ECOLOGY IN SOMERSET 2018

EDITORIAL

Last year it was plastic, with David Attenborough's TV series *Blue Planet II* raising our awareness of what this substance is doing to our oceans and their wildlife. And the response from Government, industry and the public was immediate and wide-ranging. In the last twelve months there has been steady progress to reduce single-use plastic and plastic carrier bags. One major supermarket chain is now trialling *paper* carrier bags, and changes of this sort are to be welcomed. But there is still a long, long way to go, and current efforts can seem puny in comparison with the size of the problem we're facing.

More recently, though, the environmental spotlight has shifted to the much larger issue of climate change. As David Attenborough's *Climate Change – The Facts* made clear, the scientific community has become much bolder in its assertion that human-induced climate change is *real*, that it's happening *right now*, and that if we don't take action *very quickly* to bring down global carbon emissions then within twelve years or so we could find ourselves having to deal with the human and ecological consequences of a climate crisis of unparalleled proportions. *The Uninhabitable Earth*, by David Wallace-Wells, published in the UK in February, makes for uncomfortable reading, but is a helpful summary of the direction in which we seem to be heading. It doesn't pull its punches.

The problem of climate change is global – as are many of the actions required to solve it – but there is a local dimension too. Each of us can do something to help the situation, and we could be encouraging others to do likewise. Earlier this year Somerset County Council and several of our District Councils declared a 'climate emergency'. Pressure is now building for a political response at national level as recent actions by 'Extinction Rebellion' in London and across the country have demonstrated.[1] There is a growing protest movement, inspired by the 'school strike' that began in Sweden last year when a fifteen-year-old schoolgirl, Greta Thunberg, decided to sit outside the Swedish parliament to demand action on climate change. This sparked similar protests by young people in 125 countries around the globe. We have had schoolchildren striking here in Somerset, while the emergence of local 'Extinction Rebellion' groups bears witness to a sense of increasing unease and alarm. The signs are hopeful, though, and we trust that in next year's editorial we will be able to reflect on a year of unprecedented progress in tackling the human causes of a warming climate.

There are, of course, many complex reasons for changes in the natural world and the abundance and distribution of species. Some reasons are more obvious than others. Habitat destruction, such as woodland clearance or the conversion of grassland to arable, is unmissable. Other impacts may be subtler, with resultant changes more insidious and taking longer to be noticed. Those with long memories will recall hearing and seeing Lapwings and Curlews in undrained pastures and how common the smaller birds of field and hedgerow were. Butterflies and bumblebees were more numerous in those days too, and vintage car drivers (referring to the drivers, not the cars) will remember a time when travelling along a country lane at night involved driving through a blizzard of moths. The trend isn't always one of decline, though, as papers and reports in this edition of *Ecology in Somerset* make plain; indeed, there are many species listed in these pages which have never before been recorded in the county, or which have been found again after an absence of many years. It should be emphasized, too, that quite a few of our recent 'natural colonists' – e.g. Wasp Spider, Jersey Tiger, Tree Bumblebee, Roesel's Bush-cricket, Long-winged Cone-head, Great White Egret, Cattle Egret – are undergoing range expansions that are more than likely linked to climate.[2]

An important function of *Ecology in Somerset* is to disseminate to a wider audience information about what's happening to wildlife in our county; much of this is based on the work of specialist groups like the Somerset Rare Plants Group and the local branch of Butterfly Conservation, as well as on observations made by our own members. The aim, as always, is that the reports assembled here should help towards a better understanding of the overall health, and wealth, of Somerset's flora and fauna.

SANHS encourages groups and individuals to apply for grants to undertake studies in the 'natural sciences' – including botany, geology, zoology, mycology and ecology – in the historic county of Somerset, with eventual publication of results in *Ecology in Somerset*. It is therefore pleasing that an article on the review of local geological sites is included this year; and we can report that funding has been agreed for the continuation of this review for a further year. Two other projects, one on harvest mice and the other on saproxylic invertebrates in

willow pollards, have also been awarded grants from the Society's Natural Sciences (Pat Hill-Cottingham) Fund.

In the present issue of *Ecology in Somerset* we have the usual reports on a wide range of subjects and taxonomic groups – from spiders to birds, butterflies, vascular plants, plant galls and first flowering dates. It is amazing to see the multiple effects that a cold snap or heatwave can have on our wildlife. And who would have guessed that Somerset could be home to so many species of dandelion, with the total still rising? Butterflies had a mixed season in 2018, an almost equal number of species showing gains and losses. It will be later this year, however, that we discover what effect the scorching summer of 2018 has had on the fortunes of the Large Blue. Will it prove to have been just too hot at a critical time for its larval stage? Hopefully not.

Thanks are expressed to all the authors who have contributed material for this edition of *Ecology in Somerset*, and to all who have helped in an editorial capacity.

The Natural History Committee
30th April 2019

Notes

1. By the end of April, more than 90 local authorities had declared a 'climate emergency'. And then, significantly, on 1st May – the day after this editorial was drafted – the UK Parliament passed a motion declaring UK-wide 'environment and climate emergency'. This followed similar pronouncements in Wales and Scotland.
2. For a wide-ranging, thoroughly readable and beautifully illustrated survey of the effects of climate change on our wildlife – including accounts of many species undergoing range expansions – we recommend the recent volume by Trevor Beebee, *Climate Change and British Wildlife*, published in 2018 (Bloomsbury, ISBN: 978-1-4729-4320-0)

DANDELIONS (*TARAXACUM*) IN SOMERSET – A FEW MORE FIRST COUNTY/VICE-COUNTY RECORDS

S. J. LEACH, A. J. RICHARDS, G. E. LAVENDER and J. WEBB

Following a bumper crop of Dandelion (*Taraxacum*) records in 2016 (Leach, Richards and Webb 2017) and 2017 (Leach and Richards 2018), we have continued to make collections of this challenging group. Listed below, in alphabetical order, are those species for which our records in 2018 represent, for the most part, county and/or vice-county 'firsts'. All records are based on material collected by SJL, GEL and/or JW, and determined/confirmed by AJR in his capacity as national referee for *Taraxacum*. Supporting voucher specimens for all records listed here are being added to the SANHS/Somerset County Herbarium (**TTN**) held at the Somerset Heritage Centre.

In 2018 the bulk of our collecting was in S. Somerset (VC5). R. D. Randall again gathered specimens from several sites in N. Somerset (VC6), but at the time of writing (1 February 2019) these have yet to be examined by AJR. We were particularly pleased to add a further five taxa to the county list belonging to *Taraxacum* section *Celtica*. As one might guess from the name, members of s. *Celtica* have a mainly western-oceanic distribution in Europe, and they are an especially striking feature of the native Dandelion flora of SW England and Wales. Amongst the highlights in 2018 there were a couple of surprises: the mainly Irish *T. pietii-oosterveldii* was found on Exmoor – a third record for Britain – while the (mainly Welsh) GB endemic *T. porteri* was collected from a lane bank at Langford Heathfield.

The list below includes 16 taxa new to VC5, 10 of which are also first records for the county as a whole. With these additions, the *Taraxacum* flora of Somerset now stands at 151 species, 133 in VC5 and 90 in VC6.

Taraxacum 'atrocollinum' – Putham Lane (SS 9331 3891), 25 Apr, on bank of damp sunken lane, GEL, det. AJR; a sixth record for VC5 of this yet-to-be-described British endemic, and more westerly in Somerset than those previously reported (Leach and Richards 2018).

Taraxacum coartatum – Oare (SS 8012 4715), 21 Apr, at edge of field, GEL, det. AJR; first record for VC5 and Somerset.

Taraxacum diastematicum – Washford (ST 0463 4140), 12 Apr, on grassy path, JW, det. AJR; first record for VC5 and Somerset.

Taraxacum excellens – Taunton, Wood Street/ Tangier Way (ST 2256 2483), 14 Apr, in wide grassy roadside verge outside former Lidl's supermarket site, SJL, det. AJR; first record for VC5, second for Somerset and first since 1983. [Also a second unconfirmed Taunton record, from gravel path at back of 15 Trinity Street, 28 Apr, SJL, but lacking voucher specimen.]

Taraxacum haematicum – Hawkcombe (SS 8839 4584), 20 Apr, in vegetable garden, GEL, det. AJR; first record for VC5, second for Somerset.

Taraxacum hesperium – Fair Cross (ST 0533 3959), 16 Apr, in mown grass verge, JW, conf. AJR; first record for VC5, second for Somerset and first since 1982.

Taraxacum insigne – Sheep Dip, Steart (ST 2616 4479), 23 Mar, grassy verge to saltmarsh, GEL, JW & Ian Salmon, det. AJR; first record for VC5 and Somerset.

Taraxacum laciniosifrons – Taunton (ST 2346 2363), 20 Apr, on edge of footpath/cycleway at base of wall behind Richard Huish College, SJL, conf. AJR (Fig. 1); first record for VC5, second for Somerset and first since 1983.

Taraxacum macranthoides – Thurlbear Wood/Great Boles Wood (ST 2673 2043), 8 May, at edge of forestry ride/track, next to timber storage stacks, SJL, det. AJR; first record for VC5 and Somerset.

Taraxacum obtusifrons – Cloud Farm (SS 7927 4730), 21 Apr, in grassy lane leading to campsite, GEL, det. AJR; Milverton (ST 1114 2697), 24 Apr, on road verge, JW, GEL & SJL, det. AJR; Hawkcombe (SS 8839 4584), 28 Apr, on waste ground, GEL, conf. AJR; first and subsequent records for VC5 and Somerset.

Taraxacum pectinatiforme – Allerford (SS 9033 4669), 2 Apr, on road verge, GEL, det. AJR; first localized record for VC5, second for Somerset and first since 1976.

Taraxacum piceatum – Sheep Dip, Steart (ST 2610 4489), 23 Mar, on grass bank by saltmarsh, GEL, JW & Ian Salmon, det. AJR; Shillett Wood (SS

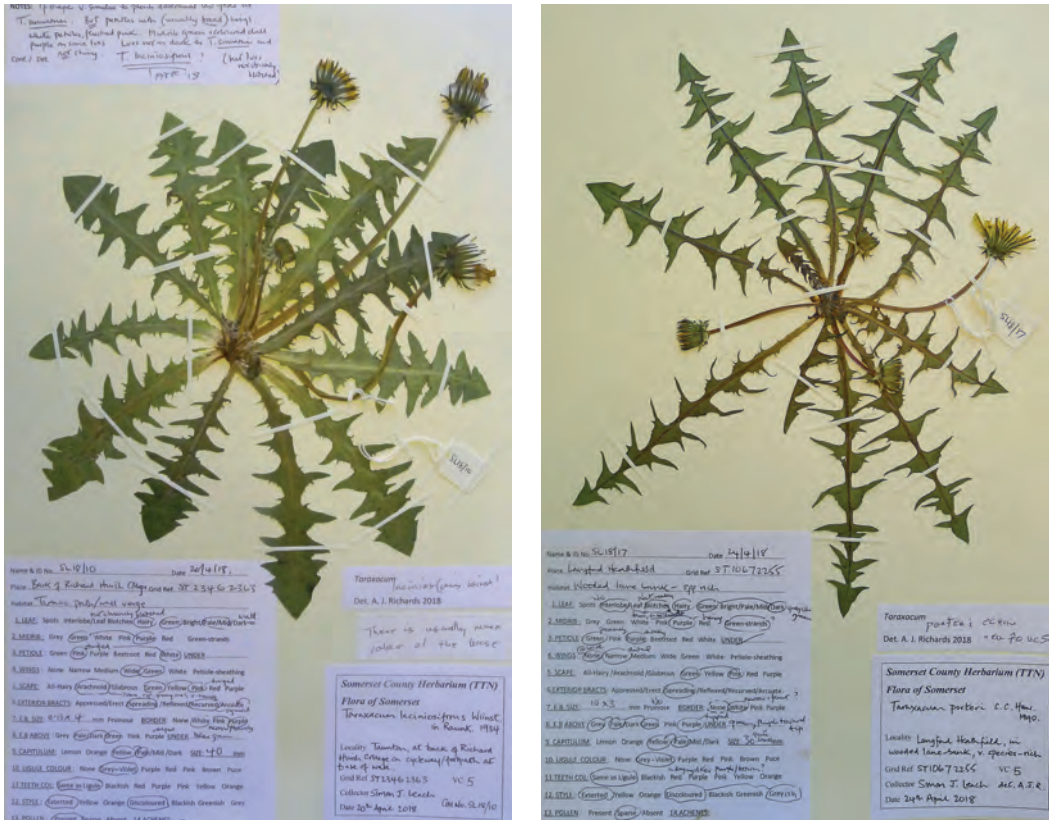

Fig. 1 Taraxacum laciniosifrons, *Taunton; voucher specimen to be held at SANHS/Somerset County Herbarium (**TTN**) (Photo: Simon Leach)*

8601 4571), 1 May, grassy bank at edge of wood, GEL, det. AJR; first and second records for VC5 and Somerset.

Taraxacum pietii-oosterveldii – Pickedstones (SS 8053 3718), 7 May, in short grassland on high moor, GEL, det. AJR; first record for VC5 and Somerset. A species belonging to s. *Celtica* and closely related to *T. nordstedtii*, it was originally described from material gathered in Denmark and the Netherlands (Øllgaard 2015), but recently it has been recorded from Ireland where it may be quite widespread (Richards and Doogue 2017). At the time, this was a third record for Britain, previous collections being from Shropshire and Carmarthenshire.

Taraxacum porteri – Langford Heathfield (ST 1067 2255), 24 Apr, on wooded lane-bank, with several other *Taraxacum* spp including *T. celticum*, SJL, det. AJR (Fig. 2); first record for VC5 and Somerset. A striking member of s. *Celtica*, originally thought to be confined to Wales and the Welsh border counties (Haworth 1990; Dudman and Richards 1997), but recently found to also occur, very sparingly, in N. Devon (VC4). *T. celticum,* too, is a species which has its core distribution in Wales.

Taraxacum proximiforme – Wall Common (ST 2613 4528), 23 Mar, grassy edge to car-parking area, JW, GEL & Ian Salmon, conf. AJR; first record for VC5 and Somerset.

Taraxacum richardsianum – Snowdrop Valley (SS 9268 3982), 3 May, edge of wet pasture, JW, det. AJR; first record for VC5, second for Somerset. [First record for the county was made by Rob Randall in N. Somerset (VC6) in 2017 (Leach and Richards 2018).]

Taraxacum stenacrum – Milverton (ST 1212 2591), 24 Apr, road verge/pavement outside parish church, JW, GEL & SJL, det. AJR; first record for

VC5 and Somerset. Also Hawkcombe (SS 8839 4584), 28 Apr, on stone path/edge of wall, GEL, det. AJR, and Galmington (ST 209 208), 1 May, in lane-bank/hedgerow in Comeytrowe Road, SJL, det. AJR; second and third records for VC5 and Somerset. Likely to be a widespread species in VC5, quite distinctive and easily spotted once one is familiar with it.

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NATURAL HISTORY REPORTS

VASCULAR PLANT REPORT 2018

After 2020, the Botanical Society of Britain & Ireland (BSBI) plans to produce a new atlas of the British and Irish flora. All Somerset plant records up to the end of 2019 will contribute to this. Distribution maps will be generated for all native species and many alien taxa, showing past and present distributions. There is likely to be particular interest in recent changes in species' distributions. In the last Atlas (Preston *et al*. 2002) the list of native species which had shown the greatest decreases since the previous Atlas made depressing reading: many of the species listed are included in the Somerset Rare Plant Register.

The next Atlas will inevitably show continuing declines for many native species; however some are clearly expanding their range, in several cases due to colonisation of a new habitat. In Somerset, one of the most thrilling records of 2018 was the discovery of *Asplenium marinum* (Sea Spleenwort) in a basement in Bath. The suitability of Bath basements for colonisation by ferns was discussed by Crouch and Rumsey (2010). They provide a sheltered, relatively frost-free, often damp environment for the germination of fern spores and for reproduction. Sea Spleenwort has an almost entirely coastal distribution, so the occurrence of this species in Bath, more than 30km from the nearest coastal populations, is astonishing, although not unprecedented. There have been a few other inland occurrences, most spectacularly in Co. Fermanagh, 17km inland and at an altitude of 210m (Forbes and Northridge 2012). Sea Spleenwort is largely restricted to coastal sites because of its requirement for a damp frost-free habitat rather than any dependence on salinity: the sheltered Bath basements thus offer an alternative suitable habitat for this coastal species, which is believed to have arrived there naturally by long-distance spore dispersal (Crouch 2019).

In last year's report (*SANH* 161, 316-23) *Polycarpon tetraphyllum* (Four-leaved Allseed) was reported at a new site on a road verge in VC6 (North Somerset); in 2018 it was found on a road verge in VC5 (South Somerset). Preston *et al*. (2002) mapped this species in only 30 hectads (10km squares), mostly in SW England and the Channel Islands, where it was known as a rare and local plant of sandy and waste places, its distribution largely coastal. The next Atlas is likely to show a four-fold increase in number of hectads for this species, with a new concentration of records in London and the south-east. Many recent sites are on road verges where this species appears to have found a new niche. A number of other native species have similarly increased their range by colonising road verges. *Torilis nodosa* (Knotted Hedge-parsley) was described by M. F. Watson (in Preston *et al*. 2002) as a plant of "dry sparsely vegetated habitats, including open grassland, sunny banks, sea walls, cliff tops, arable fields, tracks and waste ground", with no mention of road verges; in the last few years it has been found in remarkable abundance on kerb edges in many of our towns, again finding an ideal new habitat. It is likely that salting of road verges creates bare areas which are then available for colonisation by this species and others. *Galium parisiense* (Wall Bedstraw) was reported as new to VC5 in 2012 when thousands of plants were found on waste ground and roadsides near Taunton railway station (*SANH* 156, 242); subsequently it has been found on verges and kerbsides in other parts of Taunton (*SANH* 159, 276; *SANH* 161, 319), and on a kerb edge in Wells (*SANH* 157, 192). The account for this species in the last Atlas pointed out that Wall Bedstraw had been declining due to loss of habitat, yet in the next Atlas its distribution map, like *Polycarpon tetraphyllum*, will show a considerable increase in range due to its recent colonisation of kerb edges, paving, verges and roadside banks.

In 2018 *Mentha pulegium* (Pennyroyal) was discovered at two new sites in Somerset. This species is a rare native of seasonally inundated grasslands and is Critically Endangered on the England Red List (Stroh *et al.* 2014); however it was reported in the last Atlas to be spreading as an alien introduced with grass seed (Preston *et al.* 2002). One of the new sites in Somerset was in grazing marsh at Steart Marshes (Fig. 1), whilst the other was on a new road verge in Taunton. From their habitats, one might deduce that the former was native, the latter introduced; however it is possible that plants arrived at Steart by seed from Pawlett Hams (across the River Parrett) where this species was found in 1996 (Green *et al.* 1997), almost certainly introduced as a constituent of the seed-mix used to revegetate the sea wall, although it is perhaps more likely that it has been similarly introduced in a sown seed-mix at Steart.

In any species distribution map where an attempt is made to distinguish between native and alien records, assumptions are made based on past known distributions and habitat preferences, but some plant species are opportunists and can adapt to new habitats. The status of coastal species which have spread inland along road

Fig. 1 Mentha pulegium *(Pennyroyal) in grassland at Steart (Photo: Ro FitzGerald)*

Fig. 2 Cochlearia danica *(Danish Scurvy-grass), a coastal species that has become increasingly common along inland road verges (Photo: Simon Leach)*

networks, successfully colonising road verges left bare by salting, has been a subject of much debate. Preston *et al.* (2002) mapped all 'roadside halophytes' as native at the coast and alien inland along road verges; however Leach (2003) and others have argued that although the initial dispersal of seeds from coast to road verge may have been by vehicles (an unintended introduction by man), these species have clearly spread naturally since then, their seeds perhaps blown along roadsides in the slipstreams of vehicles.

Without documented evidence of introduction, it is becoming increasingly difficult to make this distinction between 'native' and 'introduced' sites for native species: many native species have historically colonised new man-made habitats, and indeed have names which reflect this. *Drabella muralis* (Wall Whitlow-grass) is a small annual crucifer native to limestone rocks and open soils; however, as its name implies (*muralis* means "of the wall"), it also happily grows on walls. In Somerset, three hectads were mapped by Preston *et al.* (2002) as native and all others as alien, yet it is only found on limestone rocks at one site in one hectad: at all other sites it grows on walls, on disused railway banks or as a weed in gardens. The only site at which this species may have been introduced is in Bath, where it grows on the rockery in the Botanic Gardens and may thus have arrived with rocks from the Mendip hills. A thrilling record in 2018 was the discovery of about 50 large plants of Wall Whitlow-grass on one anthill on Little Solsbury Hill near Bath, where it must be considered native. Although this species had spread naturally to a man-made habitat (walls), it has been declining dramatically on walls in Somerset, so a new record for a natural habitat is particularly pleasing.

There is a clearly understood distinction between plants which are considered to be part of the native flora and to have arrived in a particular country naturally, and those which were originally deliberately introduced by man, as crops or as ornamental plants for gardens. Confirmed native species may appear in the fossil record, whilst for many aliens of horticultural origin there is documentary evidence of the date and mode of introduction. Numerous alien species jump the garden fence, as illustrated by many of the records below, but they remain aliens and will always be mapped as such, although some have become so widespread and familiar that they may reasonably appear to be a natural part of our flora. When acknowledged native species move into new habitats, it seems unreasonable that they should be mapped as alien in the same way as introduced species, especially when the mode of arrival is usually unknown and may have involved natural dispersal. The arrival of Sea Spleenwort in Bath is likely to have occurred without any human assistance and so should be considered an expansion of its native range (albeit to a man-made habitat). It follows a number of other coastal plants which have also recently appeared in Bath, including *Cochlearia danica* (Danish Scurvy-grass) (Fig. 2), *Spergularia marina* (Lesser Sea-spurrey), *Catapodium marinum* (Sea Fern-grass), *Atriplex littoralis* (Grass-leaved Orache) and *Armeria maritima* (Thrift), but these species were all mapped in the last Atlas as 'alien' where they occurred inland on salted road verges. With so many native species declining due to loss of habitat, we should perhaps celebrate those which have expanded into new habitats, rather than branding their inland records as 'alien'.

The records below were, unless otherwise

stated, made during 2018. They fall into one of the following categories:

- A taxon recorded for the first time in the wild in Somerset (Watsonian vice-counties 5 (South Somerset) and 6 (North Somerset)), ie *a new county record*
- A taxon recorded for the first time in the wild in one of the Somerset vice-counties, either VC5 or VC6, ie *a new vice-county record*
- Other records of particular interest, for example second or third vice-county record, species re-found after a long absence, or newly discovered populations of Nationally Rare, Scarce or threatened species. These records are divided into two sections – native and alien – to give prominence to records of *native* taxa. (A Nationally Rare species is one found in 15 or fewer hectads in GB; a Nationally Scarce species is one found in 16-100 hectads in GB.)

Within each category, records are listed alphabetically by 'taxon', which may be a species, microspecies, subspecies, variety or cultivar. Both native and introduced taxa are included, with those more recently introduced ('neophytes') being distinguished by an asterisk before the name. Nomenclature follows Stace (2019) for all taxa included in that work. The vice-county is given for each record; the boundary between VC5 and VC6 follows the River Parrett/River Yeo/A303. As in previous years, new county/vice-county records of *Taraxacum* (Dandelion) species are reported separately (pp. 107 – 109).

Recorders and referees whose names appear more than once have been abbreviated as follows: Somerset Rare Plants Group (SRPG); Wild Flower Society (WFS); John Akeroyd (JRA); Helena Crouch (HJC); Ro FitzGerald (RFitzG); Dave Green (DEG); Geoffrey Kitchener (GDK); Graham Lavender (GEL); Simon Leach (SJL); Roger Maskew (RM); Liz McDonnell (EJMcD); Ellen McDouall (EllenMcD); Chris Metherell (CM); John Poingdestre (JP); Rob Randall (RDR); Tim Rich (TGCR); Fred Rumsey (FJR); Ian Salmon (ITS); Jeanne Webb (JW).

Where mentioned in the following list, *The Atlas Flora of Somerset* (Green *et al*. 1997) is abbreviated as *AFS*.

New Somerset records

Acaena inermis (Spineless Acaena) – Barrington (ST 3886 1816), 4 Jun, small patch on verge of Copse Shoot Lane, JP, VC5.

Cardamine amara (Large Bitter-cress) – Bath, Royal Victoria Park (ST 745 652), 5 Jun, well-established amongst *Phalaris arundinacea* var. *picta* in pond at crazy golf course, possibly accidentally introduced with the grass, RDR, VC6.

Centaurea nigra subsp. ***rivularis*** (Common Knapweed) – East Quantoxhead (ST 1387 4332), 18 Aug, in pasture field, very long ray florets, RFitzG, VC5. First record for SW England.

Eryngium giganteum (Tall Eryngo) – Down End, nr Puriton (ST 31 41), 17 Jul, one flowering plant in shade on verge, Andrew Robinson, VC6.

Hedera algeriensis (Algerian Ivy) – Bath, East Twerton (ST 7354 6456), 13 Nov, abundant along fence-line on N side of railway bank, almost certainly colonised from garden across footpath (probably the cultivar 'Gloire de Marengo'), HJC & DEG, VC6.

Paeonia lutea (Yellow Tree-peony) – Saltford, N of (ST 6848 6815), 12 Jul, one plant on E bank of Avon Valley Railway cycle path, HJC & DEG, VC6.

Perovskia atriplicifolia (Russian Sage) – Taunton, Church Street (ST 2358 2448), 12 Jul, one young plant in pavement crack with *Verbena bonariensis*, escaped from neighbouring front garden, SJL, VC5.

***Saxifraga* 'Arendsii'** (Rockery Saxifrage) – Ilminster (ST 3564 1499), 30 Jul, in tarmacked pavement, apparently surviving trampling, JP, VC5. [Maybe formerly mis-recorded in Somerset as *S. hypnoides*.]

Thalictrum speciosissimum (Glaucous-leaved Meadow-rue) – Burrington Ham (ST 4829 5834), 4 Jul, one plant in flower by main E-W path, HJC & Cam Valley Wildlife Group, VC6.

Veronica pinguifolia (Thick-leaved Speedwell) – North Brewham, NE of (ST 7354 3788), 23 Feb, one large old plant established on W verge of lane, under trees, possibly originally dumped, HJC & Gill Read, VC6.

New vice-county records

Agrostis castellana (Highland Bent) – Kilton (ST 1616 4303), 30 Jun, in sown conservation headland, EJMcD & RFitzG, det. T.A. Cope, VC5.

Euphrasia confusa x ***tetraquetra*** (a hybrid Eyebright) – Shurton Bars (ST 1921 4588), 4 Jul, in short grass on cliff edge, GEL & RFitzG, det. CM, VC5.

Festuca rubra subsp. ***juncea*** (a Red Fescue) – First Rocks (SS 8552 4836), 3 Sep, on rocky maritime cliffs and very glaucous, GEL, conf. A. Copping, VC5.

Hieracium cardiophyllum (Heart-leaved Hawkweed) – Upton churchyard (SS 9961 2891), 10 Sep 2008, in wall of car park and on grassy bank of churchyard, JW, det. P.D. Sell, conf. 2018 D.J. McCosh; (SS99632891), 1 Jun, still present on walls in church parking area, GEL, VC5.

Malva alcea (Greater Musk-mallow) – Yeovil Marsh, N of (ST 5419 1952), 25 Aug, several flowering/fruiting plants in field ditch used as overflow from slurry pit, JP, VC5.

Mentha x ***villosonervata*** (Sharp-toothed Mint, *M. spicata* x *longifolia*) – Williton Allotments (ST 0924 4179), 25 Jul, one plant next to roadside

hedge, presumably escaped from nearby allotments or landfill site, GEL & RFitzG, VC5.

Rubus cockburnianus (White-stemmed Bramble) – Stockwell Stream/Richard Huish cycleway (ST 2320 2399), 23 May, large patch, well established here for at least 10 years, SJL, conf. HJC, VC5.

Verbascum speciosum (Hungarian Mullein) – Yeovil, Houndstone (ST 5222 1680), 15 Jun, two well-grown plants in highways depot where trucks and mowing machines are washed, JP, VC5.

Other interesting records – native species

Asplenium marinum (Sea Spleenwort) – Bath, Guildhall (ST 7509 6490), 30 Jul, 15 plants on outer wall of basement area, growing beneath stone balustrade, at Bridge Street/High Street corner, Mark & Clare Kitchen, det. HJC, VC6.

Atriplex x ***gustafssoniana*** (*A. longipes* x *prostrata*) – Kilve Pill (ST 1447 4442), 10 Aug, at top of shingle, GEL & RFitzG, det. JRA; Lilstock Pill (ST 1743 4523), 24 Aug, around high tide region in shingle, GEL, det. JRA; Porlock Weir (SS 8645 4790), 3 Sep, c. 50 plants on shingle, GEL; Westhay, Burtle Road (ST 4203 4229), 2 Sep, one plant on disturbed peat on the side of a rough track by Godwins peat extraction area, EJMcD & Clive Lovatt, det. JRA, VC6. Third and subsequent sites for this hybrid in VC5, and an unusual inland record in VC6.

Bupleurum rotundifolium (Thorow-wax) – Norton St Philip (ST 7731 5513), 7 Aug, one plant on imported topsoil in cultivated bed in private field, found by the owners, HJC, VC6 (Fig. 3). Second record for Somerset since 1955.

Fig. 3 Bupleurum rotundifolium *(Thorow-wax) at Norton St Philip (Photo: Helena Crouch)*

Callitriche brutia subsp. ***brutia*** (Pedunculate Water-starwort) – Priddy (ST 5213 5225), 21 Jul, frequent in dried-up duck pond on S side of B3135, HJC & FJR, VC6. Third record for VC6; first record was in nearby pond on N side of B3135.

Carex viridula (Small-fruited Yellow-sedge) – Berrow Dunes (ST 3000 5098), 26 Jun, many plants in slack towards SE end of golf course, N of club house, FJR, VC6. First record for VC6 and Somerset since *AFS*.

Drabella muralis (= ***Draba muralis***) (Wall Whitlow-grass) – Little Solsbury Hill (ST 766 682), 23 Apr, 50+ large plants on one large active anthill, RDR, VC6. First native record for this Nationally Scarce species in ST 76 since pre-1939, confirming a previously doubted record by T.H. Green, and an unusual site as it usually occurs on rock outcrops or walls.

Epilobium x ***heterocaule*** (a hybrid Willowherb, *E. montanum* x *roseum*) – West Coker (ST 5227 1297), 12 May, three clumps on W side of Font Lane, in damp patch close to base of bank, JP, VC5. Second record for VC5 and first since 1935, and fourth record for Somerset.

Gaudinia fragilis (French Oat-grass) – Hollies Lane, nr Batheaston (ST 7764 6923), 17 May, in field near N end of Hollies Lane, present throughout field, EllenMcD; Ashton Court Meadow (ST 5449 7213), 25 May, David Hawkins, VC6. First records for this Nationally Scarce grass in both hectads since pre-2000.

Hieracium eustomon (Bristol Channel Hawkweed) – Culver Cliff (SS 9622 4788, SS 9605 4787), 29 May, two plants and 17 plants, probably of this species, visible from beach, GEL, TCGR, ITS, JW & Tim Webb, VC5. First record for VC5 and Somerset since 1985, at only known location (no safe access to plants at either site, so cannot definitively confirm identification).

Hieracium umbellatum subsp. ***bichlorophyllum*** (Umbellate Hawkweed) – Nutcombe Bottom (SS 9776 4238), 8 Oct, 150+ plants on steep bank opposite car park entrance, stretching for c. 100 m, GEL, VC5. First record for the subspecies in VC5 and Somerset since 1981.

Mentha pulegium (Pennyroyal) – Steart Marshes, Stockland Marsh (ST 2452 4400), 11 Aug, large amount in grazed, former flooded pasture, SRPG & WFS; Taunton (ST 2200 2555), 27 Oct, one plant in newish road verge next to roundabout at junction of Staplegrove Rd and Trenchard Way, SRPG (found by Paul Seymour), VC5 (Fig. 1). Fourth and fifth records for VC5, the fifth a new hectad record for this Nationally Scarce Endangered species (Critically Endangered in England). But see discussion of these records above.

Orobanche elatior (Knapweed Broomrape) – Greendown (ST 580 532), 14 Jun, two spikes on *Centaurea scabiosa* in garden, EllenMcD, VC6. Third post-2000 site for VC6 and Somerset.

Pilosella officinarum subsp. ***officinarum*** (a Mouse-ear Hawkweed) – Uphill (ST 316 583), 19 May, in flower in churchyard, Bristol Naturalists' Society & SRPG, det. GEL; Westbury-sub-Mendip (ST 499 487), 23 Jun, several flowering/fruiting plants in mown moderately species-rich grassland in churchyard, EJMcD, VC6. Second and third records for VC6 and first since 1917.

Polycarpon tetraphyllum (Four-leaved Allseed) – Yeovil, Houndstone (ST 5255 1659), 15 Jun, 30 clumps at base of short low wall and on adjacent bank, N side of road, JP, VC5. Second record for VC5.

Potentilla verna (= ***P. tabernaemontani***) (Spring Cinquefoil) – Keynsham (ST 6425 6994), 11 Apr, small patch on bank, on top of retaining wall on W side of A4174, HJC & DEG, VC6. New hectad record for Nationally Scarce species.

Rosa corymbifera (a Dog Rose, *R. canina* group *Pubescentes*) – Worthy Manor (SS 8608 4807), 26 Sep, edge of footpath; Culbone Church (SS 8421 4824), 5 Oct, edge of woodland path near church, both GEL, det. RM, VC5. First records for VC5 since pre-2000.

Rosa micrantha (Small-flowered Sweet-briar) – Warren Bay Cliffs (ST 0565 4333), 16 Jul, one shrub of 2m at base of cliff close to shingle. GEL, ITS & JW (det. RDR); Hawkcombe (SS 8835 4587), 10 Oct, one bush at edge of woodland just above lane, GEL (det. RM); Island Pond, Nettlecombe (ST 0601 3814), 18 Oct, edge of wood round the pond, GEL (det. RM), VC5. First records for VC5 since *AFS*.

Rosa tomentosa (Harsh Downy-rose) – Briggins Moor (SS 8936 2510), 15 Aug, in roadside hedge, GEL; Yearnor Wood (SS 8482 4840), 26 Sep, steep wooded coastal cliffs, GEL, det. RM; Monkham Hill (SS 9821 3875), 8 Oct, edge of footpath, GEL, det. RM, VC5. First post-2000 records for VC5.

Rosa x ***andegavensis*** (*R. stylosa* x *canina*) – Lilstock (ST 1649 4515), 20 Sep, in hedge by footpath to cliff, GEL, det. RM, VC5. First post-2000 record for VC5.

Rosa x ***scabriuscula*** (*R. canina* x *tomentosa*) – Briggins Moor (SS 8951 2497), 15 Aug, roadside, GEL; Lilstock (ST 1616 4537), 20 Sep, on cliff edge, GEL, det. RM, VC5. Second and third post-2000 records for VC5 and Somerset.

Rumex x ***mixtus*** (*R. pulcher* x *sanguineus*) – Bossington (SS 9003 4797), 15 Oct, in steep SW-facing field with both parents, GEL, conf. GDK, VC5. Second record for VC5 and Somerset since *AFS*.

Rumex x ***ruhmeri*** (*R. conglomeratus* x *sanguineus*) – Bossington (SS 9004 4793), 15 Oct, at bottom of steep field near stream, with both parents, GEL, det. GDK; Bridgwater (ST 2988 3644), 3 Jun, one plant by Brown's Pond, SRPG, det. JRA, VC5. First records for VC5 and Somerset since *AFS*.

Sorbus porrigentiformis (Grey-leaved Whitebeam) – Yearnor Wood (SS 8481 4840), 26 Sep, one tree with five small trunks from base, GEL, conf. TCGR, VC5. First record for Somerset since 1995; may be the tree first recorded by J. Bevan and RFitzG in 1981.

Verbascum lychnitis (White Mullein) – Axbridge (ST 4250 5467), 4 Oct, eleven plants on road verge at S end of link road between Cross Lane and Axbridge by-pass (A371), EJMcD, VC6. First record for this Nationally Scarce species in this hectad since pre-2000.

Other interesting records – alien species

Allium subhirsutum (Hairy Garlic) – Cudworth (ST 3730 1089), 19 Apr, population at known site now reduced to one small patch in rank grassland by fence, JP, VC5. First record for VC5 since *AFS*.

Capsella rubella (Pink Shepherd's-purse) – Bath, Beechen Cliff School (ST 7499 6364), 27 Feb, many plants on bank in school grounds, HJC & DEG, VC6. Second record for VC6 and Somerset, and first since 1949.

Chenopodium giganteum (Tree Spinach) – Bruton, St Catherine's Hill (ST 680 349), 2 Aug, one young plant in lane verge, SJL, VC6. Second record for VC6.

Helleborus argutifolius (Corsican Hellebore) – Darshill (ST 6069 4393), 4 May, street weed on N edge of Back Lane, HJC & Val Graham, VC6. Third record for VC6.

Lonicera caprifolium (Perfoliate Honeysuckle) – Martock (ST 4750 1978), 8 May, one plant scrambling through hedgerow on E side of track/footpath immediately N of Taepper Court Farm, JP, VC5. First record for VC5 and Somerset since pre-2000.

Macleaya x ***kewensis*** (Hybrid Plume-poppy, *M. cordata* x *microcarpa*) – Litton Churchyard (ST 5936 5470), 12 Sep, large stand in churchyard, probably rooted through wall from adjacent cottage garden, HJC & DEG; Bath, Locksbrook (ST 7284 6488), 7 Dec, small clump on waste ground at side of gardens, none in adjacent garden, HJC & DEG, VC6. Third and fourth records for VC6 and Somerset, and first since pre-2000.

Malva trimestris (Royal Mallow) – Bath, South Twerton (ST 7304 6429), 13 Nov, one plant at edge of track to playing field, HJC & DEG, VC6. Third record for VC6 and first since pre-2000.

Oloptum miliaceum (=***Oryzopsis miliacea***) (Smilo-grass) – Bath, Bear Flat (ST 7486 6388), 27 Feb, 12 clumps along alley between back gardens, spread from a planted specimen, HJC & DEG, VC6. Second record for VC6 and Somerset, and first since 1978.

Saxifraga cymbalaria (Celandine Saxifrage) – Crowcombe Heathfield Station (ST 1363 3447), 19 May, one plant on road verge close to Puff Cottage, SJL, det. Stephen Parker, VC5. Fourth record for VC5 and first for VC5 and Somerset since *AFS*.

Sorbus croceocarpa (Orange Whitebeam) – Minehead (SS 9699 4694), 29 May, one tree of 5m, c. 10m above road near tight bend, confirmed from fruit in October, GEL, ITS & TCGR, VC5. Second record for VC5.

Teucrium chamaedrys (Wall Germander) – Merriott (ST 4470 1288), 13 Jul, large patch in dry area of nursery field, JP, VC5. Third site for VC5.

Vicia villosa (Fodder Vetch) – Kilton/Stringston (ST 1616 4286, ST 1616 4303), 30 Jun, in sown conservation headland, EJMcD & RFitzG, det. D.A. Pearman, VC5. Third and fourth records for VC5.

Vinca difformis (Intermediate Periwinkle) – Upper Westholme (ST 5785 4143), 23 Oct, on verge of Higher Westholme Road, HJC & FJR, VC6. Third record for VC6.

Xanthium spinosum (Spiny Cocklebur) – Nethercott (ST 1588 3223), 17 Nov, one plant on waste ground, GEL & ITS, VC5. Third record for VC5 and first since 1990.

Xanthium strumarium (Rough Cocklebur) – Halse (ST 1410 2876), 2 Nov, one plant at edge of game cover field with *Datura stramonium* (Thorn-apple), GEL & ITS, VC5. Third record for VC5 and first since 1994.

The BSBI vice-county recorders in Somerset are: Stephen Parker and Simon Leach in VC5, and Helena Crouch and Liz McDonnell in VC6. There is also an active recording group, the Somerset Rare Plants Group (SRPG), which holds an annual programme of field meetings, winter talks and identification workshops. Further information on the SRPG and the list of taxa included in the Somerset Rare Plant Register can be found at www.somersetrareplantsgroup.org.uk.

We would be delighted to receive records for possible inclusion in future reports; these should be submitted to one of the 'receiving recorders', as follows:

VC5 Stephen Parker, The Old Coach House, Newton Road, North Petherton, Bridgwater, TA6 6SN

VC6 Helena Crouch, Bronwen, Farrington Road, Paulton, Bristol, BS39 7LP

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HELENA J. CROUCH

FIRST FLOWERING DATES 2018

In 2018 I learnt that it is far easier to start something than to finish it. In 2017 I completed the original objective of recording first flowering dates (FFDs) in the Taunton area for a decade, concluding that FFDs for 339 species over that period were, on average, about two weeks earlier than those recorded by Walter Watson in the first half of the last century (*SANH* 161, p.325, Table 1).

But old habits die hard, and in January the temptation to note early bloomers was difficult to resist. And then, just as I resolved to call a halt and turn my attention to other things, along came the 'Beast from the East' in late February-early March, and then another 'mini-Beast' later in March. The consequences for FFDs of such extreme weather events couldn't be ignored, so recording (bar one or two brief lapses) would have to continue after all.

In the end, FFDs were noted for 309 (91.2%) of the 339 species recorded in the decade-long study. A

summary is given here of FFDs recorded, along with the main features of the weather in meteorological winter (December-February), spring (March-May) and summer (June-August), based as usual on my own observations and regional (S.W. England and S. Wales) values available on the Met Office website (https://www.metoffice.gov.uk/climate/uk/summaries). Records of snowfall, snow lying and air and ground frosts were from my back garden in Taunton.

The weather in 2018

It was a year of contrasts. While December and January had daily mean temperatures 0.6°C and 1.6°C above the long-term (1961-90) average, in February and March it turned colder, particularly so in the last week of February when a 'blocking High' took up residence across much of the UK – the so-called 'Beast from the East'.

Named winter storms were relatively few, with one at the end of December ('Dylan') and none in February, while those in January – 'Eleanor', 'Fionn', 'David' and 'Georgina' – tended to impact mainly in northern England, Scotland and Ireland. 'Emma', however, at the start of March, came up against 'the Beast', resulting in blizzards and extreme cold; on 1st and 2nd March, the first days of meteorological spring, maximum day temperatures remained at or below freezing even in the middle of Taunton, and the River Tone froze over above Firepool Weir for the first time since December 2010. A further cold snap later in the month (the 'mini-Beast') resulted in more snow, while rain-bearing depressions at other times combined with snow-melt to cause localized flooding.March, in fact, was a particularly wet month (166% of the long-term average), while February and March were the only months to record below-average temperatures, with mean daily temperatures 0.7°C and 0.8°C below average respectively – a colder late winter/early spring than we were used to, certainly, but still nothing like as cold as in 2010 and 2013.

In contrast, late spring and summer temperatures were well above the long-term average: 1.9°C above in both April and May, 2.7°C and 2.9°C above in June and July, and 1.0°C above in August.After a run of indifferent summers, 2018 was noteworthy for its prolonged fine, dry weather; indeed, across England as a whole it proved to be the hottest summer on record

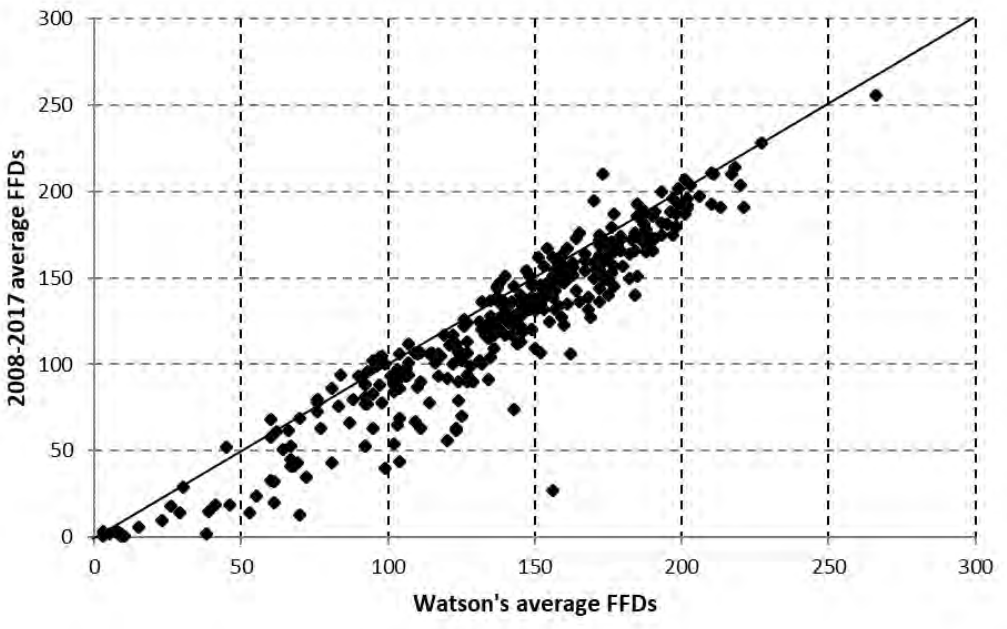

Fig. 1 Average first flowering dates (FFDs) for 339 species in the decade 2008-2017, plotted against 'average first flowering times' given by Watson. Dates are shown as day numbers (day 1 = 1st January). The diagonal line marks the line along which data-points would lie if the 2008-2017 decadal average FFDs were identical to those given by Watson; above the line the decadal average FFD is later than Watson's date, below the line earlier

(since 1910). This was matched by relatively low summer rainfall (just 65% of the long-term average) and high sunshine totals.

Over the period as a whole, sleet or snow was observed falling on 13 days (one in December, one in January, five in February, six in March), with lying snow recorded on nine mornings (one in February, the rest in March).Air or ground frosts were noted on 44 days – eight in December, eight in January, 17 in February and 11 in March.

First flowering dates

In previous reports I have compared each year's FFDs with Watson's 'average first flowering times' (Watson 1949; Leach 2011 *et seq.*). There is, of course, considerable variation between years (and between species), such that while most springs have tended towards being 'early' by Watson's standards – and those in 2012, 2014 and 2016 were *exceptionally* early – there has also been the odd relatively 'late' spring, notably in 2010 and 2013 (Leach 2011 *et seq.*). But the general pattern is clear enough: for the vast majority of species, mean FFDs for the decade 2008-2017 were considerably earlier than in Watson's day (Figs 1 and 2).

Having established this shift towards earlier FFDs, it may be of more interest from now on to compare FFDs of species, like those recorded in 2018, with their mean values in the decade 2008-2017, rather than with the dates given by Watson. This should produce a clearer picture of how a single year's observations deviate (or not) from the 'modern baseline'.

For the 309 species recorded, a comparison between 2018 FFDs and 2008-2017 average FFDs is shown in Fig. 3. It can be seen how the relatively mild December and January produced a large batch of very early FFDs – early even by modern standards. Twenty-two species were already in flower by 1st January, including Cow Parsley (*Anthriscus sylvestris*), Thale-cress (*Arabidopsis thaliana*) and Pellitory-of-the-wall (*Parietaria judaica*). Several January-flowering woodland species also had markedly early FFDs: Dog's Mercury (*Mercurialis perennis*), for example, was in flower by the 7th, 22 days earlier than its decadal average, while Lesser Celandine (*Ficaria verna*) was flowering on the 11th, eight days early. Opposite-leaved Golden-saxifrage (*Chrysosplenium oppositifolium*)

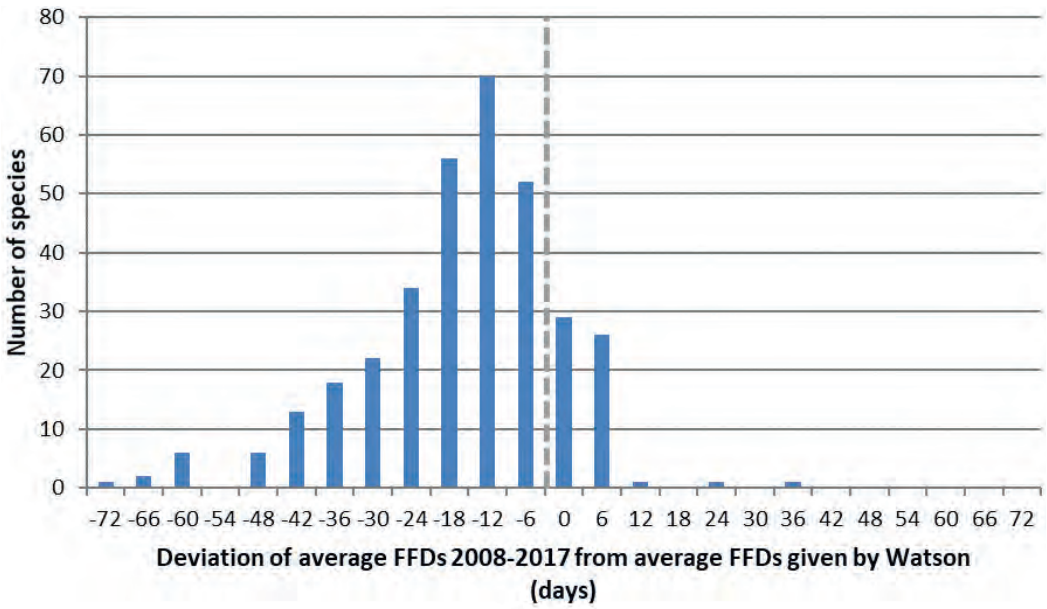

Fig. 2 Frequency distribution of deviations in average FFDs of 339 species for the decade 2008-2017 with the average FFDs for those species given by Watson. Categories are 6-day periods, the numbers shown representing the lower limit of each category. Negative values (to left of grey dashed line) indicate earlier flowering than suggested by Watson's dates, positive values (to right of grey dashed line) indicate later flowering. One species, Mercurialis annua, *with an extreme deviation of -105 days, is omitted*

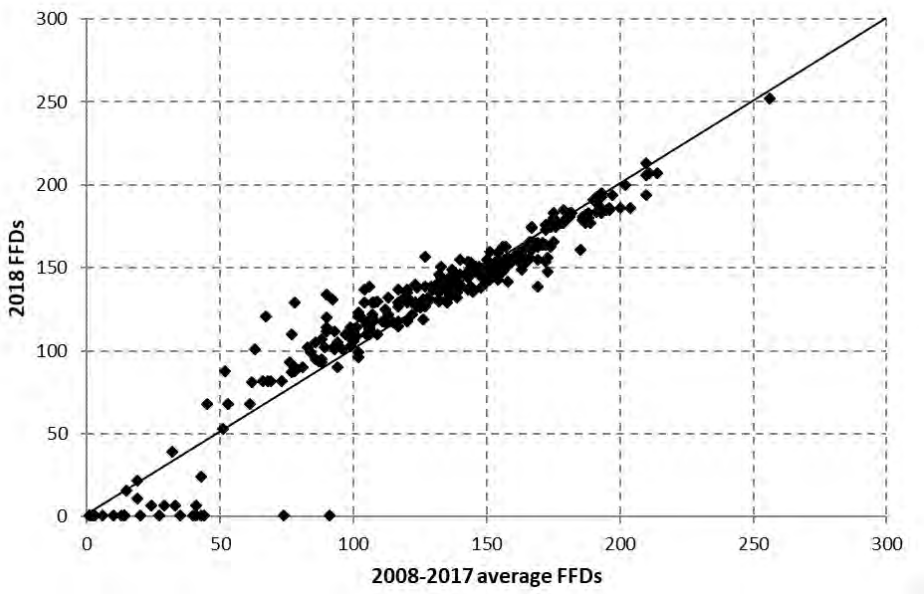

Fig. 3 First flowering dates (FFDs) for 309 species in 2018, plotted against average FFDs for the decade 2008-2017. Dates are shown as day numbers (day 1 = 1st January). The diagonal line marks the line along which data-points would lie if 2018 FFDs were identical to the decadal average FFDs; above the line the 2018 date is later than the decadal average, below the line the 2018 date is earlier

Fig. 4 Smooth Sow-thistle (Sonchus oleraceus), *one of a number of species having exceptionally late first flowering dates in the Taunton area in 2018 (Photo: Simon Leach)*

was first spotted on the 24th, its second earliest date since 2008 (2016 was the earliest) and 19 days earlier than its decadal average – and incidentally more than six weeks earlier than Watson's date.

But the 'Beast from the East' caused spring to stall. All but two species with decadal-average FFDs between the third week of February and mid-April had markedly delayed FFDs (Fig. 3). Sweet Violet (*Viola odorata*), Wood Anemone (*Anemone nemorosa*), Greater Stitchwort (*Stellaria holostea*) and Goat Willow (*Salix caprea*), for example, all had their latest FFDs since 2010, while Barren Strawberry (*Potentilla sterilis*) and Moschatel (*Adoxa moschatellina*) were later than in any year since the start of the study. Bluebell (*Hyacinthoides non-scripta*) was 15 days later than its 2008-2017 average, having its third-latest FFD since 2008 (only 2010 and 2013 were later). Perhaps the most remarkable 'late bloomer', however, was Smooth Sow-thistle (*Sonchus oleraceus*) (Fig. 4), usually flowering by about the third week of March but in 2018 delayed until the second week of May.

The impact of the 'Beast' seemed to last until well into May, despite the relatively warm April; indeed many April-flowering plants like Germander Speedwell (*Veronica chamaedrys*), Red Clover (*Trifolium pratense*), Cock's-foot (*Dactylis*

glomerata) and Wood Melick (*Melica uniflora*), didn't start to bloom until at least the first or second week of May.

A rush of first-flowerings then followed, such that by the end of May FFDs had, by and large, caught up; and after that, as can be seen in Fig. 3, the trend was toward relatively early FFDs in comparison with 2008-2017 average dates. Pyramidal Orchid (*Anacamptis pyramidalis*), for example, was first seen in flower on 29th May, 14 days earlier than its decadal average and its earliest date since the start of the study. Other summer-flowering species with notably early FFDs included Wild Carrot (*Daucus carota*), Slender St John's-wort (*Hypericum pulchrum*) and Hoary Ragwort (*Senecio erucifolius*, now to be known as *Jacobaea erucifolia* (Stace 2019)). The last of these has been noted in previous reports (e.g. *SANH* 161, 326) as one of a dozen or so species that seem to have bucked the general trend towards 'earliness', with FFDs today considerably later than those recorded by Watson. In 2018 Hoary Ragwort was first found in flower on 13th July, admittedly still late by Watson's standards but eight days earlier than my previous earliest record (in 2014), and 16 days earlier than the 2008-17 decadal average.By the end of July the 'Beast from the East' was a distant memory.

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SOMERSET BUTTERFLIES 2018

It might well be assumed that butterflies in Somerset fared well in England's hottest summer on record; alas, this was not so throughout the whole county. It was, indeed, an extraordinary year with severe frosts and snow in February and March, followed by long spells of hot and dry weather in June and July. Perhaps surprisingly, the total number of butterflies recorded on 48 transects walked between 1 April and 30 September each year since 2014 was the lowest recorded – down from a 'high' in 2014 of 98,503 to just 68,230 in 2018. However, the average number of butterflies recorded per walk (78.3) was higher than in 2016 (69.1). The same pattern emerges when all 68 transects walked throughout the year are considered.

Forty-two species of butterfly were recorded on transects in 2018, one more than in 2017, the additional species being Duke of Burgundy (*Hamearis lucina*), of which just a single specimen was recorded. On a more positive note, 22 species increased in number when compared with the previous year, while 20 decreased. Table 1 shows results for the ten most abundant species on the 48 transects which have been walked since 2014.

As can be seen, the most abundant butterfly was Meadow Brown (*Maniola jurtina*), which accounted for 30% of the total, but nevertheless had its lowest count in the last five years, down 33% on 2017. The species with the biggest increase was Small White (*Pieris rapae*), up 204% with its highest count for five years. Large White (*Pieris brassicae*) and Speckled Wood (*Pararge aegeria*) also had their best year since 2014 but the other seven species all fell considerably short of their numbers five years ago, even though six of them did show an increase over 2017.

Whilst the so-called 'cabbage whites' had a good year, the other resident Pierids (and harbingers of spring) Brimstone (*Gonepteryx rhamni*) and Orange Tip (*Anthocharis cardamines*) were down by 11% and 10% respectively. Other early species, those that hibernate as imagines, also disappointed: Peacock (*Inachis io*) and Comma (*Polygonia c-album*) were down by 47% and 29% respectively. More worrying was the collapse of Red Admiral (*Vanessa atalanta*) which had had a record year in 2017 and might therefore have been expected to do well again in 2018 – not so, it fell in numbers from 2,508 to 580, a drop of 77%. Likewise, Small Tortoiseshell (*Aglais urticae*), about which there has been concern for several years but which seemed to make a come-back in 2017, slumped by 79% from 1,735 to 358. The reasons for these declines are not known; but it is possible that Red Admiral in particular was affected by the very cold winter/early spring period, with many overwintering individuals unable to survive these conditions.

The hot summer might also have been expected to produce large numbers of our regular immigrant species, but this did not happen. Painted Lady

TABLE 1 THE 'TOP 10' BUTTERFLIES ON 48 BUTTERFLY TRANSECTS IN SOMERSET RECORDED ANNUALLY SINCE 2014, SHOWING TOTAL NUMBERS OF SIGHTINGS OF EACH SPECIES IN EACH YEAR. THE PERCENTAGE DIFFERENCES BETWEEN 2018 AND 2017 TOTALS ARE SHOWN IN THE RIGHT-HAND COLUMN

Species	**2014**	**2015**	**2016**	**2017**	**2018**	**2018v 2017 (% change)**
Meadow Brown (*Maniola jurtina*)	24877	34752	24042	30521	20397	-33
Ringlet (*Aphantopus hyperantus*) [Fig. 1]	10662	8089	7321	9969	7852	-21
Speckled Wood (*Pararge aegeria*)	6246	4420	4890	5750	6294	+9
Common Blue (*Polyommatus icarus*) [Fig. 2]	6613	4561	1800	2726	5530	+103
Gatekeeper (*Pyronia tithonus*)	7295	10212	5495	6958	4132	-41
Small White (*Pieris rapae*)	1948	1694	1861	1180	3586	+204
Large White (*Pieris brassicae*)	1483	2070	2344	1243	2669	+115
Marbled White (*Melanargia galathea*)	5430	6071	4486	4814	2602	-46
Green-veined White (*Pieris napi*)	5113	2991	2806	1894	2387	+26
Brown Argus (*Aricia agestis*)	2237	1153	701	881	1663	+89

Fig. 1 Ringlet (Aphantopus hyperantus), *a species that was less abundant in 2018 than in 2017 (Photo: Julian Rawlins)*

Fig. 2 Common Blue (Polyommatus icarus), *a species that did particularly well in 2018 following two relatively poor years (Photo: Julian Rawlins)*

(*Vanessa cardui*) was down 38%. There hasn't been a 'Painted Lady year' since 2009, and since they tend to occur every ten years or so, might we be due for one in 2019? Clouded Yellow (*Colias croceus*) was up 178% but, at only 25 records, this was nothing to shout about.

On the other hand, the hairstreaks, with the exception of Brown Hairstreak (*Thecla betulae*) which was marginally down, had a good year, as did most of our Skippers. Somerset's iconic Large Blue (*Maculinea arion*) (Fig. 3) had a record year with 740 counted at Collard Hill compared with 300 in 2017. There is, however, concern over the effect that the hot weather had on both the larval food plant and the ant species, *Myrmica sabuleti,* on which the Large Blue depends; after a previous hot summer the Large Blue population declined significantly.

In 2018 the Branch continued to support the 'All the Moor Butterflies' project (which has now ended), as well as the 'Munching Caterpillars' project in Bristol.

In 2019 it is planning to fund a project to produce an inventory of possible sites in the Blackdown Hills AONB for Small Pearl-bordered Fritillary (*Boloria selene*) and Marsh Fritillary (*Euphydryas aurinia*) and, in 2020, for Wood White (*Leptidea sinapis*) and Duke of Burgundy. Subject to results, the data could then form the basis of a bid for external funding for a major conservation project for these species.

Visit our website **www.somersetbutterflies.org.uk/** for further information about butterflies in Somerset, or follow us on Facebook **www.facebook.com/BCSomerset/** or Twitter **@BCSomerset**.

JULIAN RAWLINS
Somerset and Bristol Branch, Butterfly Conservation

Fig. 3 Large Blue (Maculinea arion), *for which 2018 was a record year (Photo: Julian Rawlins)*

WAITING TO BE FOUND: ARACHNIDS IN SOMERSET 2018

There are only two reasons why a species not previously recorded is discovered.The first is that it has only just arrived. The second is that it has been there for a long time and no-one has previously found it. It is probably impossible to determine which of the two reasons applies unless the species is frankly difficult to miss when it is there. The Wasp Spider *Argiope bruennechi* clearly falls into the first category, a recent arrival that is also hard to miss (see illustration in *SANH* 161, 333). It has turned up in various parts of Somerset over the last few years but so far only seems to have a well-established population at Carymoor, near Castle Cary (VC6). In 2018 it was reported from a new site in Yeovil Country Park and I was able to visit there in January 2019 and meet up with one of the District Council Rangers to discuss potential ways of managing the site in a way that could help the Wasp Spider population. Unfortunately the species likes to make its web in long grass and associated vegetation, and to deposit its egg sac attached to the same vegetation. Grazing and cutting are both likely to be damaging, but hopefully the population can be encouraged by piecemeal cutting, or by marking the places where spiders are present so they can be avoided.If the Wasp Spider can establish a population in the Country Park lots of people will get a chance to view this impressive spider.

Since last October the spiders of Somerset have received a great deal of attention from James McGill who has been actively recording at a number of sites across the county. As a result, James has found seven species not previously recorded from Somerset, plus several that are new to one or other of the two vice-counties according to the Spider Recording Scheme database (see lists below). Most of these are very small spiders in the family Linyphiidae (money spiders) and the majority were caught by James using a modified garden vacuum. Many have also been found in the winter months. If these species have been literally 'waiting to be found' there are some possible explanations in addition to James's diligence. Firstly the season could be a factor. Recording effort almost certainly drops off in winter so species which are adult at this time of year would tend to be under-recorded. The use of the vacuum is also a factor. Some species are known to live on or within the soil layer and in summer with cracked dry soil may be deeper (and so more hidden) than they are in winter. Their small size and appearance makes them very hard to find just by grubbing around, whereas the vacuum readily picks them up. Whatever the reason it shows that field work

Fig. 1 Crook Peak, site of the Nationally Rare money spider Typhochrestus simoni

in winter can be very worthwhile.

One of the most significant species James has found is *Typhochrestus simoni* which was recorded on Crook Peak (Fig. 1) in November. This species, which is classed as Nationally Rare, hadn't been recorded in Britain since 2003 and is known from only a few other sites which include Snowdonia, Porton Down and Portland Bill. *Glyphesis servulus*, another Nationally Rare species, was found at Shapwick Heath. Species known to have a peak population of males in autumn and winter include *Agroeca inopina, Allomengea vidua, Ceratinopsis romana* and *Meioneta mollis*. *Porrhomma microphthalmum* is an example of a species that is sometimes subterranean in cracks within the soil.

Many of the newly discovered species are associated with coastal habitats, including the tidal River Parrett, a rare habitat bringing tidal conditions far inland. Four of the species listed below were found there in riverside vegetation or in scrapes which have been created within the confines of the flood-banks. *Allomengea vidua*, for example, was in litter at the base of Reed Canary-grass (*Phalaris arundinacea*). Previously this species has only been recorded in Somerset from the RSPB reed-bed reserve at Ham Wall. The tidal Parrett forms the boundary between VC5 and VC6, so the discovery of *Halorates distinctus* in both vice-counties is not surprising as the sites are a river's width apart. There are three non-linyphiid spiders in the species listed below: *Agroeca inopina*, new to VC5 and previously recorded in Somerset from Ebbor Gorge and Uphill (both VC6); *Hahnia helveola*, new to VC6; and the salticid *Pseudeuophrys lanigera*, which James found in High Street, Bridgwater (VC5). The latter had previously been recorded in VC6 from East Quay, Bridgwater, on the other side of the Parrett, and just a short hop away for this jumping spider!

Records of new spider species are summarised below.Dates are for 2018, and in all cases the recorder was J. A. McGill.

Agroeca inopina – Dunster Beach (ST 00 44), 30 Dec; first record for VC5.

Allomengea vidua – tidal River Parrett (ST 36 29), 13 Oct, 21 Oct; first and second records for VC5.

Ceratinopsis romana – Dunster Beach (ST 00 44), 30 Dec; Wall Common (ST 25 45), 29 Dec; Wall Common (ST 26 45), 16 Nov, 9 Dec, 29 Dec; first and subsequent records for VC5.

Erigonella ignobilis – Yarty Moor (ST 23 15), 22 Dec; first record for VC5 and Somerset.

Glyphesis servulus – Shapwick Heath (ST 41 40), 2 Sep; first record for VC6 and Somerset. Nationally Rare.

Hahnia helveola – Crook Peak (ST 39 55), 17 Nov; first record for VC6.

Halorates distinctus – tidal River Parrett in three 1-km squares: (ST 37 28), 21 May, 17 Jun, 23 Sep, 13 Oct; (ST 36 29), 21 Oct; (ST 37 29), 21 May, 23 Sep; first and subsequent records for Somerset, straddling both VC5 and VC6.

Meioneta mollis – Netherclay (ST 25 19), 28 Oct; Orchard Wood (ST 24 19), 28 Oct; first and second records for VC5.

Meioneta simplicitarsis – Dunster Beach (ST 00 44), 30 Dec; Hurlstone Point (SS 89 49), 14 Nov; first records for VC5 and Somerset.

Porrhomma microphthalmum – Wall Common (ST 24 45 and ST 25 45), 29 Dec; Thurlbear (ST 27 20), 31 Dec; first and subsequent records for VC5.

Pseudeuophrys lanigera – Bridgwater (ST 29 37), 12 Oct; first record for VC5.

Silometopus ambiguus – Wall Common (ST 26 45), 15 Sep, 14 Oct, 16 Nov, 29 Dec; tidal River Parrett (ST 32 34), 22 Dec; first and subsequent records for VC5.

Tmeticus affinis – tidal River Parrett (ST 37 28), 19 Aug; first record for VC6.

Typhochrestus simoni – Crook Peak (ST 39 55), 17 Nov; first record for VC6 and Somerset. Nationally Rare.

Walckenaeria furcillata – Horner Wood (SS 89 44), 15 May; first record for VC5 and Somerset.

Walckenaeria nodosa – Yarty Moor (ST 23 15), 22 Dec; first record for VC5 and Somerset.

Walckenaeria monoceros – Hurlstone Combe (SS 90 49), 28 Dec; first record for VC5.

Spiders are not the only arachnids that James has been recording; he has also been noting harvestmen (Opiliones) and pseudoscorpions (Pseudoscorpiones). Amongst the latter is a first record of *Roncocreagris cambridgei* for VC6, which he found on the Poldens at Worley Hill.

FRANCIS FARR-COX
Somerset County Recorder
British Arachnological Society

PLANT GALLS IN SOMERSET 2018

Readers of previous reports will be aware that we have tended to be fairly cautious in claiming a record as a vice-county/county 'first'; with good reason too, as it turns out, since a lack of records on the database of the British Plant Gall Society (BPGS) doesn't necessarily mean a species has never been seen before in our area. This point was brought forcefully home over the winter, when one of us found in the SANHS collections a small folder of pressed specimens (and drawings) of rust-infected plants collected by Walter Watson in the first decade of the last century. These were mainly from the area around Bruton (VC6), presumably acquired while he was employed as a teacher at Sexey's School. It transpires that several of Watson's records pre-date our own alleged 'firsts' by more than a century! *Melampsora populnea*, for example, we recorded for the first time in VC6 in 2017 (*SANH* 161, p.336); but we now know that Watson had collected it – under the then accepted name of *Caeoma mercurialis* – in 1906. His pressed specimen, and close-ups of some of his drawings of it, are shown in Fig. 1.

It is with a sense of trepidation, then, that we list below records of plant galls that *appear* to be 'firsts' for VC5 and/or VC6 based on records held in the BPGS database. Species are arranged in alphabetical order with brief details of each record's (apparent) significance, notes on host plants, location, date, recorder, etc. For those featured in Michael Chinery's photographic guide (Chinery 2011) we give the page numbers on which they are illustrated.

Thanks to all those submitting records during the year, especially Helena Crouch, Liz McDonnell, James McGill, Gill Read and Ian Salmon; and thanks also to Simon Haarder, Keith Harris and Brian Spooner

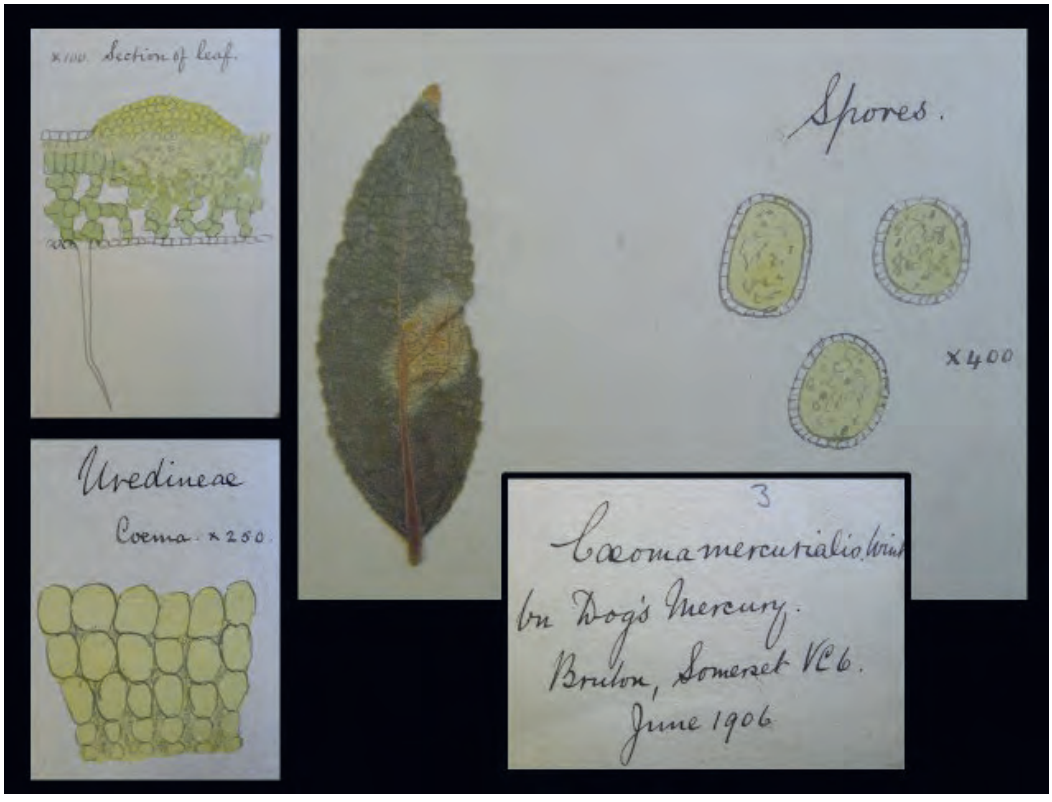

Fig. 1Dog's Mercury (Mercurialis perennis) *with rust* Caeoma mercurialis (= Melampsora populnea), *and details of leaf cross-section, urediniae and spores; from specimen collected and drawn by Walter Watson, June 1906, and held in the SANHS collections, Somerset Heritage Centre (Photos: Simon Leach, with kind permission of SANHS and South West Heritage Trust)*

Fig. 2 Galls of the gall midge Dasineura hygrophila *– Yarty Moor, 16 Sep 2018 (Photo: Simon Leach)*

for help in determining or confirming the identity of several gall-midge galls. In the list below, records made by us are denoted by initials SJL and/or SJP. Names of other recorders are given in full. Dates refer to 2018 unless otherwise stated. Species names follow Redfern and Shirley (2011).

Acalitus calycophthirus (gall mite causing 'big bud' galls on BIRCH, *Betula* spp) – Yarty Moor (ST 23 15), 16 Sep, J.A. McGill, conf. SJL; first record for VC5 on BPGS database. [Chinery 2011, p.36]

Brachycolus stellariae (aphid gall on leaves of STITCHWORTS, *Stellaria graminea* and *S. holostea*) – Yarty Moor (ST 23 15), 16 Sep, on *Stellaria graminea*, Somerset Rare Plants Group, det. SJL; first record for VC5 and Somerset on BPGS database.

Dasineura hygrophila (gall midge inducing distinctive swollen-bud galls on BEDSTRAWS, *Galium palustre* and *G. uliginosum*) – Yarty Moor (ST 23 15), 16 Sep, on *Galium uliginosum*, J. A. McGill & SJL, conf. from photos by Simon Haarder, "Yes, this is indeed *Dasineura hygrophila* – a good record. I've found it myself a few times [in Denmark], usually in somewhat wet habitats…" (email dated 25 Sep); first record for VC5 and Somerset, and seemingly a scarce species nationally. [Fig. 2.]

Frankia alni (a Protozoan, formerly considered to be a fungus, causing root swellings/nodules on ALDER, *Alnus glutinosa*) – Barford Park (ST 23 35), 24 Sep 2017, SJP, SJL & J.A. McGill; first record for VC5 but, like all root galls, massively under-recorded and overlooked.

Phragmidium violaceum (rust gall on BRAMBLE, *Rubus fruticosus* agg.) – Yarty Moor (ST 231 6 & ST 23 15), 16 Sep, Somerset Rare Plants Group, conf. SJP & SJL; Wellington Monument (ST 13 17), 13 Oct, SJP & SJL; first and subsequent records for VC5 on BPGS database, but recorded by Watson a century ago and probably widespread but generally overlooked.

Phyllocoptruta coryli [= ***Phyllocoptus coryli***] (gall mite causing distortion of HAZEL, *Corylus avellana*, catkins) – Thurlbear Quarrylands (ST 27 20), 1 Feb, SJL; first record for VC5 and Somerset on BPGS database. [Chinery 2011, p. 46]

Taphrina carpini (fungus causing witch's brooms on HORNBEAM, *Carpinus betulus*) – Leigh Woods (ST 55 73), 8 Apr, Somerset Rare Plants Group; possibly first record for VC6 and Somerset.

Trioza centranthi (psyllid bug inducing leaf-roll galls on RED VALERIAN, *Centranthus ruber*) – see previous reports in *SANH* 160, p.233 and *SANH* 161, p.337; continuing to spread rapidly in Somerset, as it is nationally. The present situation is summarised in Fig. 3. We would be delighted if any members seeing this distinctive and easily-spotted gall could please send their records to us at the email address below. [Illustrated in *SANH* 161, p.233.]

Uromyces muscari (rust on BLUEBELL, *Hyacinthoides non-scripta*) – Shapwick Heath (ST 41 40), 17 Mar 2017, SJP; first record for VC6 on BPGS database.

Xestophanes brevitarsus (gall wasp inducing rounded swellings on stems of TORMENTIL, *Potentilla erecta*, and TRAILING TORMENTIL, *P. anglica*) – Black Down, Mendip (ST 469 577), 23 Aug, on *Potentilla erecta*, E.J. McDonnell, conf. SJL; possibly first record for VC6 and Somerset.

Chinery, M., 2011. *Britain's plant galls: a photographic guide*, Basing, Hampshire: Wildguides.

Redfern, M. and Shirley, P., 2011. *British Plant Galls*, Shrewsbury: Field Studies Council.

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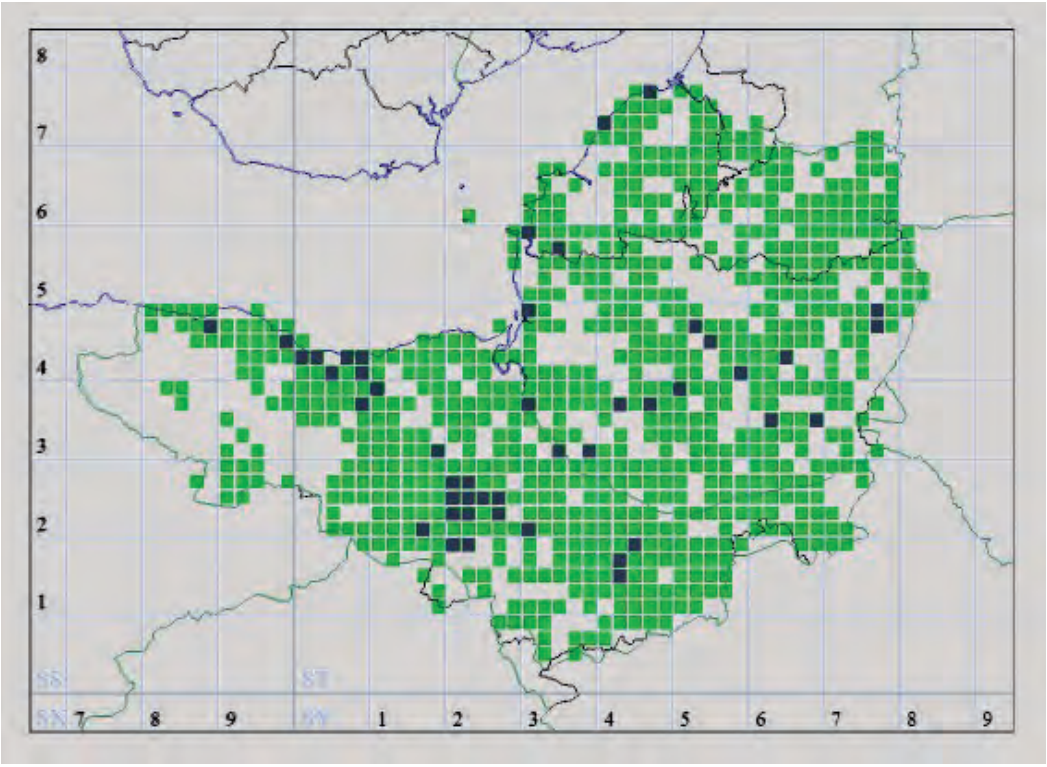

Fig. 3 Tetrad (2x2km square) distribution of Red Valerian (Centranthus ruber) *in Somerset (green squares), overlain with records of* Trioza centranthi *galls (blue squares) [map created using MapMate; data correct as at 15/01/2019]*

SOMERSET BIRDS 2017

It was another poor year for rarities, i.e. species for which records have to be assessed by the *British Birds Rarities Committee*. The most popular of these was a Two-barred Crossbill (*Loxia leucoptera*) found in a sizeable flock of Common Crossbills (*Loxia curvirostra*) by the County Recorder on Haddon Hill (Fig. 1). It was present for at least two weeks. A Ferruginous Duck (*Aythya nyroca*) moved between Ham Wall and Shapwick Heath during November-December. Remarkably, for the second year running a Gull-billed Tern (*Gelochelidon nilotica*) was noted. This, the fifth record of this species for Somerset, was seen on 30 May at WWT Steart Marshes. Although almost annual in Somerset, Savi's Warbler (*Locustella luscinioides*) remains a great national rarity. Two were seen at different sites on the Avalon Marshes, but with the abundance of suitable, yet inaccessible habitat, it seems likely that others are being overlooked.

Fig. 1 Two-barred Crossbill (Loxia leucoptera), *Haddon Hill (Photo: Brian Gibbs)*

Lesser rarities included single records of Green-winged Teal (*Anas carolinensis*), Red-necked Grebe *(Podiceps grisegena*), Hoopoe (*Upupu epops*), Golden Oriole (*Oriolus oriolus*) and Richard's Pipit (*Anthus richardi*). Scarcer wildfowl were represented by Scaup (*Aythya marila*), Velvet Scoter (*Melanitta fusca*), Red-breasted Merganser (*Mergus serrata*) and two Ring-necked Ducks (*Aythya collaris*), the last both at inland sites. Also noteworthy was a Sooty Shearwater (*Puffinus griseus*) seen from Minehead on the remarkably late date of 10 December. A storm-driven juvenile Shag *(Phalacrocorax aristotelis*) spent several days in September aboard a fishing pontoon on the Tone outside Morrisons supermarket; it made the pages of the *Somerset County Gazette*, albeit being featured, rather improbably, as a Pygmy Cormorant (*Phalacrocorax pygmeus*).

Although not unexpected, the proven breeding of a pair of Night Herons (*Nycticorax nycticorax*) at Westhay Moor was yet another first for Somerset and Britain. Previous to this record, nesting had been strongly suspected in 1997. Great White Egrets (*Ardea alba*) continued to do well in 2017, with 16 young fledged from seven successful pairs. Cattle Egrets (*Bubulcus ibis*) now seem increasingly likely to join their white cousins in establishing themselves in the county – following in the footsteps of the Little Egret (*Egretta garzetta*), sightings of which are now commonplace. Forty-six Bitterns were booming in the Avalon Marshes, with a few elsewhere, but for the second year running there were no breeding Little Bitterns (*Ixobrychus minutus*). At least one Glossy Ibis (*Plegadis falcinellus*) was present in the Avalon Marshes throughout the year, and there was a single record of Purple Heron (*Ardea purpurea*).

Not all was good news. The status of Turtle Dove (*Streptopelia turtur*) is extremely precarious in Britain, and the single record from Somerset in 2017, that of a bird on Catsford Common in May, is hardly reassuring. Quail (*Coturnix coturnix*) had a better year, but were still in single figures. Grey Partridge (*Perdix perdix*) only just maintains a toehold, but two pairs did breed successfully.

Among raptors, the Buzzard (*Buteo buteo*) remains common almost everywhere, and both Goshawk (*Accipiter gentilis*) and Marsh Harriers (*Circus aeruginosus*) continue to increase. However, Red Kites (*Milvus milvus*), well-established elsewhere in Britain, continue to puzzle. Although there were 158 widely-scattered sightings reported, successful breeding has yet to be proven although it may have occurred in east Somerset. Scarcer raptors include two Montagu's Harriers (*Circus pygargus*) and at least one Honey-buzzard (*Pernis apivorus*), but Osprey (*Pandeon haliaetus*) passage was well down on 2016.

Autumn seabird and wader movements were generally unexceptional, and skua passage was again poor. Of the rarer gulls, a single Glaucous (*Larus hyperboreus*) and five Iceland (*Larus glaucoides*) Gulls were located in roosts by dedicated watchers. There were seven records of Sabine's Gulls (*Xema sabini*), all in autumn. Storms during September and October drove perhaps as many as 25 Grey Phalaropes (*Phalaropus fulicarius*) into Somerset waters, together with several Storm (*Hydrobates pelagicus*) and Leach's (*Oceanodroma leucorhoa*) Petrels and high numbers of Manx Shearwaters (*Puffinus puffinus*). A Puffin (*Fratercula arctica*) was seen off Minehead on 29 November.

Early autumn saw the ornithological event of the year, with an exceptional arrival of Hawfinches (*Coccothraustes coccothraustes*) throughout Britain, something not experienced for many years. It seems likely that unusual weather conditions in the wake of storm 'Brian' diverted birds northwards from their usual southern-European wintering areas; but, whatever the reason, Somerset had an ample share of this influx. Churchyards, especially those with Yews (*Taxus baccata*), were particularly favoured, and during November most of the Quantock churches hosted at least a few birds. For many people, this was a rare opportunity to get good views of this handsome and enigmatic bird. Double-figure flocks were well-distributed throughout the county into the New Year.

This short account is inevitably selective and a comprehensive analysis of 2017, together with a feature on the Hawfinch invasion, can be found in the annual report, *Somerset Birds*. Visit www.somersetbirding.co.uk for details or contact the Recorder, Brian Gibbs, on 01823 274887.

BRIAN HILL
Somerset Ornithological Society

A REVIEW OF LOCAL GEOLOGICAL SITES IN SOMERSET

The Somerset Geology Group (SGG) is in the process of carrying out a review of the county's Local Geological Sites (LGSs), in partnership with Somerset Environmental Records Centre (SERC). These are 'second tier' sites that complement the county's 'top tier' geological Sites of Special Scientific Interest administered by Natural England. Somerset's 232 LGSs were originally identified, under the banner of 'Regionally Important Geological Sites' (RIGS), by the late Hugh Prudden from the 1980s onwards. Hugh was assisted by SGG members and by several students employed under a Manpower Services Commission scheme. In Somerset, as in most other parts

of the country, site information on LGSs is now held by the relevant local environmental records centre, in our case SERC. These records can then be made available for use by local authorities when determining planning applications or imposing planning conditions, in just the same way as they are in relation to Local Wildlife Sites (LWSs).The area covered by the review is the same as SERC's area of responsibility, i.e. modern administrative Somerset rather than the historic county. The location of LGSs in Somerset is shown in Fig. 1.

Guidance issued by Defra in 2006 (amended in 2018) called for more robust scientific evidence to be collected to support the designation of sites as LGSs. Given the time that had elapsed since the county's LGSs were first identified, and the new guidance from Defra, SGG and SERC decided that a full review should be undertaken of LGSs in Somerset.

We began work on the project during 2016 by drawing up work plans and designing a site assessment form, plus guidance notes with background information and advice on completing the form. This preparatory work was done in consultation with Natural England and drew upon the experience of a recent review of LGSs in Cambridgeshire.The site assessment form was designed to enable the collection of site metadata (name, location, other landscape designations, planning authority, ownership, previous survey details, etc.), geological background (relevant research papers, rock formations, etc.), results of field survey (photos, description of site features), and the surveyor's assessment of the site's scientific, educational, historical and aesthetic value.

A few LGSs have been surveyed and assessed by SGG volunteers, but the bulk of the work has been undertaken by student volunteers. In 2017 we recruited two geology students, who worked on the project from July to September with volunteers from SGG acting as 'mentors'. A third student joined in September and worked until early 2018. We established a 'panel of experts' to review students' site assessments and to either confirm a site's re-designation or recommend its removal from the list if judged to be no longer of sufficient value. The panel includes representatives from the planning authorities, SGG mentors/area experts and other local geologists (e.g. from Natural England).For the students a three-step work plan was developed, as follows:

- *Preparatory work* – obtain permission from landowner to visit site, research background to site and fill in assessment form with background data
- *Fieldwork* – visit, survey, photograph and record site
- *Back in the office* – complete site form, make recommendations on designation and inform mentor that forms completed and ready for review by panel.

In early 2018 we ran a second recruitment campaign and two students joined the project in July, one of whom

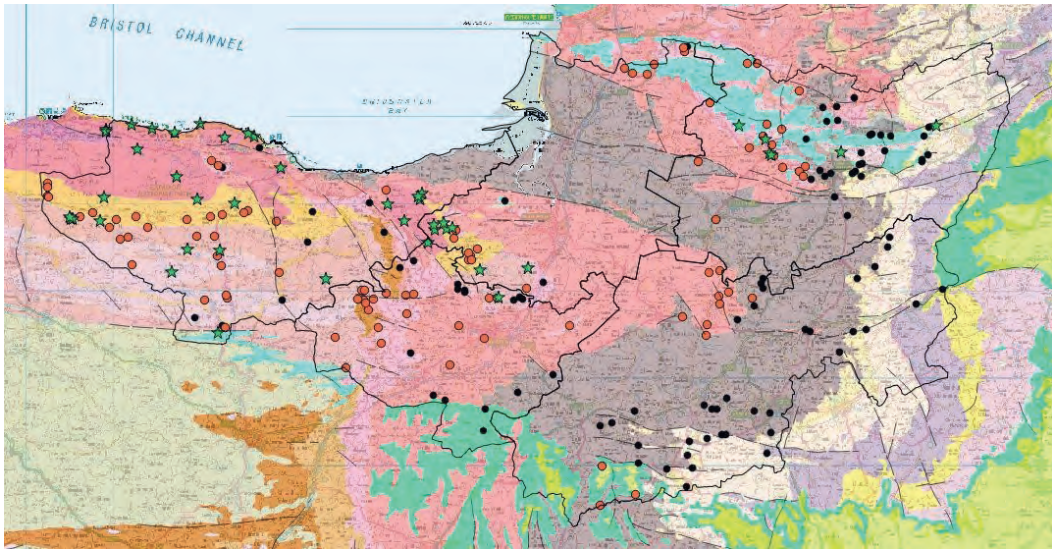

Fig. 1 Locations of LGSs in Somerset. Green stars indicate sites that have been re-designated (as at December 2018), red circles show sites where work is underway, black circles where work has yet to start. (Background geological data is reproduced with permission of British Geological Survey ©UKRI. All rights reserved)

TABLE 1 REASSESSMENT OF SOMERSET'S LOCAL GEOLOGICAL SITES – NUMBERS OF SITES AND PROGRESS (AS AT 7TH DECEMBER 2018)

Area	No. sites re-designated by Panel	No. sites for which work is in progress	No. sites not yet started	Total no. sites within area
No. sites within each District Council area				
West Somerset	29	30	10	69
Taunton Deane	2	21	16	39
Sedgemoor	7	14	3	24
South Somerset	0	12	38	50
Mendip	6	15	29	50
Totals	**44**	**94**	**94**	**232**
No. sites within National Park Authority (incl. in West Somerset totals above)				
Exmoor	22	29	4	55
No. sites within each AONB (incl. within District Council totals above)				
Blackdown Hills	0	1	4	5
Mendip Hills	2	14	1	17
Quantock Hills	8	12	3	23
Cranborne Chase	0	0	1	1

has worked through into 2019. To ensure that they had the necessary confidence and knowledge to work in the field and provide the robust data required, we recruited either newly-qualified graduates or undergraduates who had completed at least two years of their courses. SERC has supported the students with office facilities, field equipment, risk assessment training and work planning, but does not have any specialist geological knowledge – hence the requirement for knowledgeable students who are able to work independently.The students are volunteers, but we have been able to pay them a mileage allowance thanks to funding support from the 'Curry Fund' of the Geologists' Association, Exmoor National Park Authority, Geckoella Ltd, Quantock AONB, Wessex Water, and the 'Pat Hill-Cottingham Fund' of the Somerset Archaeological and Natural History Society.

Progress of the project is shown in Fig 1 and Table 1. The column showing 'number of sites started' includes those where very little work has been done right through to those for which survey work has been completed and assessment forms are ready to be submitted to the panel.

Not surprisingly, we have learnt from our experience and have streamlined our processes over time. An early lesson was that it was important to start work to obtain permissions to visit sites well in advance of anticipated survey dates. Landowners are busy people and we found that a phone call to follow up the letter asking for permission was often needed. We have also learnt much about the intricacies of site assessments, and when to question whether a site is worth re-designating. For example, many sites are overgrown and, as a result, exposures or outcrops may be hardly visible. It would be easy to underestimate the value of these sites on the grounds that the geology is at present obscured by vegetation. In most such instances a site would normally be recommended for re-designation on the grounds that the geological features that led to its initial designation are still present, and with site clearance and appropriate management could easily

Fig. 2 An overgrown pathside LGS at Clatworthy Reservoir, prior to clearance work. The site is listed for its exposures of Devonian age Morte Slates, c. 385-360 million years old (Photo: Garry Dawson)

Fig. 3 The same LGS as in Fig. 2, in the process of being cleared of vegetation by members of the Open University Geological Society and Milverton Conservation Volunteers (Photo: Garry Dawson)

Fig. 4 The same LGS as in Figs 2 and 3, following completion of clearance work. Note a newly discovered fault-line, running from upper right of photo to lower left. There are now plans to install interpretation boards at the site to explain its geological interest (Photo: Garry Dawson)

be uncovered again (see example in Figs 2-4 of a site which was previously overgrown, but then cleared to reveal once again its geological interest).

We anticipate that it will be two or three more years before the project is completed, by which time all LGSs in the county will have been re-assessed and either re-designated or recommended for removal from the list of Somerset's LGSs. The comprehensive data-set we have collected for the review will help to protect these sites for many years to come. At the time of writing (April 2019) no sites have been removed from the list but a small number are on hold pending further research or investigation. Once site information has been gathered we can then start to think about future priorities for geo-diversity work in the county, including site clearance on LGSs, educational trails and the whole business of interpreting geological features to a wider audience – so even when we think we've finished there will be much more to do!

GARRY DAWSON
Somerset Geology Group