## UKBMS 2020 publication Official Statistic policy briefing

## Key facts about the release

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| **1. Official Statistic name** | Point of first release for statistics on abundance of UK butterflies (2021 publication; includes data up to 2020) |
| **2. Publication timing** | This Official Statistic was published at 9:30am on 26th March 2021. |
| **3. How to access** | The Official Statistics are available at <https://ukbms.org/official-statistics> |
| **4. Short description** | * The statistics comprise trends of UK butterfly species based on results of the UK Butterfly Monitoring Scheme (UKBMS). * The UKBMS is a long-term monitoring scheme (running since 1976) involving repeat sampling at thousands of locations across the UK. The key method involves regularly counting butterflies along defined transects on days with specified weather criteria. * The statistics incorporate data from three components of the UKBMS: traditional self-selected transects; stratified random Wider Countryside Butterfly Survey squares; and targeted species surveys. * The UK Butterfly Monitoring Scheme is organised and funded by Butterfly Conservation (BC), the UK Centre for Ecology and Hydrology (UKCEH), British Trust for Ornithology (BTO), and the Joint Nature Conservation Committee (JNCC). The UKBMS is indebted to all volunteers who contribute data to the scheme. |
| **5. Scope of statistics** | * Population trends are presented at UK level for 58 of the 59 regularly occurring species. * Trends are presented at country level where sufficient data are available. * Figures are presented for annual change (2019-2020), the last 10 years, and long-term trends (since monitoring began from 1976). |
| **6. Who was involved and key contact point** | * The statistic was produced by the UKBMS partnership, with UKCEH having primary responsibility for producing the statistics. * Quality Assurance was carried out by the UKCEH, BC, BTO and JNCC. * This is published as a JNCC Official Statistic and the key contact for any queries is [kirsi.peck@jncc.gov.uk](mailto:kirsi.peck@jncc.gov.uk). |
| **7. Associated comms activity** | * A press release will be released on 31st March, after the Butterfly Recorders’ Conference. |
| **8. Relation to any other National/Official Statistics** | * This statistic forms part of a suite of statistics coming out of partnership monitoring schemes in JNCC’s terrestrial evidence programme. See <https://jncc.gov.uk/about-jncc/corporate-information/jncc-official-statistics-list-and-release-dates/> * The statistic feeds into the National Statistics Compendium – UK Biodiversity Indicators. <https://jncc.gov.uk/ukbi> and country level indicators e.g. [www.snh.gov.uk/docs/B424909.pdf](http://www.snh.gov.uk/docs/B424909.pdf) for Scotland and <https://www.gov.uk/government/statistics/england-biodiversity-indicators> for England. |
| **9. Further information** | * The summary below gives a brief overview of the Official Statistic results and related information. * Technical details of the method and quality assurance process are set out in a separate document that will accompany the Official Statistic publication. * A separate discussion paper on drivers of change has been produced and is available on UKBMS website [here](https://ukbms.org/official-statistics). |

## Take home messages

1. Results summary

* Trends for UK butterfly species vary, with just under a third of butterfly species assessed in the UK showing a significant long-term decline in abundance (31%), compared to 28% showing a significant long-term increase. However, over the last decade 7 species (12%) showed a statistically significant increase compared to 2 species (3%) showing a significant decline.
* 2020 was the third consecutive good year for butterflies. At UK level, 31 species were recorded in above average numbers, while 27 species fared worse than their long-term average.
* None of the 58 species had their best year on record, although Large Blue, Dark Green Fritillary and Cryptic Wood White all recorded their second best year in 2020. Similarly, no species had their worst year on record. However, note that some habitat specialist species have not recovered to the higher numbers that were typically found in the early 1970s[[1]](#footnote-1), whilst some wider countryside species are also in long-term decline.
* The restrictions brought on by the Covid pandemic resulted in less data than in 2019, and there are regional variations in the extent of available data due to the differing country-level restrictions. It was not possible to produce trends for Small Blue in Scotland, or for Pearl-bordered Fritillary in Wales due insufficient sampling in 2020.

1. **Drivers of change**

* Key drivers responsible for long-term declines in abundance include changes in the extent, condition and fragmentation of habitats caused by the intensification of farming, changes in forestry practices, urban development, pollution and climate change. Note that some drivers, e.g. climate change are likely to have mixed, species dependent impacts.
* Weather conditions can create noticeable fluctuations in butterfly populations from one year to the next as they impact butterfly development and activity directly, as well as indirectly (e.g. via impacts on habitat). Generally butterflies tend to fare better with warm sunny weather during their flight period.
* Targeted conservation management to protect and improve habitat can have positive impacts on species abundance.

### Relevance of scheme results

* Butterfly populations are used as indicators for environmental change due to their rapid and sensitive responses to subtle habitat and climatic changes, and to reflect the responses of other wildlife.
* UKBMS data are widely used in scientific research, for local site management, and have broad policy relevance. UKBMS data feed into [European indicators](https://ec.europa.eu/eurostat/cache/metadata/EN/sdg_15_61_esmsip2.htm), and [UK biodiversity indicators](https://jncc.gov.uk/our-work/uk-biodiversity-indicators-2019/) as part of measuring progress towards EU and CBD targets. UKBMS data has fed into country level indicators and reporting on Priority Species e.g. S41 species in England.

### Value of citizen science approach

* 2,500+ skilled volunteers are involved, at an estimated annual value of approximately £2million[[2]](#footnote-2).
* This ‘citizen science’ approach enables wide-scale simultaneous sampling coverage, and gives health benefits to the volunteers engaging in an active out-of-doors conservation/monitoring project.

1. **Confidence in results**

* The UKBMS uses peer reviewed methodologies to ensure results are scientifically robust. The WCBS sampling framework has been designed to ensure representative land cover sampling.
* Records submitted undergo quality assurance to check for unexpected data entries, and the statistical analytical approach is designed to account for gaps in the recording.
* The statistical significance of 10-year and long-term trends has been assessed and is clearly presented. Species plots on [https://ukbms.org](https://eur03.safelinks.protection.outlook.com/?url=https%3A%2F%2Fukbms.org%2F&data=04%7C01%7CKirsi.Peck%40jncc.gov.uk%7C5b2c25340b4a4b3d8bc008d8ede96df9%7C444ee4e8b2fd491d8c318b0508370a6b%7C0%7C1%7C637520934124373846%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=Y0jGmSdqrSfzFD02VpeMaHETOYX%2BKJsqjDNXReAvfZs%3D&reserved=0) show uncertainty in indices over time.

**Results Overview**

**Table 1: UK trends for butterfly populations**

The annual, 10-year and long-term changes are shown. Whilst annual change is interesting, it should be noted that there are naturally year to year fluctuations in butterfly populations, and the 10-year and long term trends are of more relevance from a conservation perspective.

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|  | **Species showing decreases in UK population** | **Species showing increases in UK population** | **Commentary** |
| ***Annual change*** | 32 out of 58 species for which annual changes were calculated | 22 out of 58 species for which annual changes were calculated | This is a simple comparison of annual change. Statistical significance is not assessed. |
| ***10-year trend*** | **2 species show a statistically significant decrease (3% of species assessed)**  (11 additional species show an apparent decrease that are not statistically significant due to high variability relative to level of change, or low sample size) | **7 species show a statistically significant increase (12% of species assessed)**  (38 additional species show an apparent increase that are not statistically significant due to high variability relative to level of change, or low sample size) | Note that 10 years is quite a short time to assess trends in butterflies and the trend is sensitive to start and end year values. |
| ***Long-term trend*** | **18 species show a statistically significant decrease (31% of species assessed)**  (11 additional species show an apparent decrease that are not statistically significant, due to high variability relative to level of change, or low sample size) | **16 species show a statistically significant increase (28% of species assessed)**  (13 additional species show an apparent increase that are not statistically significant due to high variability relative to level of change, or low sample size) | This was the third consecutive good year for UK butterflies. |
| ***Species that fared particularly well in 2020***  *annual change of 35% or greater* | Small Tortoiseshell 103%  Swallowtail 66%  Clouded Yellow 66%  Purple Hairstreak 38% | | No species had their best year on record. |
| ***Species that fared particularly badly in 2020***  *annual change of 35% or greater* | Painted Lady -98%  Black Hairstreak -74%  Chequered Skipper -62%  Marsh Fritillary -44%  Ringlet -41%  Brown Argus -38% | | No species had their worst year on record. |

**Table 2: Country level breakdown of trends**

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|  | **England** | **Wales** | **Scotland** | **Northern Ireland** |
| **Number of regularly occurring species** | 57 | 41 | 34 | 26 |
| **Number of species** assessed | 55 | 32 | 25 | 14 |
| **Significantly increasing species** over 10 years and long term. Presented as % (numbers in parentheses) of those species assessed | 1. Over 10 years:   13% (7 species)   1. Over series   25% (14 species) | 1. Over 10 years:   12% (4 species)   1. Over series   27% (8 species) | 1. Over 10 years:   16% (4 species)   1. Over series   36% (9 species) | 1. Over 10 years:   7% (1 species)   1. Over series   0% (0 species) |
| **Significantly decreasing species** over 10 years and long term. Presented as % (numbers in parentheses) of those species assessed | 1. Over 10 years:   2% (1 species)   1. Over series:   36% (20 species) | 1. Over 10 years:   3% (1 species)   1. Over series:   21% (7 species) | 1. Over 10 years:   8% (2 species)   1. Over series:   8% (2 species) | 1. Over 10 years:   0% (0 species)   1. Over series:   14% (2 species) |
| **Species with an increase of 35% or more** in each country in 2020. | * Small Tortoiseshell 105% * Clouded Yellow 74% * Swallowtail 71% * Glanville Fritillary 59% * Purple Hairstreak 38% * Peacock 38% | * Purple Hairstreak 232% * Small Tortoiseshell 105% * Small White 86% * High Brown Fritillary 79% * Large White 65% * Holly Blue 35% | * Northern Brown Argus 70% * Small Tortoiseshell 55% | * Small Tortoiseshell 297% |
| **Species that decreased by 35% or more** in each country in 2020 | * Painted Lady ‑98% * Black Hairstreak ‑74% * Ringlet ‑43% * Brown Argus ‑40% | * Painted Lady ‑99% * Marsh Fritillary ‑63% * Wall ‑61% * Grayling ‑55% * Orange-tip ‑46% * Small Pearl-bordered fritillary ‑45% * Small Copper ‑45% * Small Heath ‑41% * Common Blue ‑35% | * Painted Lady ‑99% * Chequered Skipper ‑62% * Small Copper ‑58% * Orange‑tip ‑51% * Large White ‑50% * Speckled Wood ‑44% * Green-veined White ‑43% * Marsh Fritillary ‑35% | * Marsh Fritillary ‑63% * Peacock ‑57% * Ringlet ‑42% * Small White ‑38% |
| Species with their best year on record | * none | * none | * Small Heath 23% | * Small Tortoiseshell 297% |
| Species with their worst year on record | * none | * none | * none | * Large White   ‑32% |

**Impacts of Covid restrictions on butterfly monitoring**

The national lockdown brought on by the Covid pandemic on 24th March resulted in suspension of the butterfly monitoring scheme, although some volunteers continued where they were able to incorporate the monitoring into their daily exercise that was permitted by government regulations. As the lockdown restrictions started to be lifted, butterfly monitoring resumed in England on 14th May, followed by subsequent dates in the other UK countries. By 6th July the monitoring resumed at a national scale. However, many factors affected how much survey was possible, including volunteers who were shielding, and reluctance to survey on popular sites where social distancing would be difficult. Some sites remained closed for the whole season.

The national lockdown had the potential to significantly impact on monitoring of those species with main flight period in April and May, with the species most likely to be affected being Orange-tip, Brimstone, Dingy Skipper, Pearl-bordered Fritillary and Green Hairstreak. In the end, adequate data was obtained for most species, although it was not possible to produce trends for Small Blue in Scotland, and for Pearl-bordered Fritillary in Wales.

Although the overall site coverage was around 80% of what was achieved in 2019, the number of sites surveyed in 2020 was still greater than all years prior to 2017, and the number of visits made to the sites was greater than all years prior to 2014. During the early season, only around one third of the sites across the UK were surveyed, compared to 2019, and in Scotland this figure was only c.17%. While this may appear concerning, it should be borne in mind that in England the number of sites visited in April 2020 was similar to 2002, and in Scotland and Wales comparable to late the 1990s and early 2000s. Early season site coverage in Northern Ireland has fluctuated over the years, largely depending on weather conditions, and 2020 is comparable to some of the other years since 2000.

The differential lifting of the restrictions across the UK and the noticeably lower coverage in Scotland, Wales and Northern Ireland compared to England has the potential to create a geographical bias when interpreting the UK trend, especially for early-flying species. However, when put into the context of survey coverage in past years, this was not considered to be problematic.

1. The UKBMS started in 1976, recording one year of high population numbers for habitat specialist species before populations crashed following drought. However, Butterflies for the New Millennium recording data confirms that higher numbers were typically around in the earlier 1970s and previously (i.e. the UKBMS did not happen to record an unusually good year in 1976). (<https://butterfly-conservation.org/sites/default/files/soukb-2015.pdf>) [↑](#footnote-ref-1)
2. Using day rate of £150 a day for the majority of volunteers and £350 a day for ‘local coordinators’ [↑](#footnote-ref-2)