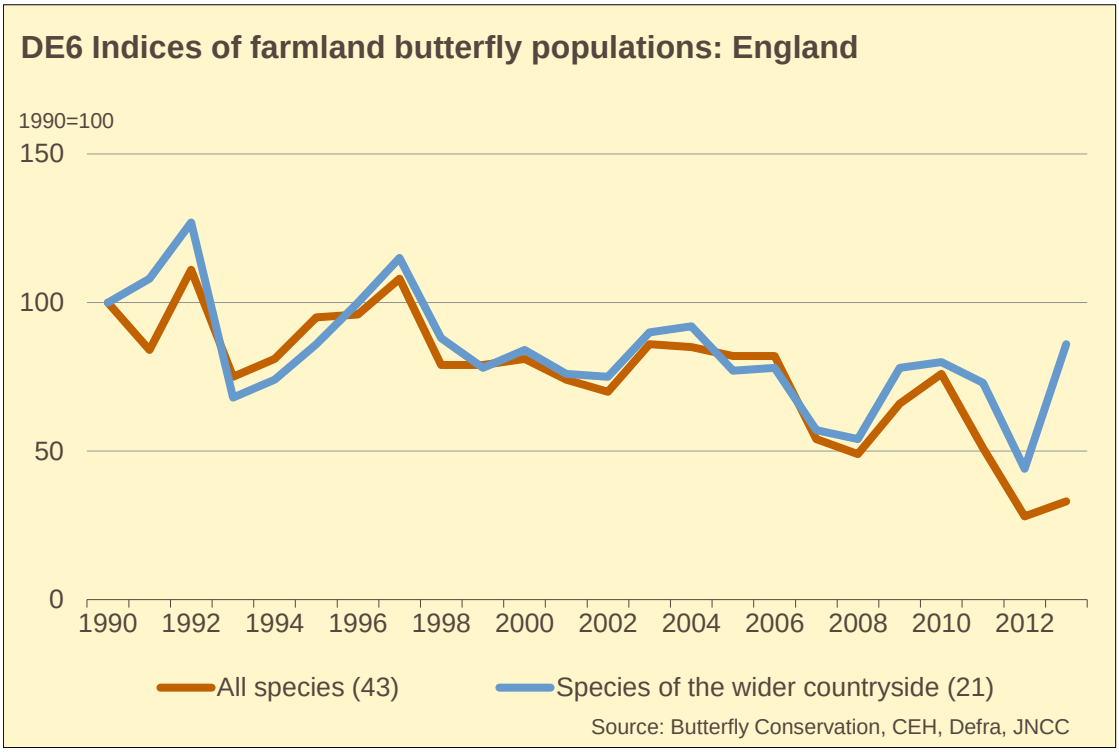
Observatory monitoring framework – indicator data sheet

Environmental impact: Biodiversity

Indicator DE6: Population trends for farmland butterflies

This indicator shows the indices of farmland butterfly populations in England.



- Since 1990, butterflies of the wider countryside on farmland have fallen by 14%, reaching a historical low point in 2012, and making a substantial recovery in 2013.
- These figures demonstrate how numbers fluctuate from year to year, but overall, based on the underlying smoothed trend, the indicator has shown a significant decline since 2008. Species in severe decline on farmland include gatekeeper, large skipper, small copper, small tortoiseshell, and wall.
- The overall population of 43 species of butterflies (comprising Species of the Wider Countryside (21) and Habitat Specialists (22)) on farmland has fluctuated over the last 20 years with peaks at five to eight year intervals and a progressive decline in the intervening years. Annual fluctuations are caused by a range of factors, especially weather conditions.

This indicator was updated in December 2014. The next update will be December 2015 when data become available.

Further information and contact

Background information can be found in the accompanying fact sheet.

This is also a Biodiversity 2020 Strategy for England indicator.

For further queries or information on this indicator contact Defra's Observatory team on +44 (0) 1904 455058 or email Observatory@defra.gsi.gov.uk

Observatory monitoring framework – indicator fact sheet

Environmental impact: Biodiversity

Indicator DE6: Population trends for farmland butterflies

Indicator	Population trends for farmland butterflies
Data	Relative abundance of farmland butterflies.
Geographic coverage	England
Years	1990 - 2013
Source	Butterfly Conservation
Origin of data	Butterfly Conservation, Centre for Ecology and Hydrology, Defra, Joint Nature Conservation Committee
Updates	This indicator will be updated annually, and was updated in December 2014. The next update will be December 2015.
Background	Butterflies are considered good biodiversity indicators because they respond rapidly to changes in environment and habitat management, occur in a wide range of habitats (especially semi-natural habitats on farmland), and are representative of many other insects, which collectively account for more than 50% of terrestrial UK wildlife species. Butterflies play a complementary role to birds and bats as an indicator because they use the landscape at a far finer spatial scale. Like birds, and contrary to most other insects, butterflies are well documented and are easy to recognise. Butterflies are also sensitive to the effects of climate change.
Statistical & methodological information	This indicator is a multi-species index that has been compiled in conjunction with Butterfly Conservation (BC) and the Centre for Ecology and Hydrology (CEH) chiefly from data collated through the UK Butterfly Monitoring Scheme (UKBMS). The indicator includes 43 of the 51 native resident English butterfly species. Insufficient monitoring data are available for the remainder. The indicator includes 21 wider countryside species on farmland. These are more generalist species which tend to be found more widely over farmland. The overall indicator includes a further 22 specialist farmland species. These specialist species are found in areas of high quality habitats and semi-natural grassland, mostly under Higher Level Environmental Schemes and in SSSIs. Within the indicators, each species is given equal weight, and the annual figure is the geometric mean of the component species indices for that year. The smoothed trend in the multi-species indicator is assessed by structural time-series analysis. A statistical test is performed using the software TrendSpotter to compare the difference in the smoothed index in the latest year versus other years in the series. Populations of individual species within the measure may be increasing or decreasing irrespective of the overall trends. Unlike the farmland bird measure, where birds are sampled on random plots throughout the countryside, the recorders select the sites of the butterfly transects within farmland. A new scheme is in place to better represent the wider countryside in the future. Further details of the methods to compile the indicators and assess change can be found in the accompanying technical document (see link

below). The baseline year is 1990, when sufficient data were first available to generate multi-species indices for specialists and generalists.

Butterflies contribute to the Farmland species Biodiversity 2020 indicator.

The species list can change between publications, mainly due to issues around variation in sample sizes. The following table lists the Wider Countryside Species included in the indicator. Those species shown in **bold** are in severe decline.

Wider Countryside Species	
Brimstone	Peacock
Brown Argus	Ringlet
Common Blue	**Small Copper**
Gatekeeper	Small Heath
Green-veined White	Small Skipper
Holly Blue	**Small Tortoiseshell**
Large Skipper	Small White
Large White	Speckled Wood
Marbled White	**Wall**
Meadow Brown	White-letter hairstreak
Orange-tip	

Further information

Biodiversity 2020: A strategy for England's wildlife and ecosystem services can be found at: https://www.gov.uk/government/publications/biodiversity-2020-a-strategy-for-england-s-wildlife-and-ecosystem-services

The Section 41 list of priority species in England under the Natural Environment and Rural Communities (NERC) Act can be found at: http://www.naturalengland.org.uk/ourwork/conservation/biodiversity/protectandmanage/habsandspeciesimportance.aspx

Technical background information can be found at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/253552/Technical_Background_Butterflies.pdf

Further information on using butterflies as indicators can be found at: http://www.ukbms.org/indicators.aspx