

Nature in Harmony 2023

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A report on the 'Nature in Harmony' flora and fauna surveys undertaken between April and September 2023 in the Diamond Wood and Harmony Woods, Andover, Hampshire.



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ABSTRACT

The 'Nature in Harmony' flora and fauna survey programme for Harmony Woods and the wider Diamond Wood in Andover, Hampshire, was established in 2020. Except for the results of a registered Butterfly Conservation Trust transect undertaken annually between 2016 and 2019, no historic data for wildlife on the site was available prior to this.

Bird, pollinator, and wildflower data is grouped into the west and east sides of the wood to reflect the difference in land management style between each side. An objective of the survey programme is to gain a better understanding of whether this difference in management style has led to any significant differences in biodiversity between each side. Andover Trees United has now secured the lease to manage the whole 44 acres.

Having a baseline data set is key in monitoring flora and fauna, as it allows for the identification of trends in species populations and ecological communities over time. Monitoring also allows for the identification of any invasive or competitive species, as well as any priority or at-risk species, which may require special attention.

This report builds upon the Nature in Harmony 2020, 2021, and 2022 reports.

Overall, the 2023 Nature in Harmony survey results can be summarised as follows:

- Bird species recorded: 20, including one Priority species
- Pollinator groups recorded (as per UKPoMS FIT Count categories): 9
- Wildflower species recorded: 45
- Butterfly species recorded: 18

ACKNOWLEDGEMENTS

I would like to thank:

The Andover Trees United Trustees for offering me the position of Ecology Intern and giving me this opportunity.

The volunteer survey assistants who gave up their free time to help with data collection in 2023: Andrew W., Patrick T., Shane P., Kiah D., Natalia V., Charlie H., and Sophie H.

Nature & Community Officer Abbey Sadler and ATU Trustee and former intern Alex Marshall for their support and advice during my internship.

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1. INTRODUCTION

The 'Nature in Harmony' surveying programme was established in 2020 by Andover Trees United, in order to gather a set of data for the flora and fauna present in their 12-acre community woodland Harmony Woods, and the wider Diamond Wood of which it is part. The site is former arable land on the northern edge of Andover in Hampshire.

In 2012 the 44-acre site was set aside by the Trinley Estate for a Queen Elizabeth II Diamond Jubilee Woodland, including 12 acres for the Andover Trees United (ATU) community planting project 'Harmony Woods'. Since then the site has been owned by Hampshire County Council, who engaged third-party contractors to undertake minimal management activities during the first three years but not since. ATU has continuously managed the 12-acre Harmony Woods section, and in 2022 formally finalised the lease to manage the entire 44 acres.

The site is bordered on three sides (north, east, and west) by arable fields, separated by mature hedgerow (except for a section of the north-east boundary), and to the south by the East Anton Sports Ground, which is adjacent to a large housing estate.

No historic wildlife data is available prior to 2020, except for the results of a registered UK Butterfly Monitoring Scheme (UKBMS) transect undertaken annually between 2016 and 2019. Although there is no historical data, it is assumed that before 2012, the biodiversity of flora and fauna would have been lower than it is today due to crop homogeneity.

Having a baseline data set is key in monitoring flora and fauna, as it allows for the identification of trends in species population and ecological communities over time. (Magurran et al., 2010.) Monitoring will also allow for the identification of any invasive or competitive species, as well as any Priority and at-risk species - both of which may require special attention.

n. The 'Nature in Harmony' project in 2020 provided the first baseline dataset of the site for other types of fauna and flora, set up methods for ongoing monitoring, and allowed the land managers (Andover Trees United) to make more informed decisions to better conserve their habitats and species. The project also provides ongoing opportunities for citizen science and community engagement in environmental education, which meets Andover Trees United's constituted aims.

Due to the differing ways in which Harmony Woods and the wider Diamond Wood have been managed, the site offers a unique opportunity to survey a piece of land that has been managed in two distinct ways.

The eastern end of the site was planted with native trees and sown with fescue grass in 2012/13, and since then has been left with very little land management input. It contains an area of mixed deciduous woodland, a hazel stand, and chalk grassland. The east also contains a main pathway running around the edge of the site as well as a gravelled Public Right of Way, and is used frequently by local residents from an adjacent housing development to walk their dogs.

The western end contains Harmony Woods, which is surrounded by two main pathways and has a number of smaller footpaths running through it. The pathways are similarly managed and used as those in the eastern end. However, the Harmony Woods section has been carefully managed since 2012 by Andover Trees United volunteers and the community of Andover, with the aims of nature conservation, environmental education, and nature connection. The wooded area has grown in succession with 1000 new native British trees planted by local school children each year between 2012 and 2021, rather than all being planted at once as was done in the east.

A number of smaller habitat areas have also been created within Harmony Woods, including a wildflower meadow (which is cut and raked on a yearly basis to mimic grazing), a wildlife pond, a chalk wildflower mound, a chalk scrape, and some 'pinch points' along one of the pathways to help reduce the size of the path and encourage more animals to migrate into the space.

The Diamond Wood site consists of Priority habitats including lowland deciduous woodland, hedgerow, lowland calcareous grassland, and chalk wildflower meadow.

Priority species (UK Post-2010 Biodiversity Framework, 2012) identified from the previous three Nature in Harmony wildlife survey seasons include: Skylark, Common Linnet, Corn Bunting, Yellowhammer, Grey Partridge, Swift, House Martin, Common Starling, Brown Hare, Small Heath butterfly, Small Blue butterfly, Marsh Fritillary butterfly, Forester moth, Argent & Sable moth, Galium Carpet moth, Speckled Footman moth, Dingy Mocha moth, Shoulder-striped Wainscot moth, Cinnabar moth, Garden Dart moth, White-line dart moth, White Ermine moth.

This report presents the results of year 4 of the 'Nature in Harmony' wildlife monitoring programme.

2. METHODS

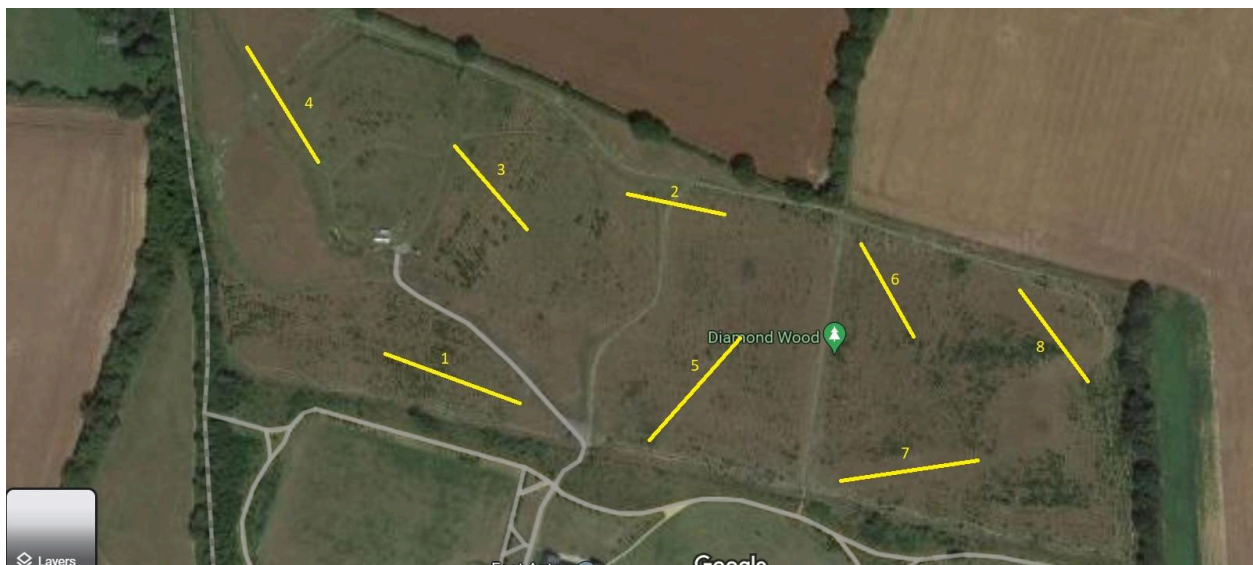
2.1 DATA COLLECTION

2.1.1 The Field Site

The Diamond Wood and Harmony Woods offer an opportunity to investigate a site where the two sides are managed in different ways. To compare the two sides and gain an insight into the impact that the differing management styles has had on the biodiversity of the site, the site was divided into East and West sides. Four 100m transects were placed across each side, making eight transects in total across the site, as seen below in Figure 1.

Each week two randomly selected transects were surveyed, one from the West and one from the East, for wildflowers, birds, and pollinators. In addition, butterfly data was collected from a butterfly transect in Harmony Woods.

Figure 1: Map of the Diamond Wood, showing the approximate locations of the 2023 transects.



2.1.2 Birds

A random number between 0 and 100 is generated and used as the point, in metres, along the selected transect at which a fixed-point bird survey will take place. At this point, the recorder stands for 15 minutes and notes down every bird sighted within the boundary of the Diamond Wood. Birds seen in flight are included, and binoculars can be used.

Abiotic data including date, time, and weather conditions are also recorded. Bird species as well as number of individuals are recorded, and care taken not to record the same individual twice (although this is an assumption).

2.1.3 Pollinators

For 2023 the pollinator survey method was changed to save time and to avoid the possibility of disturbance and of recording the same individual twice. In previous years the method has been to slowly walk the 100m transect and record pollinators seen within a 2.5m band either side of the centre line (5m-wide band total). The method was changed to a 10-minute fixed-point survey, as per the UK Pollinator Monitoring Scheme's (UKPoMS) Flower-Insect Timed Count (FIT Count), no date.

A random number between 0 and 100 is generated and used as the point, in metres, along the selected transect at which the FIT Count will take place. The recorder selects the flower closest to this point (or group of flowers of the same species), and stands for 10 minutes and records pollinators seen visiting the flower.

Due to the 2023 lead surveyor's low knowledge level regarding pollinators, they were recorded to group level rather than species level, again as per the UKPoMS FIT Count methodology. The FIT Count groups are as follows: Bumblebees, Honeybees, Solitary bees, Wasps, Hoverflies, Other flies, Butterflies and moths, Beetles (>3mm), Small insects (<3mm, e.g. pollen beetles, aphids), and Other insects (e.g. shield bug).

Abiotic data including date, time, and weather conditions are also recorded. Number of individuals as well as insect groups are recorded, and care taken not to record the same individual twice (although this is an assumption).

2.1.4 Wildflowers

A random number between 0 and 5 is generated and used as the starting point, in metres, along the selected transect. At the starting point, recorders place a 50x50cm quadrat (divided into 25 squares) on the ground on the left- or right-hand side of the transect. Then the approximate percentage of grass cover is noted. Species of wildflower within the quadrat are recorded along with the number of squares each appears in. Any unsure observations are looked up in an ID guide or photographed for later analysis. The process is repeated at 5m intervals.

2.1.5 Butterfly Transect

Butterflies are recorded in a fixed width band (typically 5m wide) along the transect each week. Even when there is a count of 0 butterflies this is recorded.

Figure 2: Map of the Butterfly Transect route and sections



2.1.6 All Other Observations

Species seen or heard within the Diamond Wood outside of the official Nature in Harmony survey sessions, are listed in Appendix 5 at the end of this report.

2.2 TRANSECT HABITAT DESCRIPTIONS

Transect 1: Open grassland moving into a densely wooded area. Grass in between young trees was tall, dense, and matted. Final ~20m or so of the transect became impassable once trees were in full leaf so the route had to deviate. Contains and crosses no footpaths or rides, so possibly least-disturbed of all 2023 transects, but sees occasional footfall from dogs, dog-walkers, and foragers.

Transect 2: Straddles main south-north grassy ride in the centre of the site and therefore both East and West sides of site. Starts at Harmony Woods eastern boundary fence and goes east across the main ride and into the area planted in 2012. Young trees and grassland. Within the area where dogs are allowed off-lead.

Transect 3: Starts near the wildflower meadow and crosses a grassy ride, then moves into an area of planted trees and grasses - so takes in managed and unmanaged areas. Trees still quite young so not too tall or dense, but the end of the transect is in close proximity to a stand of silver birch. The grass in between the trees is not managed (mown) so is tall, thick, and matted. This provides great habitat for invertebrates and small mammals but will prevent light from reaching other plants.

Transect 4: Very open, following a straight footpath starting from the Habitats Trail gate. Surrounded by grassland and very young trees, the final section of the 10-year Harmony Woods community planting project. One slightly more mature tree and some shrubs are located along the path. Includes an intersection with a wide grassy ride. Nearby areas are planted with wildflowers.

Transect 5: Starts at corner of 'Princess Anne's Tree Enclosure', crosses footpath, goes into area of grasses and young trees planted in 2012. Within the area where dogs are allowed off-lead. First section by the enclosure used to see a high level of footfall before the fence was constructed to allow the ground vegetation to regrow, but now very little.

Transect 6: Starts at the gravelled Public Right of Way, goes into grassland and trees planted in 2012. Density of trees varies, some areas are more open than others.

Transect 7: Very open, through grassland that has been set aside to become a wildflower meadow to be created in 2024 and beyond. Starts at the edge of one of the large hazel thickets, crosses a footpath, and ends at another hazel thicket.

Transect 8: Open, starts at the edge of a wooded area near the eastern boundary of the site (where there are lots of mature trees), moves across grassland, crossing a footpath or two, ending at the northern boundary of shrubs and young trees. Trees sparse, planted in the nearby thickets rather than in this area of grassland.

2.3 STATISTICAL ANALYSIS

2.3.1 Birds, Pollinators, and Wildflowers

The number of different species or groups recorded on each transect for each survey was summed to give diversity. An average was then calculated from these values, giving the average number of different species or groups recorded on each transect over the duration of the survey season.

The diversity values were allocated between 'west' and 'east' groups. The 'west' group contains data collected from transect 1, 2, 3 & 4. The 'east' group contains data collected from transects 5, 6, 7 & 8.

Google Sheets was used to produce all tables and graphs and calculate totals and averages on all datasets.

2.3.2 Butterflies

Google Sheets was used to produce all tables and graphs and calculate totals and averages on all datasets.

3. RESULTS AND DISCUSSION

Please note that for all results, the Western side of the site contains data from transects 1, 2, 3, and 4, and the Eastern side of the site contains data from transects 5, 6, 7, and 8. Birds, Pollinators, and Wildflowers were recorded on each of the 8 transects once per month between the start of April and the end of September, so 6 times per transect and 48 surveys total per category.

Results for fauna could be influenced by weather conditions before and during a survey. Generally, animals are less likely to be out in cold, wet, or windy weather (Elkins, N., 2010). Also, birds are most active in the early mornings (Yousaf et al., 2020), many butterflies only fly when it is warm and dry (WallisDeVries et al., 2011), and invertebrates will be higher in number following damp or wet weather (Barnett and Facey, 2016) than during a period of hot, dry days which leave the habitat of the ground parched and hard. These conditions could contribute to the taxa seen on any given day of data collection and should be considered when interpreting the results.

Finally, the quality of the data collected in any given year is affected by the level of knowledge and experience of the lead recorder and survey assistants. The Nature in Harmony lead recorder changes each year and this should be considered when interpreting the results.

4.1 BIRDS

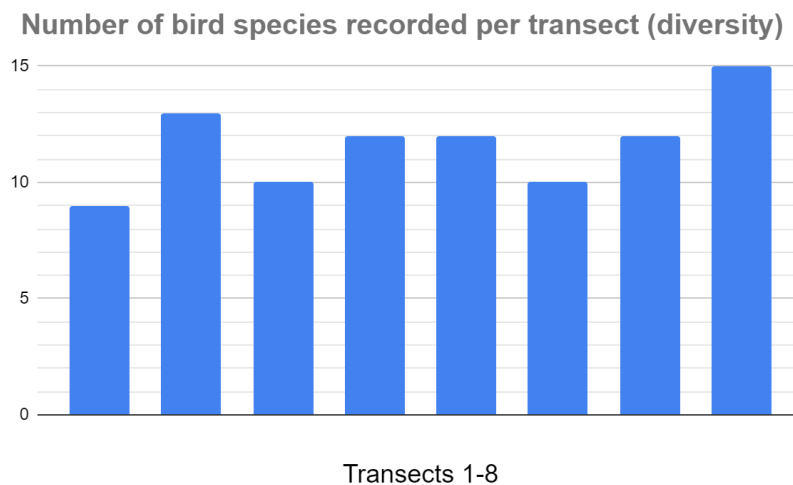
Table 1 (below): The species of bird and number of individuals of each species recorded on transects in the West side, East side, and the whole of the Diamond Wood between April and September 2023.

BIRDS 2023	Species and number of individuals recorded in each transect										
	T1	T2	T3	T4	TOTAL WEST	T5	T6	T7	T8	TOTAL EAST	WHOLE WOOD
Blue tit	0	2	0	1	3	0	0	0	1	1	4
Buzzard	0	0	0	1	1	0	0	4	0	4	5
Carrion crow	2	6	3	1	12	18	9	9	8	44	56
Chaffinch	0	0	1	0	1	0	0	0	0	0	1
Corvid spp	0	0	0	0	0	50+	0	0	0	50+	50+
Finch spp	0	14	7	3	24	10	19	9	6	44	68
Goldfinch	4	5	20	3	32	7	2	12	12	33	65
Green woodpecker	0	0	0	0	0	0	0	1	0	1	1
Gull spp	2	2	2	1	7	3	0	1	1	5	12
House martin	0	0	0	0	0	0	0	0	2	2	2
Jackdaw	0	5	20	0	25	1	3	3	4	11	36
Magpie	2	3	0	5	10	0	4	4	2	10	20
Red kite	1	2	4	5	12	2	1	3	3	9	21

Rook	0	0	0	0	0	0	5	0	4	9	9
Skylark	1	14	8	1	24	9	5	5	5	24	48
Starling	0	12	0	0	12	1	0	1	6	8	20
Swallow	1	7	0	2	10	5	0	0	7	12	22
Swift	4	1	2	3	10	6	1	0	0	7	17
Woodpigeon	13	17	20	22	72	18	16	24	20	78	150
Yellowhammer	0	0	0	0	0	0	0	0	1	1	1
TOTAL SPECIES (diversity)	9	13	10	12	15	12	10	12	15	19	20
TOTAL INDIVIDUALS	30	90	87	48	255	130	65	76	82	353	608

In total, 20 species of bird were recorded over the eight transects. 15 species were recorded in the Western half of the wood, and 19 species were recorded in the Eastern half, as seen in Table 1 above.

Figure 3 (below): Number of bird species recorded per transect over the 2023 season (diversity)



To maintain consistency with the previous reports I have included the total individuals recorded (see Table 1), however the high numbers of some species may not be an accurate reflection of the numbers consistently using the site (e.g. 150 Woodpigeons and 21 Red Kites). This could be because very few bird individuals were seen landing within the site but rather flying over and potentially some could have been counted more than once especially over the six-month survey season. Therefore I am also including the maximum number of each species seen together at any one time - see Figure 3 on the following page.

In contrast to 2022, this year the East side of the site had higher numbers of most species, particularly Carrion Crow (44 East, 12 West), while the West side had significantly higher numbers of Jackdaw (25 West, 11 East). All other bird species were recorded with a difference of between 0 and 6 individuals between each side of the wood. Green Woodpecker, House

Martin, Rook, and Yellowhammer were not recorded in the West, while Chaffinch was the only species not recorded in the East.

The only Priority bird species, as given in the UK BAP Priority Species List, 2007, recorded in the Diamond Wood in 2023 is Skylark. This year there was no difference in the numbers of Skylark recorded in the East and West sides of the site.

Green Woodpecker was recorded for the first time (see Appendix 1 for a year-on-year comparison of species recorded). The 7 species that were recorded in 2022 but not in 2023 are: Blackbird, Collared Dove, Great Tit, Greenfinch, Kestrel, Linnet, and Pheasant.

Figure 4 (below): The highest number of individuals recorded in a single observation in 2023, per species of bird

Highest count in a single observation per species of bird, 2023

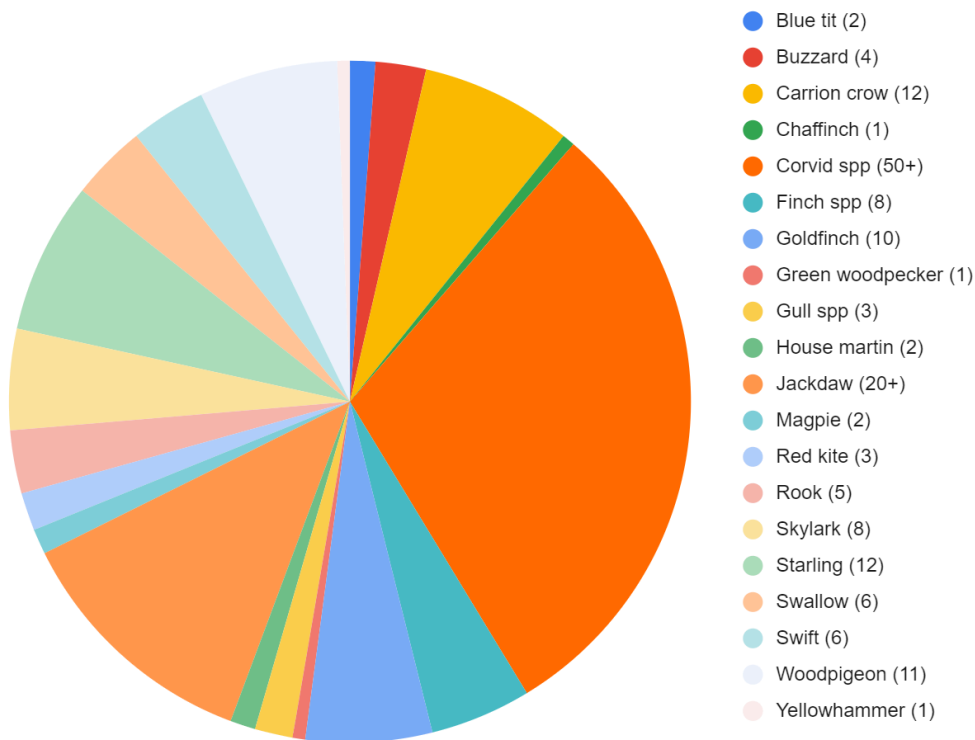


Figure 5 (below): Species and numbers of birds recorded per month over the 2023 survey season

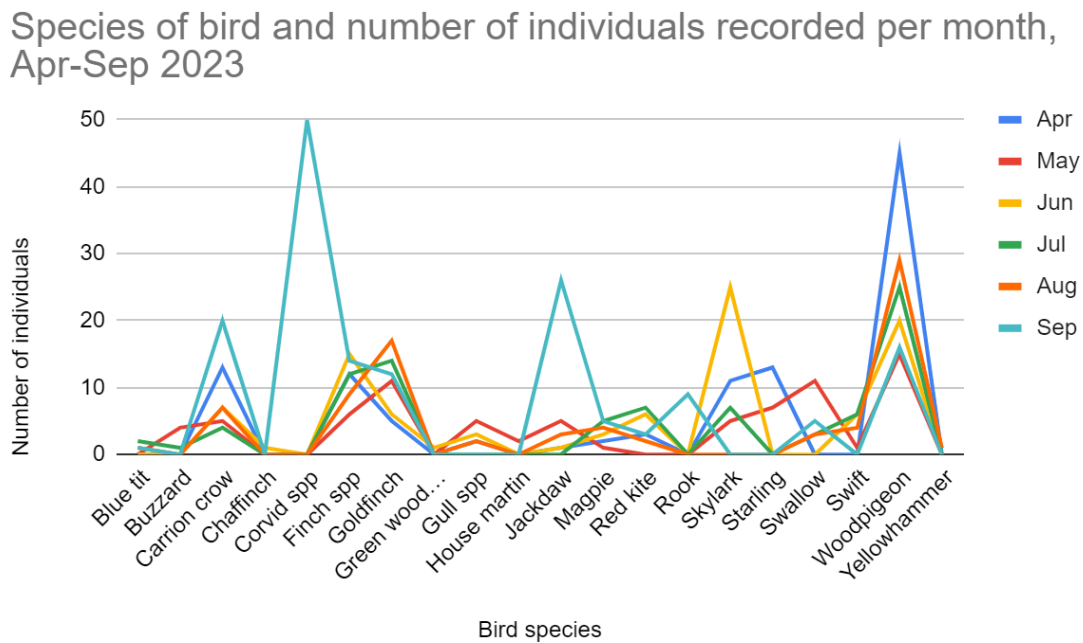


Table 2 (below): Species and number of birds recorded per month over the 2023 season

BIRDS 2023	Species and number of individuals recorded per month					
	Apr	May	Jun	Jul	Aug	Sep
Blue tit	0	0	0	2	1	1
Buzzard	0	4	0	1	0	0
Carrion crow	13	5	7	4	7	20
Chaffinch	0	0	1	0	0	0
Corvid spp	0	0	0	0	0	50+
Finch spp	12	6	15	12	9	14
Goldfinch	5	11	6	14	17	12
Green woodpecker	0	0	1	0	0	0
Gull spp	2	5	3	0	2	0
House martin	0	2	0	0	0	0
Jackdaw	1	5	1	0	3	26
Magpie	2	1	3	5	4	5
Red kite	3	0	6	7	2	3
Rook	0	0	0	0	0	9
Skylark	11	5	25	7	0	0
Starling	13	7	0	0	0	0
Swallow	0	11	0	3	3	5
Swift	0	1	6	6	4	0

Woodpigeon	45	15	20	25	29	16
Yellowhammer	0	0	0	0	1	0
TOTAL SPECIES	10	13	12	11	12	11
TOTAL INDIVIDUALS	107	78	94	86	82	161

There was little difference in the number of species recorded per month, varying between 10 and 13. The highest number of individuals was recorded in September (161), however this number includes large numbers of corvids - a large flock of 50+ corvids, a flock of 20+ Jackdaws, and 20 Carrion Crows. The second-highest total of individuals was recorded in April, when birds are very active feeding, attracting mates, and gathering nesting materials.

April saw the highest number of Woodpigeons recorded (11 at once, 45 total), while September had very high numbers of the black corvid species (105 total). The highest numbers of Skylark were recorded in June (8 at once, 25 total). 5 species were recorded in every month of the survey season: Carrion Crow, Goldfinch, Magpie, Woodpigeon, and Finch Spp - the latter being small passerines such as Blue Tit, Great Tit, Goldfinch, Sparrow, Linnet (all of which have been recorded this year or in previous years) but were unable to be clearly identified to species level. Only one individual of Chaffinch, Green Woodpecker, and Yellowhammer was recorded.

See Appendix 1 for a year-on-year comparative list of bird species recorded. (Please note I have not included “Corvid spp” recorded in 2023 in Appendix 1 comparing the species recorded each year, because the black corvid species of which it comprises (Carrion Crow, Jackdaw, and Rook) are all otherwise present in 2023.)

This year, 20 different species of bird with a total of 608 individuals were recorded. This is an increase in individuals but a decrease in species compared to the previous three years. See Table 3 below for the comparison. For consistency with the previous Nature in Harmony reports, which contained the Average Diversity (number of species recorded per transect per survey) for East and West, I have also included those figures in this table.

Table 3: At-a-glance annual comparison of the number of bird species and individuals recorded in the East side, West side, and over the whole site

Year-on-year comparison of birds recorded				
	2020	2021	2022	2023
Species recorded (diversity) - whole wood	29	24	21	20
Individuals recorded - whole wood	660	434	388	608
Species recorded - West	29	23	20	15
Species recorded - East	23	17	16	19
Average diversity West	7.63	7.5	5.93	4.08
Average diversity East	5.18	6.29	5.89	4.92

The increase in individual numbers may be due to the fact that bird surveys were conducted on a higher number of occasions than in previous years, but the decrease in species could be down to the lower knowledge and experience level of the 2023 lead surveyor. This year's data also includes a flock of 20+ Jackdaws and a large flock of 50+ mixed black corvids, which increases the number of individuals significantly. This is potentially an outlier and could therefore be removed, when comparing data sets in the future.

For the first time, more species were recorded in the East side of the site (19) than in the West (15). Although Andover Trees United in their management of the West side have created a number of different habitats in order to attract a wider range of species, there is a higher level of human activity there than in the East side, potentially leading to more disturbance of birds (Price, M., 2008). The East side also contains a very large dense stand of hazel where small birds can shelter, nest, feed, and perch with little disturbance, as well as more mature trees on the site boundary (Yousaf et al., 2020). It is also in closer proximity to the adjacent sports fields, immediately to the south of the site, where flocks of corvids and gulls are frequently seen foraging, and to the adjacent agricultural field to the north and wider countryside beyond.

4.2 POLLINATORS

Table 4 (below): The pollinator groups and numbers in each group recorded on transects in the West side, East side, and the whole of the Diamond Wood between April and September 2023.

POLLINATORS 2023	Pollinator groups and number of individuals recorded in each transect										
	T1	T2	T3	T4	TOTAL WEST	T5	T6	T7	T8	TOTAL EAST	WHOLE WOOD
Beetles	9	0	4	1	14	10	18	2	6	36	50
Bumblebees	2	0	0	0	2	0	0	1	0	1	3
Butterflies and moths	2	3	3	0	8	0	1	2	0	3	11
Hoverflies	2	22	3	3	30	7	13	7	8	35	65
Other flies	1	1	4	2	8	3	2	3	4	12	20
Other insects	1	0	0	0	1	3	0	0	9	12	13
Small insects (<3mm)	0	0	0	4	4	0	3	0	0	3	7
Solitary bees	1	1	1	2	5	2	2	2	5	11	16
Wasps	0	0	0	0	0	1	0	0	2	3	3
TOTAL GROUPS (diversity)	7	4	5	5	8	6	6	6	6	9	9
TOTAL INDIVIDUALS	18	27	15	12	72	26	39	17	34	116	188

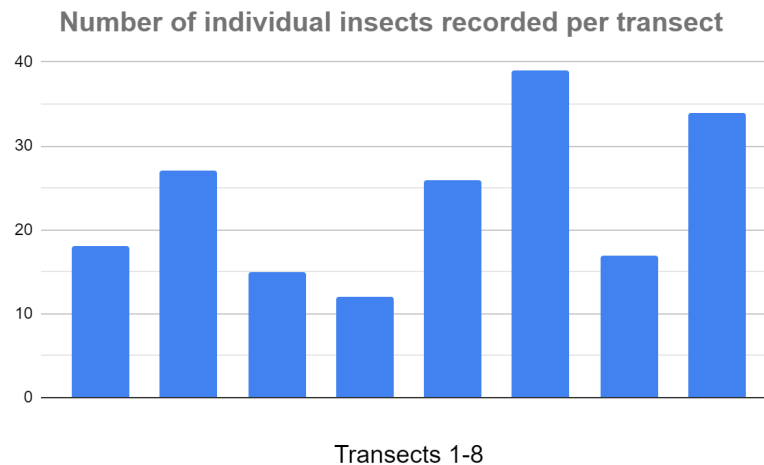
In total, 188 individuals across 9 pollinator groups were recorded over the eight transects. 8 groups were recorded in the Western half of the wood, and all 9 groups were recorded in the Eastern half, as seen in Table 5 above.

While the number of groups is higher than in previous years, this is a significant reduction in individual numbers from 2022 and 2020 - 308 and 603 respectively - although higher than the 139 recorded in 2021. With 48 pollinator surveys conducted over the 2023 season this is an average of 4 individuals recorded per survey (rounded to the nearest whole number). These lower numbers are likely due to the fact that the survey methodology used in 2023 was different to previous years, with a much shorter timeframe and smaller area surveyed. See [section 2.1.3](#) for more detail and reasons why this was done. Also, for many of the surveys in 2023 the selected flowers covered less than half of the 50x50cm quadrat area; in many cases it was just one or two individual flowers - providing less food for the pollinators than higher-density areas.

The group with the highest number of individuals recorded across the whole site was Hoverflies (65), followed by Beetles (50). The groups with the lowest numbers recorded were Wasps and Bumblebees, both at 3 individuals each, followed by Small Insects at 7 individuals.

Transect 1 had the highest number of groups at 7, while Transect 2 had the lowest number of groups at 4. All transects in the East - T5, T6, T7, and T8 - all had 6 groups, and Transects 3 and 4 in the West both had 5 groups. Transect 6 had the highest number of individual insects at 39, and Transect 3 the lowest at 15. (See Figure 5 for a chart of the number of individuals recorded per transect.)

Figure 6 (below): Number of individual pollinators recorded per transect over the 2023 season



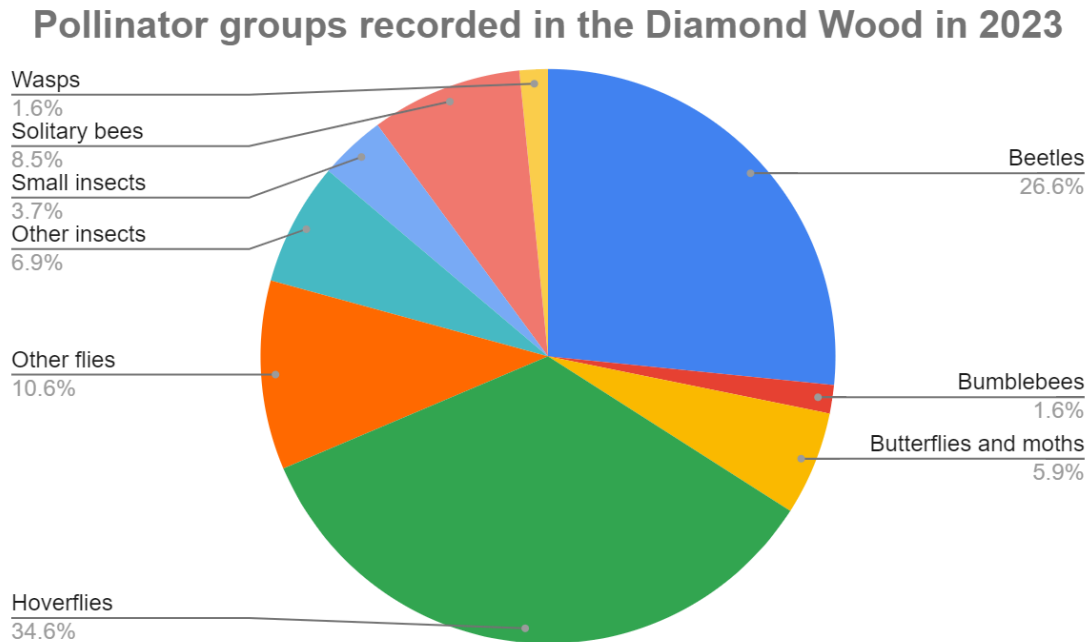
In contrast to 2022, this year the East side of the site had higher numbers of most groups than the West, particularly Beetles (36 East, 14 West). All groups were recorded in the East, but Wasps was the only group not recorded in the West.

Although the previous 3 surveys have identified pollinators to species level, I looked back at the reports and collected the species into groups to be able to make a comparison with this year. See Table 7 for the comparison.

For the first time, more groups and individuals were recorded in the East side of the site (9 and 116, average diversity 1.46) than in the West (8 and 72, average diversity 2.25). Although a number of different habitats have been created by the charity in the West side in order to attract a wider range of species, there is a higher level of human activity there than in the East side, potentially leading to more disturbance (Winfrey et al., 2009). The transects also did not take in these specifically-created habitats, but some of the more unmanaged areas where grasses are thick and matted. The East side also included a particularly large area of thistles - a very attractive food plant for pollinators (Balfour and Ratnieks, 2022) - along Transect 5.

This year the only type of insect recorded under “Other insects” were shield bugs.

Figure 7 (below): Pollinator groups recorded across the Diamond Wood over the 2023 season



Due to pollinators only being recorded to group rather than species level, it is not possible to know whether any Priority insect species, as given in the UK BAP Priority Species List, were recorded in the Diamond Wood in 2023.

Out of the FIT Count groups, Honeybees was the only group not recorded in 2023. This may be down to the identification skill of the lead surveyor.

Figure 8 (below): Pollinator groups and number of individuals recorded per month over the 2023 season

Pollinator groups and number of individuals recorded per month, Apr-Sep 2023

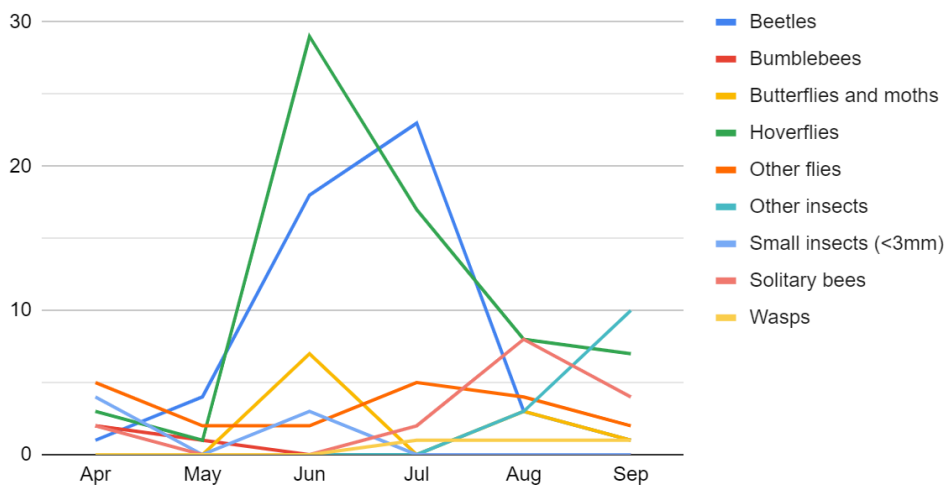


Table 5 (below): Pollinator groups and individuals recorded per month over the 2023 season

POLLINATORS 2023	Pollinator groups and number of individuals recorded per month					
	Apr	May	Jun	Jul	Aug	Sep
Beetles	1	4	18	23	3	1
Bumblebees	2	1	0	0	0	0
Butterflies and moths	0	0	7	0	3	1
Hoverflies	3	1	29	17	8	7
Other flies	5	2	2	5	4	2
Other insects	0	0	0	0	3	10
Small insects (<3mm)	4	0	3	0	0	0
Solitary bees	2	0	0	2	8	4
Wasps	0	0	0	1	1	1
TOTAL GROUPS	6	4	5	5	7	7
TOTAL INDIVIDUALS	17	8	59	48	30	26

3 of the 9 groups were recorded in every month of the survey season: Beetles, Hoverflies, and Other Flies. The highest number of pollinators was recorded in June (59), followed by July (48). May had the lowest number of groups and individuals at just 4 and 8 respectively. While the weather could affect pollinator activity - being cold-blooded, they need the warmth from the sun and so are less likely to be out or very active in cold, very wet, or windy weather (Mellanby, K., 1939) - there is no clear reason for such a low number of individuals over the month. For the days when surveys took place, April was wetter than May, however the weather conditions recorded are subjective and terms such as “cloudy”, “mild”, “breezy”, “rain” can vary in meaning from day to day.

Table 6: At-a-glance annual comparison of the pollinator groups recorded in the East side, West side, and over the whole site

Year-on-year comparison of pollinator groups recorded				
	2020	2021	2022	2023
Groups recorded (diversity) - whole wood	5	6	7	9
Individuals recorded - whole wood	603	139	308	188
Groups recorded - West	5	6	7	8
Groups recorded - East	4	6	7	9
Average diversity - West				1.46
Average diversity - East				2.25

Please note that I have left out the Average Diversity figures for 2022, 2021, and 2020, due to the fact that the 2023 identification of pollinators was done to group rather than species level, when in previous years it was done to species level, so the figures would not be comparable.

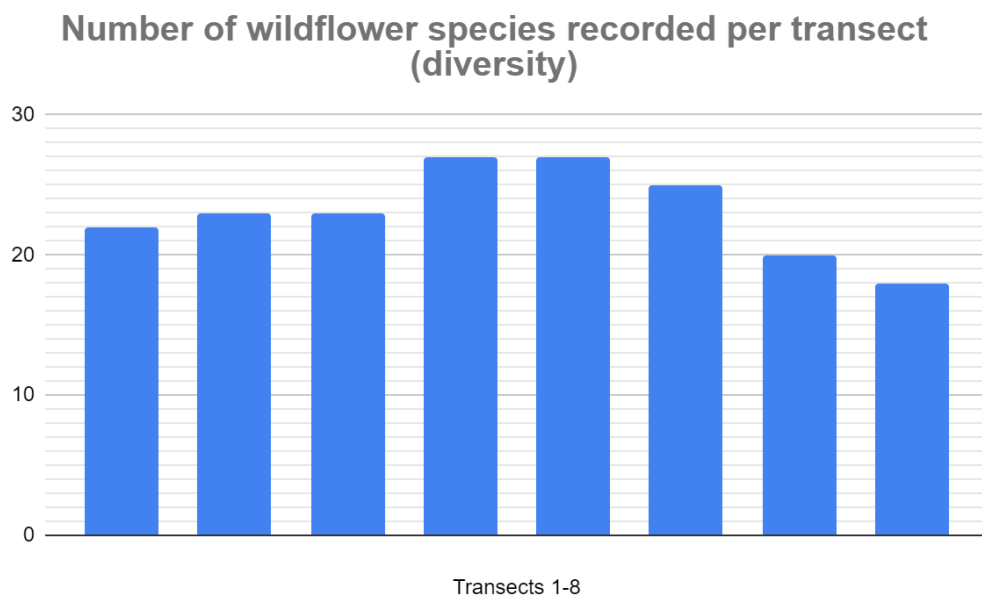
See Appendix 2 for a year-on-year comparative list of pollinator groups recorded.

4.3 WILDFLOWERS

In total, 45 species of wildflower were recorded over the eight transects. 37 species were recorded in the Western half of the wood, and 36 species were recorded in the Eastern half, as seen in Tables 7 and 8 below.

This is a reduction from previous years: 50 species in 2022, 55 in 2021, and 58 in 2020. (These figures do not include grasses, moss, and bare earth, which were recorded in previous years; I have looked back at the previous reports and counted wildflowers only.) However, the 2023 lead surveyor's knowledge level and capacity among other workloads for spending time identifying species from photographs taken while surveying, was lower than those in previous years.

Figure 9: Number of wildflower species recorded per transect over the 2023 season (diversity)



The most abundant wildflower species over the whole site was Dandelion Spp (a range of yellow Asteraceae including Dandelion, Hawkbit, Hawk's-beard, etc.), which was recorded in 3130 boxes. ("Boxes" refers to the 25 squares within the 50x50cm quadrat used for the surveys.) However, if 'Clover - Red' and 'Clover - White' are added to the second-most abundant 'Clover Spp' then clover becomes the most abundant overall, in 3879 boxes.

Ribwort Plantain was the most abundant species recorded in the West (2241 boxes), and Dandelion Spp was the most abundant species in the East (1655 boxes). The least-abundant wildflowers, recorded in less than 10 boxes over the whole site, were Agrimony (9), Bindweed (6), Bristly Ox-tongue (2), Centaury (1), Common Nettle (5), Common Sorrel (8), Forget-me-not (2), Great Mullein (3), Pyramid Orchid (1), Scarlet Pimpernel (1), and Speedwell Spp (8).

None of the wildflower species recorded are UK BAP Priority species.

The six species recorded for the first time in 2023 are: Agrimony, Cleavers, Eyebright, Forget-me-not, Great Mullein, and Red Bartsia.

23 of the 45 species were more abundant in the East, and 20 species were more abundant in the West. Two species - Bristly Ox-tongue and Hoary Plantain - were equally abundant on both sides of the site.

Transects 4 and 5 contained the joint highest number of species at 27. Transect 8 had the lowest at 18.

The highest number of species and boxes was recorded in July: 36 and 4064 respectively. The lowest was recorded in April: 19 and 2434 respectively. This is unsurprising - in April flora is still in the early stages of growth and plants are small, while by July most plants will have grown as much as they can (Okubo, H., 2000).

Table 7: At-a-glance annual comparison of wildflower diversity in the East side, West side, and over the whole site

Year-on-year comparison of wildflowers recorded				
	2020	2021	2022	2023
Species recorded (diversity) - whole wood	58	55	50	45
Species recorded - West	45	38	40	37
Species recorded - East	41	39	37	36
Average diversity - West	16.95	17.11	3.71	12.46
Average diversity - East	16.16	15.25	2.73	12.13

Please note the Average Diversity figures for 2023 do not include grasses and therefore is not comparable to the previous years.

Statistically, there is no difference between the East and West sides of the site for wildflower diversity.

Table 8 (below): Wildflower species and number of boxes recorded on transects in the West side, East side, and the whole of the Diamond Wood between April and September 2023.

WILDFLOWERS 2023	Species and number of boxes recorded in each transect										
	T1	T2	T3	T4	TOTAL WEST	T5	T6	T7	T8	TOTAL EAST	WHOLE WOOD
Average % grass cover	96%	98%	99%	96%		98%	95%	96%	97%		
Agrimony	9	0	0	0	9	0	0	0	0	0	9
Bindweed	0	0	0	0	0	1	0	0	5	6	6
Black medick	28	44	6	17	95	124	268	184	85	661	756
Blue fleabane	19	23	0	0	42	33	6	17	0	56	98
Bristly ox-tongue	0	1	0	0	1	0	0	0	1	1	2
Broomrape	1	6	4	2	13	0	0	0	0	0	13
Buttercup spp	0	0	0	6	6	0	19	0	0	19	25
Cat's-ear	23	16	63	2	104	8	10	4	0	22	126
Centaury	0	0	0	0	0	1	0	0	0	1	1
Cleavers	0	0	0	18	18	0	7	0	1	8	26
Clover - Red	0	0	128	348	476	0	0	0	0	0	476
Clover - White	0	0	100	163	263	14	71	0	76	161	424
Clover spp	37	361	330	1,260	1,988	235	224	35	497	991	2,979
Common daisy	0	0	0	4	4	3	5	0	0	8	12
Common nettle	0	0	0	0	0	0	5	0	0	5	5
Common sorrel	1	0	7	0	8	0	0	0	0	0	8
Cranesbill spp	231	380	49	8	668	326	60	495	21	902	1,570
Dandelion spp	225	424	28	798	1,475	224	519	337	575	1,655	3,130
Eyebright	0	0	0	102	102	0	0	0	0	0	102
Forget-me-not	0	0	0	0	0	2	0	0	0	2	2
Goat's-beard	17	9	0	0	26	12	24	33	2	71	97
Great mullein	0	0	0	0	0	0	0	3	0	3	3
Greater plantain	1	8	0	65	74	13	33	1	43	90	164
Hedgenettle	0	23	2	0	25	0	4	0	8	12	37
Hoary plantain	0	3	13	22	38	27	11	0	0	38	76
Hogweed	2	13	1	0	16	57	49	1	27	134	150
Lady's bedstraw	0	0	0	0	0	0	0	26	2	28	28
Mouse-ear	0	0	2	8	10	0	0	0	0	0	10
Mugwort	0	3	0	0	3	0	58	0	0	58	61
Oxeye daisy	148	23	111	110	392	450	0	49	15	514	906
Pyramid orchid	0	0	0	0	0	1	0	0	0	1	1
Ragwort	36	41	14	5	96	28	61	88	35	212	308

Red bartsia	0	0	0	18	18	1	0	0	0	1	19
Ribwort plantain	18	36	1,261	926	2,241	73	3	0	0	76	2,317
Sainfoin	0	0	27	0	27	0	0	0	0	0	27
Scarlet pimpernel	0	0	0	0	0	0	1	0	0	1	1
Self-heal	21	3	5	104	133	7	10	1	0	18	151
Speedwell	1	0	0	7	8	0	0	0	0	0	8
St John's wort	2	0	0	3	5	5	33	109	0	147	152
Thistle spp	70	177	10	13	270	302	64	135	59	560	830
Vetch spp	418	36	482	3	939	21	0	22	0	43	982
Wild carrot	364	244	5	655	1,268	268	165	179	180	792	2,060
Willowherb	13	16	0	0	29	9	6	6	1	22	51
Yarrow	0	1	2	10	13	64	0	31	0	95	108
Yellow rattle	0	0	33	7	40	0	0	0	0	0	40
TOTAL SPECIES (diversity)	22	23	23	27	37	27	25	20	18	36	45
TOTAL BOXES	1,685	1,891	2,683	4,684	10,943	2,309	1,716	1,756	1,633	7,414	18,357

Figure 10 (below): Number of wildflower species, pollinator groups, and pollinator individuals per transect

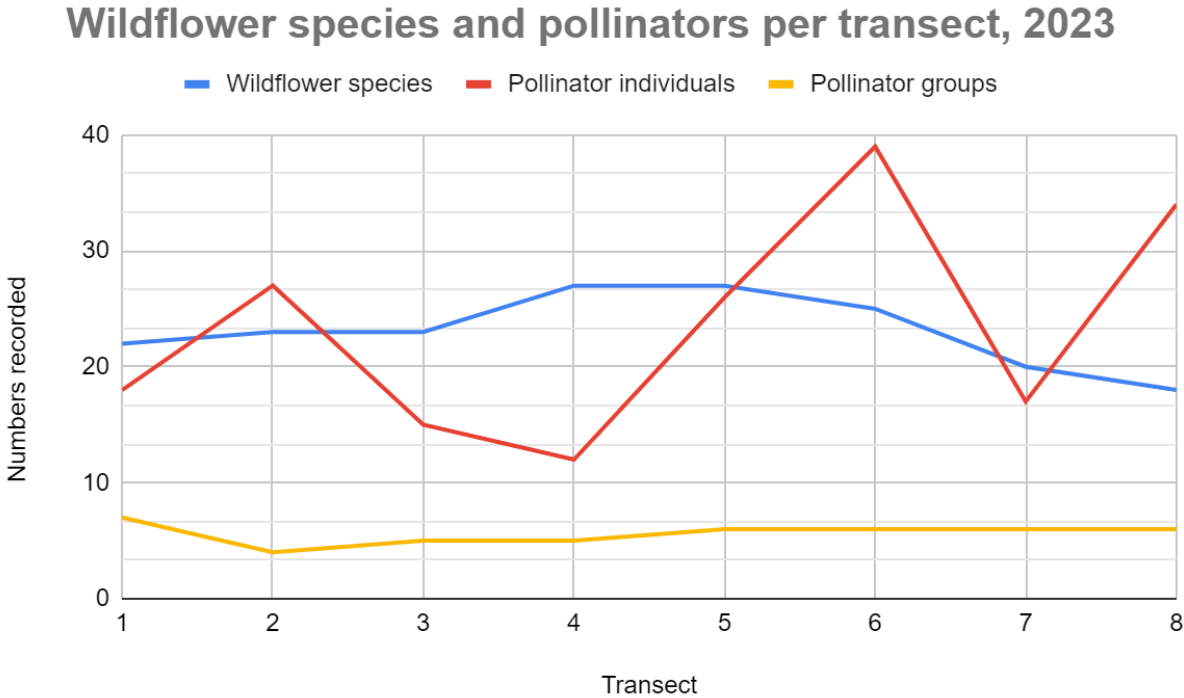
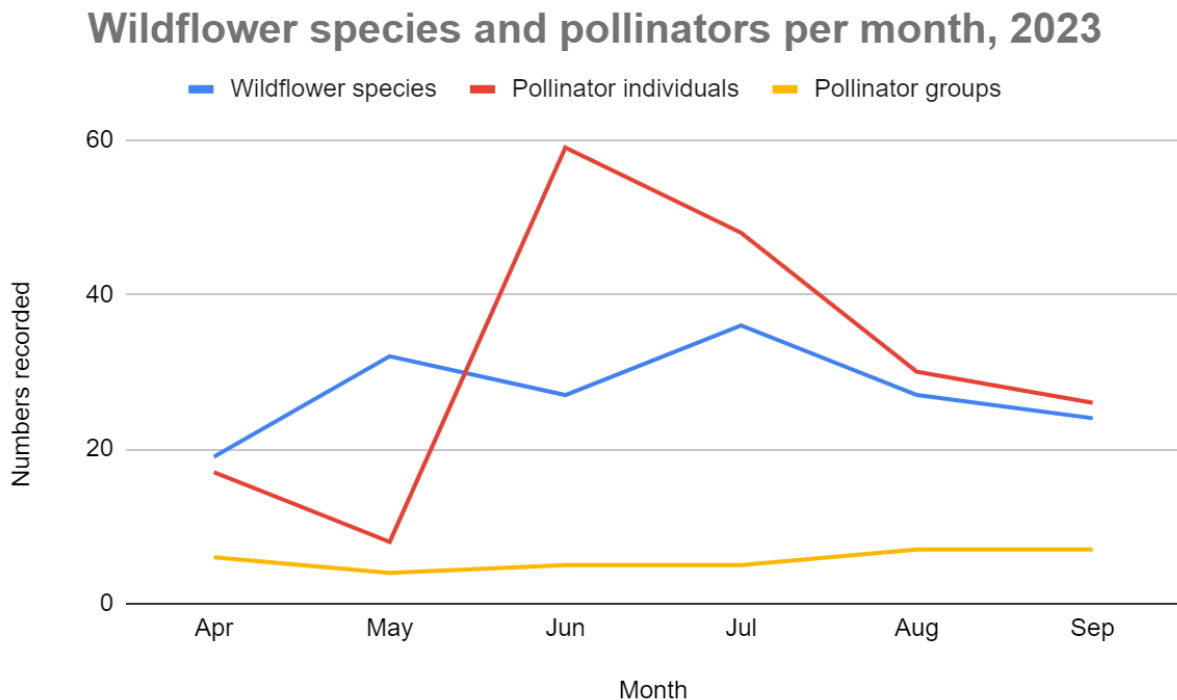


Table 9 (below): Wildflower species and number of boxes recorded per month over the 2023 season

WILDFLOWERS 2023	Wildflower species recorded each month					
	Apr	May	Jun	Jul	Aug	Sep
Agrimony	0	0	0	0	0	9
Bindweed	0	0	5	1	0	0
Black medick	0	16	61	86	309	284
Blue fleabane	0	0	0	23	43	36
Bristly ox-tongue	0	2	1	47	19	29
Broomrape	0	0	0	1	0	1
Buttercup spp	0	5	1	0	19	0
Cat's-ear	0	2	10	0	0	1
Centaury	8	37	35	20	11	15
Cleavers	0	0	0	0	0	1
Clover - Red	19	7	0	0	0	0
Clover - White	0	204	227	45	0	0
Clover spp	0	102	128	194	0	0
Common daisy	501	251	265	559	669	734
Common nettle	2	6	0	4	0	0
Common sorrel	0	2	0	0	3	0
Cranesbill spp	0	5	0	3	0	0
Dandelion spp	356	401	502	272	14	25
Eyebright	543	252	467	749	550	569
Forget-me-not	0	2	0	0	0	0
Goat's-beard	3	6	36	35	17	0
Great mullein	0	0	0	3	0	0
Greater plantain	49	19	35	24	11	26
Hedgenettle	0	0	35	2	0	0
Hoary plantain	25	0	0	6	41	4
Hogweed	25	28	42	24	15	16
Lady's bedstraw	0	0	0	16	12	0
Mouse-ear	0	6	0	3	1	0
Mugwort	0	21	0	17	23	0
Oxeye daisy	157	146	154	171	141	137
Pyramid orchid	0	0	0	1	0	0
Ragwort	8	75	36	75	46	68
Red bartsia	0	0	0	13	6	0
Ribwort plantain	258	271	393	526	478	391
Sainfoin	0	17	10	0	0	0
Scarlet pimpernel	0	0	0	1	0	0

Self-heal	35	16	27	45	16	12
Speedwell	0	8	0	0	0	0
St John's wort	0	20	48	46	23	15
Thistle spp	59	118	156	210	132	155
Vetch spp	183	143	206	242	41	167
Wild carrot	181	265	274	565	317	458
Willowherb	0	0	8	2	16	25
Yarrow	12	20	16	16	30	14
Yellow rattle	10	1	12	17	0	0
TOTAL SPECIES	19	32	27	36	27	24
TOTAL BOXES	2,434	2,474	3,190	4,064	3,003	3192

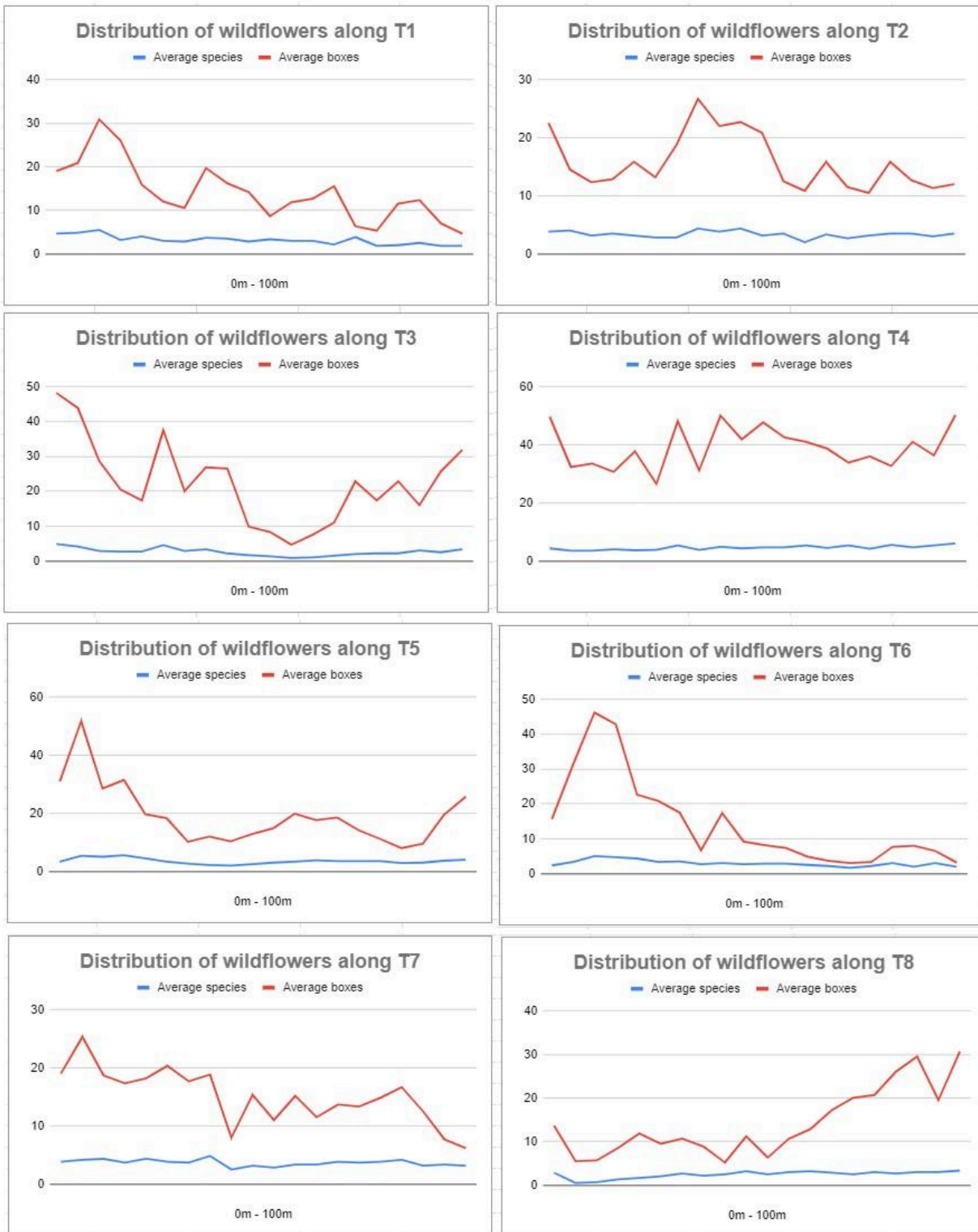
Figure 11 (below): Number of wildflower species, pollinator groups, and pollinator individuals per transect



For April, July, August, and September it could be argued that there is some correlation between the diversity of wildflowers and the number of pollinator individuals recorded. However that is not the case in May (which saw the lowest number of pollinator individuals at just 8) and June.

See Appendix 3 for a year-on-year comparative list of wildflower species recorded.

Figure 12: Average number of species and average number of boxes recorded in quadrats along each transect in the 2023 season



In the above graphs showing the distribution of the average number of species and average number of boxes recorded in the quadrats along the length of each transect, it can be seen how the habitats of each transect may influence not so much its diversity, which remains fairly steady, but the abundance of the plants present. See [Section 2.2 - Transect Habitat Descriptions](#).

In Transect 1 the average number of boxes recorded per survey is highest near the start of the transect and falls along its length, indicating there is a higher abundance of plants in the open grassy habitat and 'edge habitat' near the trees, but the wildflower abundance level falls once the transect moves into the trees.

In T2 the average number of boxes recorded per survey is highest around the middle section of the transect, where it crosses a wide grassy ride. This could be because the plants on the footpaths and rides were much smaller than those in unmown and undisturbed areas, so more species can fit into each square of the quadrat. However in T3, which also straddles a grassy ride, the average number of boxes recorded per survey was lowest around the middle section and highest at the start.

In both T4 and T7, the average number of boxes recorded does fluctuate but not by as wide a range as in other transects. Both transects were entirely in open grassland, with T4 following a footpath and T7 crossing one, and so the habitat stayed consistent throughout the length. T4 also has multiple points along the transect where the highest average (or near) is recorded, unlike other transects where the highest average is recorded at just one or two points.

In T5, the highest average is near the start of the transect, in an area that is regenerating after the installation of a fence to prevent further footfall. The vegetation is fairly tall, but not dense and matted as in other areas.

The average number of boxes recorded was low at the start of T6. The first few metres of this transect are wedged between a gravelled path, the northern boundary fence, and is dominated by a large Mugwort plant with a few other vigorous species. The average quickly rises as the transect moves across the footpath and into the grass, but then drops again sharply where there are a few rows of trees planted closely together. The second half of the transect, where it is more open but the grass is unmanaged, dense and matted, has very low abundance.

T8 has its highest abundance nearer the end, where it crosses a narrow footpath before reaching shrubs and grass.

Figure 13 (below): Abundance of wildflower species in the East side of the Diamond Wood in 2023

Abundance of wildflower species in the East side, 2023

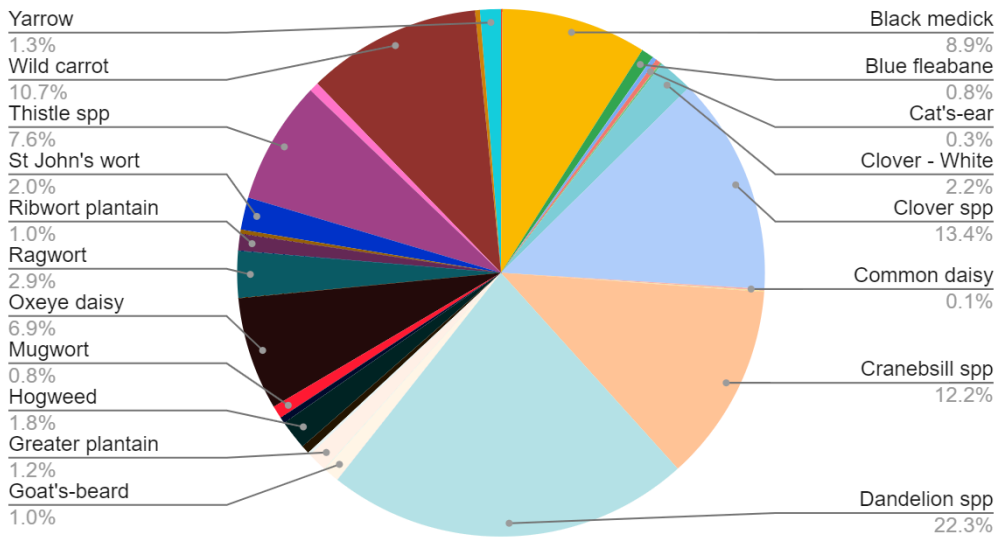
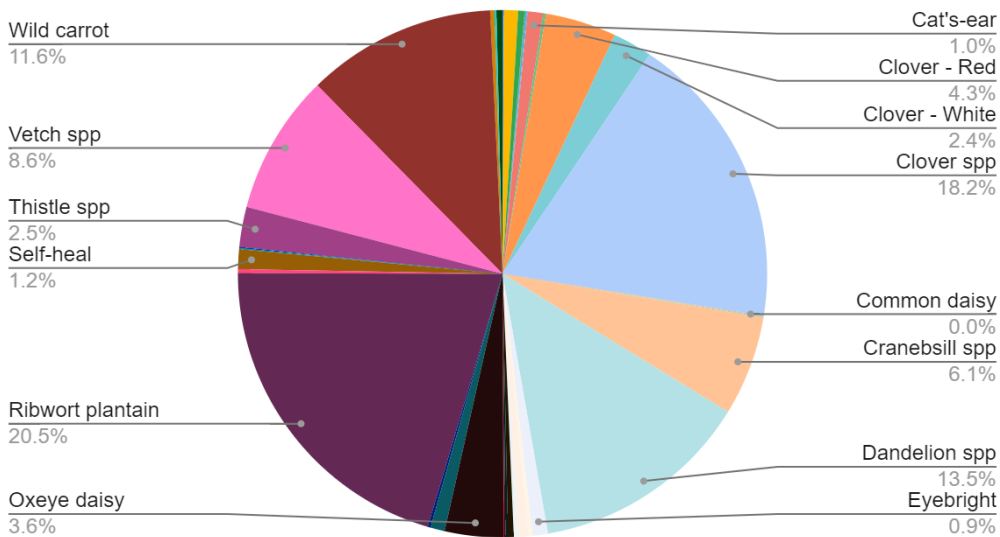


Figure 14 (below): Abundance of wildflower species in the West side of the Diamond Wood in 2023

Abundance of wildflower species in the West side, 2023



4.4 BUTTERFLY TRANSECT

In 2023 the Harmony Woods Butterfly Transect was undertaken once a week between the start of April and end of September, 24 times in total.

In total, 474 individuals of 18 species of butterfly were recorded on the Butterfly Transect in 2023. This is the lowest number of species recorded since 2020, but the second-highest number of individuals after 2020.

Table 10: At-a-glance annual comparison of butterflies recorded on the Butterfly Transect, 2020-2023

Year-on-year comparison of butterflies recorded				
	2020	2021	2022	2023
Number of surveys	23	13	9	24
Species recorded (diversity)	21	24	20	18
Individuals recorded	1176	333	374	474

The knowledge level of the 2023 lead recorder is such that the common species with more obvious identification features were recorded, but other species which have been recorded before but have much more subtle identification features, such as the Green-Veined White and Green Hairstreak, may have been missed. Of course, it is also difficult to identify species that are constantly moving and cannot be closely looked at.

Figure 15: Number of species recorded in each section of the 2023 Butterfly Transect

Diversity of butterfly species across the 8 sections of the 2023 Butterfly Transect

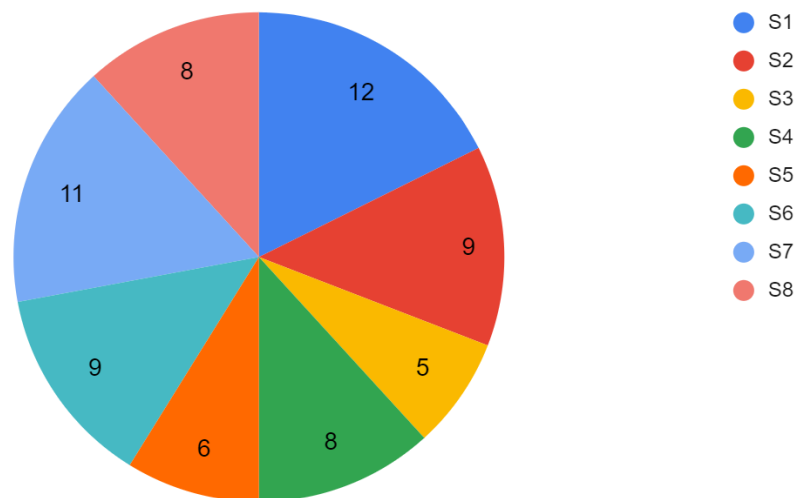


Figure 16: Number of butterfly individuals recorded in each section of the 2023 Butterfly Transect

Number of butterfly individuals recorded in each section of the 2023 Butterfly Transect

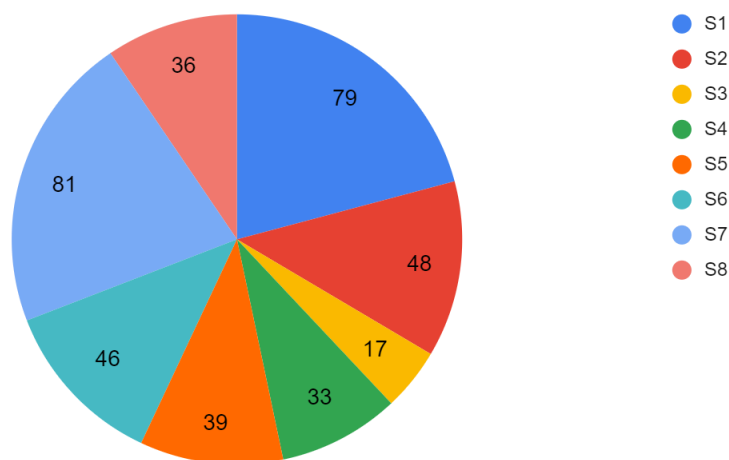


Table 11: Species of butterfly and number of individuals recorded in each section of the Butterfly Transect

BUTTERFLIES 2023	Species and number of individuals recorded in each section of the transect									
	S1	S2	S3	S4	S5	S6	S7	S8	Section Unclear	TOTAL
Brimstone	0	1	0	0	0	0	0	0	0	1
Comma	0	0	0	0	0	0	9	0	0	9
Common blue	0	1	0	0	0	0	0	0	0	1
Essex skipper	0	0	0	0	0	0	0	0	1	1
Gatekeeper	12	9	5	2	0	2	9	9	0	48
Holly blue	0	0	0	0	0	1	0	0	0	1
Large white	7	2	1	1	2	7	8	6	2	36
Marbled white	8	6	4	12	11	8	2	0	44	95
Meadow brown	26	22	5	7	17	22	23	12	34	168
Orange tip	1	0	0	0	0	0	0	0	0	1
Peacock	3	1	0	2	4	0	1	1	0	12
Red admiral	1	0	0	1	0	0	9	0	0	11
Small blue	6	0	0	0	0	3	8	2	0	19
Small copper	0	0	0	0	0	0	0	1	0	1
Small heath	3	1	0	2	3	1	1	3	8	22
Small skipper	10	5	2	6	2	1	6	2	6	40
Small tortoiseshell	1	0	0	0	0	0	0	0	0	1
Small white	1	0	0	0	0	1	5	0	0	7
TOTAL SPECIES (diversity)	12	9	5	8	6	9	11	8	6	18
TOTAL INDIVIDUALS	79	48	17	33	39	46	81	36	95	474

Please note the “Section Unclear” column in the above table contains the data collected in June Week 3, when the survey was undertaken by two assistants while the lead surveyor was on leave, and the sections in which the butterflies were observed were not recorded clearly - so only a total is available.

Two species recorded in 2023 are UK BAP Priority species: Small Blue and Small Heath.

The most abundant species was Meadow Brown, with 168 individuals recorded, followed by Marbled White at 95. Seven species only had one individual recorded over the whole season: Essex Skipper, Brimstone, Orange Tip, Small Copper, Common Blue, Holly Blue, and Small Tortoiseshell.

Small Skipper and Meadow Brown were recorded in all sections of the transect. Marbled White, Gatekeeper, and Small Heath were recorded in 7 out of 8 sections. In addition to the species which only had one individual recorded across the whole site, Comma was recorded in only one section.

Not counting the data from June Week 3, the section with the highest number of butterfly species recorded (diversity) was Section 1 with 12 species, closely followed by Section 7 with 11 species. There was a difference of only 2 individuals between these sections - 79 in S1 and 81 in S7. Both these sections contain large amounts of flowers for butterflies to feed on: Section 7 follows a path which is bordered on one side by a mature hedgerow and thick brambles, and on the other by grassland, and Section 1 contains a wildflower mound specifically created to attract pollinators. Section 3 had the least number of species and individuals recorded, possibly because instead of following a main pathway or ride through Harmony Woods, it goes through an area planted with trees, including a mature stand of silver birch where there is lots of shade and few flowers (Janz, N., 2005).

Figure 17: Number of butterfly species recorded per month (Apr-Sep) in the 2023 Butterfly Transect

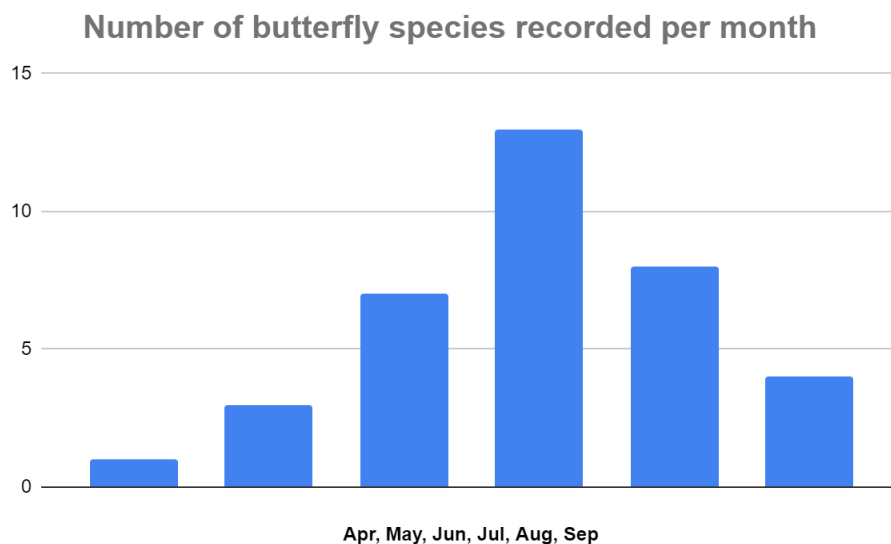


Table 12: Species of butterfly and number of individuals recorded per month Apr-Sep 2023

BUTTERFLIES 2023	Butterfly species recorded each month					
	Apr	May	Jun	Jul	Aug	Sep
Brimstone	0	0	0	1	0	0
Comma	0	0	0	9	0	0
Common blue	0	0	0	0	1	0
Essex skipper	0	0	1	0	0	0
Gatekeeper	0	0	0	45	3	0
Holly blue	0	0	0	0	1	0
Large white	0	0	2	29	3	2
Marbled white	0	0	77	18	0	0
Meadow brown	0	2	76	75	15	0
Orange tip	0	1	0	0	0	0
Peacock	2	0	0	10	0	0
Red admiral	0	0	0	8	1	2
Small blue	0	3	1	10	5	0
Small copper	0	0	0	1	0	0
Small heath	0	0	16	0	6	0
Small skipper	0	0	8	29	0	2
Small tortoiseshell	0	0	0	1	0	0
Small white	0	0	0	1	0	6
TOTAL SPECIES	1	3	7	13	8	4
TOTAL INDIVIDUALS	2	6	181	237	35	12

Very low numbers of species and individuals were recorded in April and May, but increased significantly in June. The highest number of species and individuals were recorded in July. Weather conditions were not recorded in enough detail to compare the numbers recorded with the amount of sunlight, wind, or temperatures on the survey days - factors which affect butterfly activity.

See Appendix 4 for a year-on-year comparative list of butterfly species recorded.

4. FURTHER THOUGHTS AND RECOMMENDATIONS

It needs to be noted that the quality of the data collected in any given year is affected by the level of knowledge and experience of the lead recorder and survey assistants. A surveyor with low levels of knowledge and/or experience can easily overlook or misidentify species present. For the Nature in Harmony programme, the lead recorder changes each year as Andover Trees United provides an annual Ecology Internship opportunity. The 2023 surveys (including the butterfly transect) were undertaken mostly by the 2023 Ecology Intern (lead recorder) alone, sometimes with an inexperienced assistant with little or no species ID knowledge. The intern was provided with identification guide books and printouts, and recommended an app, but no other training was given.

As a result, grasses were not recorded at all this year and for the other categories a number of similar species have not been clearly identified but grouped together. For example, a range of yellow Asteraceae including dandelion, hawkbit, and hawk's-beard, have been recorded as "Dandelion spp", and a number of small passerine birds which could include tits, finches, and sparrows, recorded as "Finch spp". And this year all pollinators were recorded to group level rather than species level (this does not include the Butterfly Transect).

I recommend that the charity work towards being able to provide the intern with in-person species ID training sessions in the field from local experts, and / or research training courses provided by reputable organisations, if they cannot offer such training in-house. Providing ID books and printouts for self-guided learning is not enough.

I would also recommend reviewing the wildflower survey methodology, in particular considering reducing the survey season period for wildflowers and the number of quadrats per transect. This category is very labour- and time-intensive, collecting many thousands of data points over the season. In April plants are still in the very early stages of growth and much more difficult to identify than in later months, and by September most wildflowers have finished flowering and are dead or dying. It is my opinion that surveying between the start of May and the end of August or even July, and placing quadrats every 10m rather than every 5m, would still be sufficient for gathering diversity and abundance data.

Additionally, it should be decided which growth stages of the plants should be recorded - any and all plants at any stage of growth, or only those which are actively flowering? These stages would need to be defined before the start of the survey season to maintain consistency. This would provide meaningful data on when different species are in flower and whether this changes over the years - an important variable to monitor as the climate continues to change (Gillison, A.N., 2019).

Simplifying the wildflower data collection would also free up time that could be used to establish surveys for other categories of flora and fauna that have not yet been surveyed on site, for example reptiles, amphibians, spiders, dragonflies and damselflies, small mammals, bats, fungi, mosses and lichens, etc. It could also be used to conduct more pollinator surveys.

For pollinators, I recommend using the full Flower-Insect Timed Count (FIT Count) methodology and recording forms as standard moving forward. The simplicity of identifying insects to group level rather than species level would create consistency over the years as the knowledge level of lead surveyors varies with each new intern, and would allow much easier annual comparison. If species can be confidently identified or the intern wishes to expand their knowledge then this can be done in addition.

The FIT Count results can also be submitted to the UK Pollinator Monitoring Scheme (UKPoMS), via their website or an app that can be used in the field without internet connection. This would contribute to a national dataset, assist the UKPoMS with their work, provide Andover Trees United with a simple citizen science survey to promote interest in insects to the local community, and - if the app is used rather than having the forms printed off - save paper, an important consideration for a tree-planting conservation charity.

To gather more data on pollinators, I would suggest conducting FIT Counts at multiple points along each transect rather than at just one point each time the transect is surveyed. Alternatively, rather than restricting pollinator data collection to the eight transects and repeating each one six times through the season, it may be worth considering conducting FIT Counts at many more locations (e.g. 20) throughout the site just once or twice each over the season.

Having said the above regarding FIT Counts and recording pollinators to group level, a better understanding of the pollinator species diversity on a given site is very valuable - the diversity and number of insects affect the entire food web and are an indicator of the health of a habitat and ecosystem - so again I would recommend to the charity that they find ways to provide robust training in this category, ideally prior to the start of each survey season.

So far the annual surveys have looked at comparing the two sides of the site, so there are four years worth of results. The first three years indicated higher diversity in the West for all categories, while 2023 has indicated higher diversity in the East for birds and pollinators. It may be worth reconsidering whether this comparison should still be an objective or whether the focus should be moved. For example, it could be decided to survey the different habitats on site each year - such as the West Wildflower Meadow, the East Wildflower Meadow to be created in 2024, the Habitats Trail, the Conservation Corner, the Pond, a section of Woodland in the West and one in the East. Currently no surveys are conducted of these created and managed habitats; it would be beneficial to do so, to monitor how they are doing and whether they are achieving what they were created for, and what could be done to improve them.

For birds, rather than adding counts from different surveys together to reach a total number of individuals recorded, I suggest that it would also be useful to record the maximum number of each species seen together at any one time, as per the methodology from the British Trust for Ornithology (BTO) Garden BirdWatch, 2010, a long-standing national fixed-point bird survey.

I have also included figures for birds recorded each month in the 2023 report, as it has not been done in previous reports and I believe it could be useful. As the climate changes, it will be important to see if and how the species present on the site changes over time - for example, if

any summer migrants start arriving earlier in the year or leaving later, or if higher temperatures in the summer months see a reduction in numbers of some species. More information on the weather conditions during surveys may be useful in this regard for future reports.

This would benefit from the establishment of a clear and consistent method of recording the abiotic variables such as weather conditions, so that the recorder simply needs to select the option which best describes the situation at time of survey, rather than try to describe it themselves. For example, the UKBMS Butterfly Transect Recording Form asks recorders to select one of seven descriptive ratings for the average wind speed: “0 - *smoke rises vertically*; 1 - *slight smoke drift*; 2 - *wind felt on face*; 3 - *leaves in slight motion...*” This would provide more accurate, consistent, and comparable information.

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APPENDIX 1: YEAR-ON-YEAR COMPARISON OF BIRD SPECIES RECORDED

Year-on-year comparison of bird species recorded			
2020	2021	2022	2023
Blackbird	Blackbird	Blackbird	
Blue tit	Blue tit	Blue tit	Blue tit
Buzzard	Buzzard	Buzzard	Buzzard
[Carrion] Crow	[Carrion] Crow	[Carrion] Crow	Carrion crow
Chaffinch	Chaffinch	Chaffinch	Chaffinch
Collared dove	Collared dove	Collared dove	
Corn bunting			
			Finch sp
Goldfinch	Goldfinch	Goldfinch	Goldfinch
Great spotted woodpecker			
Great tit	Great tit	Great tit	
		Greenfinch	
			Green woodpecker
	Grey partridge		
Gull spp		Herring gull	Gull spp
House martin	House martin	House martin	House martin
Jackdaw	Jackdaw	Jackdaw	Jackdaw
Jay			
Kestrel	Kestrel	Kestrel	
Linnet	Linnet	Linnet	
Magpie	Magpie	Magpie	Magpie
Pheasant		Pheasant	
Red kite	Red kite	Red kite	Red kite
Robin	Robin		
Rock pigeon			
Rook	Rook		Rook
Skylark	Skylark	Skylark	Skylark
Sparrow			
	Sparrowhawk		
Starling			Starling
Swallow	Swallow		Swallow
Swift	Swift	Swift	Swift
	Willow warbler		
Woodpigeon	Woodpigeon	Woodpigeon	Woodpigeon
Yellowhammer	Yellowhammer	Yellowhammer	Yellowhammer
Species: 29	Species: 24	Species: 21	Species: 20
Total species recorded on site since 2020: 35			

APPENDIX 2: YEAR-ON-YEAR COMPARISON OF POLLINATOR GROUPS RECORDED

Year-on-year comparison of pollinator groups recorded			
2020	2021	2022	2023
		Beetles	Beetles
Bumblebees	Bumblebees		Bumblebees
	Butterflies and moths	Butterflies and moths	Butterflies and moths
Honeybees	Honeybees		
Hoverflies	Hoverflies	Hoverflies	Hoverflies
		Other flies	Other flies
		Other insects	Other insects
			Small insects
Solitary bees	Solitary bees	Solitary bees	Solitary bees
Wasps	Wasps		Wasps
Groups: 5	Groups: 6	Groups: 6	Groups: 9

APPENDIX 3: YEAR-ON-YEAR COMPARISON OF WILDFLOWER SPECIES RECORDED

Year-on-year comparison of wildflower species recorded			
2020	2021	2022	2023
			Agrimony
Autumn hawkbit			
		Barren strawberry	
Bird's-foot trefoil	Bird's-foot trefoil	Bird's-foot trefoil	
Black bindweed			Bindweed sp
Black medick	Black medick	Black medick	Black medick
Blue fleabane	Blue fleabane		Blue fleabane
Bramble		Bramble	
Bristly oxtongue	Bristly oxtongue		Bristly oxtongue
		Broom	
Broomrape	Broomrape	Broomrape	Broomrape
Buttercup spp			Buttercup spp
		Centaury	Centaury
			Cleavers
	Red Clover	Red Clover	Clover - Red
White Clover	White Clover	White Clover	Clover - White
Clover spp			Clover spp
Common cat's-ear	Common cat's-ear	Common cat's-ear	Cat's-ear spp
Common daisy	Common daisy	[Common] Daisy	Common daisy
		Common Mallow	
Common mouse-ear	Common mouse-ear	Common mouse ear	Mouse-ear
	Common knapweed		
Common nettle			Common nettle
Ragwort	Common ragwort	Ragwort	Ragwort
		Common sorrel	Common sorrel
	Common vetch	Common vetch	Vetch spp
		Cowslip	
Cut-leaved cranesbill	Cut-leaved cranesbill	Cut-leaved cranesbill	Cranesbill spp
	Creeping buttercup		
	Creeping thistle	Creeping thistle	
Dandelion spp	Dandelion	Dandelion	Dandelion spp
	Devil's-bit scabious		
Dock spp		Dock	
Dove's-foot cranesbill	Dove's-foot cranesbill		
			Eyebright

Field bindweed		Field bindweed	
Field scabious	Field scabious		
	Field speedwell		
Fool's parsley			
			Forget-me-not
	Germander speedwell		
Goat's-beard	Goat's-beard		Goat's-beard
Greater knapweed			
			Great mullein
Greater plantain	Greater plantain	Greater plantain	Greater plantain
	Groundsel		
Hawkbit spp	Hawkbit spp		
	Hawksbeard	Hawksbeard	
Hawkweed spp	Hawkweed oxtongue		
Herb bennet			
			Hedgenettle
Hoary plantain	Hoary plantain		Hoary plantain
Hogweed	Hogweed	Hogweed	Hogweed
Hop trefoil			
Kidney vetch		Kidney vetch	
	Lady's bedstraw	Lady's bedstraw	Lady's bedstraw
Lesser knapweed		Lesser knapweed	
	Little mouse-ear		
		Meadow buttercup	
Meadow cranesbill		Meadow cranesbill	
		Mugwort	Mugwort
Nipplewort	Nipplewort	Nipplewort	
	Old man's beard	Old man's beard	
Oxeye daisy	Oxeye daisy	Oxeye daisy	Oxeye daisy
Plantain spp			
		Poppy	
	Prickly sow-thistle		
Pyramid orchid	Pyramid orchid		Pyramid orchid
		Ragged robin	
			Red bartsia
		Restharrow	
Ribwort plantain	Ribwort plantain	Ribwort plantain	Ribwort plantain
Sainfoin	Sainfoin	Sainfoin	Sainfoin

	Salad burnet		
	Scarlet pimpernel		Scarlet pimpernel
Self-heal	Self-heal	Self-heal	Self-heal
		Small-leaved cranesbill	
	Small scabious		
Smooth cat's-ear			
Smooth hawksbeard	Smooth hawksbeard		
	Smooth sow-thistle		
	Soft brome		
Sorrel	Sorrel spp		
Sow-thistle spp	Sow-thistle spp		
	Spear-leaved willowherb		
Speedwell spp		Speedwell	Speedwell
St John's wort		St John's wort	St John's wort
Teasel spp			
Thistle spp			Thistle spp
		Tiny vetch	
Wild carrot	Wild carrot	Wild carrot	Wild carrot
Wild clematis			
Wild daffodil		Wild daffodil	
Willowherb spp	Willowherb spp	Willowherb	Willowherb
	Wood avens	Wood avens	
Yarrow	Yarrow	Yarrow	Yarrow
Yellow rattle	Yellow rattle	Yellow rattle	Yellow rattle
	Zigzag clover		
Species: 58	Species: 55	Species: 50	Species: 45
Total species recorded on site since 2020: 98			

APPENDIX 4: YEAR-ON-YEAR COMPARISON OF BUTTERFLY SPECIES RECORDED

Year-on-year comparison of butterfly species recorded			
2020	2021	2022	2023
Brimstone	Brimstone	Brimstone	Brimstone
Brown argus	Brown argus	Brown argus	
		Chalkhill blue	
Comma	Comma	Comma	Comma
Common blue	Common blue	Common blue	Common blue
			Essex skipper
Gatekeeper	Gatekeeper	Gatekeeper	Gatekeeper
	Green hairstreak	Green hairstreak	
Green-veined white	Green-veined white	Green-veined white	
Holly blue		Holly blue	Holly blue
		Large blue	
Large skipper			
Large white	Large white	Large white	Large white
Marbled white	Marbled white	Marbled white	Marbled white
	Marsh fritillary	Marsh fritillary	
Meadow brown	Meadow brown	Meadow brown	Meadow brown
Orange tip	Orange tip	Orange tip	Orange tip
Painted lady	Painted lady	Painted lady	
Peacock	Peacock	Peacock	Peacock
Red admiral	Red admiral	Red admiral	Red admiral
	Ringlet	Ringlet	
Small blue	Small blue	Small blue	Small blue
Small copper	Small copper	Small copper	Small copper
Small heath	Small heath	Small heath	Small heath
Small skipper	Small skipper	Small skipper	Small skipper
Small tortoiseshell	Small tortoiseshell	Small tortoiseshell	Small tortoiseshell
Small white	Small white	Small white	Small white
Speckled wood	Speckled wood	Speckled wood	
		Wessex skipper	
		Western marbled white	
Species: 22	Species: 23	Species: 28	Species: 18
Total species recorded on site since 2020: 30			

APPENDIX 5: LIST OF ADDITIONAL SPECIES OBSERVED IN THE DIAMOND WOOD

The following list contains species observed (seen or heard), or inferred through the presence of clear signs, on the site throughout the whole of 2023 outside of official 'Nature in Harmony' transect surveys. This includes results from citizen science sessions run by the 2023 Ecology Intern (NIH lead surveyor) during the spring and summer, observations made by the Intern while on site, images from motion-sensor wildlife cameras set up on site by the youth team (co-led by the Intern), and observations made by Andover Trees United volunteers and staff while working on site.

Birds: Barn Owl, Blackbird, Chiffchaff, Collared Dove, Great Tit, Grey Partridge, Jay, Kestrel, Linnet, Pheasant, Robin, Song Thrush, Wren

Flora: Common Poppy, Columbine, Common Knapweed, Common Vetch, Cowslip, Cut-Leaved Cranesbill, Flag Iris, Garlic Mustard, Herb Robert, Kidney Vetch, Musk Mallow, Old Man's Beard, Prickly Lettuce, Purple Loosestrife, Red Campion, Teasel, Toadflax, Wild Marjoram

Grasses: Common Couch, Crested Dog's-Tail, Cock's-Foot, Perennial Rye-Grass, Quaking Grass, Red Fescue, Timothy Grass, Yorkshire Fog

Beetles: Black-striped Longhorn Beetle, Blue Ground Beetle, Devil's Coach-horse Beetle, Ladybird spp, Swollen-Legged Beetle, Red Soldier Beetle

Bees: Common Carder Bee, Honeybee, Ivy Bee, Buff-Tailed Bumblebee, White-tailed Bumblebee, Red-Tailed Bumblebee

Moths: Cinnabar (and caterpillars), Common Footman, Dun-Bar, Forester, Grass moth spp, Large Yellow Underwing, Light Arches, Nut-Tree Tussock, Six-spot Burnet, Small Yellow Underwing, Spindle Ermine (caterpillars), Wax Moth larvae

Other terrestrial invertebrates: Aphid, Common Candy-Striped Spider, Common Green Grasshopper, Common Banded Hoverfly, Crab Spider, Cricket sp, Damselfly spp, Dragonfly spp, Earwig sp, Flesh Fly, Greenbottle Fly, Hairy Shieldbug, *Ichneumon* sp, Marmalade Hoverfly, Meadow Grasshopper, Millipede sp, Nursery Web Spider, Oak Marble Gall Wasp (presence inferred from galls), Rose Bedeguar Gall Wasp (presence inferred from "Robin's Pincushion" galls), Spider spp

Mammals: Bat spp, Hedgehog, Rabbit (presence inferred from droppings), Red Fox, Roe Deer, Wood Mouse

Amphibians: Common Frog, Newt spp

Aquatic invertebrates: Bloodworm spp, *Daphnia* spp, Leech spp, Water Louse

Aquatic flora: Duckweed, *Elodea* sp

Fungi: Fieldcap spp, Pestle Puffball



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