groups originally cancelled due to Covid-19 are looking to come back out.

[4] – LOOKING AHEAD TO 2022

Long-horned Bee *Eucera longicornis* in the North West Zone © Rachel Bicker

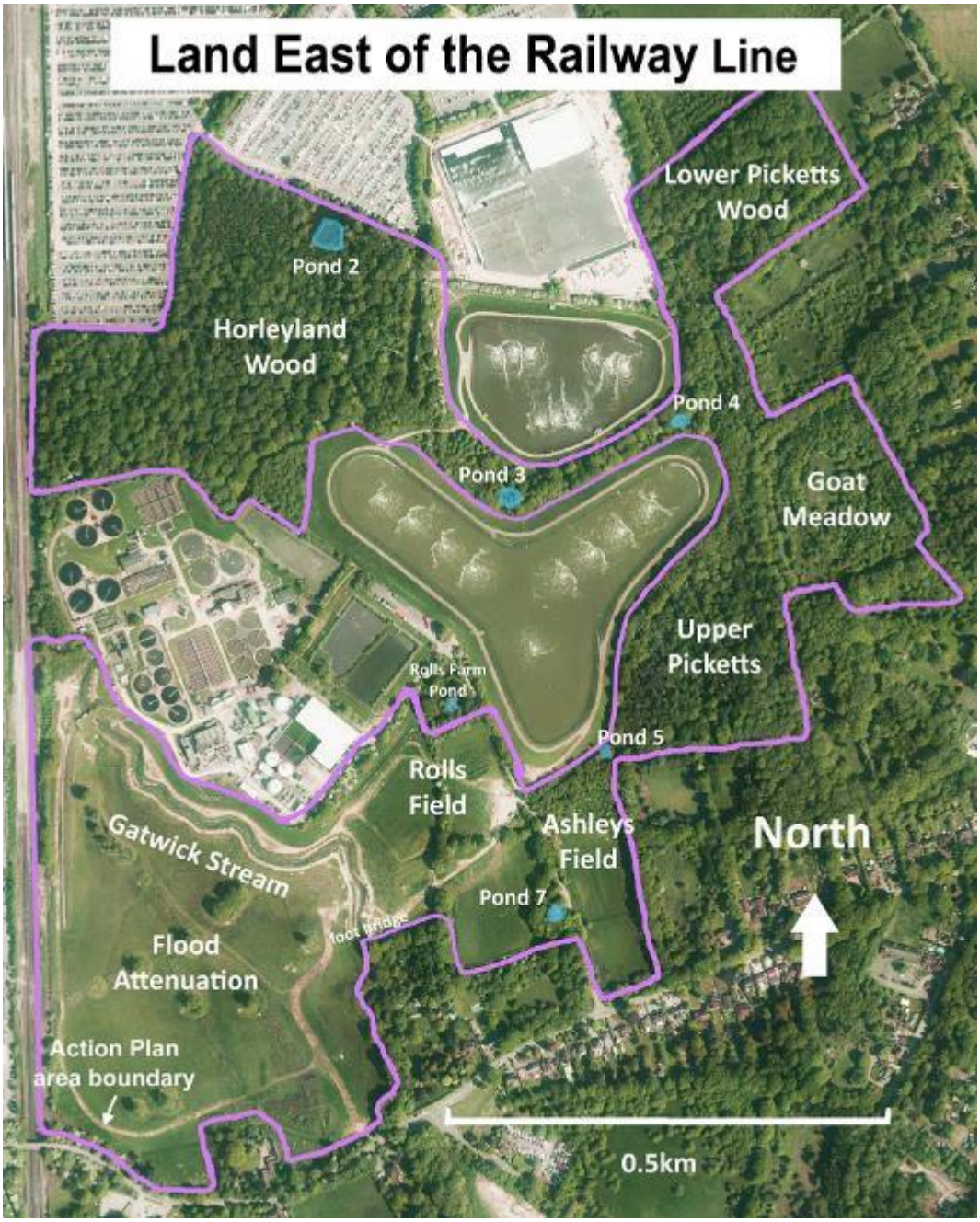
- Resuming our tours of Biodiversity sites for University of Sussex Conservation in Practice module
- Working with the grounds maintenance team to implement a seeding plan in spring for Gatwick's wildflower road verges enhancement project
- Protecting and enhancing the Pennyroyal conservation area at Pond F
- Resuming bat box maintenance and checks
- Further ringing of targeted bird species
- Repeating a baseline surveys of dragonfly populations on waterways within the biodiversity areas.

[6] – MAPS

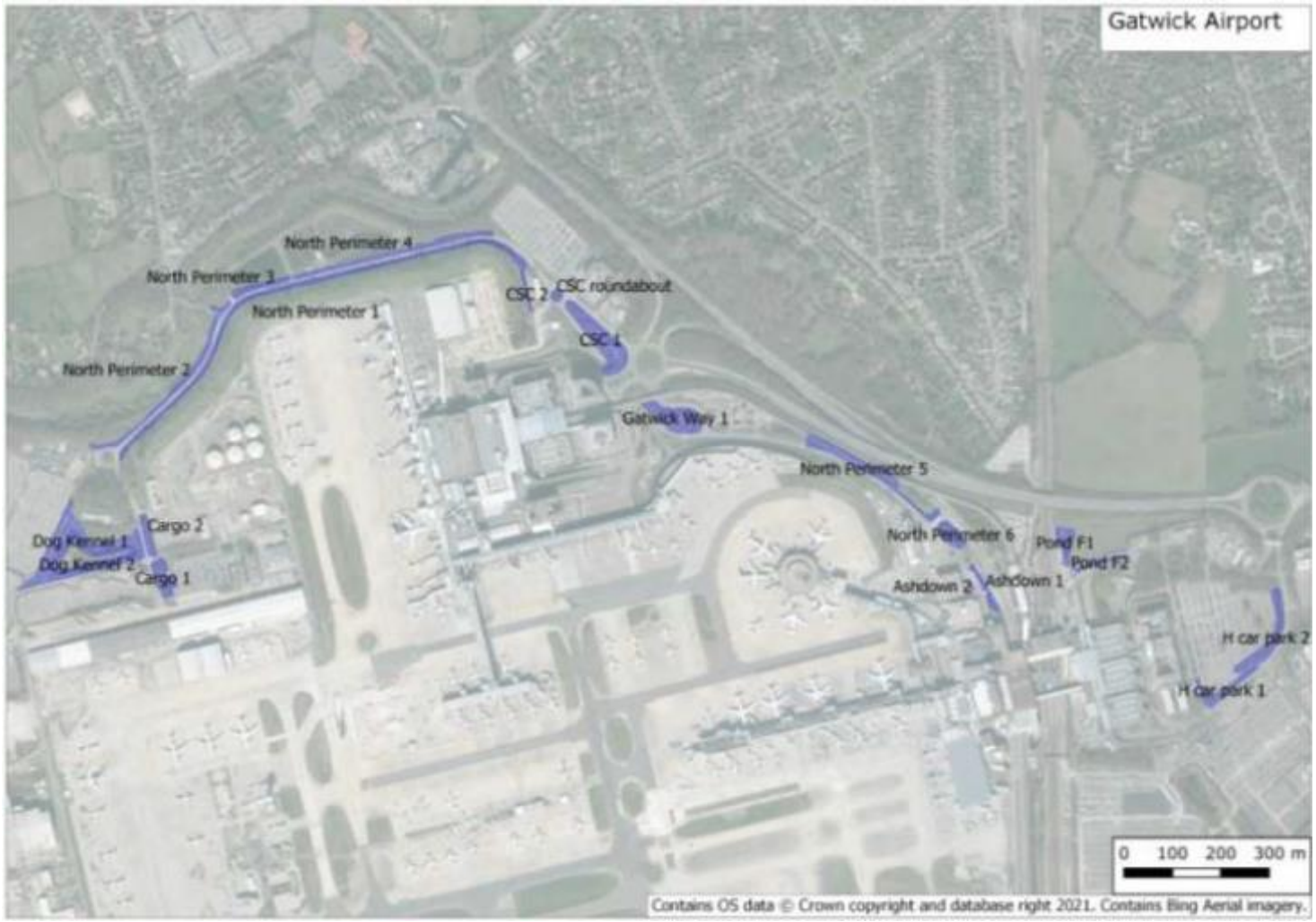


Map 1. Gatwick Airport biodiversity areas

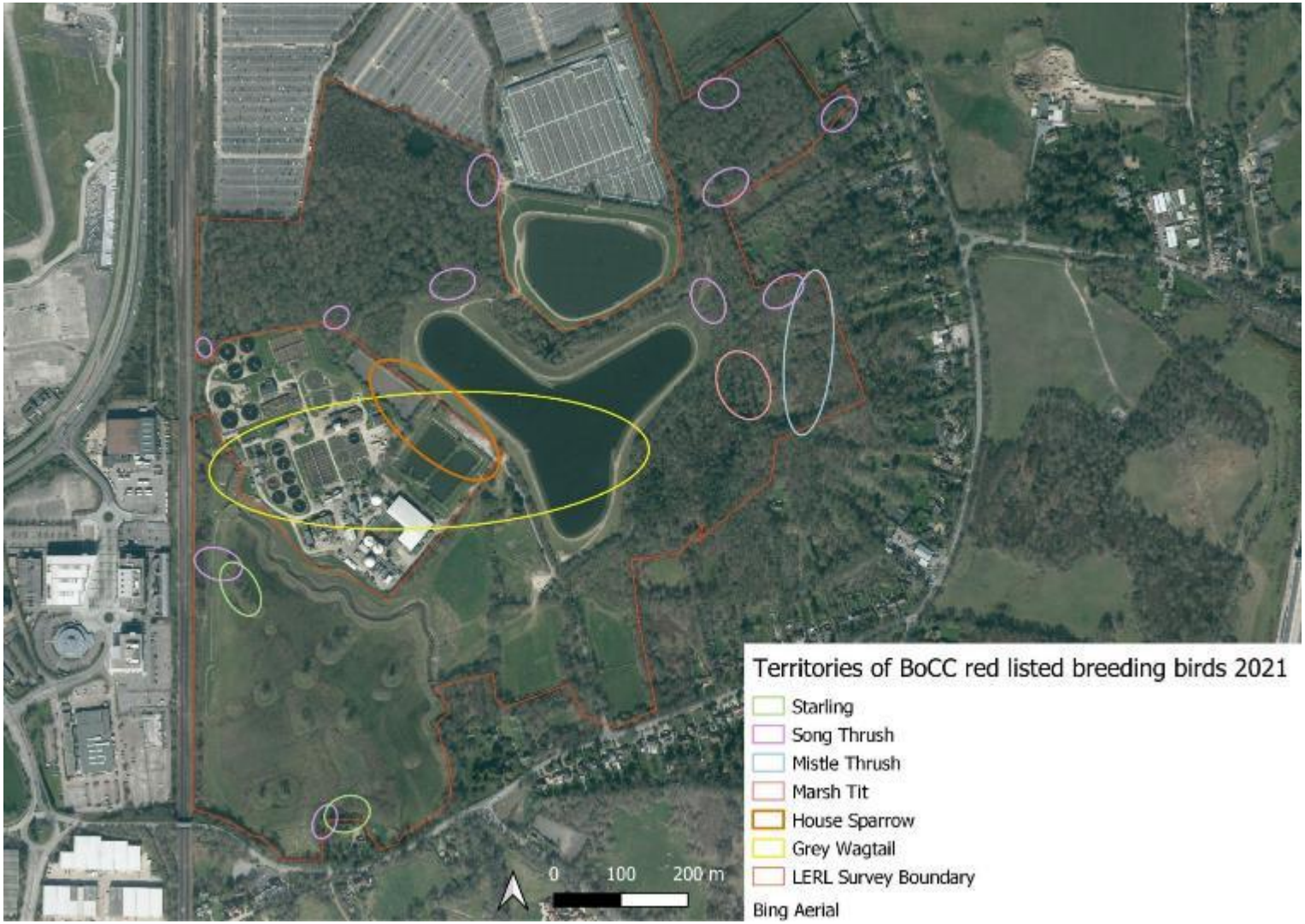
Map 2. North West Zone (Brockley Wood and the River Mole corridor) TQ2540



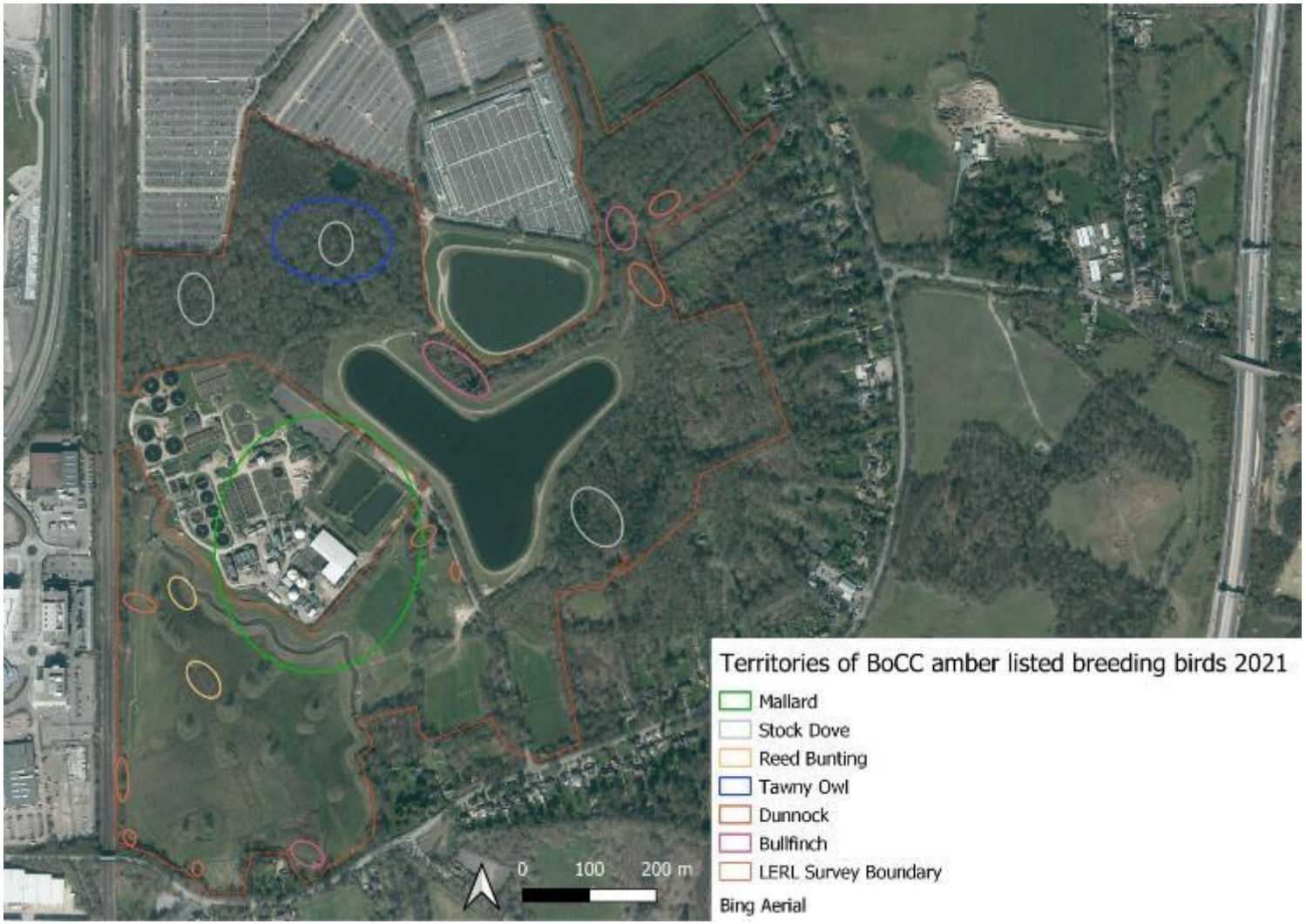
Map 3. Land East of the Railway Line (Gatwick Stream, Flood Attenuation and Gatwick woodlands) TQ2940



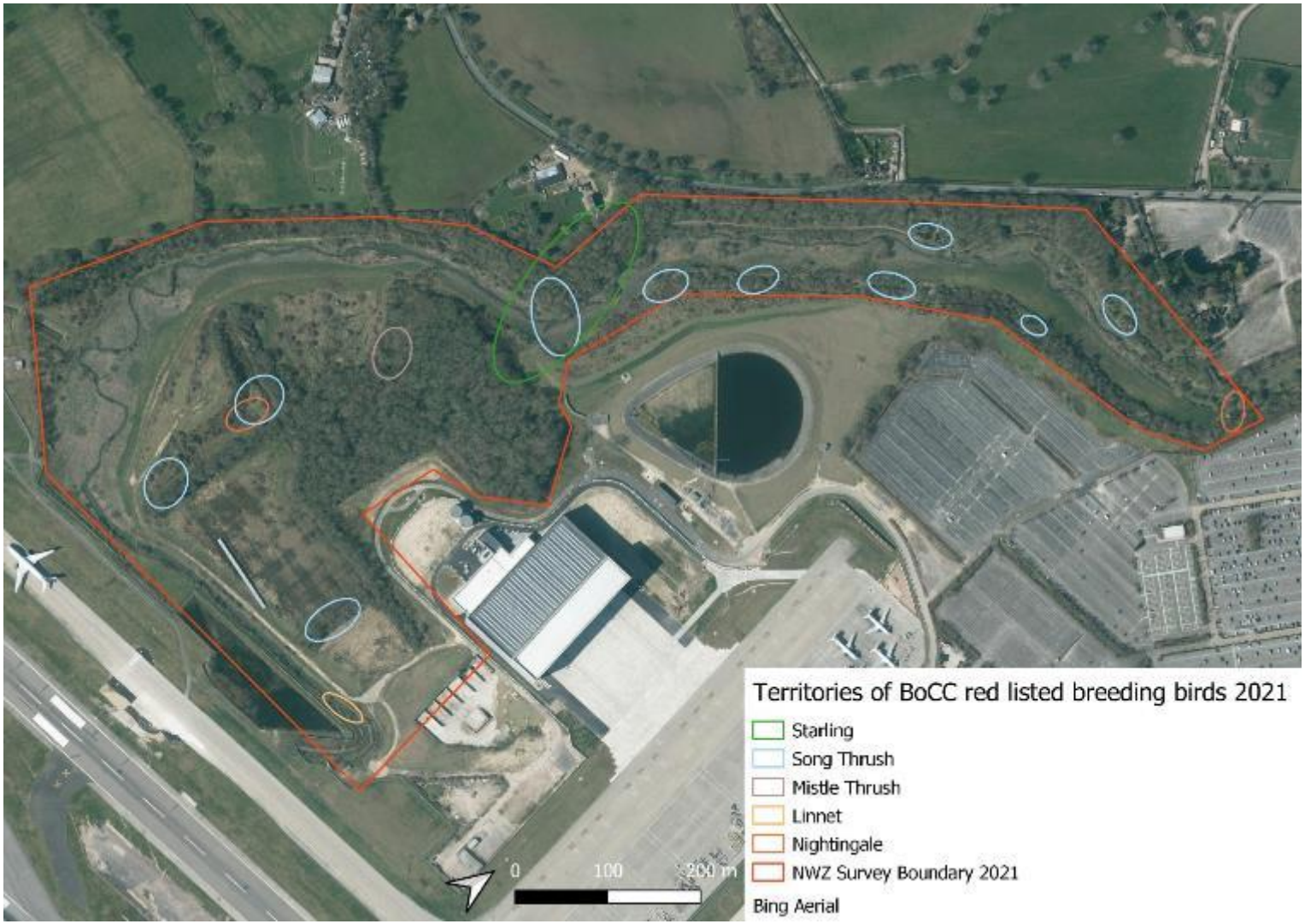
Map 4. Gatwick's wildflower road verges under an enhancement and monitoring programme



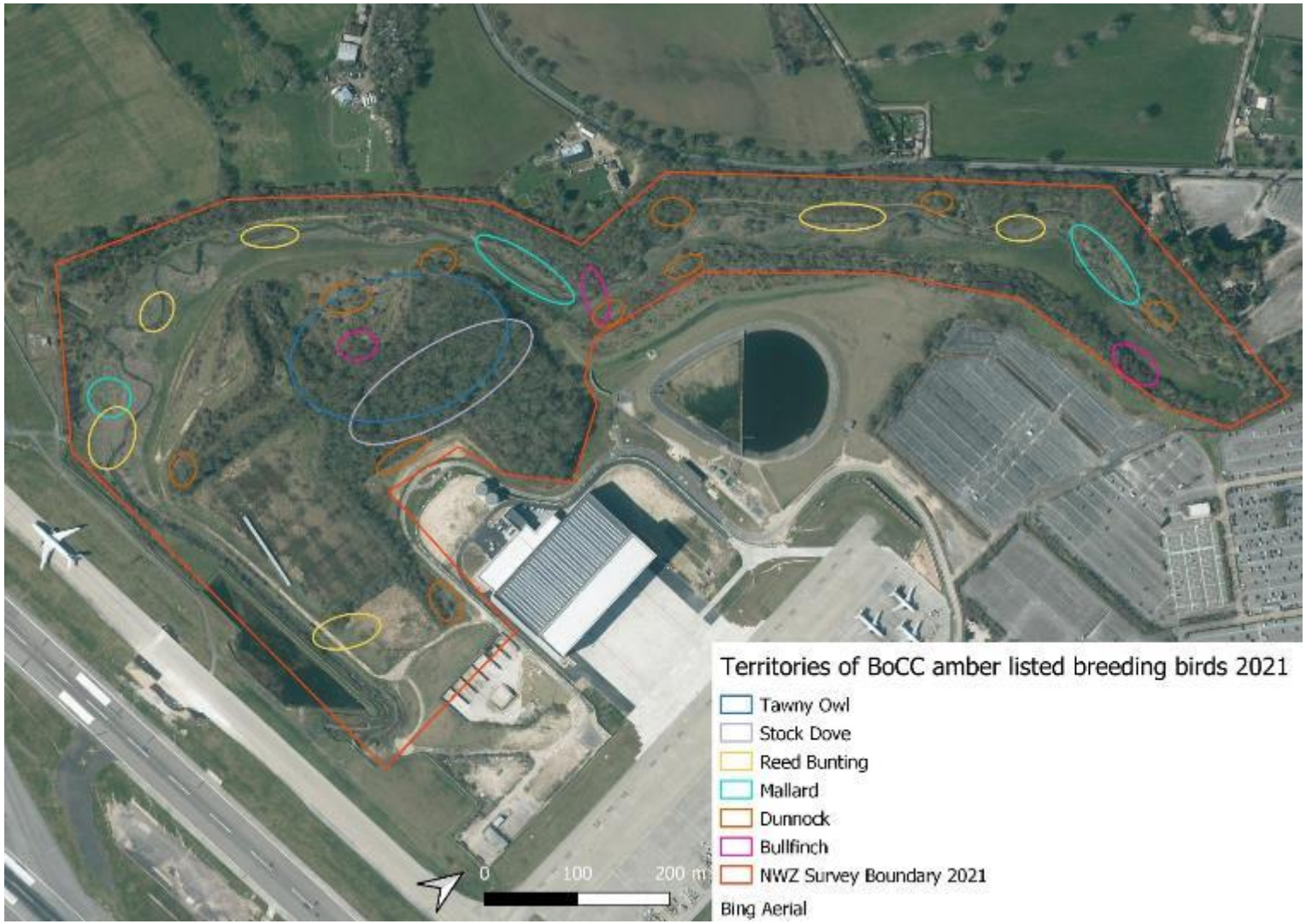
Map 5. LERL red listed breeding birds 2021



Map 6. LERL amber listed breeding birds 2021



Map 7. NWZ red listed breeding birds 2021



Map 8. NWZ amber listed breeding birds 2022