



# Grassland Butterfly Index: General introduction

Chris van Swaay

De Vlinderstichting – Dutch Butterfly Conservation

Butterfly Conservation Europe



## Using butterfly monitoring data to develop a European grassland butterfly indicator

Chris Van Swaay<sup>1</sup> & Arco van Strien<sup>2</sup>

<sup>1</sup> De Vlinderstichting/Dutch Butterfly Conservation & Butterfly Conservation Europe,  
P.O. Box 506, NL-6700 AM Wageningen, Netherlands

<sup>2</sup> Statistics Netherlands, P.O. Box 4000, 2270 JM Voorburg, Netherlands

Contact: [chris.vanswaay@vlinderstichting.nl](mailto:chris.vanswaay@vlinderstichting.nl)





A European index and trend is produced for each species by combining national results for that species. The individual European species indices are combined (averaged) to create multi-species supranational indicators. This method is based on the one for bird indicators (Gregory *et al.*, 2005):

1. **National level.** The indices for each species are produced for each country, using TRIM (Pannekoek & Van Strien, 2003). TRIM is a programme to analyse time-series of counts with missing observations using Poisson regression.
2. **Supranational level.** To generate European trends, the difference in national population size of each species in each country has to be taken into account. This weighting allows for the fact that different countries hold different proportions of a species' European population (Van Strien *et al.*, 2001). **A weighting factor is established as the proportion of the country (or region) in the European distribution** (Van Swaay & Warren, 1999). The missing year totals are estimated by TRIM in a way equivalent to imputing missing counts for particular sites within countries (Van Strien *et al.*, 2001).
3. **Multi-species level.** For each species the geometric mean of the supranational indices is calculated.

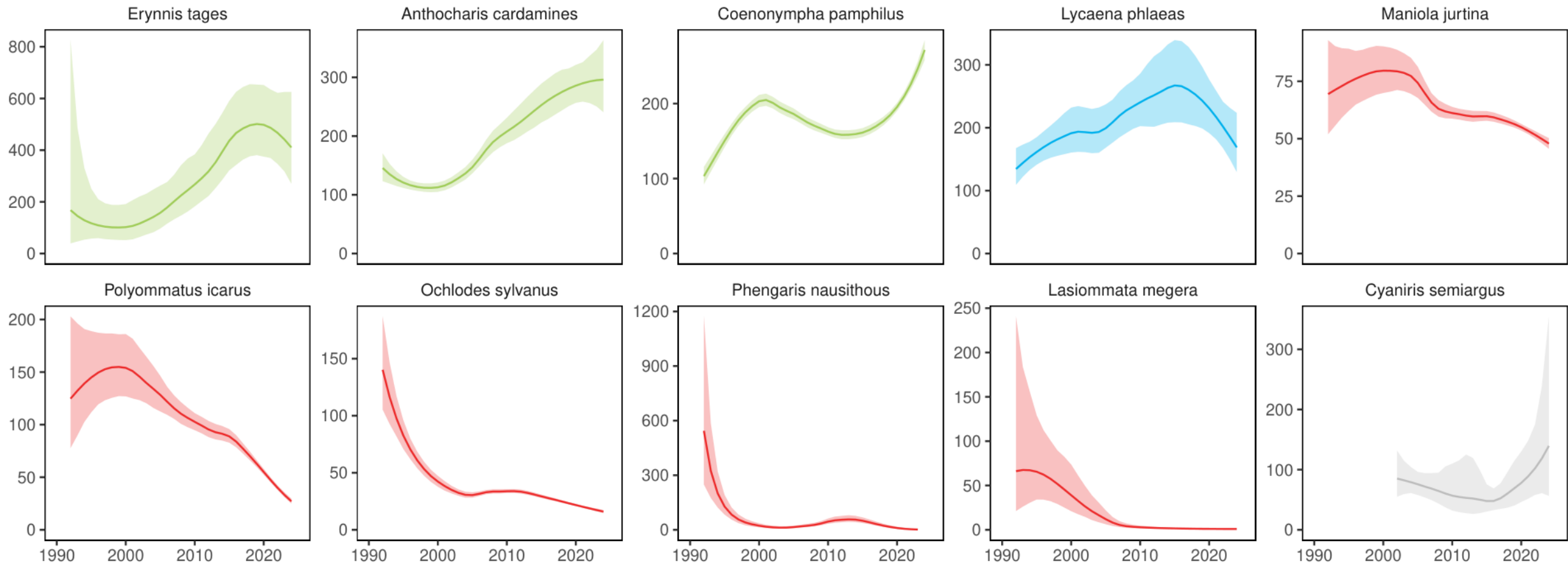
# What does the indicator show?



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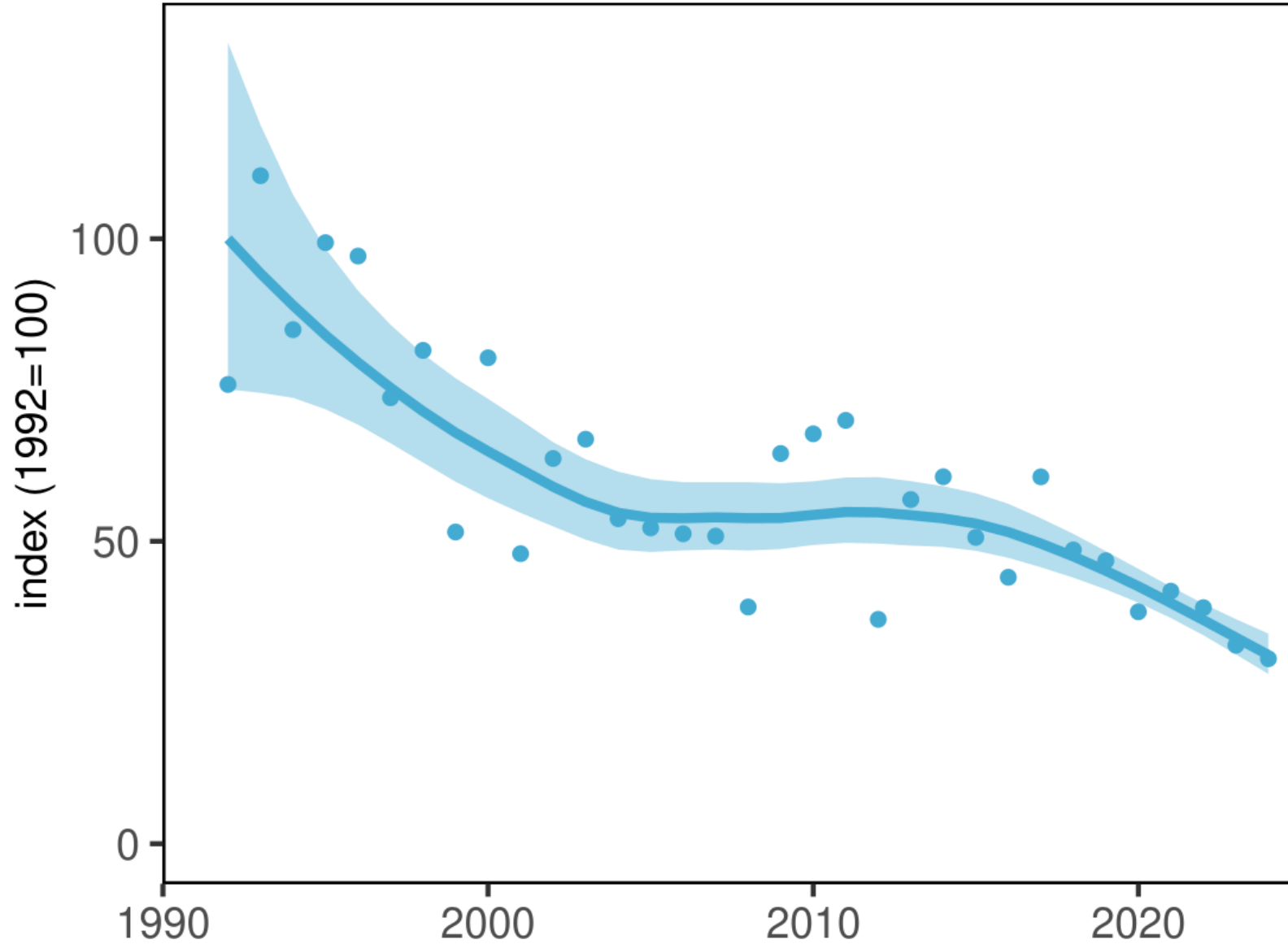


GERELATEERDE AANDELEN AEX							
Instrument	Koers	Vershil   %	Hoog	Laag	Volume   Gem.		
AEX	598,19 12-nov-19 14:00:15	+1,80 +0,30%	599,05	597,26			
AALBERTS NV	39,410 13:59:00	-0,260 -0,66%	39,800	39,370	112.568 Gem. 355,8K	-68%	
ABN AMRO BANK N.V.	17,525 13:59:30	+0,215 +1,24%	17,570	17,370	1.143.823 Gem. 2,7M	-57%	
ADYEN NV	637,000 14:00:06	-5,000 -0,78%	645,400	635,400	17.057 Gem. 68,4K	-75%	
Aegon	4,269 14:00:11	+0,070 +1,67%	4,275	4,203	2.605.715 Gem. 10,9M	-76%	
Ahold Delhaize	24,315 14:00:20	-0,095 -0,39%	24,465	24,285	853.561 Gem. 4,1M	-79%	
Akzo Nobel	87,040 14:00:22	+0,870 +1,01%	87,070	86,130	189.064 Gem. 747K	-75%	
ArcelorMittal	15,654 14:00:15	+0,140 +0,90%	15,828	15,556	3.742.554 Gem. 10,2M	-63%	
ASML	242,700 14:00:24	+0,850 +0,35%	243,800	242,000	224.973 Gem. 933,9K	-76%	
ASR Nederland	34,780 13:53:20	+0,090 +0,26%	34,950	34,650	70.729 Gem. 427,4K	-83%	
DSM	116,450 13:59:58	-0,200 -0,17%	117,500	116,250	129.623 Gem. 824K	-84%	



— decline — stable — increase — uncertain

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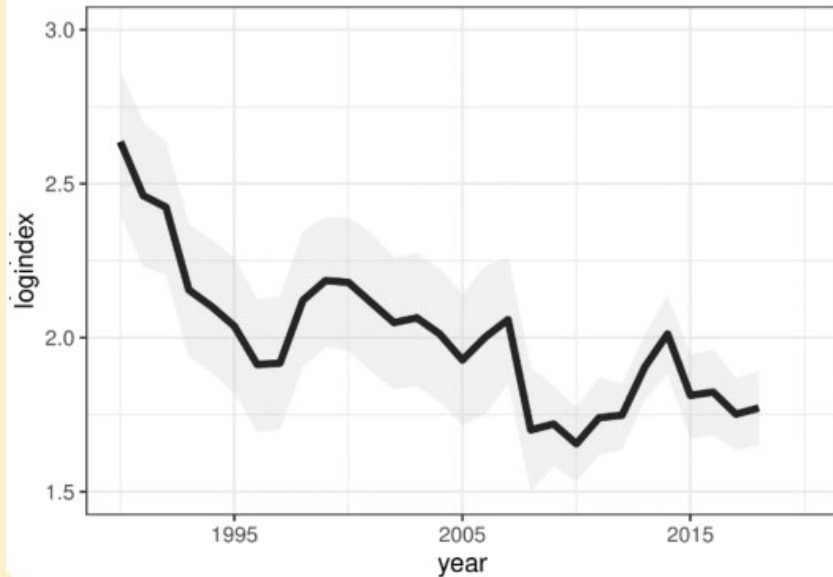
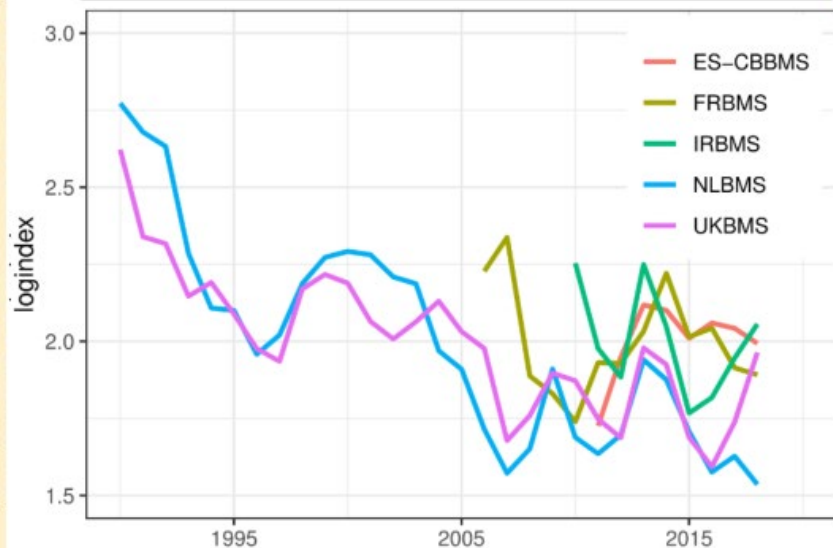
# From national to European trends



**Box 1: Indices for *Lasiommata megera* in the Atlantic region.**

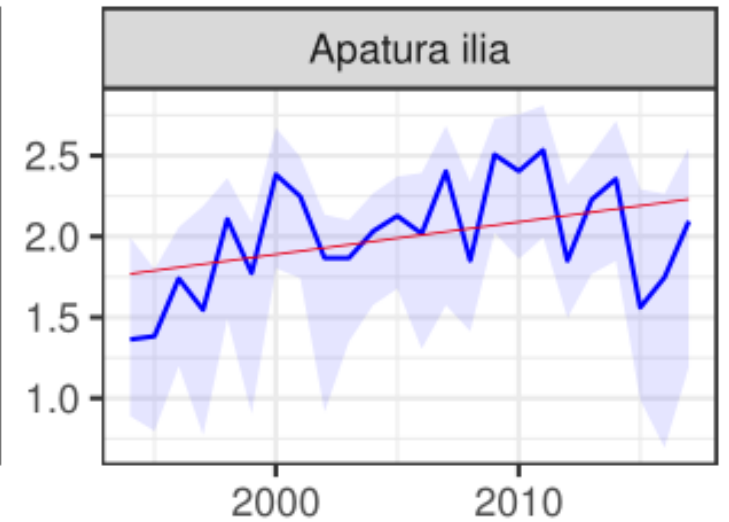
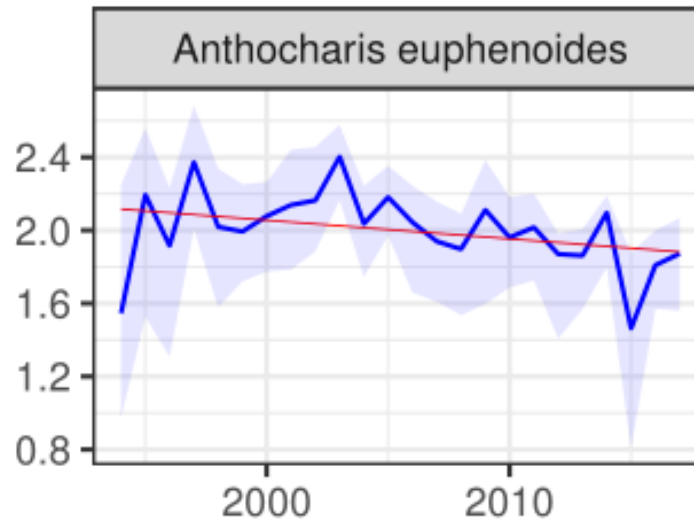
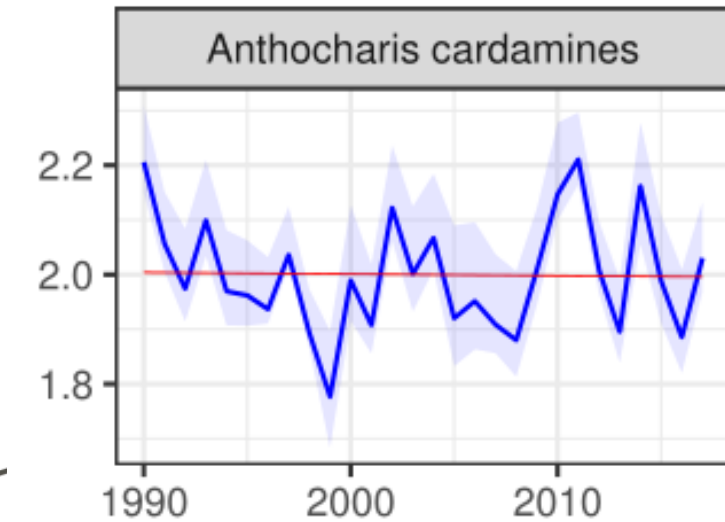
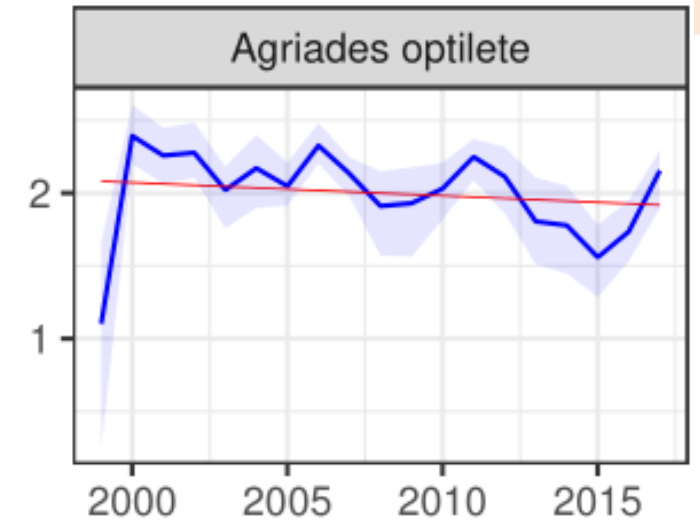
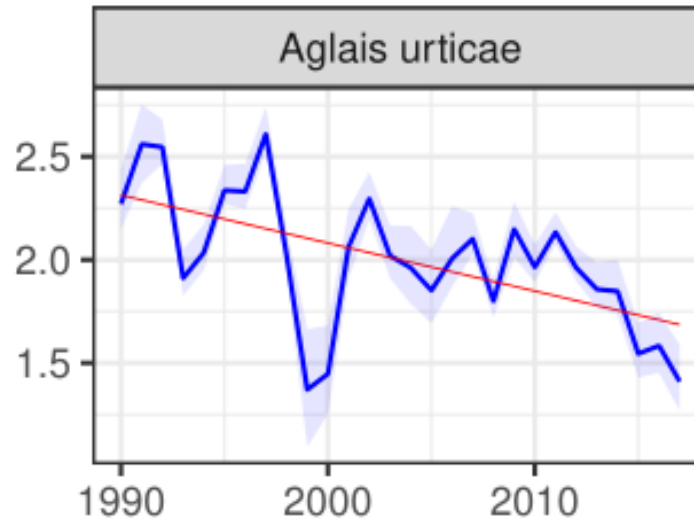
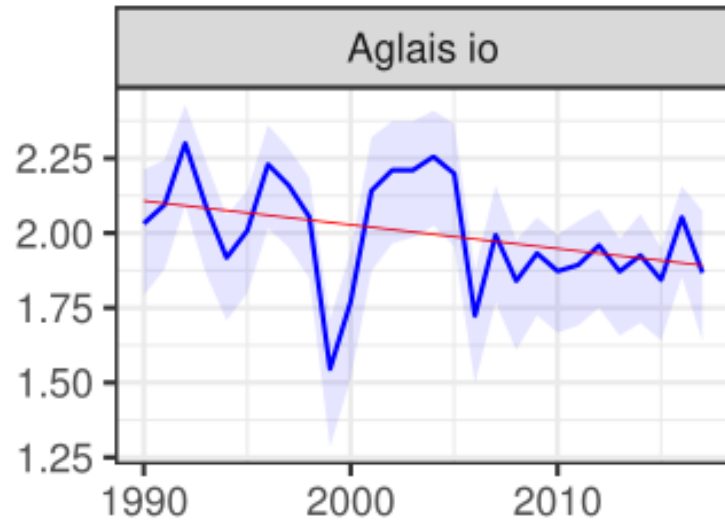
The upper graph shows the relative abundance indices for five Butterfly Monitoring Schemes. Note that the starting year for each scheme is different.

The lower graph shows the species index and 95% confidence interval for the whole Atlantic region, resulting from all the Butterfly Monitoring Schemes in this region.





# European speciestrends





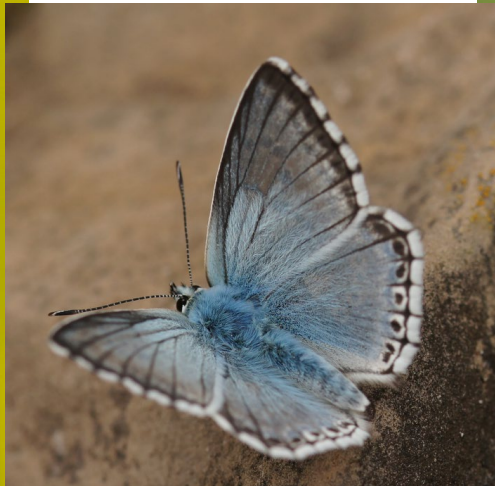
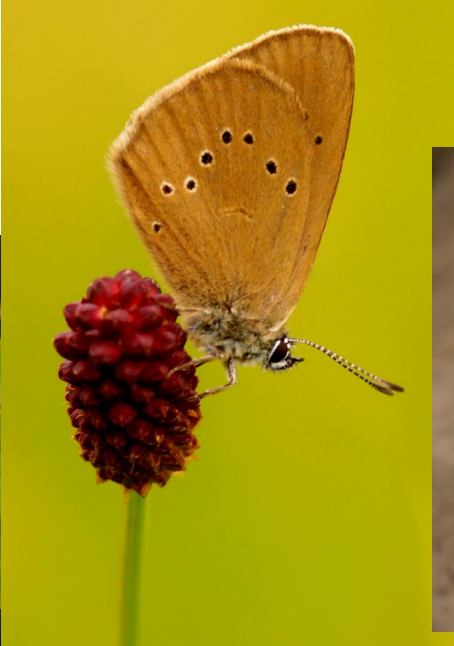
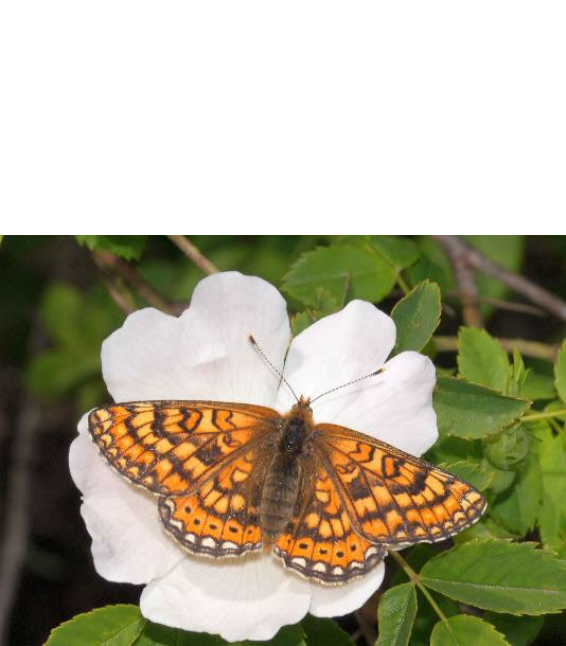
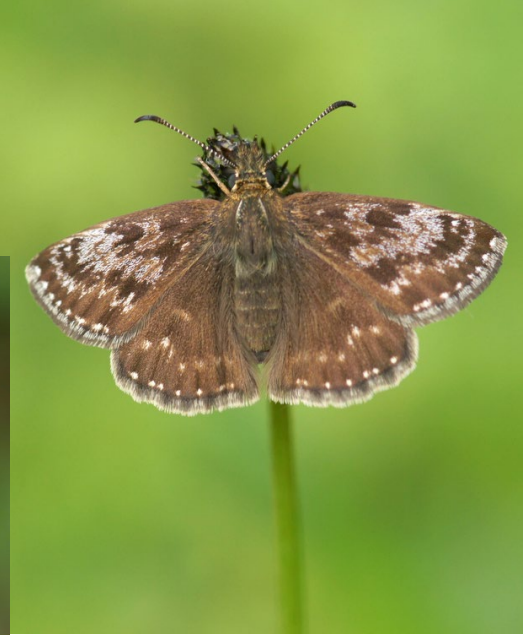
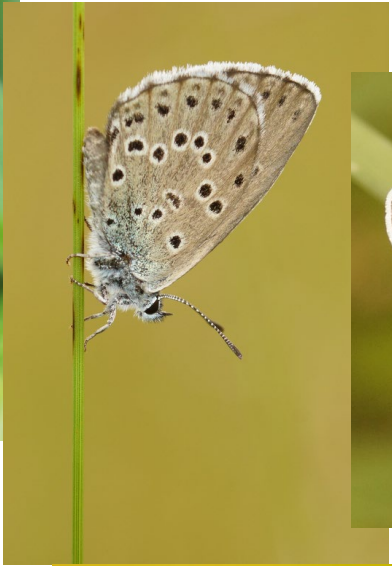
# European Grassland Butterfly Index GBI

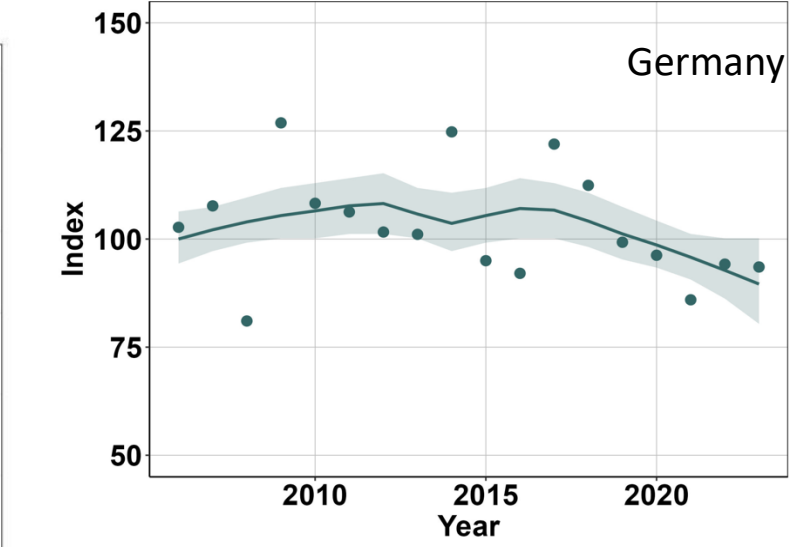
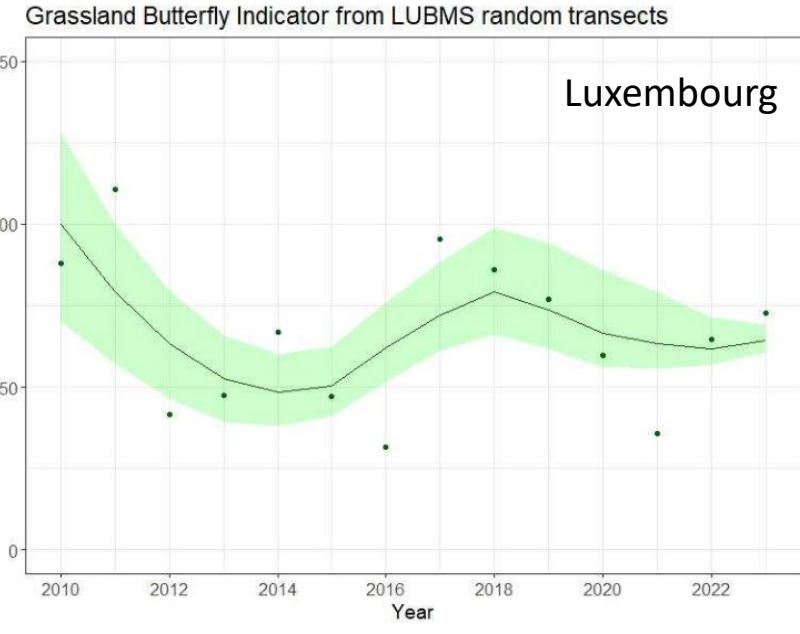
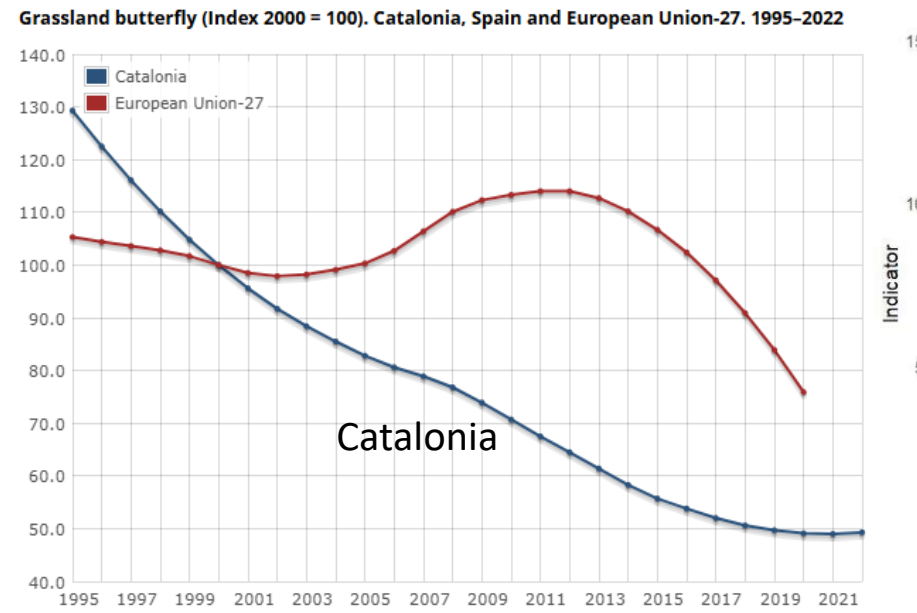
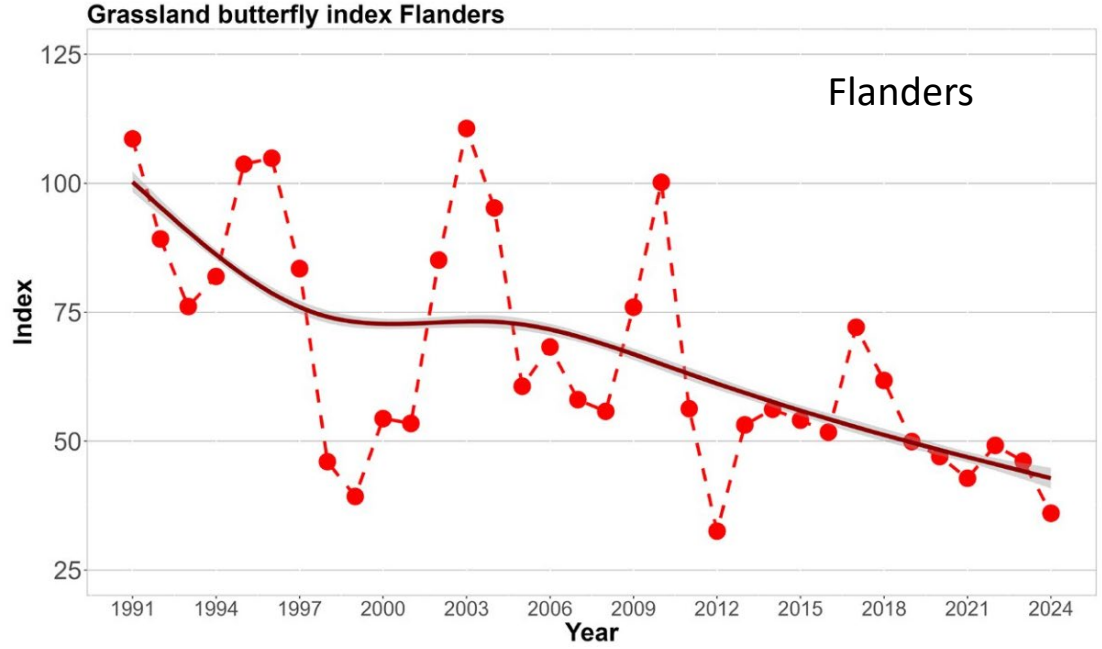
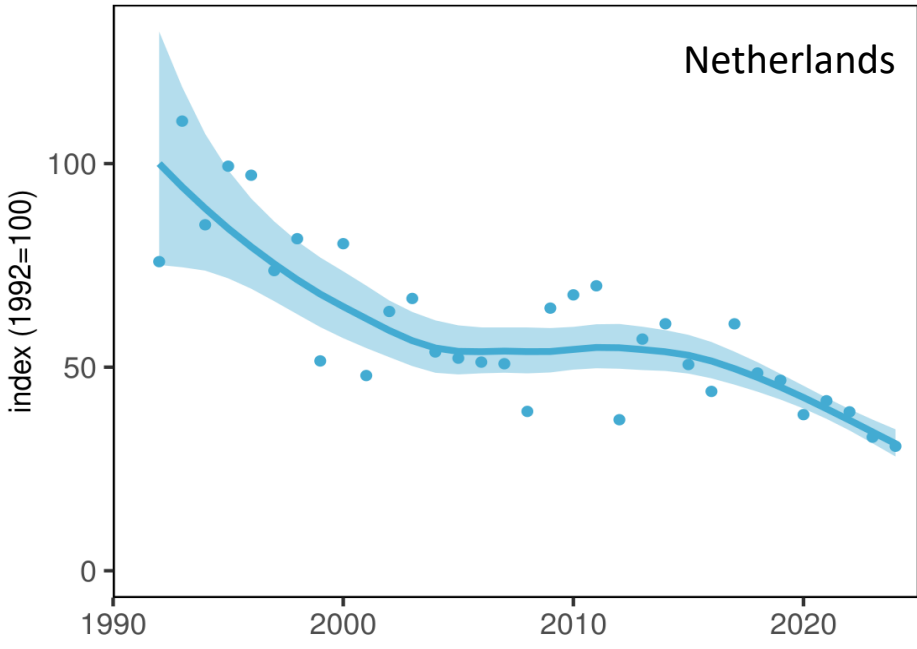
- Oldest butterfly indicator: since 2005
- 17 characteristic grassland butterflies
- Both specialist and widespread species

# 7 Widespread grassland butterflies



# 10 Specialist grassland butterflies





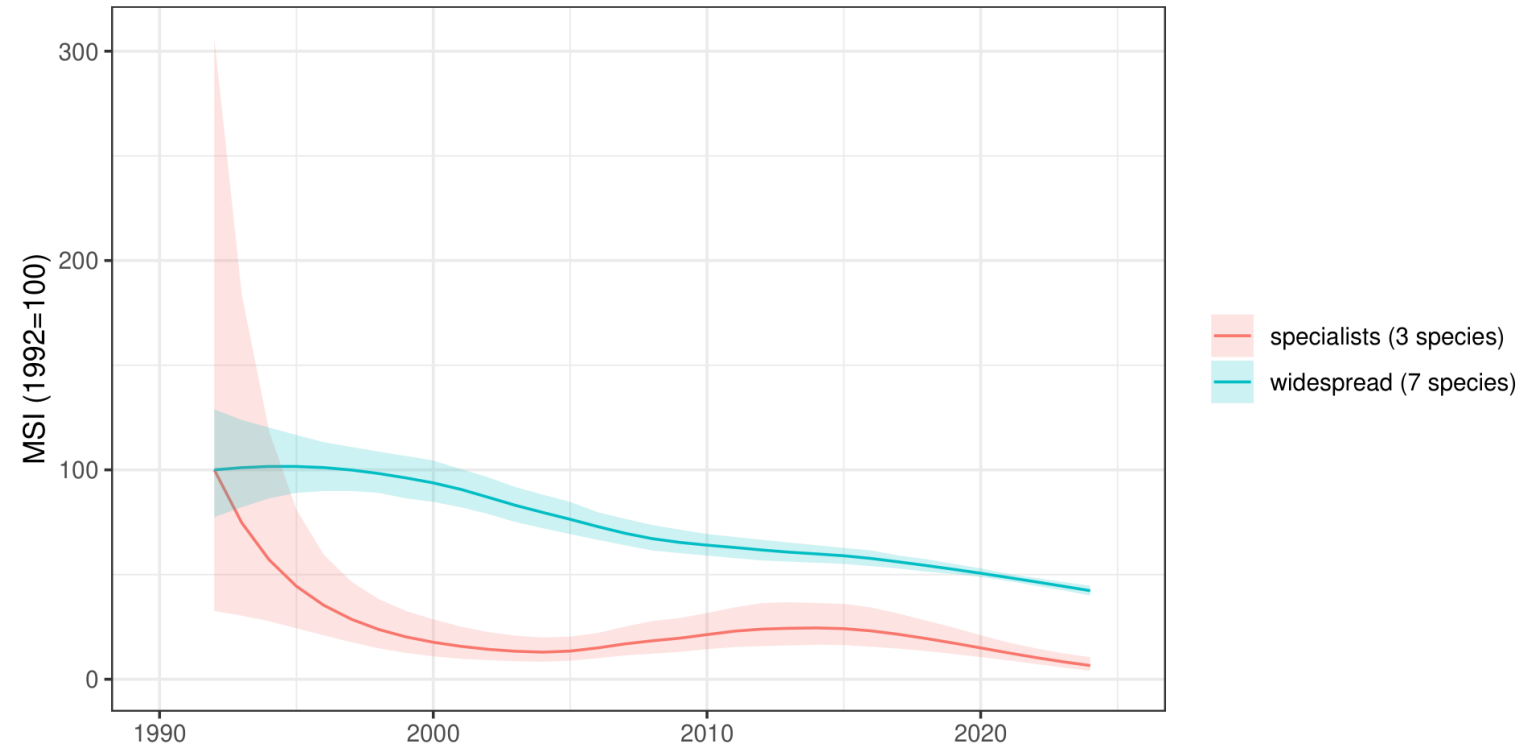
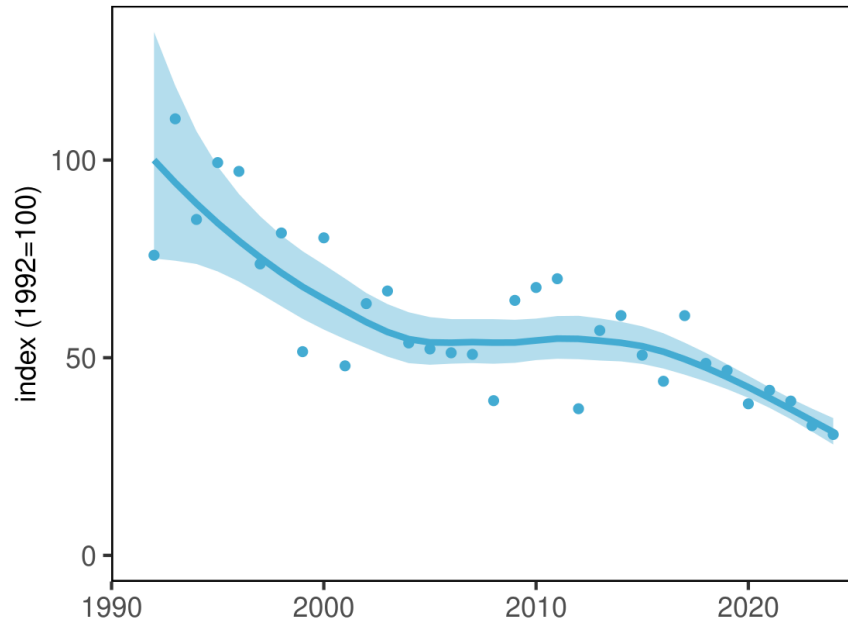
Source Catalonia: Ministry of Climate Action, Food and Rural Agenda. Source Spain and European Union: Eurostat.

# Problems with national GBI

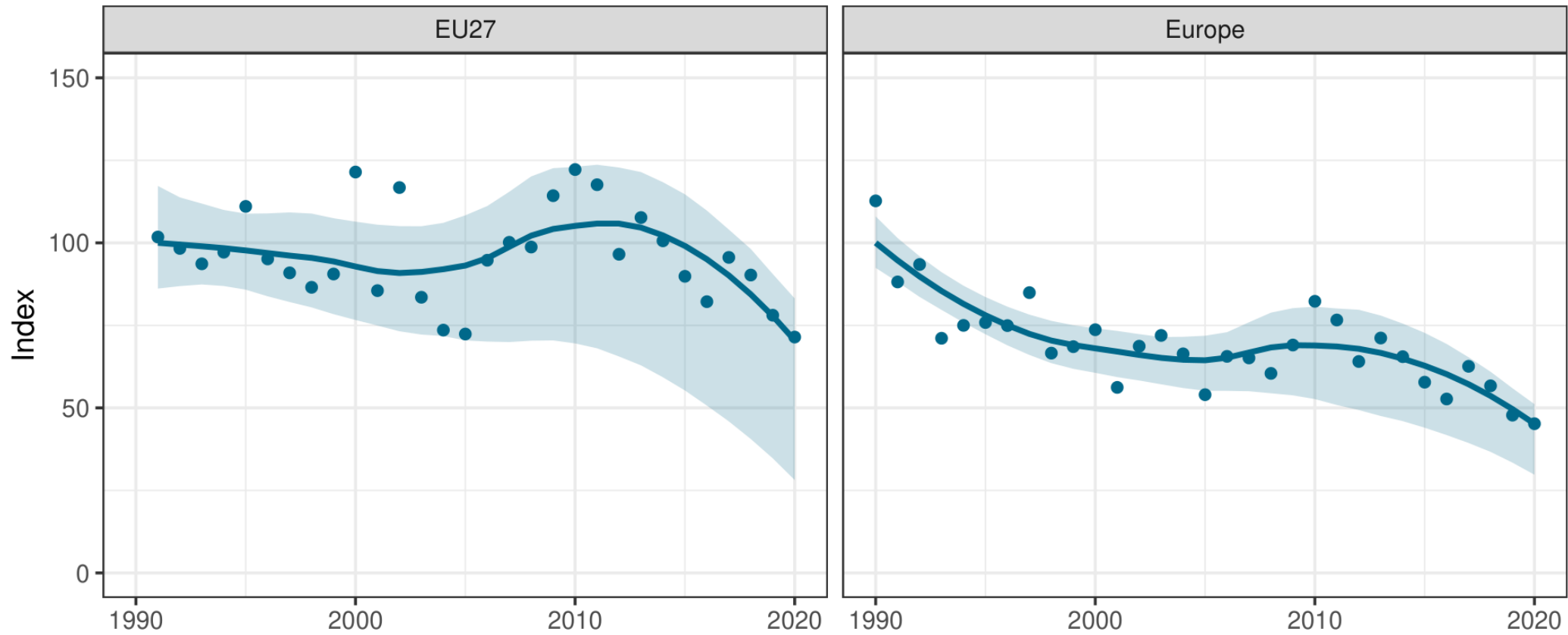


- Few sites
- Some countries have a low number of GBI species
- Or only widespread species (e.g. Netherlands has only three specialists)
- Sometimes only trends for the widespread species
- Sites not representative (so trend not representative)

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# GBI: last update





# Problems with EU GBI



- New BMS's start relatively small
- But represent an important part of the populations
- Leading to an increase in the confidence intervals per species
- Leading to an increase in the CI for the GBI
- And a larger CI for EU than for Europe (which includes CH and UK)
- Last time 2/17 grassland species were not in the indicator

# National GBI



- Method: Rcode + video still available on [www.butterfly-monitoring.net](http://www.butterfly-monitoring.net)
- If needed we can provide you with the national/regional GBI
- BMS co-ordinators have to communicate to policy makers
- Solve their problem and show you can produce a GBI



**Chris van Swaay**

chris.vanswaay@vlinderstichting.nl

**De Vlinderstichting**

Mennonietenweg 10

Postbus 506

6700 AM Wageningen

info@vlinderstichting.nl

[www.vlinderstichting.nl](http://www.vlinderstichting.nl)