BSBI New Year Plant Hunt 2024

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Michael Jones' eight-month old daughter examines the new spotter sheet on her first New Year Plant Hunt in East Hampshire
Image courtesy of Michael Jones

Summary

- The BSBI's thirteenth New Year Plant Hunt (NYPH 2024) took place between Saturday 30th December 2023 and Tuesday 2nd January 2024. Volunteers submitted lists of native and non-native plants they found in bloom in the wild during a three-hour walk at locations throughout Britain and Ireland. The results were submitted online via smartphones and other electronic devices.
- 3,336 recorders took part, almost double the number of participants in 2023.
- They submitted 22,212 plant records on 2,205 lists including 40 hunts that yielded no records of plants in flower.
- 629 plant species were recorded in bloom, a 30% increase compared to 2023 and the third highest total in the history of the New Year Plant Hunt.
- The three species most frequently recorded in flower in 2024 were, as in previous years, Daisy (*Bellis perennis*), Dandelion (*Taraxacum* agg.) and Groundsel (*Senecio vulgaris*).
- In 2024, as in previous years, more species were flowering late (53%) than early (27%) whereas 30% of species were flowering as expected at New Year, including species that flower all-year round.

Introduction

Since 2012, the Botanical Society of Britain & Ireland (BSBI) has run an annual hunt for plants in flower during a four-day period over New Year (Marsh, 2015, 2016; Walker & Marsh, 2017, 2018, 2019, 2020; Goddard, Walker & Marsh, 2021; Rowley, Humphrey & Marsh, 2022, 2023). Participation has grown steadily over the years, with thousands of citizen scientists across Britain and Ireland taking part. A very similar scheme (Year End Plant Hunt), run by the Dutch botanical society (FLORON), has been running in The Netherlands since 2015 and has had a similar level of participation (Sparrius, 2019).

Originally the main aim of the New Year Plant Hunt (NYPH) was to provide a fun and engaging project for wildflower enthusiasts during the winter months when few botanical activities typically take place. More than a decade on, it now also provides valuable insights into how many species normally flower during the winter and, along with initiatives such as the Woodland Trust's 'Nature's Calendar' project, it is helping to build up a picture of how our flora is responding to changing weather patterns as a consequence of climate change (Büntgen et al., 2022). Due to media coverage, NYPH is also raising the profile of the BSBI and introducing its work to new audiences via new technologies such as online recording applications. Here we provide a brief summary of the results of the NYPH 2024.

Method

For NYPH 2024, volunteers picked a day between 30th December 2023 and 2nd January 2024 and recorded all native and non-native plants that they found in flower on a walk not exceeding three hours, excluding breaks and time travelling between sites. Plants that had obviously been planted in private and public gardens were excluded.

Participants were encouraged to restrict their hunts to a single area/site but in a few cases multiple sites were visited within the three-hour period (for example at stops along a motorway). Participants were encouraged to check that plants were actually in flower and not just immature or seeding, for example by checking that catkins were open, that grasses had open florets with stigmas or anthers etc. Conifers were included but all ferns and fern-allies were excluded from lists.

Several innovations were introduced in 2024 with the aim of increasing participation in the Hunt at all skill levels. Firstly, our advance promotion campaign was widened to alert other organisations (Wildlife Trusts, RSPB, Plantlife etc.) to the importance of the Hunt as a citizen science initiative and ask them to use their newsletters and social media platforms to encourage their members to participate. Secondly, the range of resources for participants was expanded to include spotter sheets for the Top Ten and Top Twenty lists of most frequently seen plants; guidance on how best to take photographs to aid identification; and clearer guidance on how to take part in the Hunt. Thirdly, we introduced an option for people to pre-register their interest in taking part in the New Year Plant Hunt and to receive (via email) ID resources and details of group hunts. 2,629 people subsequently pre-registered, of which only 403 (15%) were already BSBI members and 2,003 (76%) had had no previous engagement with the Society, as members, event attendees or supporters.

Most participants in the 2024 Hunt went out in small groups with family and friends, or on their own, although some established community groups and botanical recording groups organised communal plant hunts. These were advertised on social media and on a Group Hunts page on the BSBI website. Group hunts tend to submit longer lists, as they benefit from more 'eyes on the ground' and they tend to attract large groups of plant hunters at all skill levels, from beginner to expert, who benefit from the plant identification advice on offer and enjoy the social aspect of the NYPH.

The majority of lists were entered via a recording app/ online form and submitted via a smartphone, tablet or PC, allowing the results to be viewed simultaneously as they came in (Fig. 1). This improved the efficiency of data entry and reduced errors during data processing. Data validation prior to analysis included checking the completeness of the lists and that the site details submitted were correct, identifying unidentified species from photographs, checking doubtful records and that taxa matched those given by Stace (2010), and removing ferns and fern-allies and taxa only identified to genera or family level. Subspecies and varieties (including colour variants, '*flora pleno*', etc.) were aggregated to species-level as were microspecies of *Hieracium*, *Rubus fruticosus* and *Taraxacum*. Aggregates were also used for closely related taxa that are generally not recorded consistently (e.g. *Arenaria leptoclados/serpyllifolia*, *Aphanes arvensis/australis*, *Galanthus* spp., *Galeopsis bifida/tetrahit*, *Hedera helix/hibernica*, *Polygonum aviculare*). Non-native crops with native subspecies (e.g. *Beta vulgaris*, *Brassica rapus*) were not usually differentiated for the purposes of analyses.

To allow an assessment of whether species were flowering early or late, species were allocated to one of three phenological categories based on their 'typical' flowering months which were collated from various sources. For this we used published flowering months given in Clapham et al. (1987) and Sell & Murrell (1996-2018). Species were categorised as flowering 'on time' if they normally flower at New Year (December-January); 'early' if the number of months from New Year to first flowering month is less than the number of months from the last flowering month to New Year; and 'late' if the number of months from the last flowering month to New Year is less than the number of months from New Year to the first flowering month. Where the number of months from first and last flowering months to New Year was equal, species were classified as 'early or late'. For several non-natives, the normal flowering period was not known.

Figure 1. Output from the New Year Plant Hunt 2024 Results webpage: nyph.bsbi.org/results.php?year=2024

Results

3,336 participants took part in 2024, submitting 22,212 unique records. This represents a 97% increase in participants compared to 2023 (Table 1). 2,205 lists were submitted in total, including 40 null lists in which plant hunters found no species in bloom; this represents an increase of 120% in the number of lists submitted compared to 2023 (Fig. 2). From these lists 21,096 unique records were used in the analysis, an increase of 107% compared to 2023. The number of lists produced in each country indicate record participation throughout Britain and Ireland (Table 2).

Overall 630 different plant species were recorded (Table 3). Whilst the relative percentage of native and non-native species was roughly even, as in previous years, a greater proportion of the total was made up by non-natives than in all previous years of the survey (Table 4).

Table 1. The number of individuals participating, the number of submitted lists, and the number of records submitted in the New Year Plant Hunts, 2017-2024, with the increase in percentage shown for 2024 in comparison to 2023.

	2017	2018	2019	2020	2021	2022	2023	2024	% change 2023-2024
Participants	416	>800	1471	1,714	1,811	1,895	1,691	3,336	+ 97%
Lists	460	612	712	798	1,185	1,256	1,002	2,205	+ 120%
Records	7123	9907	14,193	14,880	21,419	20,612	10,199	21,096	+ 107%

Table 2. The number of New Year Plant Hunt lists submitted 2017-2024 broken down by country, with percentage increase shown for 2024 in comparison to 2023.

Number of lists	2017	2018	2019	2020	2021	2022	2023	2024	% change 2023-2024
England	282	427	466	538	821	923	695	1552	+ 123%
Wales	28	33	41	42	132	76	66	144	+ 118%
Scotland	43	56	94	102	138	122	99	180	+ 82%
Ireland	104	94	99	90	98	126	98	171	+ 74%
Channel Isles	3	2	6	7	6	9	6	8	+ 33%
Isle of Man	0	0	6	19	0	0	0	12	-
Total	460	612	712	798	1185	1256	1002	2205	+ 120%

Table 3. The number of plant species recorded during the New Year Plant Hunt 2015-2024.

Number of species	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Native	205	311	264	291	327	322	379	315	235	303
Non-native	161	300	228	241	300	293	331	354	247	326
Total	366	611	492	532	627	615	710	669	482	629
% native	56	51	54	55	52	52	53	47	48	48
% non-native	44	49	46	45	48	48	47	53	52	52

Table 4. The number of individual records made during the New Year Plant Hunt 2017-2024.

Number of records	2017	2018	2019	2020	2021	2022	2023	2024
Native	4509	6376	9055	9521	13777	12284	5212	14088
Non-native	2614	3531	5138	5359	7642	7571	4987	7840
Total	7123	9907	14193	14880	21419	19855	10199	21096
% native	63	64	64	64	64	62	51	63
% non-native	37	36	36	36	36	38	49	35

Participants recorded an average of 10.2 (±0.3) species within the three-hour period although there was a large range in the length of lists across the country, with one list recording 100 species in flower, and there were 40 null returns (Figs 3 & 4a). The longest lists tended to be submitted by established botanical recording groups rather than individuals. In 2024 the average number of native species recorded was 6.0 (±0.1) natives (Fig. 4b) whereas the average number of non-natives was 3.7 (±0.1) (Fig. 4c).

Figure 2. Map of the New Year Plant Hunt Lists received in 2024 (each dot represents a 10 x 10 km grid square for which at least one New Year Plant Hunt list was submitted).

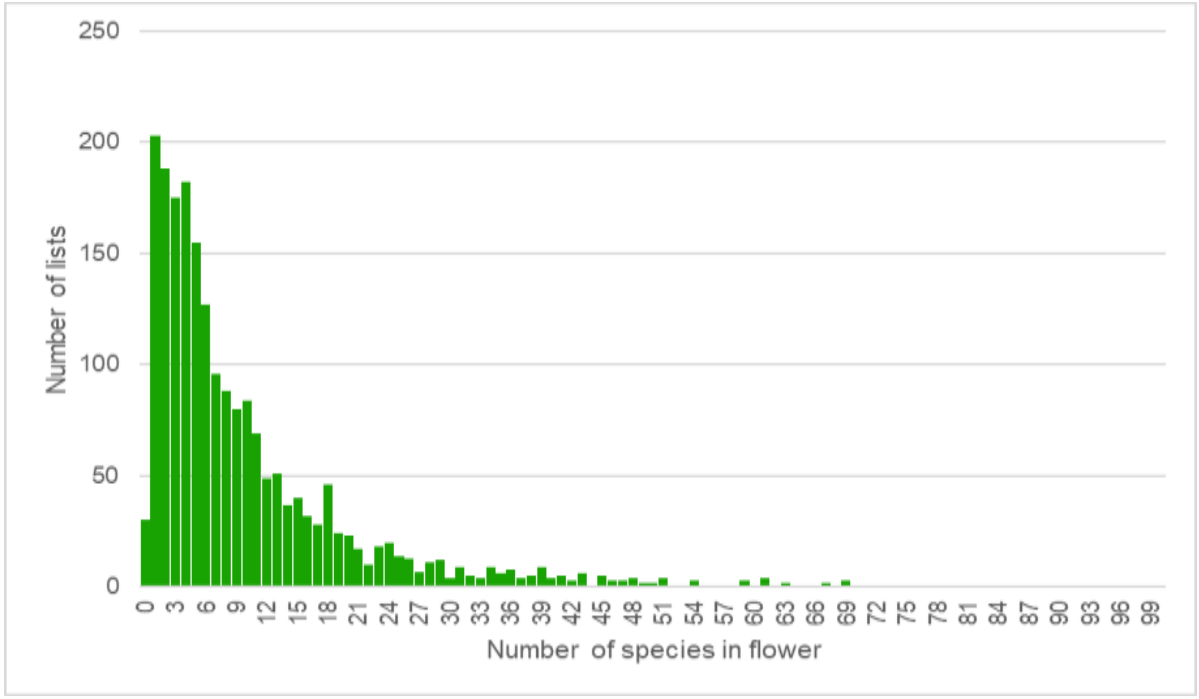

Figure 3. Histogram of the number of species recorded in flower per visit (list length) in the New Year Plant Hunt 2024.

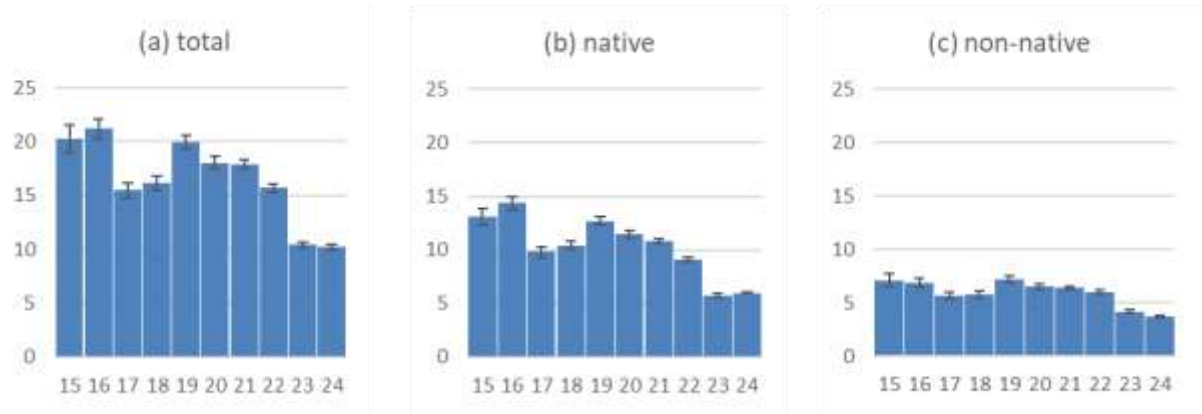

Figure 4. The mean number of species recorded in flower at New Year, 2015-2024. Error bars represent standard error.

Although the top three recorded plant species have remained constant since 2015, their order, in terms of frequency, has fluctuated: Daisy (*Bellis perennis*), Dandelion (*Taraxacum*), Groundsel (*Senecio vulgaris*) were all recorded in more than fifty percent of the lists submitted in 2023, but only Daisy was recorded in more than 50% of the 2024 lists (Table 5). White dead-nettle *(Lamium album)* was more frequent this year than in 2023, whereas Red Dead-nettle (*Lamium purpureum*) was less frequent; both are archaeophytes (ancient introductions) that colonise fertile and disturbed soils, but only White Dead-nettle is considered winter-green.

New arrivals in this year's Top 20 List of Frequent Plants compared to the 2023 list were Lesser Celandine (*Ficaria verna*), Common Ragwort (*Jacobaea vulgaris*) and Smooth Hawk's-beard (*Crepis capillaris*), displacing Smooth Sow-thistle (*Sonchus oleraceus*), Hogweed (*Heracleum sphondylium*) and Ivy (*Hedera helix*).

Despite increased participation in 2024, there appears to be little change in recent years in the relative proportions of species flowering late (53%), early (27%) or as expected at New Year (5%) (Fig. 5).

Table 5. The 10 species recorded most frequently in flower during the New Year Plant Hunt 2023. Species are listed in their rank order in 2023 and shown against their position in 2017-2023. The top ranked species are shaded dark (1-5) and light grey (6-10).

Taxon	***2017***	***2018***	***2019***	***2020***	***2021***	***2022***	***2023***	***% lists 2024***	***Flowering***
Bellis perennis "Daisy"	*1*	*1*	*1*	*1*	*1*	*1*	*3*	*60%*	*early or late*
Taraxacum "Dandelion"	*3*	*3*	*3*	*3*	*3*	*2*	*2*	*49%*	*early*
Senecio vulgaris "Groundsel"	*2*	*2*	*2*	*2*	*2*	*3*	*1*	*42%*	*expected*
Poa annua "Annual Meadow-grass"	*4*	*4*	*4*	*4*	*4*	*4*	*5*	*36%*	*expected*
Lamium album "White Dead-nettle"	*18*	*9*	*13*	*10*	*8*	*5*	*9*	*30%*	*late*
Ulex europaeus "Gorse"	*6*	*5*	*11*	*8*	*11*	*10*	*7*	*29%*	*early*
Euphorbia peplus "Petty Spurge"	*7*	*8*	*8*	*9*	*9*	*8*	*8*	*23%*	*expected*
Achillea millefolium "Yarrow"	*12*	*16*	*12*	*11*	*10*	*15*	*11*	*23%*	*late*
Lamium purpureum "Red Dead-nettle"	*9*	*6*	*6*	*6*	*7*	*7*	*4*	*22%*	*early or late*
Capsella bursa-pastoris "Shepherd's-purse"	*5*	*7*	*5*	*7*	*6*	*6*	*6*	*21%*	*expected*

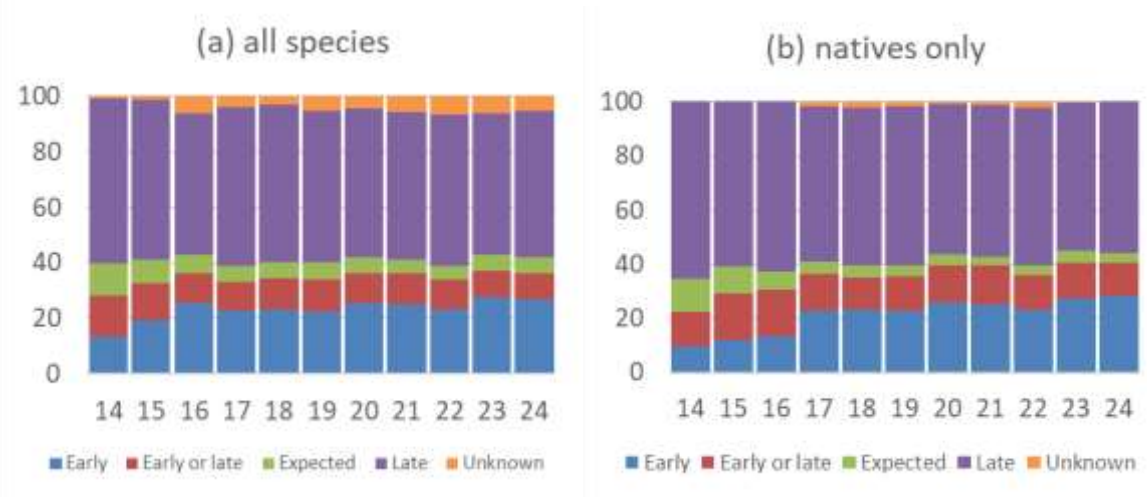

Figure 5. The proportion of plant species flowering early, early or late, late or as expected at New Year, 2014-2024. (a) all species and (b) native species only.

Figure 6 presents the flowering time offsets in terms of the number of records in each class (in contrast to the *species* counts shown in Figure 5). A similar pattern emerges, with most occurrences of flowering belonging to late flowering 'autumn stragglers' (39%) or species flowering as expected (25%) (Fig. 6a). Unsurprisingly, the relatively small number of species flowering as expected are heavily represented on our lists. Among native taxa only (Fig. 6b) a possible trend for increased early flowering since 2020 requires further investigation.

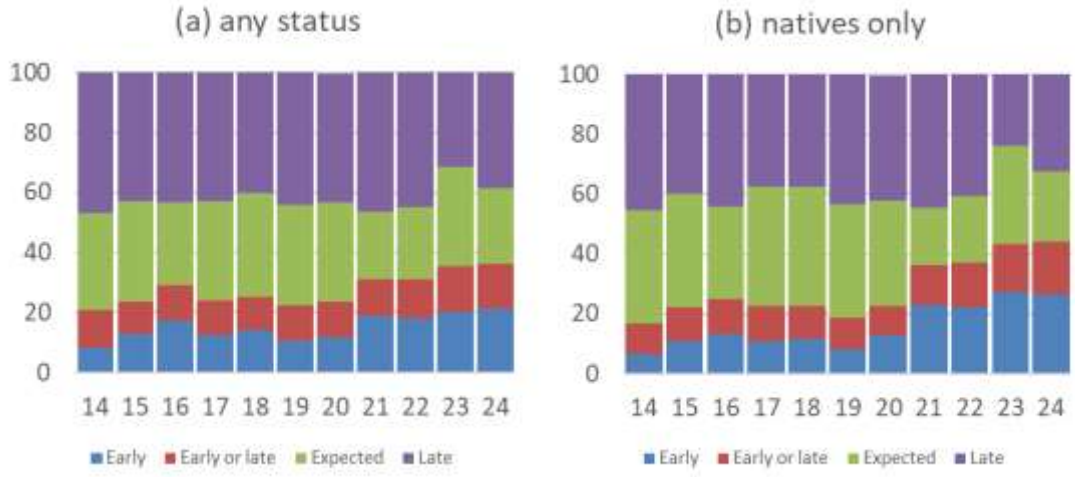

Figure 6. The proportion of records of species flowering early, early of late, late or as expected at New year, 2014-2024. (a) all species and (b) native species only.

Discussion

The 2024 Plant Hunt was preceded by an unusually mild December (Met Office, 2023). The temperature was 2.8 degrees above average across Nov-Dec, although as these temperature anomalies were taken as an average from the whole of the UK there may be regional differences (Fig. 7).

Many recorders in Scotland and northern England submitted 'null record' lists or reported being unable to go out recording due to snow or flooding from Storm Henk. Some recorders who have been participating in the New Year Plant Hunt over the years noted that they had followed the same routes that they had taken in previous years.

Some recorders used social media to comment that they were finding more species than last year, when totals were around half those recorded in 2019-2022.

Due to the lack of systematic records, we can't tell with any certainty whether plants are flowering more often now than in the past but what the results from NYPH clearly show is how many plants respond to 'unseasonal' weather, for example the exceptionally warm weather experienced in late 2015 when temperatures were more than 4°C above average. Such conditions allow plants to continue flowering well into the winter, presumably because of the absence of severe frosts which would normally kill any late-flowering shoots. The implications of this for plant performance are far from clear. The premature spring growth of some arctic-alpine plants during warmer winters (as many gardeners will know) can weaken some plants due to the depletion of carbohydrate reserves and damage to tender plant parts such as buds and flowers from snow and frost (Crawford, 1997, 2000). Shifts in flowering time may also cause asynchrony between flowering and associated pollinators with potential knock-on effects for plant and insect productivity (Solga *et al.*, 2014).

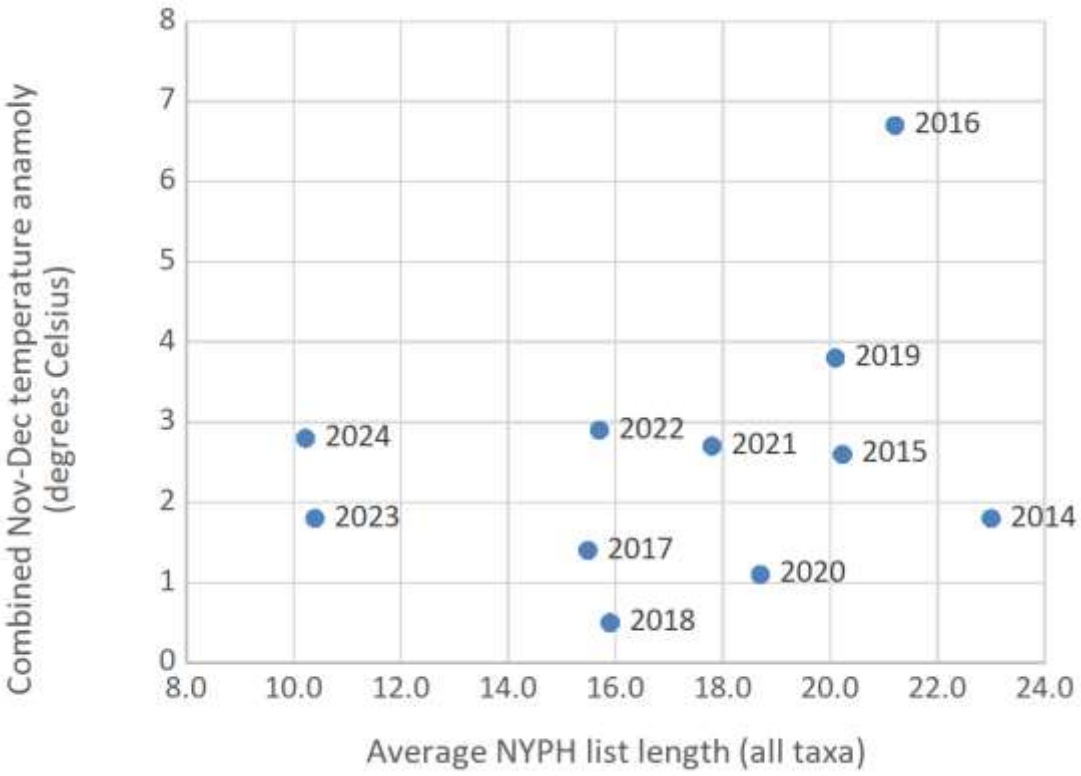

Figure 7. The combined UK mean temperature anomalies for November and December plotted against the average New Year Plant Hunt list lengths, 2014-2023. Temperature data from the UK Met Office using the 1961 — 1990 period as the anomaly control. (https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-temperature-rainfall-and-sunshine-anomaly-graphs)

A number of studies have shown that many plant species now flower earlier than in the past as a result of warmer winter and spring temperatures (Fitter & Fitter, 2002; Amano *et al.*, 2010). However, the evidence from the New Year Plant Hunt is less marked with relatively few species flowering earlier rather than late, presumably because very large advances in flowering would be needed for them to be in flower at New Year. In addition, many spring-flowering (vernal) species require periods of freezing temperatures (stratification) to break dormancy and stimulate growth; consequently, phenological responses to warming will not be straightforward to predict (Crawford, 1997, 2000).

One of the most intriguing findings of the NYPH has been the sheer number of species flowering at New Year. Standard British Floras (e.g. Clapham *et al.*, 1987) lead us to expect around 2% will be in flower in December and January. The numbers have been significantly higher than this in each year of this survey and suggests that a radical reassessment of flowering is needed, ideally based on observations at multiple sites across the whole of Great Britain and Ireland in each month.

The large numbers of non-native plants in flower at New Year has also been a notable feature of the survey largely because the majority of hunts take place in urban and suburban areas where alien plant diversity is highest. In these areas, aliens as well as natives benefit from the elevated temperatures found in towns and cities (the so-called 'urban heat island-effect').

The increased participation, particularly from first-time participants, was another notable feature of the NYPH 2024. The Hunt is, arguably, as much an outreach/ engagement activity as a citizen science/ data collecting activity. The increased publicity ahead of this year's event, the new spotter sheets, the resumption of group hunts now that the threat of Covid has diminished, and the support on offer in the run-up to and during the Hunt, all helped those taking their first steps in plant identification or citizen science to submit their data and feel reassured that their contributions were valued.

A follow-up programme is planned to help all NYPH 2024 participants take their next steps in botanical recording and to help BSBI meet its aims of building a diverse community of botanists and sharing our vision of a world where our wild plants thrive and are valued, whenever and wherever they bloom.

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