Butterfly Conservation Dorset Branch

Newsletter No 84

www.dorsetbutterflies.com

Spring 2017

Butterfly Conservation

Saving butterflies, moths and our environment

Chairman's Notes

From Nigel Spring, Dorset Branch Chair

It's all about communication! We know there are other factors that influence whether an organisation is successful but whichever walk of life you are in, communication is vitally important. It might be something quite simple like giving a volunteer instructions on where to dig a hole; or far more crucial like explaining clearly the consequences of a no vote in a referendum, or expressing one's views about an urgent local issue before it is too late.

Butterfly Conservation now has over 30,000 members (the Dorset Branch has around 900 and rising), the RSPB over a million and the National Trust several millions. That's a lot of voices to inform us of their views on the things that concern them….and by the same token, a very large number of people for us to keep in touch with. We at the Dorset Branch of BC spend a lot of time and energy trying to improve our lines of communication with our members and supporters. The printed medium of the newsletter (with the accompanying events booklet) is one way of doing it – and we like to think we are getting better at it, especially with the exciting full-colour format. We are always on the look-out for material, so please send Jane Smith your observations, experiences and views, preferably, but not necessarily, with a photo or two to illustrate your piece.

Our events booklet, circulated with this newsletter, is full to overflowing with walks, meetings, courses and other opportunities to enjoy, learn about or monitor butterflies and moths this summer. Please pass on the information in the events booklet to your friends for them to put the dates in their diaries, and try to take part in as many as you can.

So much communication these days is via the ether, and accordingly our website www.dorsetbutterflies.com is getting better and better, thanks to the hard work of Lyn Pullen (Website officer), Dom Greves, Andrew Cooper and others (a big thank you to everyone involved!). All the events in the events booklet are listed on the website, along with any others which have been arranged since the booklet went to press. It is worth checking on the site to make sure the details of an event haven't been altered. And don't forget to submit your butterfly sightings via the webpage: even reports of the common species are important!

From the poll we carried out at our branch AGM in February, it looked as though everyone in the audience of over 80 people had regular access to the internet. 15% of the membership now receive their newsletter by email; this saves the branch quite a tidy sum, though we also appreciate there are good reasons to have a paper copy to refer to and to share. Please contact Robin George if you could change to a digital copy of the newsletter. Every little helps!

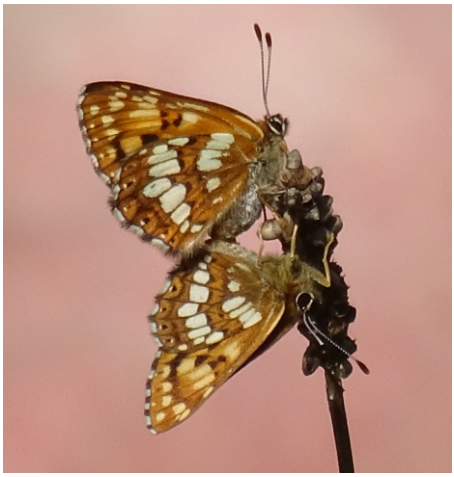
Facebook, Twitter and the other social media are effective ways to communicate news and opportunities. It was suggested at the AGM that we should hold an afternoon session to help people understand the advantages of using social media – this is something we'll aim to do in the autumn. There are links on our website where you can sign up for our branch Facebook or Twitter accounts. You will then have access to information which is far more up-to-date than the newsletter can ever be, and you can communicate with us too! That way, we can be one body of 900 members with a strong voice rather than 900 separate individuals…..

And finally: Colin Burningham has written an appreciation of the contribution Bridget and Lawrie de Whalley have made over the years to the work of the Dorset Branch and to butterflies and moths in Dorset. I would like to emphasise how much we will miss their energy, experience, wisdom and very sharp eyes.

Nigel Spring

Editor's Note by Jane Smith

Welcome to our Spring Newsletter. We have a variety of articles in this issue, including the second article about Andrew Cooper's urban garden meadow; a feature on the Radipole transect in its 30th anniversary year, by Allan Neilson; and Brian Arnold has written about the Small Pearl-bordered Fritillary in Purbeck. Many of you will have heard Rachel Jones (Conservation Officer at Butterfly Conservation) speak at our AGM about the Dorset Dukes Project, and she has written about this for us.



Duke of Burgundy mating pair. Photo: James Gould.

I have included two particularly interesting articles from other branches. The article on the effects of Neonics on butterflies was previously published by Somerset and Bristol Branch, and that on how the study of white butterflies is leading to improved solar technology was previously published by Cornwall Branch. Colin Burningham's article about Bridget and Lawrie de Whalley highlights their dedication and commitment to butterflies and moths over some 15 to 20 years, This was acknowledged by Butterfly Conservation in 2011, when they both received Outstanding Volunteer Awards at the BC National AGM. We will miss them as both friends and colleagues and hope that all goes well with Lawrie's treatment.

The Dorset Branch of Butterfly Conservation is one of 32 Branches of this UK organisation, dedicated to saving butterflies, moths and the environment.
www.butterfly-conservation.org

Butterfly Conservation

More Walkers urgently needed for Dorset Butterfly Transect Walks

This year the numbers of walkers for our Dorset butterfly monitoring walks has declined seriously as a result of retirement and movement out of Dorset. To preserve their scientific value as data used by butterfly researchers and even global warming analysers, the walks need to be kept going regularly from April to September each year. Most walks are done as a team effort with the weeks shared between several different walkers.

A basic grasp of butterfly identification is needed but much can easily be picked up because the records of what was seen at similar dates in previous years are available to walkers. A quick check in a butterfly identification book of species previously seen can be very helpful before a walk.

If anyone could volunteer, please contact me (see below for contact details) giving me your postal address so that I can work out which of our 65 Walks are within your reach. I will arrange to send you further details of butterfly walk recording and then put you in touch with the local walk co-ordinators who can show you round the walk route.

Contact Bill on w.shreeves@btinternet.com or 01747 852587

Newsletter deadlines:
31 August for early October publication
28 February for early April publication
We welcome contributions - if it's the sort of thing you'd talk about to another butterfly/moth enthusiast, why not share it with lots of them?

Lawrie and Bridget de Whalley

by Colin Burningham

Bridget and Lawrie de Whalley have been a very active part of the Dorset Branch of Butterfly Conservation for many years. There can be few members that can remember the time before they joined our branch!

They have always had homes both in London and in Dorset, but with Lawrie's recent ill-health, they have made the difficult decision to sell their home in Winterborne Stickland and move back to London.

This move has happened rather rapidly and has meant that we as a group have not had the chance to say goodbye. It was felt that perhaps a big vote of thanks for all their efforts over the years would best be achieved by reviewing all the different jobs they so nobly performed in support of their joint love of butterflies and moths.

At the grass roots, Lawrie in particular carried out a great many

Bridget on our stall at Kingston Maurward in 2010. Photo: Lyn Pullen.

Lawrie assisting at the Identification Training Day in 2010. Photo: Lyn Pullen

butterfly counts in support of the weekly butterfly transect walks around Dorset, while Bridget masterminded the transect walks carried out on the Milldown in Blandford.
Lawrie carried out butterfly surveys on the central and southern chalk downlands in Dorset in support of the Regional Action Plan, and also carried out surveys on the various Duke of Burgundy sites.

Perhaps the greatest task that they took on was the running of the Display and Sales stalls at various locations around the county, organised in the main by Bridget. They had many helpers in this task but the stall and all its sales goods and leaflets were nearly always delivered and taken away by Lawrie and Bridget, a true dedication. Bridget specialised in encouraging children, while Lawrie entranced young and old with live moths and caterpillars.

Their work at outdoor practical conservation tasks should not be passed by without mention. During the winter months, they supported a number of sites including Lydlinch Common, Broadcroft, Cashmoor and Cerne Abbas. The energy they put into

their work often left younger volunteers feeling quite exhausted!

Lawrie has been a great support to Bill Shreeves, in particular running the power-point presentations at Bill's area meetings and offering his knowledge to any problems of identification.

Lawrie is also a keen moth enthusiast and he supported a number of field events with his generator and moth-traps.

Bridget also found time to pot up numerous plants for the plant stall run by Lyn Pullen, helping the branch in yet another way.

It is difficult to know where to stop and my apologies to Bridget and Lawrie for any tasks I have inadvertently left out.

Bridget and Lawrie at Lyndlinch Common. Photo:Mike Adams

On behalf of the branch, we would like to say very many thanks for all you both have done for the Dorset Branch, you are both difficult acts to follow! We wish you well in London and we hope that Lawrie's treatment goes well and that we will see you again in Dorset before long.

Butterfly Surveys at Radipole

Allan Neilson on the Radipole RSPB Reserve, just outside Weymouth

Narrow borders of herbs and shrubs alongside surfaced paths through wet reed-beds are not obvious environments for one of the oldest butterfly transects (butterfly monitoring walks) in Dorset. Yet 2017 sees the 40th anniversary of the first walks at Radipole in 1977 which continued, with just one break in 1990, until 1996 when other activities took precedence. They were resurrected by two volunteers in 2007 and have continued to date. So 2017 is a triple anniversary as it also marks the 10th anniversary of the restart as well as giving the 30th year of transect data.

The walk starts at the Discovery Centre by the Swannery car park and, bar a short length of grass track at the finish, follows paths in the public area of the reserve. Depending on the sightings it takes one to two hours to walk the 1.6 km route. There are 22 "regular" species on the transect list. It comprises two skippers, six whites and yellows, six browns, six vanessids and three coppers and blues. Small Blue (added 1979), Dark Green Fritillary (added 2015) and Ringlet (added 1995) are "occasionals". Brown Argus is an unconfirmed addition. After an undocumented "possible" sighting in 2009, a photograph taken in 2015 (upper, below) is near-identical to the upper-side of the male (lower left). The butterfly's behaviour did

Clockwise from top: Possible Brown Argus: Allan Neilson; Female Common Blue: UK Butterflies; Brown Argus: Peter Eeles

Transect Section 4. Photo: Allan Neilson

not match that of any female Common Blue (lower right), but we had no sighting of the underside, which shows the critical differentiators from female Common Blue.

In common with the national trend, average annual totals at Radipole have reduced from c.1,550 (1978-88) to c.590 (2010-16). Totals for skippers and most browns have plummeted by 90% with Small Skipper unseen since 1996; natural declines augmented by physical changes which have reduced the areas of grassy scrub and rough grazing. Local vegetable growers may be relieved that average totals for Large White have reduced from c300 to c30 in the same periods. Average totals of most other species have "just" halved but Orange-tip, Holly Blue and Comma have risen whilst Red Admiral and Speckled Wood have remained stable. A few Ringlets have been recorded in five of the seven years 2010-16.

Of the day-flying moths, we regularly encounter the Scarlet and Jersey Tigers. Recent counts of the equally eye-catching Narrow-bordered Five-spot

Burnet have plummeted as the sole area of long-stemmed grasses favoured for their larval cocoons has become overgrown with other species.

Rather than make solo walks, we generally go out in small groups as many eyes make it easier to spot butterflies and moths resting in the path-side vegetation. A side-effect of this has been that our surveys have added several new species of invertebrate to the reserve list. The most recent highlight was the discovery in May 2014 of a small spider previously unrecorded in SW England, a brightly-coloured female *Hypsosinga heri*. Its only previous recording was the much less colourful male in 1898 and 1912 at Wicken Fen, near Ely, and it was on the verge of being deleted from the British List.

If you would like to join the RSPB team (currently four RSPB volunteers), please leave your contact details at the Discovery Centre (01305 778313) and they will be in touch. All skill levels are welcome. You may even be part of the group that discovers another new species of invertebrate for the regional list - and with the coastal location it might even be a butterfly!

For more information on this RSPB Reserve, go to www.rspb.org.uk

Hypsosinga heri at Radipole:. Photo: Allan Neilson

Purbeck and the SPBF

Brian Arnold tells us about the Small Pearl-bordered Fritillary in the Purbeck Hills

My interest in butterflies started when I was at school in Bournemouth. At the age of 13 I joined the school Biology Club along with three other boys, and we started a hobby that has continued to this day. We cycled to the New Forest and to the Purbeck Hills in search of butterflies, but in those days we did as boys did, and caught and pinned them - unthinkable these days of course. I still have some of the butterfly cabinets and records showing that we were butterfly hunting from 1965.

Small Pearl-bordered Fritillary June 2016. Photo: Brian Arnold.

More than 50 years later, three of us are still going out together, now with cameras and notebooks to look for and photograph butterflies. It is my ambition to see and photograph every British butterfly, and so far I have logged up 55 species, plus a few rare migrants. My notes show that on 4th June 1966 I saw 3 Small Pearl-bordered Fritillary (SPBF) in the New Forest at Oberwater by the Burley Old Inclosure. Unfortunately I have no record of seeing them in the Purbeck Hills.

I am lucky to live just a few minutes drive from the last known colony of SPBF in Dorset at Godlingston Heath near Swanage. Along with the National Trust, and others who do Purbeck transects, we decided to monitor the site in 2016 to provide NT with data to help them manage the site and the surrounding area. We met and planned the transect which we would walk only for the SPBF flight period, and included

surrounding areas to try and establish their complete range.

The transect was walked 15 times from 10 June to 3 July within which we recorded just 29 sightings. Some of these will be duplicates due to frequency of the counts, and we will have missed some, so I think it likely that overall numbers were in the region of 25 to 40. None were seen outside the known area, so the site and colony are quite fragile in my opinion.

Small Pearl-bordered Fritillary June 2016. Photo: Brian Arnold.

The flight period for SPBF in 2016 was similar to sightings at Godlingston Heath in 2014 and 2015. Numbers in 2016 were lower than the last two years in my own experience. Hopefully this mostly echoes the general trend of butterfly counts of many species in 2016, and that in 2017 we will see an increase in numbers for most butterflies including SPBF - fingers very much crossed!

Small Pearl-bordered Fritillary underside June 2016. Photo: Brian Arnold.

Small Pearl-bordered Fritillary June 2015. Photo: Brian Arnold.

In the 1950s this butterfly was deemed 'common' in its habitat. Even the 1970-84 distribution map shows it in 75 kilometre squares. The major cause of decline is probably the lack of coppicing of deciduous woodland.

Urban Butterfly Gardening

Andrew Cooper brings us Part Two of his description of his wildlife garden in Bournemouth.

In part one of my Urban Butterfly Article (Newsletter no. 83) I began preparation for turning my Bournemouth garden from a largely lawn 'desert' into a haven of wildflowers and foodplants for some of Britain's widespread but struggling butterfly species.

Unfortunately, traditional wildflower meadows have suffered greatly within the UK's landscape, an estimated 98% have vanished from our countryside. With memories of wildflower meadows and golden grasslands delighting me in summer, a backdrop abounding in butterflies and floral beauty, it was only logical to me that I should try reproducing one in my own backyard, albeit on a smaller scale. They are not only beautiful but in fact vital for many declining plant and insect species while providing a source of interest and pleasure to us!

Deciding on where to place such a feature is more important than you might think, in order to achieve success, the mini-meadow should be situated in the sunniest section of your garden where it'll receive the most light and warmth. For my meadow, and partly due to limited space, I chose an area between two trees,

Meadow in Andrew's garden.
Photo: Tim Melling

on the right-hand side of my south-facing garden which is exposed to the sunshine and warmth for the best part of the day but sheltered enough with partially shaded areas at the edges to provide some cover.

To begin with, I had to completely clear the area of grass and

Orange Tip. Photo: Andrew Cooper.

topsoil, removing any large stones, breaking up the soil to a fine tilth and removing any remaining grass roots before adding lime, to reduce the acidity of the remaining soil (the amount varies depending on your soil pH). After a few weeks, picking out any 'weeds' that grew over that time, I began to sow by hand a mix of native wildflower and grass seeds and raked them in, then watered. Depending on what you want to provide for the wildlife in your garden or see from your mini-meadow will decide the percentage of wildflowers to wild grasses in the mixture you'll need. I settled on a 50% wildflower and 50% wild grasses mix so that the end result would be a mosaic of both nectar plants for the pollinating adults as well as foodplants for the caterpillars, appealing particularly to species such as Meadow Brown and Gatekeeper.

In the first season, a light cut every five weeks or so in the summer will establish the new swards, but the display will be a subtle one as this does take time but by June/July the mini-meadow will begin to take shape. Plug plants can also be added in bare patches to fill out spaces and provide additional nectar for passing insects while the seedlings develop. By the second year the grass should be well established but again proceed with a light cut in mid-summer followed by closer cut in September but keep in mind to leave some areas untouched on a rotational basis so that shelter is always available for overwintering insects and caterpillars such as those of the Speckled Wood. In the third year, a trim of the mini-meadow may be necessary in early Spring, but can then be left until September. If preferred and if conditions are favourable in the autumn another tidying cut may be made in late October.

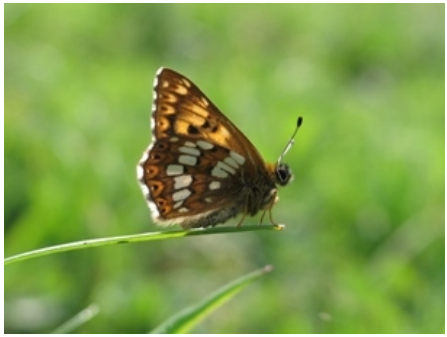
This type of management will then be the basis pattern for future years as your meadow should begin to flourish after two or three years from when you first began planning.

Saving Dorset's Dukes

By Rachel Jones

The Duke of Burgundy is a delicate butterfly that inhabits scrubby calcareous grasslands and open sunny woodlands. Males perch on tall stems or scrub, investigating any passing butterfly and aggressively chasing them away if they are not a female Duke. Giant Hill is one of the best places in Dorset to see the Duke of Burgundy during the flight period, from late April to May. During this time female Dukes lay eggs on the undersides of the leaves of the larval foodplants; cowslip and primrose. Larvae hatch and feed in late June/July and will spend the winter as pupae deep within grass tussocks.

The Duke of Burgundy has specific habitat requirements as larvae feed at a time when the foodplant is prone to drought. Egg-laying females select foodplants sheltered by scrub and tall grasses, often on north or westerly facing slopes as these foodplants are less likely to dry out when larvae are reliant on the succulent leaves. On grassland Dukes are particularly sensitive to over-grazing or excessive scrub clearance which exposes larval foodplants. In woodlands open sunny rides and glades are preferred; the cessation of traditional woodland management is associated with the extinction of many woodland colonies.



Duke of Burgundy at Giant Hill May 2012. Photo: Mark Parsons.

In 2012 a UK site dossier compiled to document the current status of the Duke of Burgundy highlighted the plight of this species, especially in South West England. In Dorset seven colonies remained and fourteen known colonies had been lost since 1980, including loss of all woodland colonies. Lessons from

landscape-scale projects show the Duke of Burgundy responds well to targeted management across networks of occupied, extinct and potential sites and this was the approach used for the Dorset Dukes project. The aim of the project is to restore, increase and connect sites, encouraging existing populations to grow and expand to newly created habitats.

Dorset Dukes includes nine woodland and grassland habitats in the Cerne and Sydling Valley. The project was developed following surveys in 2014 to confirm the current distribution and assess potential habitat. Foodplant abundance, sward structure, site isolation, site area, management of surrounding sites and current management were all considered during surveys and the management required to improve habitats was identified and discussed with landowners.

Management has been conducted by contractors and volunteers on four project sites so far. Conservation efforts were targeted to complement management undertaken across the wider landscape through agri-environment schemes and other conservation initiatives. Through this project scrub has been cleared to increase chalk grassland habitat and improve connectivity within sites. Sheltered edge habitats have been enhanced by coppicing hazel on woodland/grassland boundaries. An existing ride was widened and two adjacent scalloped glades created within a woodland site. 300m of electric

Ride clearance. Photo: Rachel Jones

Electric fencing at Giant Hill. Photo: Rachel Jones.

fencing has been purchased to exclude sheep from summer grazing a bank which previously supported Dukes. To improve this bank further volunteers have enhanced the scrub edge and scrub patches are being allowed to regenerate to increase shelter.

Dorset Dukes is still in the early stages and it will take time for the habitat and butterfly to respond to management and continued monitoring of both adults and larval stages is required. In the coming years more work is planned to maintain habitat on sites where management has occurred and conduct new management to enhance and connect sites within the north of the Cerne and Sydling landscape.

This project would not have been possible without support from: Butterfly Conservation Dorset Branch, Butterfly Conservation members and supporters, Cerne Valley Community Group, Dorset AONB Sustainable Development Fund, EuCAN, Natural England Species Recovery Programme, private donors, Valentine Charitable Trust and Wessex Watermark Award. If you wish to help with future monitoring or management of sites please contact Rachel Jones (rjones@butterfly-conservation.org).

Volunteers at Giant Hill. Photo: Rachel Jones.

Rachel is a Conservation Officer at Butterfly Conservation, and the above article is a summary of a talk she gave at our Branch AGM in February on the Dorset Dukes Project. We hope to bring updates as the project progresses.

How we started with butterflies

By Lynda Lambert

Back in 2001 my late husband and I decided to go for a local walk up to the Knoll at Corfe Mullen. It was a lovely sunny Sunday morning and we had never spent any time walking in that patch. After disengaging ourselves from two overly friendly horses, Richard proceeded to photograph whatever sat still long enough, while I wandered along behind him mentally noting the various butterflies present and generally enjoying the peace of the place.

I noticed a small butterfly, and when I looked at it through my binoculars I couldn't believe my eyes. It was a Long-tailed Blue! I

Long-tailed Blue (male) at Kingston Lacy in September 2015. Photo: Steve Maskell.

Long-tailed Blue (male) at Kingston Lacy, Sep 2015. Photo: Steve Maskell

called to Richard to stop, turn around and to point his camera to the area I was pointing at, and he actually did as asked without question (quite unusual!). He managed to creep up on it and get a reasonable picture. We were very excited by this find, and next day when I was on Brownsea Island the wardens told me to report it to someone called Bill Shreeves, as they said it was very unusual to find this species in Britain.

When I telephoned Bill, he was very interested, and on mentioning the other butterflies I had seen that morning, he suggested we both might like to start recording butterflies on our future walks. Bill was very good at encouraging us, and because of him we acquired a new interest,g

spending many happy years recording what we came across.

White Admiral. Photo: Richard Lambert

We were only ever casual butterfly recorders, but we really enjoyed having a purpose to our ramblings. I say casual, but in truth there was nothing casual about it, we actively hunted the butterflies down, using binoculars to home in on distant ones so we could provide Bill with a decent list. It became rather competitive at times! Of course, after getting interested in butterflies it didn't take Richard long to move on to moths!

Having a motor caravan for many years enabled us to take a moth trap on holiday at home and abroad, and we had great fun trapping moths in the UK as well as in France, Hungary and Spain. We could have got ourselves into trouble in Spain, as we didn't know you had to have a licence to trap moths there! Happy days.

I still like to record butterflies on a casual basis, as well as recording my garden butterflies. While away from Dorset, I enjoy recording and forwarding my sightings to the relevant county recorder.

A day in the Woods

By Richard Belding

The annual trek around Chase Woods [in the far north of Dorset] took place last summer on July 9th, and 24 optimistic folk joined me. As usual, this was a joint visit with Wiltshire Branch who have an interest as the county border runs through the woods.

We started off in bright sunshine, and there was a lot of activity along Birdmore Ride which straddles the border. Highlights were a couple of Dark Green Fritillaries, one of which obliged the photographers by posing for a few minutes, and a couple of White Admirals. We also saw Silver-washed Fritillary and Marbled White in good numbers.

By one o'clock, however, it was evident that the forecast deterioration in weather conditions was a reality as we entered the realm of the Ringlet. Among the 200+ Ringlets recorded were a few of the aberration *arete* in which the hindwing rings are missing, leaving just the dots as shown in the photograph.

Ringlet aberration *arete*. Photo: Richard Belding

We had our lunch in the New Town Ride but as there seemed little hope of improving conditions we made our way homewards.

Despite the disappointing conclusion, it was an enjoyable day catching up with our neighbours and welcoming new faces to our ranks. In all, 13 species of butterfly were recorded and five day-flying moths including the striking Scarlet Tiger.

We are grateful to the Rushmore Estate for facilitating the visit.

Neonics and Butterflies

Sue Davies questions whether Neonicotinoids are destroying our butterflies.

This article first appeared in the Winter 2016 issue of the Somerset and Bristol Branch newsletter, and is reproduced with kind permission from the author.

The first scientific study to examine the effects of this controversial group of pesticides on British butterflies suggests that they may be contributing to their decline. Researchers found that 15 of 17 farmland species such as the Small Tortoiseshell, Wall Brown and Small Skipper, show declines associated with increasing neonicotinoid (neonic) use. *

Neonicotinoids are a new type of highly toxic chemical which acts as nerve agent for insects. They were first introduced in 1994 and are now widely used on crops such as cereals, sugar beet and oil seed rape. They are also sold for use in gardens, so many gardeners may be unwittingly adding to the problem.

Population data from 1985 to 2012 gathered from more than 1,000 sites across the country was studied by scientists at the universities of Stirling and Sussex, in partnership with Butterfly Conservation and the Centre for Ecology and Hydrology. They found that neonics use better explained steep population declines than other factors.

Although the study cannot definitively identify the cause of the population drops, Martin Warren, chief executive of Butterfly Conservation, said that the correlation revealed by the research required urgent further investigation: "The debate up until

Wall Brown.
Photo: Betty & Tony Rackham

* https://peerj.com/articles/1402/

now has been focused on bees. If neonicotinoids are affecting a lot of other insects, we should be even more worried. What we really want is more research. It's crazy that we're using a potentially dangerous-to-wildlife chemical and nobody has done those studies. If we're going to get smart about using chemicals in the countryside, we need to test them better before they get out there."

Dr Andre Gilburn, of the University of Stirling, who led the butterfly study, said: "Our study not only identifies a worrying link between the use of neonicotinoids and declines in butterflies but also suggests that the strength of their impact on many species could be huge."

Neonics usage increased at its fastest rate during the first decade of the 21st century, when farmland butterflies also experienced a precipitous decline, despite a doubling in conservation spending and predictions that climate change would benefit most species. The Small Skipper declined by 62% and the Essex Skipper by 67% between 2000 and 2009. Both species' caterpillars live on grasses found on field margins. In the same period the Large Skipper declined by 35%, the Wall Brown by 37% and the Small Tortoiseshell by 64%. According to the study, published in the journal PeerJ, these declines have largely occurred in England, where neonic usage is at its highest. By contrast in Scotland, where spraying of the pesticide is comparatively low, butterfly numbers are stable.

A US study published earlier this year found that dust emitted when seeds treated with neonicotinoids are planted causes sub-lethal effects in caterpillars of the Monarch butterfly. Another study* identified mobile dust containing a high concentration of neonicotinoids on the surface of fields, suggesting the pesticide could spread to affect insect populations which don't live adjacent to arable fields.

Matt Shardlow, chief executive of the charity Buglife, said: "Clearly the use of neonicotinoid seed treatments has been an unmitigated ecological disaster. It is such a shame that the government continues to support their use

* http://bioscienceresource.org/wp-content/uploads/2015/04/Pecenka-andLundgren-2015-Early-On-line.pdf

when the time has clearly come to extend the ban on seed treatments to cover all crops, not just oilseed rape."

In 2013, the EU introduced a temporary ban on certain types of neonics for flowering crops such as oilseed rape to allow scientists to better determine the insecticides' impact on bees. But neonics continue to be widely and legally used on other crops, particularly wheat.

Scientific studies have shown how neonics stay in the soil for years, leak into water and can be absorbed by wildflowers and grasses growing in field margins, which provide nectar for butterflies and food for their caterpillars. Researchers in the Netherlands have linked neonics found in surface water to declines in insectivorous birds and there is widespread scientific evidence that neonics harm bees, reducing their ability to pollinate plants. However scientists judge that there is still not enough data to say whether this harm ultimately leads to a decline in bee populations.

Dave Goulson, professor of biology at the University of Sussex, said: "Many of us can remember a time when our meadows and hedgerows had far more butterflies, bees and other insects than today. This study adds to the growing mountain of evidence that neonics are one of the causes of these declines." *

Butterfly Conservation launched a crowd-funding appeal to support a more detailed scientific assessment of the potential impact of neonics on farmland butterflies. They also want scientists to test butterflies and their caterpillars to see if they have neonics in their bodies.**

There are many scholarly articles related to this issue. I have included a few references but there are many others readily accessible on the Internet for anyone wishing to read further on this extremely important subject.

* http://www.researchgate.net/profile/Dave_Goulson/publication/264056414_Ecology_Pesticides_linked_to_bird_declines/links/540cb99f0cf2d8daaacaeb2a.pdf

** http://www.crowdfunder.co.uk/are-pesticides-killing-our-butterflies

White Butterflies' solar secret

By Roger Hooper. This article first appeared in the Cornwall Branch newsletter and is reproduced with Roger's kind permission.

Two of our most familiar butterflies, the Large and the Small White, may soon be helping to increase the efficiency of solar panels, which are one of the main providers of renewable energy.

You are no doubt aware that, if looking for butterflies on a cloudy day, the white species are often the first to be seen, sometimes by quite a margin of time. This ability to be first to warm-up and take flight gives them first access to the nectar in nearby flowers, well ahead of any rivals. What is it about white species that allows them to do this?

This was the question a team of researchers from Exeter University asked themselves. The answer, they found, was in the way the butterfly holds its wings when basking. The 'V' shaped posture adopted by both the 'cabbage whites' on cloudy days reflects more solar energy to the butterfly's thorax, allowing it to warm up much faster and so warming the flight muscles within it.

Their discoveries clearly had potential in the solar energy field. Researchers replicated the posture of the butterflies in a solar panel and found that the overall power to weight ratio of the solar structure was increased 17 fold, thus making it vastly more efficient. Lead author of the research, Professor Tapas Malick explains: "Biomimicry in engineering is not new. However, this truly multi-disciplinary research shows pathways to develop low-cost solar power that have not been done before".

The fact that 'cabbage white' butterflies were on the wing before other species showed that somehow they limited the time it took to warm up to flying temperature. The 'V' shaped posturing they adopted, known as

reflectance basking, maximises the concentration of solar energy onto the thorax. Specific sub-structures within the butterfly's wings allow light from the sun to be reflected most efficiently ensuring the flight muscles are ready in as short a time as possible.

The scientists then investigated how to replicate the wings to develop a new, lightweight reflective material that could be used in solar energy production. The team found that the optimal angle at which the butterfly should hold its wings was 17 degrees. This angle increased the temperature of the panel material by 7.3 degrees C compared to when the wings were flat. They also found that by replicating the simple mono-layer of scale cells found in the butterfly wings in solar energy producers they could vastly improve the power-to-weight ratio of future solar concentrators, making them much more efficient.

So, the lowly 'cabbage whites' could go from villain to hero in one step. From agricultural pest to a solar saviour that could play a part in fighting global warming, the single biggest threat to bio-diversity on earth.

Small White on Perryfields, Portland. Photo: Penny Hawes

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Photo on front cover: Silver-washed Fritillary, valezina form: Ken Dolbear
Photo on back cover: Duke of Burgundy at Springhead Hill, Sussex: Neil Hulme