BUTTERFLY CONSERVATION UPPER THAMES BRANCH

Small Blue Report 2015-2024

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Introduction

I think we are all agreed that 2024 was a terrible year for butterflies, but was that perception more than reality? If it was reality, was it the case for all species equally? Was 2024 a terrible year for Small Blue, and if so, was it the case everywhere, or were there parts of its range that unexpectedly bucked the trend? This report aims to try and answer those questions.

In this report, I've introduced the term "wonk" as shorthand for "1km x 1km square" or "1km square". I like it! I think it's short and memorable; I hope it catches on.

Data basis and validation

The data set upon which this report was an export of 4,063 Small Blue records from Levana covering the years 2000-2024. It was imported into SCRIPT, and summarised and validated using the various functionalities offered by SCRIPT. SCRIPT retains for potential analysis only adult insect records, to 1k precision or better and with a complete date. This left a total of 3,908 records before duplicates were removed and validation was carried out, with the following results:

- 10 records were excluded because they had a duplicate
- 16 false positive records were excluded because (for historical reasons) they were not from UTB territory
- 3 false negative records (in the Levana export but apparently not in UTB territory) were corrected and included because the site name indicated a "twisted digit" grid reference error
- 21 records were excluded because the grid reference and site name were inconsistent.

For analysis purposes, the data set was restricted to the period 2015-2024, on the basis that in order to assess how a species is faring, too long a time horizon is liable to confuse matters by including data that may no longer be relevant.

Analysis of record count and visit count

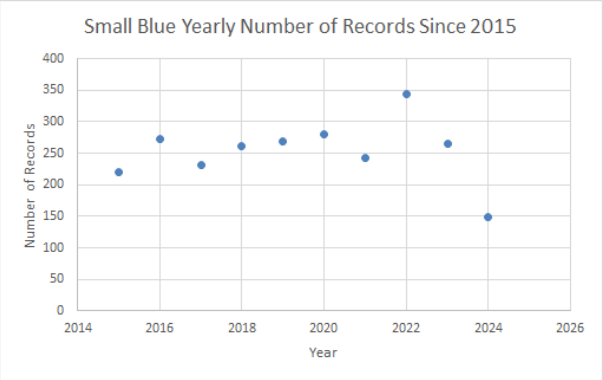

Figure 1: Small Blue UTB record count 2015-2024

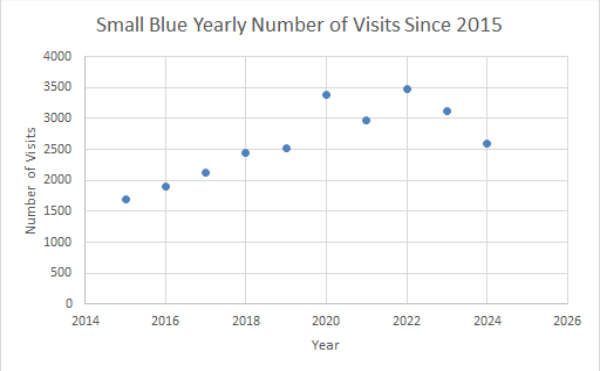

Figure 2: Small Blue UTB visit count 2015-2024

Figure 1 shows that Small Blue record count dropped significantly in 2024 compared to 2023, but then the same was true for 2023 compared to 2022. Up to 2022, the trend was a slow and steady increase.

On the other hand, Figure 2 shows that much the same is true for the number of visits made to UTB territory occupied by the Small Blue, during its flight period. The graph is broadly similar to the graph of record count, although the visit count has been increasing more steeply, and the two successive drops in visit count in 2022-2024 are also not as dramatic as those for record count.

Nonetheless, there seems potentially to be an element of 'chicken and egg' here (or perhaps of self-fulfilling prophecy). Perhaps the sharp 2022-2024 decreases in record count reflect, at least partly, concomitant drops in visit count? Perhaps fewer butterflies were seen simply because fewer visits were made during the period of time when they could have been seen.

We can start to test this hypothesis by analysing the data in terms of 'scarcity'. Scarcity is defined as visits per record, and calculated as visit count divided by record count, for territory and years where the Small Blue has been recorded, during the part of the year when it was recorded there. It thus measures how many visits, on average, were required to yield a Small Blue record, overall and in different parts of UTB territory; hence the term scarcity (a higher value means that more visits were required to yield the records).

Clustering the data

SCRIPT was used to identify clusters of wonks, isolated wonks and random wonks, as described in the SCRIPT user guide.

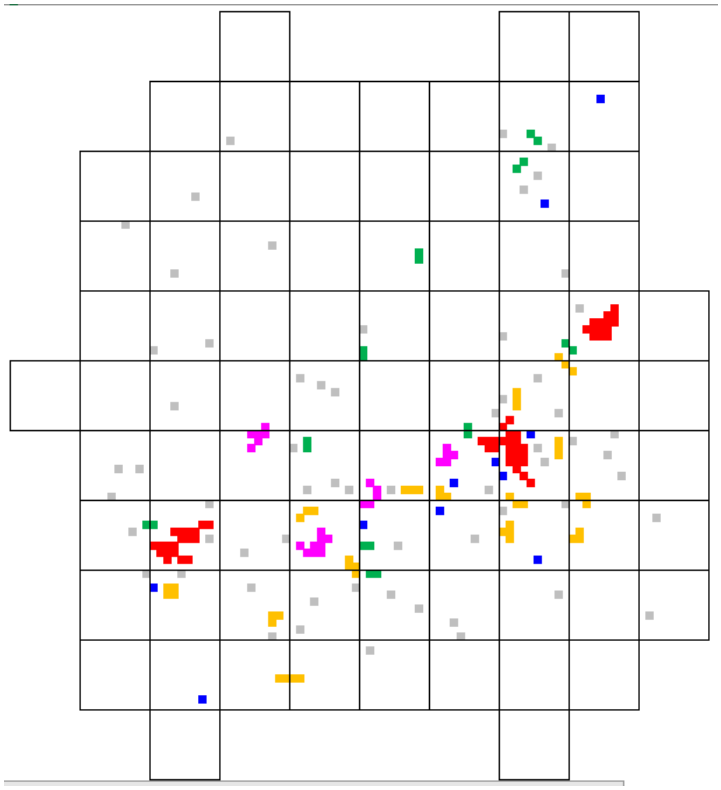

Figure 3: Map of Small Blue distribution in UTB territory 2015-2024

Figure 3 shows the resulting map of Small Blue distribution in UTB territory, divided into 10km squares, according to the key in Table 1. Three primary clusters consisting of more than 10 wonks can be seen in red, along with four secondary clusters in magenta, consisting of 5-10 wonks.

As well as a liberal sprinkling of smaller clusters in yellow and green, and isolated wonks in blue, a large number of random wonks can be seen in light grey. These are typically wonks with only a single record (occasionally with more than one record, but only from one year). Many if not most of these are likely to be misidentifications of Holly Blue or Common Blue.

Number of wonks	*More than 10*	*5-10*	*3-4*	*2*	*1 (isolated)*	*1 (random)*
Colour						

Table 1: Colour key used to illustrate clustered, isolated and random wonks

An overview of UTB Small Blue territory

Appendices 1-3 summarize, in table form, the data for the 31 clusters, 11 isolated wonks, and 62 random wonks identified by the analysis. Appendices 1 and 2 are sorted by record count from highest to lowest. In Appendix 3, the random wonks have instead been sorted by visit count from lowest to highest, in an attempt to rank them in some sort of order of decreasing plausibility. It is still likely that many of the instances at the top of the table, with one record from only a small number of visits during the Small Blue flight period, are false positives (i.e. what was seen and recorded was not in fact a Small Blue). On the other hand, it seems likely at least that the instances at the bottom of the table, with a high number of visits over many years during the flight period, are genuine cases of mistaken identity.

Cluster highlights

The three largest clusters are Bradenham & environs (24 wonks), Ivinghoe Beacon & environs (14 wonks), and Seven Barrows & environs (19 wonks). They are also the three clusters with the most records. All three of them have an average scarcity from 3.5 to 5.1 i.e. on average, Small Blue is recorded there every three to five visits, when it is on the wing.

Aston Upthorpe and environs is the fourth biggest cluster, with 9 wonks, and is an interesting cluster because it has a much higher scarcity of 21.6, apparently indicating that although the Small Blue is well established over a large area there, it is much thinner on the ground. Indeed, there is reason to be worried about Aston Upthorpe, as discussed in the section Any changes in distribution.

Hagbourne is interesting because although it is a small cluster with just three wonks, it is heavily visited and generates a lot of records. Small Blue scarcity there is comparable to the three largest clusters.

Grangelands and Aston Rowant NNR are both popular locations with lots of visits, and yet with only one or two records per year on average. Both clusters hence have a very high scarcity, although not the highest scarcity values in the table. SCRIPT's detailed analysis of clusters by year shows that the Small Blue has long been trying to establish itself at both these locations, but for whatever reason it is only able to subsist at a very low population density.

Isolated wonk highlights

The isolated wonks mostly have too few records to merit singling out for discussion. Two exceptions stand out: Maidenhead Thicket and Blue Lagoon NR. Unfortunately, the conclusion to be drawn is only positive for Maidenhead Thicket. Small Blue has been recorded there most years since 2017, including 2024. The scarcity of 7.5 indicates that it is not easy to find, but it appears to be well established. Blue Lagoon NR, on the other hand, is clearly bad news. Small Blue was recorded there every year from 2015 to 2019, and the scarcity of 3.0 indicates that it was easy to find there in those years, but there have been no records since. We don't need to look at a detailed breakdown of scarcity by year to conclude that the Small Blue has been lost from this site.

Consideration of the other isolated wonks is deferred to the section Any changes in distribution because they appear to be either 'flashes in the pan' or recent additions to the Small Blue's territory.

Random wonks

With usually only a single record, random wonks cover everything from probable misidentifications at one end of the spectrum, to possible representatives of new or newly-discovered colonies at the other. Trying to figure out the truth is unusually laborious for the Small Blue, because it is unusually prone to misidentification. Two other pieces of information combine to give some indication of how seriously we should take a random

wonk: the number of visits that have been made to it, and how far it is from the nearest known population. The more visits that have been made to it, and the further it is from a known population, the more likely it is that a random wonk can be discounted as a genuine record. Calculation of the distance from the nearest known population has yet to be incorporated into SCRIPT. As an interim measure, random wonks that are close to known populations can be identified (in SCRIPT) on the cluster map, and looked up in the tables in Appendix 3 and Appendix 6 to find how many visits have been made. Contrasting examples will illustrate.

Segsbury (SU3884) is only separated by 1-2km from the periphery of the Seven Barrows & environs cluster. It has one record from 2017, the result of 35 visits between 2015 and 2024 during the Small Blue's flight period, three or four visits per year on average. This has to be a good bet for at least being a genuine sighting; whether it was of a vagrant individual, or a representative of a newly-discovered population, would require further investigation. Basildon Park to SW (SU5977) falls into the same category: 1-2km separated from the periphery of the Lardon Chase cluster, with a single record resulting from 31 visits spread over six of the years between 2015 and 2024.

Conversely, Higher Denham (TQ0287) has been visited no fewer than 180 times during the Small Blue's flight period, four lean years (0-8 visits per year) and six popular years (19-48 visits per year), and yet we have only one record, from 2018. Furthermore, TQ0287 is the only random wonk in the 55% of its 10k square that is UTB territory, and is more than 10km distant from the two nearest UTB clusters. This intensity of visiting ought surely to have produced more than one sighting, if it were genuine, and the distance from the nearest clusters makes even a genuine vagrant seem unlikely. It seems highly likely that this record is not worth following up on.

More systematic and automated analysis along these lines is on the wish list of SCRIPT development, before species champion reports for 2025 are due.

Flight period

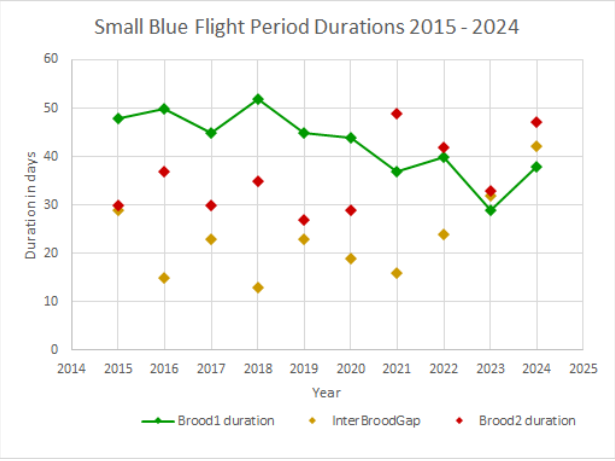

Figure 4: Small Blue flight period durations 2000-2024

Figure 4 shows, for each year from 2015 to 2024, the duration of the first and second broods (there has always been a second brood in recent years, but this has not always been the case; historical data indicate that in 2002 and 2007, the Small Blue did not complete a second brood).

The first brood duration has been trending steadily down since 2015, and the second brood duration has flipped, after six successive years being shorter than first brood duration, to four successive years being longer. Similarly, in 2024, the gap between the two broods was longer than ever before, and (for the first time with plenty of

data to give confidence) longer than the duration of the first brood. This seems to suggest the possibility of a progressive change in the Small Blue's phenology, with the second brood becoming steadily more established and of longer duration.

The overall population size (compared with recent years)

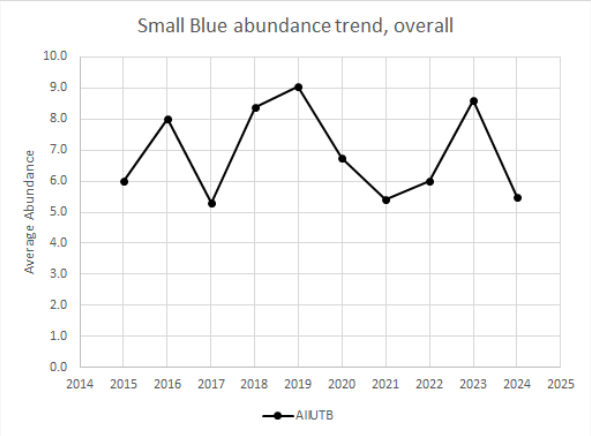

Figure 5: Abundance trend for Small Blue 2015-2024

Figure 5 shows the overall UTB abundance trend for 2015 to 2024 (abundance for each year defined as total number of adults seen, divided by the number of records, for all of UTB). It has been stable between 5 and 9 adults per record. The value dropped sharply in 2024, but not to an unprecedentedly low level; abundance has several times been comparably low to its 2024 value. The next three figures show why abundance may, counterintuitively, be a misleading indicator of population health.

Unlike abundance, Figure 6 shows scarcity to be on a depressing and inexorably upwards trend; in other words, more visits have been required every year to secure a Small Blue record (albeit with some statistical fluctuation). 2024 does indeed appear to have been as spectacularly bad as received anecdotal wisdom suggests, with a sharp increase relative to the slowly increasing trend of the preceding ten years.

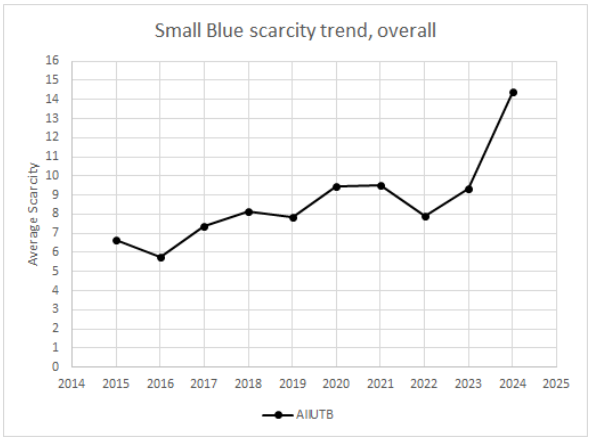

Figure 6: Scarcity trend for Small Blue 2015-2024

When we look at the scarcity trend for the three major Small Blue clusters, on the other hand, we find something fascinating.

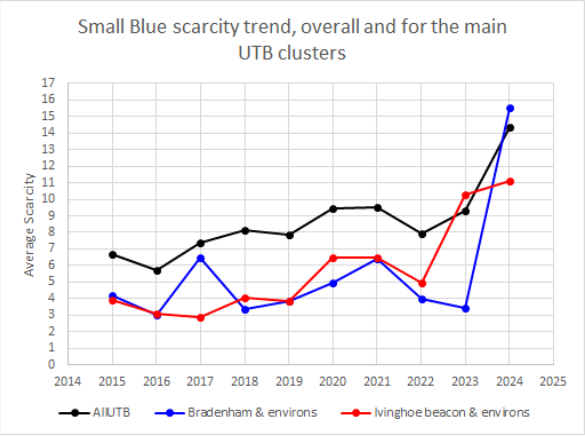

Figure 7: Small Blue scarcity trend for Bradenham and Ivinghoe 2015-2024

Figure 7 shows that Bradenham and environs, and Ivinghoe Beacon and environs, largely follow the overall trend, although there are differences. The sharp increase in scarcity for Ivinghoe Beacon and environs actually happened in 2023, with 2024 being little different. Bradenham and environs, on the other hand, had a particularly sharp increase in scarcity in 2024, after being more or less stable in recent years.

Conversely, Figure 8 shows that Seven Barrows and environs is completely bucking the overall trend. The scarcity trend for this cluster is a steady *decrease*! In other words, Small Blue has been doing steadily better in this cluster, year on year for several years, *including 2024*. One can only speculate about the reason(s) for the difference, but it seems difficult to deny that there are important conservation lessons to learn from close scrutiny of the Seven Barrows and environs cluster.

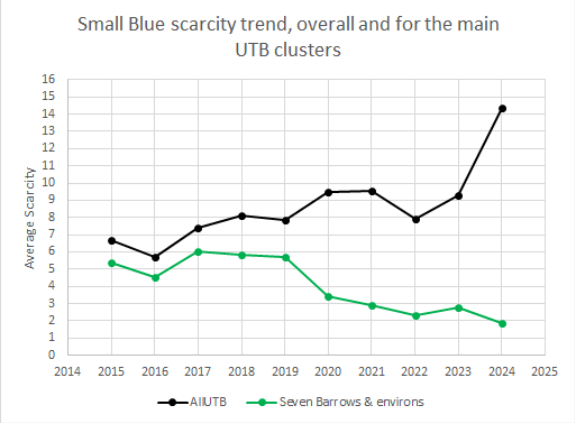

Figure 8: Small Blue scarcity trend for Seven Barrows and environs 2015-2024

Any changes in distribution

A key part of our understanding of a championed species is an assessment of whether the species is doing better or worse over time. In particular, whether it appears to have been lost from formerly established sites, or to have migrated to any new sites. Almost by definition, clusters will be the main source of evidence for loss from formerly established locations, and isolated and random wonks for evidence of appearance at new locations. Appendix 4 and Appendix 5 give a detailed analysis of scarcity, overall (i.e. for 2015-2024) and (for want of space) by year for 2020-2024 only, for clusters and isolated wonks respectively. Appendix 6 gives a detailed breakdown of random wonk visits on the same basis.

Lost and struggling sites

Inspection of Appendix 4 shows that for 9 clusters of the 13 where Small Blue was actually recorded in 2024, Small Blue scarcity was high in 2024 compared to the trend in previous years. This is a potentially worrying feature but not one that is undeniably conclusive; we'd expect 6 or 7 to be high simply as the result of statistical fluctuation.

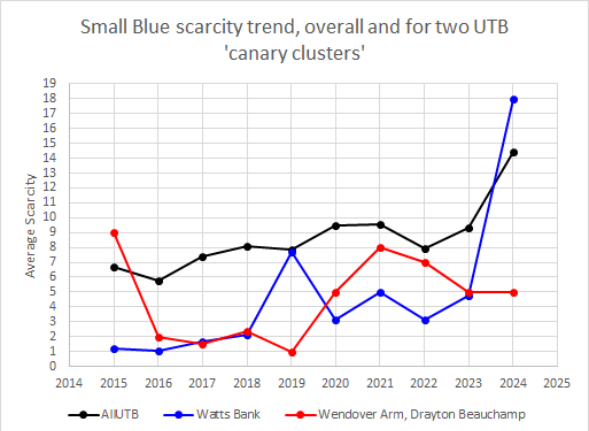

Figure 9: Small Blue scarcity trend for Watts Bank & Wendover Arm, Drayton Beauchamp 2015-2024

A small number of clusters offer potential examples of 'canaries in the coalmine': early warning indicators that we would be prudent to pay attention to. Although Small Blue was recorded in both the Watts Bank and Wendover Arm, Drayton Beauchamp clusters in 2024, the data for both has the apparently anomalous feature that the overall scarcity is lower than the value for every year from 2020-2024. Because it is a ratio, scarcity does not average quite according to naïve expectation, but it is nonetheless still true that an overall average value should lie in the

range of the values that it represents. What, then, is going on with these two clusters? The answer is that, in both cases, some if not all of the scarcity values for 2015-2019, not shown in the table for want of space, were sufficiently lower than the values for 2020-2024 that the overall scarcity for 2015-2024 was lower than any of the 2020-2024 values.

It would be straightforward to build automated identification of 'canary clusters' into SCRIPT, and I have added it to the development wish list.

More immediately worrying is that Small Blue was *not recorded at all* in 18 of the 31 clusters defined by the data for 2015-2024. It is to these clusters that we should look for evidence of the Small Blue being potentially lost, with particular attention to the clusters near the top of the table that have been the best-established, with few or no previous years with no records.

- Aston Upthorpe is a big worry. Scarcity for this cluster has had its ups and down over recent years, and the Small Blue has struggled there since 2020. However, 2024 is the first year in the last ten when the Small Blue has not been recorded at all, in any of the nine wonks that make up the cluster.
- The story is much the same for Oakley Hill, except that Small Blue was not recorded there in either 2023 or 2024.
- Dry Sandford Pit also looks to be in trouble. Small Blue has only been recorded there in two years from 2020 to 2024.
- Finally, we should note Aston Rowant NNR. Despite being overall one of UTB's most noteworthy and species-diverse sites, the Small Blue has never flourished there. The high overall scarcity value is consistent with the annual values from 2020-2023, and Small Blue was not recorded there at all in 2024.

We should avoid the temptation to be *too* worried about the other clusters where the Small Blue was not recorded in 2024, because scrutiny of the data for 2015-2024 shows that Small Blue was not recorded at those sites in at least five years out of ten.

Potential new sites

All of the 13 clusters where Small Blue was recorded in 2024 also have records for either three or all four of the years from 2020-2023, so no news of potentially new clusters arose in 2024. Hence, any potentially new populations will be found amongst the isolated wonks identified in the analysis.

Scrutiny of Appendix 5 identifies four isolated wonks where the Small Blue was recorded in 2024. Two of them also have records from every year from 2020-2023 (so not new news), leaving Swains Wood and Speen to be considered.

Swains Wood appears to be a genuine new colonization, with at least one record from every year from 2022-2024, and no records prior. The scarcity of 15.3 indicates that the species is yet to flourish there, but it does seem to have established itself.

Speen is interesting, with 3 records from only 5 visits during 2023-2024. The individual records indicate that they are of WCBS provenance (so in principle they ought to be reliable), and for a square recently allocated (so that they seem to indicate a population whose existence was not previously known about, rather than a new one).

Final food for thought

Nil desperandum!

This report has, for the first time, identified a potential data-driven early warning system, for butterfly populations that are in danger of being lost in the future. Given that 'a stitch in time saves nine', the concept of 'canary clusters' will be a valuable new development, if it turns out to deliver what it promises. The current state of the art in SCRIPT, where assessment of changes in distribution is concerned, is still completely manual, relying on detailed scrutiny of large tables of numbers by the species champion. It is therefore doubly good news that building automated identification of 'canary clusters' clusters into SCRIPT will be straightforward.

The cluster of Seven Barrows and environs illustrates dramatically that all is not doom and gloom for the Small Blue. If we can dig deeper, guided by the people who have been recording there in recent years, it seems reasonable to assume that there are important, and hopefully transferable, lessons to learn about what we can do (or maybe *should not* do), in order to facilitate the Small Blue continuing to thrive elsewhere.

Also, if I may be allowed to anticipate next year's report a little, based on limited intelligence to date from 2025, Small Blue appears to be having a good year. In particular, I recorded it at Crowell chalk pits on 25 May, in one of the Oakley Hill cluster wonks and an adjacent one. I have also had three reports of hundreds, if not thousands, of Small Blue being seen at Pitstone LWS (the site formerly known as Quarry 1), part of the Ivinghoe Beacon and environs cluster.

Appendix 1: Small Blue clusters

Name	Wonks	Visits	Records	Scarcity	First In	Last In	Consistency
Bradenham & environs	24	2404	536	4.5	2015	2024	100%
Ivinghoe beacon & environs	14	2146	422	5.1	2015	2024	100%
Seven Barrows & environs	19	1148	332	3.5	2015	2024	100%
Hagbourne	3	1139	272	4.2	2015	2024	100%
Holtspur Bottom NR	3	563	195	2.9	2015	2024	100%
Lardon Chase	4	1067	145	7.4	2015	2024	100%
Watts Bank	4	253	108	2.3	2015	2024	100%
Swyncombe Downs	3	219	44	5.0	2015	2024	90%
Aston Upthorpe & Environs	9	800	37	21.6	2015	2023	100%
Stonepit field	2	288	29	9.9	2015	2024	100%
Dancers End & environs	3	978	28	34.9	2015	2024	90%
Oakley Hill & environs	2	308	26	11.8	2016	2022	100%
Wendover Arm, Drayton Beauchamp	2	63	19	3.3	2015	2024	100%
Dry Sandford Pit	6	499	18	27.7	2015	2022	88%
Aston Rowant NNR	5	1506	18	83.7	2015	2023	78%
Greenham Common	4	565	18	31.4	2015	2023	44%
Homefield Wood	4	370	13	28.5	2019	2024	100%
White Horse Hill	2	98	11	8.9	2016	2023	63%
Grangelands	3	1080	10	108.0	2017	2024	75%
Wallingford, Benson, Warwick Spinney	5	1363	9	151.4	2018	2023	50%
Cliveden	3	367	9	40.8	2017	2023	71%
Nineacres & environs	3	91	8	11.4	2015	2022	50%
Greenfield	3	31	8	3.9	2016	2022	57%
Hartslock & Goring	2	615	5	123.0	2018	2022	40%
Bernwood M40 compensation area	2	429	4	107.3	2017	2017	100%
Chieveley	3	22	3	7.3	2016	2020	40%
Great Kingshill	3	534	3	178.0	2018	2023	33%
South Stoke	2	34	3	11.3	2019	2022	50%
Calvert Jubilee NR & Greatmoor and environs	2	245	2	122.5	2019	2019	100%
Lodge Lake, Loughton	2	95	2	47.5	2019	2023	40%
Radley Lakes	2	215	2	107.5	2021	2023	67%

Appendix 2: Small Blue isolated wonks

Name	Wonk ID	Visits	Records	Scarcity	First In	Last In	Consistency
Maidenhead Thicket	SU8581	306	41	7.5	2017	2024	88%
Blue Lagoon NR	SP8632	42	14	3.0	2015	2019	100%
Cholsey	SU6086	79	9	8.8	2019	2024	100%
Piddington	SU8093	59	7	8.4	2017	2023	57%
Bottom Wood	SU7995	30	6	5.0	2018	2023	83%
Astwood	SP9447	644	5	128.8	2018	2022	60%
Swains Wood	SU7392	61	4	15.3	2022	2024	100%
Warburg	SU7188	210	3	70.0	2020	2023	50%
Speen	SU8499	9	3	3.0	2023	2024	100%
Walbury Hill	SU3761	39	3	13.0	2022	2023	100%
Lodge Down	SU3077	7	2	3.5	2019	2020	100%

Appendix 3: Small Blue random wonks

Name	Wonk ID	Visits	Records	Scarcity	From
Cross Hands Quarry	SP2629	1	1	1.0	2023
Worsham to NE	SP3011	1	1	1.0	2019
Curridge to SW	SU4770	2	1	2.0	2018
Fognam Chalk Pit	SU2979	4	1	4.0	2009
Peasemore, Eastley meadow	SU4477	5	1	5.0	2012
Farnborough	SU4382	6	1	6.0	2018
Seer Wood glade	SU8597	7	1	7.0	2019
Lambourn Downs	SU3479	7	1	7.0	2018
Wroxton	SP4141	9	1	9.0	2022
Chilton to S	SU4984	10	1	10.0	2002
Fawley Court Farm, Remenham	SU7684	10	1	10.0	2017
Theale	SU6168	11	1	11.0	2017
Cheddington	SP9117	13	1	13.0	2023
Chisbridge Farm	SU8088	13	1	13.0	2021
Ashbury	SU2785	14	1	14.0	2005
Hampstead Norreys to east	SU5375	17	1	17.0	2020
Willen Park	SP8740	19	1	19.0	2021
Little Missenden to west	SU9098	21	1	21.0	2015
Pangbourne Sewage Treatment Works	SU6476	24	1	24.0	2022
Chadlington	SP3322	24	1	24.0	2021
Collymore Farm & Brimstone Farm	SU2594	25	1	25.0	2022
Grove Business Park	SU3889	25	1	25.0	2022
Scours Lane Allotments	SU6874	25	1	25.0	2018
Braziers common	SU6583	26	2	13.0	2018
Road Farm - S2	SP8802	29	1	29.0	2022
Touchen End	SU8876	30	1	30.0	2019
Basildon Park to SW	SU5977	31	1	31.0	2018

Fingest Lane	SU7891	31	1	31.0	2003
Chalfont St Giles	SU9793	33	1	33.0	2023
Horsenden	SP7902	34	1	34.0	2020
Segsbury	SU3884	35	1	35.0	2017
Steeple Aston	SP4726	39	1	39.0	2022
Wraysbury Scrub	TQ0173	40	1	40.0	2024
Chilton-Didcot railway embankment	SU5291	41	1	41.0	2015
Hook Norton	SP3633	43	1	43.0	2023
Cold Ash to north	SU5171	46	1	46.0	2015
Chesham Bois Burial Ground	SU9699	49	1	49.0	2018
North Leigh	SP3812	55	1	55.0	2019
Ascott House	SP8922	62	1	62.0	2015
Elfield Park	SP8536	65	1	65.0	2019
Watchfield	SU2490	66	1	66.0	2023
Alscot	SP8004	76	1	76.0	2020
Hughendon Park	SU8695	78	1	78.0	2022
Amersham Old Town to south	SU9596	84	1	84.0	2019
Shotover	SP5605	88	1	88.0	2023
Bushy Bank transect	SU5891	88	1	88.0	2019
Marston Meadows	SP5107	97	1	97.0	2015
Floodplain Forest	SP8042	107	1	107.0	2023
Barton Fields	SU5097	124	1	124.0	2011
Lower Hartwell to east	SP8013	126	1	126.0	2023
Little Wittenham	SU5692	142	1	142.0	2014
Bacombe Hill	SP8507	175	3	58.3	2022
Higher Denham	TQ0287	180	1	180.0	2018
Aston, Oxon	SP3303	188	1	188.0	2023
Whiteknights	SU7372	189	1	189.0	2022
Faringdon	SU2894	191	1	191.0	2020
Howe Park Wood	SP8334	206	6	34.3	2023
Ewelme watercress beds	SU6491	209	4	52.3	2003
New Headington	SP5406	274	1	274.0	2019
Whitecross Green Wood	SP6014	382	1	382.0	2001
Maiden Erlegh LNR	SU7470	564	1	564.0	2020
Flackwell Heath	SU8989	595	3	198.3	2022

Appendix 4: Small Blue cluster scarcity detail 2020-2024

Name	Scarcity	2024	2023	2022	2021	2020
Bradenham & environs	4.5	15.5	3.4	4.0	6.4	4.9
Ivinghoe beacon & environs	5.1	11.1	10.3	4.9	6.5	6.5
Seven Barrows & environs	3.5	1.9	2.8	2.3	2.9	3.4
Hagbourne	4.2	6.5	36.0	9.7	4.4	2.9
Holtspur Bottom NR	2.9	11.0	4.2	3.0	5.1	3.7
Lardon Chase	7.4	5.4	3.9	5.9	6.5	18.1
Watts Bank	2.3	18.0	4.8	3.2	5.0	3.1
Swyncombe Downs	5.0	4.0	5.0	2.3		28.0
Aston Upthorpe & Environs	21.6		40.5	49.5	76.0	22.4
Stonepit field	9.9	38.0	17.3	5.9	15.5	11.0
Dancers End & environs	34.9	102.0	33.7	28.0	13.0	
Oakley Hill & environs	11.8			22.5	12.0	42.0
Wendover Arm, Drayton Beauchamp	3.3	5.0	5.0	7.0	8.0	5.0
Dry Sandford Pit	27.7			51.0		65.0
Aston Rowant NNR	83.7		84.0	42.5	37.2	59.3
Greenham Common	31.4		34.0	20.7		
Homefield Wood	28.5	36.0	29.0	15.7	19.5	26.0
White Horse Hill	8.9		6.0	13.0		
Grangelands	108.0	55.5		155.0	108.0	112.0
Wallingford, Benson, Warwick Spinney	151.4		51.5		158.0	
Cliveden	40.8		13.6	60.0	74.0	
Nineacres & environs	11.4			1.0	7.5	5.0
Greenfield	3.9			2.3	3.5	1.0
Hartslock & Goring	123.0			24.3		
Bernwood M40 compensation area	107.3					
Chieveley	7.3					1.5
Great Kingshill	178.0		58.0			
South Stoke	11.3			4.0		
Calvert Jubilee NR & Greatmoor and environs	122.5					
Lodge Lake, Loughton	47.5		19.0			
Radley Lakes	107.5		22.0		23.0	

Appendix 5: Small Blue isolated wonk scarcity detail 2020-2024

Name	Visits	Records	Scarcity	2024	2023	2022	2021	2020
Maidenhead Thicket	306	41	7.5	3.9	7.8	8.2	6.2	7.1
Blue Lagoon NR	42	14	3.0					
Cholsey	79	9	8.8	6.0	4.5	3.0	3.5	14.0
Piddington	59	7	8.4		6.0	8.0	8.0	
Bottom Wood	30	6	5.0		4.0	5.0	2.5	
Astwood	644	5	128.8			80.0		
Swains Wood	61	4	15.3	13.0	14.0	8.5		
Warburg	210	3	70.0		21.0			15.5
Speen	9	3	3.0	2.0	1.5			
Walbury Hill	39	3	13.0		10.0	6.0		
Lodge Down	7	2	3.5					2.0

Appendix 6: Small Blue random wonk visit detail 2020-2024

Name	Visits	2024	2023	2022	2021	2020
Cross Hands Quarry	1	0	1	0	0	0
Worsham to NE	1	0	0	0	0	0
Curridge to SW	2	0	0	0	0	0
Fognam Chalk Pit	4	0	0	0	0	0
Peasemore, Eastley meadow	5	0	0	0	0	0
Farnborough	6	2	1	0	1	0
Seer Wood glade	7	1	1	0	1	3
Lambourn Downs	7	1	1	0	1	1
Wroxton	9	0	2	1	2	4
Chilton to S	10	0	0	0	0	1
Fawley Court Farm, Remenham	10	0	0	2	3	1
Theale	11	0	0	1	1	3
Cheddington	13	2	4	2	1	2
Chisbridge Farm	13	1	0	1	3	1
Ashbury	14	1	2	1	3	5
Hampstead Norreys to east	17	0	0	0	0	3
Willen Park	19	7	3	2	2	2
Little Missenden to west	21	3	8	3	0	3
Pangbourne Sewage Treatment Works	24	3	7	4	5	2
Chadlington	24	3	4	3	8	2
Collymore Farm & Brimstone Farm	25	13	1	6	0	1
Grove Business Park	25	1	11	6	3	0
Scours Lane Allotments	25	0	1	2	6	4
Braziers common	26	0	1	0	0	19
Road Farm - S2	29	7	7	9	1	1

Touchen End	30	2	4	3	3	6
Basildon Park to SW	31	3	5	0	11	1
Fingest Lane	31	0	1	1	1	4
Chalfont St Giles	33	2	4	4	0	17
Horsenden	34	5	5	5	4	9
Segsbury	35	3	1	2	1	6
Steeple Aston	39	1	4	7	13	7
Wraysbury Scrub	40	1	1	0	14	8
Chilton-Didcot railway embankment	41	7	14	4	10	1
Hook Norton	43	5	16	19	3	0
Cold Ash to north	46	0	1	1	2	14
Chesham Bois Burial Ground	49	10	12	3	9	8
North Leigh	55	2	9	9	10	5
Ascott House	62	7	6	4	5	5
Elfield Park	65	17	17	19	0	9
Watchfield	66	2	4	9	16	20
Alscot	76	12	7	4	23	13
Hughendon Park	78	5	14	19	7	12
Amersham Old Town to south	84	9	3	8	12	6
Shotover	88	15	21	13	8	9
Bushy Bank transect	88	12	20	9	4	2
Marston Meadows	97	14	8	4	7	20
Floodplain Forest	107	20	20	32	7	16
Barton Fields	124	17	20	5	11	13
Lower Hartwell to east	126	3	7	18	25	32
Little Wittenham	142	7	7	10	20	6
Bacombe Hill	175	17	17	21	19	10
Higher Denham	180	3	1	48	0	20
Aston, Oxon	188	53	67	64	0	1
Whiteknights	189	18	22	38	24	26
Faringdon	191	14	31	15	31	8
Howe Park Wood	206	25	44	42	15	46
Ewelme watercress beds & environs Random#1	209	13	17	20	20	30
New Headington	274	37	50	46	34	30
Whitecross Green Wood	382	39	36	66	34	34
Maiden Erlegh LNR	564	56	106	66	70	75
Flackwell Heath	595	26	95	113	117	128