## UKBMS 2024 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 (2024 publication; includes data up to 2023) |
| **2. Publication timing** | This Official Statistic was published at 9:30am on 22nd March 2024.  |
| **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 (WCBS) transects; 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.
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| **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 (2022-2023), trends over the last 10 years, and long-term trends (since monitoring began from 1976).
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| **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 jasmine.salvati@jncc.gov.uk
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| **7. Associated comms activity** | * A press release will be released on 2nd April, embargoed till 00:01 3rd April, after the Butterfly Recorders’ Meeting. Please wait until this date before proactively promoting these official statistics.
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| **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. for [Scotland](https://www.nature.scot/doc/scotlands-indicators-terrestrial-insect-abundance-butterflies) and for [England](https://www.gov.uk/government/statistics/england-biodiversity-indicators) and will feed into the [Outcome Indicator Framework](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/992970/Outcome_Indicator_Framework_for_the_25_Year_Environment_Plan_2021_Update.pdf) for the 25y Environment plan in England.
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| **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 on the UKBMS website [here](https://ukbms.org/official-statistics).
* A separate discussion paper on drivers of change has been produced and is available on UKBMS website [here](https://ukbms.org/official-statistics).
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## Take home messages

1. Results summary
* Trends for UK butterfly species can vary, but 2023 shows about a third of the species assessed in the UK showing a significant long-term decline in abundance (33%), and the same (33%) showing a significant long-term increase. Short-term (10 year) trends show 5 species (9%) showing a statistically significant increase and 4 species (7%) showing a significant decline.
* Overall, 2023 was a slightly above average year for butterflies, ranking 23rd in the 48-year series. Four of the 58 species assessed had their best year on record at UK level: Chequered Skipper, Brimstone, Red Admiral, and Large Blue. Two species recorded their worst year on record: Small Pearl-Bordered Fritillary and Small Tortoiseshell.
* Brown Argus had its 2nd best year on record, and Marbled White, Comma, Black Hairstreak, and Holly Blue had their third best year on record. Cryptic Wood White recorded its 2nd worst year on record, while Grizzled Skipper and Green-veined White had their 3rd worst years since 1976. A further large annual decline for Small Tortoiseshell resulted in the 5th worst year on record for this species, continuing the significant long-term decline of this common and widespread species (down by 82% since 1976).
* There were some regional differences in how butterflies fared in 2023. Long-term declines still outnumber long-term increases on English sites, but over the last ten years most species are showing stable numbers with four species showing significant short-term declines. In Wales and in Northern Ireland, out of the species with sufficient data to be assessed, there are both long- and short-term declines in several species, but it is encouraging that nine species are showing a long-term increase in Wales. The most positive outlook comes from Scotland, where many more species are increasing than decreasing. The fact that some species are expanding their range in Scotland is likely to be contributing to these more positive trends.
* Speckled Wood had its best year on record in Scotland, while Scotch Argus had its worst year on record in England (second worst year in Scotland), and Green-veined White had its worst year on record in Scotland. Contrary to elsewhere in the UK, it was a very good year for Small Tortoiseshell in Northern Ireland, registering its 2nd best year on record.
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. An increasing number of sites are consistently recording substantial second broods of Dingy Skipper in southern and central England, which may be due to effects of climate change.
* 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. [Met Office data](https://www.metoffice.gov.uk/research/climate/maps-and-data/summaries/index) shows that 2023 had some significant record-breaking months, although the weather fluctuated considerably each month with cold snaps across the start and end of the year, a warm summer, with named storms from August and across Autumn, and more rain than average across the year. Eight months of the year were warmer than average, with Wales and Northern Ireland having their warmest years on record. 2023 had the warmest June on record, although the UK’s highest temperature was in September, which is a rarity. The UK had one of the wettest years on record overall, with Northern Ireland and England having their third and sixth wettest years respectively.
* Targeted conservation management to protect and improve habitat can have positive impacts on species abundance. For example, the Heath Fritillary is a threatened habitat specialist species that has benefited from habitat management. Whilst its long-term trend is of significant decline, Heath Fritillary has increased on monitored sites in recent years.

### Relevance of scheme results

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

### Value of citizen science approach

* Around 3,000 skilled volunteers are involved, at an estimated annual value of over £2million[[1]](#footnote-1).
* 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.
* Sample size is high; a total of a total of 2,221 self-selected transects and 798 WCBS squares submitted data in 2023, as well as 297 sites where additional targeted surveys took place.

**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***  | 27 out of 58 species for which annual changes were calculated | 30 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*** | **4 species show a statistically significant decrease (7% of species assessed)**(20 additional species show an apparent decrease that is not statistically significant due to high variability relative to level of change, or low sample size) | **5 species show a statistically significant increase (9% of species assessed)**(29 additional species show an apparent increase that is 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*** | **19 species show a statistically significant decrease (33% of species assessed)**(11 additional species show an apparent decrease that is not statistically significant, due to high variability relative to level of change, or low sample size) | **19 species show a statistically significant increase (33% of species assessed)**(9 additional species show an apparent increase that is not statistically significant due to high variability relative to level of change, or low sample size) |  |
| ***Species that fared particularly well in 2023 compared to 2022****annual change of 35% or greater* | Red Admiral 289%Brown Argus 168%Black Hairstreak 152%Holly Blue 151%Heath Fritillary 138%Small Copper 76%Lulworth Skipper 70%High Brown Fritillary 67%Brimstone 59%Marsh Fritillary 55%Gatekeeper 52%Chequered Skipper 51%Peacock 51%Meadow Brown 48%Purple Hairstreak 48%Comma 41%Essex Skipper 37% | Four species had their best year of the series in 2023: Chequered Skipper, Brimstone, Red Admiral, and Large Blue |
| ***Species that fared particularly badly in 2023 compared to 2022****annual change of 35% or greater* | Clouded Yellow -82%Painted Lady -50%Chalk Hill Blue -49%Silver-spotted Skipper -48%Dark Green Fritillary -47%Small Tortoiseshell -46%Dingy Skipper -42%Swallowtail -41%Cryptic Wood White -40%Purple Emperor -38%Ringlet -37% | Two species had their worst year of the series in 2023: Small Pearl-bordered Fritillary and Small Tortoiseshell |

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

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|  | **England** | **Wales** | **Scotland** | **Northern Ireland** |
| **Number of species** assessed  | 55 | 33 | 27 | 14 |
| **Significantly increasing species** over 10 years and long term. Presented as % (numbers in parentheses) of those species assessed  | 1. Over 10 years:

9% (5 species)1. Over series

29% (16 species) | 1. Over 10 years:

3% (1 species)1. Over series

27% (9 species) | 1. Over 10 years:

7% (2 species)1. Over series

44% (12 species) | 1. Over 10 years:

7% (1 species)1. Over series

7% (1 species) |
| **Significantly decreasing species** over 10 years and long term. Presented as % (numbers in parentheses) of those species assessed  | 1. Over 10 years:

7% (4 species)1. Over series:

38% (21 species) | 1. Over 10 years:

18% (6 species)1. Over series:

30% (10 species) | 1. Over 10 years:

0%1. Over series:

7% (2 species) | 1. Over 10 years:

14% (2 species)1. Over series:

14% (2 species) |
| **Species that fared particularly well in 2023 in each country compared to 2022**annual change of 35% or greater | Red Admiral 318%Brown Argus 168%Holly Blue 164%Black Hairstreak 152%Heath Fritillary 138%Glanville Fritillary 124%Small Copper 85%Lulworth Skipper 70%High Brown Fritillary 69%Brimstone 63%Gatekeeper 59%Peacock 58%Meadow Brown 48%Purple Hairstreak 48%Comma 41%Essex Skipper 39% | Brown Argus 189%Purple Hairstreak 184%Holly Blue 109%Red Admiral 104%Comma 100%Peacock 81%Meadow Brown 55%Small Heath 44%Large White 39% | Marsh Fritillary 489%Red Admiral 224%Comma 170%Large Heath 124%Speckled Wood 109%Small Blue 87%Green Hairstreak 79%Large White 44%Scotch Argus 43%Pearl-bordered Fritillary 35% | Peacock 145%Meadow Brown 81%Small Copper 61%Small White 53%Large White 46% |
| **Species that fared particularly badly in 2023 in each country compared to 2022**annual change of 35% or greater | Clouded Yellow -82%Scotch Argus -69%Small Tortoiseshell -50%Dark Green Fritillary -50%Chalk Hill Blue -49%Painted Lady -48%Silver-spotted Skipper -48%Swallowtail -44%Dingy Skipper -41%Ringlet -39%Purple Emperor -38%Green Hairstreak -36% | Painted Lady -70%Silver-washed Fritillary -59%Small Tortoiseshell -51%Dark Green Fritillary -45%Dingy Skipper -44%Ringlet -36% | Painted Lady -64%Grayling -37% | Cryptic Wood White -40% |
| Species with their best year on record | Large Blue, Brimstone, Red Admiral | None | Red Admiral, Comma, Large Heath, Speckled Wood, Chequered Skipper | Meadow Brown |
| Species with their worst year on record | Small Pearl-bordered Fritillary, Small Tortoiseshell, Scotch Argus | Dingy Skipper | Green-veined White | Green-veined White |

1. Using day rate of £150 a day for ‘skilled labour’ as requires specialist identification skills. [↑](#footnote-ref-1)