## UKBMS 2020 publication Official Statistic 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 (2020 publication; includes data up to 2019) |
| **2. Publication date** | 20th March 2020 |
| **3. How to access** | The Official Statistics are available at <http://www.ukbms.org/> |
| **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, including a trend for Cryptic Wood White for the first time. * Trends are presented at country level where sufficient data are available. * Figures are presented for annual change (2018-2019), 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 [anna.robinson@jncc.gov.uk](mailto:anna.robinson@jncc.gov.uk) |
| **7. 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/our-work/uk-biodiversity-indicators-2019/> 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. |

## 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 26% showing a significant long-term increase. However, the situation is more positive over the last decade, with 6 species (10%) showing a statistically significant increase over this time period compared to 5 species (9%) showing a significant decline.
* Following a modest recovery in 2018, 2019 was an excellent year for butterflies. Just over half of species (53%) showed a higher population index in 2019 compared to the year before. 2019 ranked as the 8th best year in the 44 year series, and the best year since 1997.
* Four species had their best year on record in the UK in 2019 (Chequered Skipper, Orange-tip, Brimstone, and Marbled White). No species had their worst year on record in the UK. 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.
* Country level trends largely reflected that 2019 was a good year for butterflies, with Scotland recording record abundances for 6 species.

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. The spring and summer of 2019 was warmer than average although the summer was also relatively wet (see [Met Office summary](https://www.metoffice.gov.uk/about-us/press-office/news/weather-and-climate/2019/weather-overview-2019)).
* 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 or 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 informed UK reporting on the European Habitats Directive (for Marsh Fritillary and Large Blue), and 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 website show uncertainty in indices over time.

**Results Overview**

2019 was the 8th best year on record, with just over half of species assessed showing higher abundances across monitored sites compared to the previous year. However, whilst this 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.

**Overall ranking by year**

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| **UK breakdown** | **Species showing decreases in UK population** | | | **Species showing increases in UK population** | | **Commentary** | | |
| ***Annual change*** | 26 out of 58 species for which annual changes were calculated | | | 31 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*** | **5 species show a statistically significant decrease (9% of species assessed)**  (20 species show an apparent decrease but most are not statistically significant, due to high variability relative to level of change, or low sample size) | | | **6 species show a statistically significant increase (10% of species assessed)**  (38 species show an apparent increase but most are not statistically significant, due to high variability relative to level of change, or low sample size) | | This is a notable improvement from last year when there were twice as many species showing significant declines compared to increases. However note that 10 years is quite a short time to assess 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)**  (30 species show an apparent decrease but most are not statistically significant, due to high variability relative to level of change, or low sample size) | | | **15 species show a statistically significant increase (26% of species assessed)**  (26 species show an apparent increase but most are not statistically significant, due to high variability relative to level of change, or low sample size) | | There continue to be more species declining than increasing in the long term, but the situation is more positive than reported last year following another relatively good year for butterflies in 2019. The change may also may partly be attributed to changes in analysis methods, for better accounting for species colonisations in range expanding species. | | |
| ***Species that fared particularly well in 2019***  *annual change (year rank)* | Painted Lady 1993% (3)  Red Admiral 195% (5)  **Chequered Skipper 175% (1)**  **Marbled White 66% (1)**  **Orange-tip 63% (1)**  **Brimstone 32% (1)** | | | | | Species with their best year on record for the country are highlighted in bold. | | |
| ***Species that fared particularly badly in 2019***  *annual change (year rank)* | Common Blue -54% (29)  Green-veined White -43% (33)  Large White -40% (25)  Heath Fritillary -34% (33)  White Admiral -26% (33) | | | | | No species had their best worst year on record. | | |
| **Country level breakdown** | | | **England** | **Wales** | | **Scotland** | | **Northern Ireland** |
| **Number of regularly occurring species** | | | 57 | 41 | | 34 | | 26 |
| **Number of species** assessed | | | 55 | 33 | | 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   24% (13 species) | 1. Over 10 years:   9% (3 species)   1. Over series   27% (9 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:   9% (4 species)   1. Over series:   36% (20 species) | 1. Over 10 years:   0% (0 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:   7% (1 species) |
| **Species that fared particularly well** in each country in 2019.  Species with their best year on record for the country are highlighted in bold. | | | * Painted Lady * Red Admiral * **Marbled White** * **Orange-tip** * Dark Green Fritillary * **Brimstone** | * Painted Lady * Dingy Skipper * Pearl-bordered Fritillary * **Brimstone** * **Orange-tip** * Green Hairstreak | | * **Chequered Skipper** * **Orange-tip** * **Speckled Wood** * **Pearl-bordered Fritillary** * **Painted Lady** * **Peacock** | | * **Peacock** * **Orange-tip** * Meadow Brown * **Marsh Fritillary** * Small Tortoiseshell |
| **Species that fared particularly badly** in 2019  Species with their worst year on record for the country are highlighted in bold. | | | * Scotch Argus * Common Blue * Green-veined White | * Large White * Small White * Common Blue * Green-veined White * Grayling | | * Small Blue * Scotch Argus | | * **Green-veined White** * **Large White** * Small White * Small Copper |

**Notable species results**

* The Orange-tip experienced its best year on record in the UK and in every constituent country in 2019. This species is an early spring flying species and likely benefitted from some warm weather early in the year. It is expanding its range and is doing especially well in Scotland where it has a long-term trend of 436%.
* The Brimstone was another range expanding species to do well. After a run of several good years it now shows a statistically significant positive 10-year UK trend, of 108%.
* Several habitat specialist species continue to show long-term decline, for example the High Brown Fritillary (-66%), Lulworth skipper (-77%), Grayling (-72%). Habitat specialist species are particularly sensitive to changes to the environment such as habitat loss, degradation and fragmentation. However, targeted conservation management action is having a positive impact on some of these species. For example, despite the long-term decline, the High Brown Fritillary has benefitted from grazing regime management and woodland coppicing to create more open areas that can support butterfly food plants, and the species shows a statistically significant increase over the last 10 years (+287%).
* For two other threatened species, the rare Lulworth skipper had a welcome substantial increase in abundance in 2019, 138% higher than the previous year, whilst the Duke of Burgundy had its 8th best year on record.

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)