European Butterfly Monitoring Scheme (eBMS)

eBMS: European Butterfly Monitoring Scheme

- What is eBMS?

- Why now?

- What we've done so far

- Next steps

A partnership to promote and develop butterfly monitoring in Europe

Towards a representative network across Europe

To support butterfly indicators

To support wider use and to raise the profile of butterflies

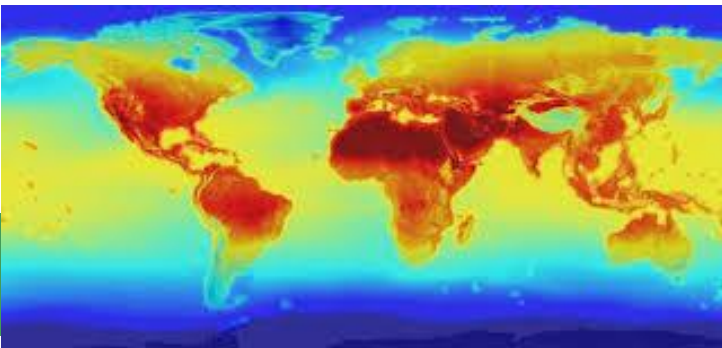*To aid butterfly conservation*

eBMS aims to...

- Produce an effective database to aid the production of a suite of butterfly indicators

- Establish a formal data sharing agreement with existing schemes to clarify intellectual property rights and rights of access to data

- Gather data annually from existing monitoring schemes

- Provide tools for calculating supra-national population trends

- Develop an online data entry system to grow the network - allow new countries to submit data efficiently and in a standard format

Why do we need this?

- Butterflies & their habitats are increasingly threatened by multiple anthropogenic pressures

- Conservation needs sound evidence to protect and mitigate impacts

- ......although money for monitoring is reducing

- Butterfly Monitoring has proven to be highly cost effective, with impact for research and conservation

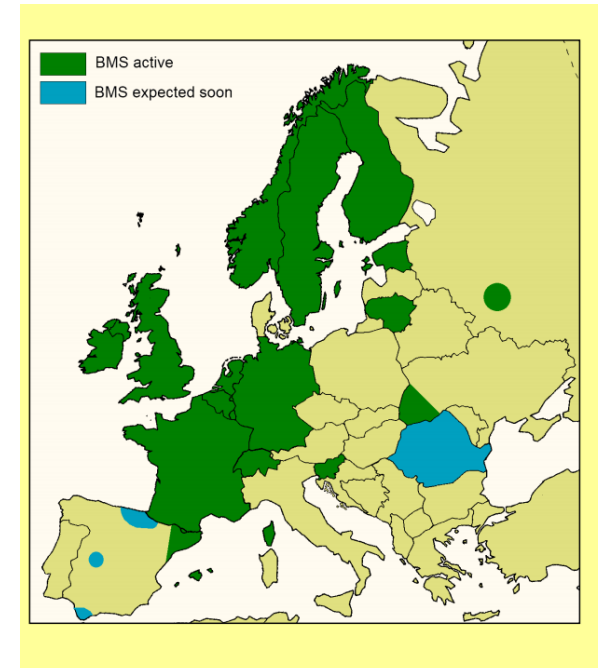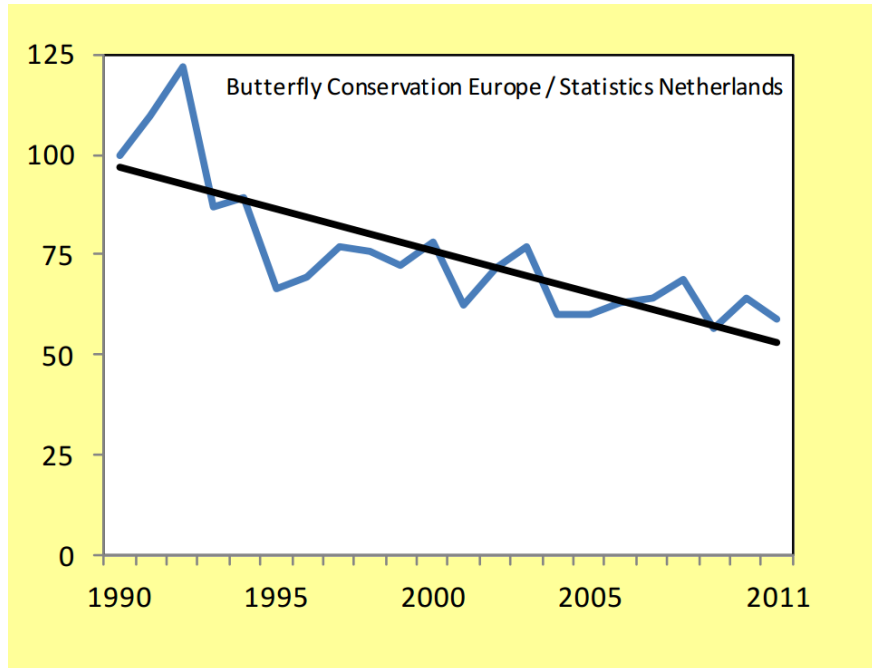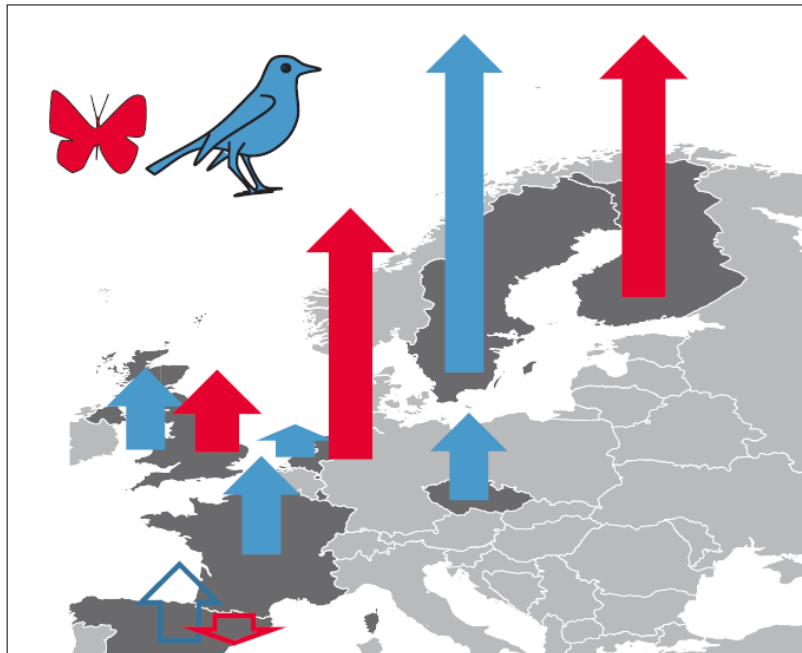## Butterflies are in trouble

van Swaay & van Strien (2005) Using butterfly monitoring data to develop a European grassland butterfly indicator. *Studies on the ecology and conservation of butterflies in Europe*. 25

Butterflies are on the move

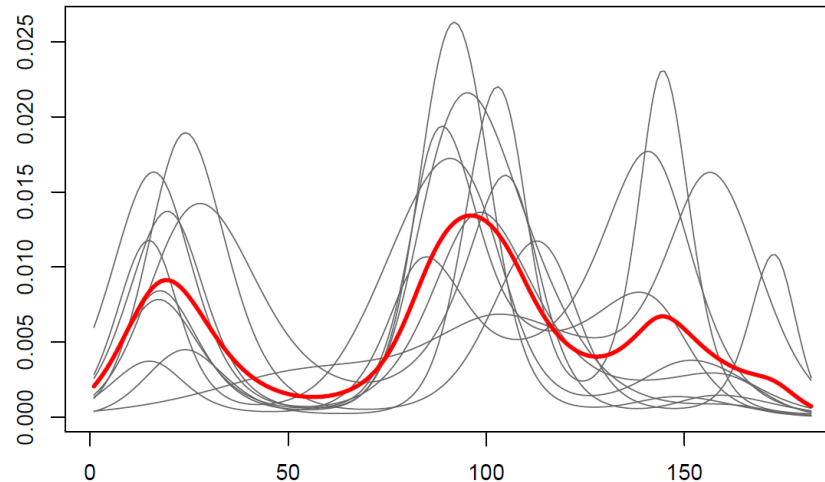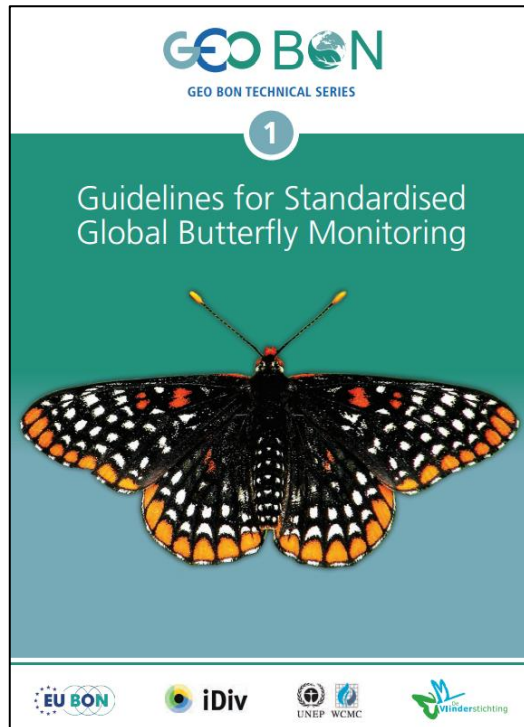Europe: butterfly (and bird) communities shifting rapidly northwards.

Butterflies = 114 km N shift (1990-2008) but 135 km lag behind climate shift

Devictor *et al.* (2012) Uncertainty in thermal tolerances and climatic debt. *Nature Climate Change*, 2 (9). 638-639

Why now?

We have the tools we need to make progress,
and the will to make it happen

What we've done so far?

- Established a remit under BC Europe

- Developed an input system for transect data (for countries to adopt, or to support new schemes)

An online input system for BMS

http://www.butterfly-monitoring.net/mydata

Transect input system

http://www.butterfly-monitoring.net/mydata

Transect input system

http://www.butterfly-monitoring.net/mydata

Transect input system: key features

Setup sites

Setup route

Site Details | Your Route | Section Details

Select a section from the list then click on the map to draw the route and double click to finish. You can also select a section using the "Query" tool to click on the section lines. If you make a mistake in the middle of drawing a route, then you can use the "Erase Route" button to remove the last point drawn. After a route has been completed use the "Modify feature" tool to correct the line shape (either by dragging one of the circles along the line to form the correct shape, or by placing the mouse over a circle and pressing the "Delete" button on your keyboard to remove that point). Alternatively you could just redraw the line - this new line will then replace the old one completely. If you are not in the middle of drawing a line, the "Erase Route" button will erase the whole route for the currently selected section.

The "Remove Section" button will remove the section completely, reducing the number of sections by one. To increase the number of sections, either return to the "Site Details" tab, and increase the value in the "No. of sections" field there (which will add new sections to the end of the list), or use the "Insert Section" button to add a new section immediately after the currently selected section.

Once all route sections are drawn, select the "Section Details" tab (or use the "Complete section details" button) to complete the route setup.

Select section: S1 S2 S3 S4 S5 S6 S7

Save Route | Complete section details | Erase Route

Transect input system: key features

This pages provide a diary view to enable you to select dates to enter transect counts. Click on a date to enter details of your transect visit. Dates for the current year are displayed by default - use the arrows to switch to a different year.

Click on the link to edit details of a transect visit that you've already entered.

Filter by site: [All my sites ▼]

Week Number							◄ 2017							
19	May	1 ⊕		2 ⊕		3 ⊕		4 ⊕		5 ⊕		6 ⊕		7 ⊕
20	May	8 ⊕		9 071_117 Consthum ⊕		10 074_103 Warken 062_100 Buschrodt 062_122 Brachtenbach ⊕		11 ⊕		12 ⊕		13 ⊕		14 ⊕

Transect: 080_086 Blaschette

Date: [17/05/2017] *

Recorder Name: [Mestdagh, Xavier] *

Start Time (hh:mm): [13:50] *

End Time (hh:mm): [14:45] *

% Sun: [100]

Temp (Deg C): [24 ▼] *

Wind Direction: [▼]

Wind Speed: [2. Wind felt on face, leaves rustle ▼] *

Notes: [   ]

Use this space to input comments about this week's walk.

[Next] [Cancel] [Delete]

Enter or edit walk dates and details

Transect input system: key features

Enter counts - Filter and sort lists – Full Europe list

060_069 Bascharage on 2017-07-14

Butterflies

Use species list : `Species known at this site ▼`

Species Sort Order:
- ⦿ Taxonomic Sort Order
- ○ Species name

Sections	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	Total
% Sun	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	
Reliability	1 ▼	1 ▼	1 ▼	1 ▼	1 ▼	1 ▼	1 ▼	1 ▼	1 ▼	1 ▼	1 ▼	1 ▼	1 ▼	1 ▼	1 ▼	1 ▼	
Thymelicus lineola									2								2
Pieris rapae			1								1						2
Lycaena phlaeas								1							1		2
Lycaena tityrus										1							1
Cupido argiades											1						1
Cyaniris semiargus		7			2				2		3				4		18
Polyommatus icarus	1		1		2			1			4	1					9
Vanessa atalanta												1					1
Araschnia levana								1									1
Coenonympha pamphilus						1		1	1	1					2		6
Pyronia tithonus				1		1											2
Aphantopus hyperantus														1			1
Maniola jurtina		1		2		1				2				1	3	1	11
Total	0	8	2	3	4	3	0	2	7	4	9	2	0	2	9	2	

Add species to list: [ ]

[Back to visit details] [Finish and return to walk list]

Transect input system: key features

Plotting results: weekly summary (tables, charts, downloads)
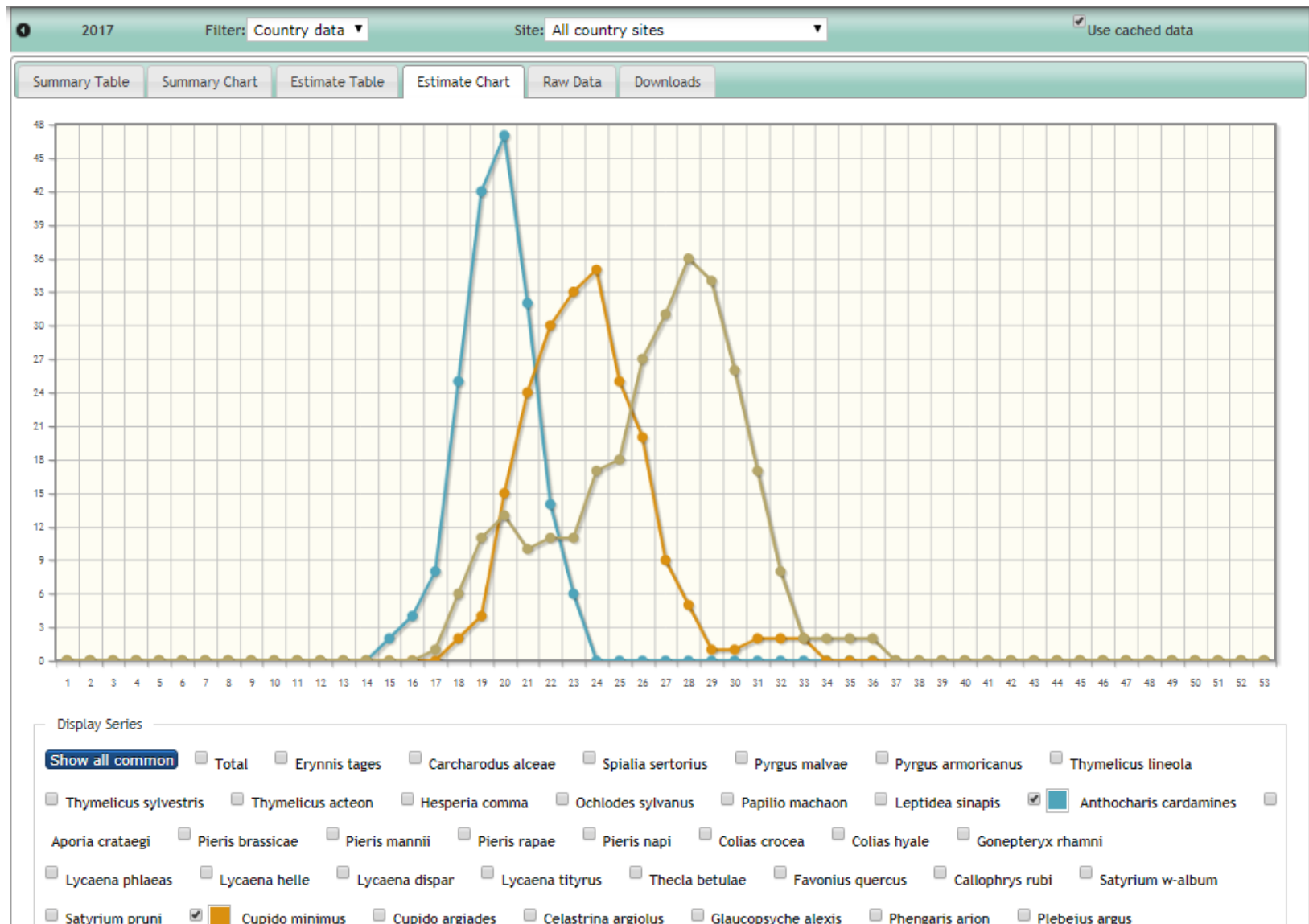
Summary of key features

- All open-source software (Indicia and Drupal)
  - Potential for shared development
  - Not tied to single developer/software company
- Administrator role for national co-ordinators
- Recorders and national co-ordinators can download data as spreadsheets, GIS layers
- Data warehouse hosted in the cloud, secure and regularly backed up
- Can setup controlled access through other systems (e.g. R) using an API
- Can be linked to other systems (e.g. for efficient data flow or for verification/quality assurance)

Butterfly
CONSERVATION EUROPE

CEH Centre for
Ecology & Hydrology
NATURAL ENVIRONMENT RESEARCH COUNCIL

Next steps

- Provide multi-lingual support
  - Help to translate into other languages

- Test in new areas
  - Setup 1-5 example transect routes in new countries across Europe?

- Add additional functionality (e.g. reports)

- Add options for additional counting methods
  - Timed counts

What we've done so far?

- Established a remit under BC Europe

- Developed an input system for transect data (for countries to adopt, or to support new schemes)

- **Developed a partnership agreement**
  - Established a decision-making structure
  - Data request policy for external requests + data licence
  - Expanded to 14 partners: CEH, BCE + UK, Netherlands, Catalonia, Finland, Germany, Flanders, France, Ireland, Sweden, Luxembourg, Spain – Zerynthia, Spain

- To collate national BMS data into eBMS

- To handle data requests from external bodies

  - To refer to National BMS co-ordinators

  - To keep a register of requests

  - To administer the granting of licences

- To undertake standard analyses, as agreed by eBMS partners

- To join the eBMS committee to make decisions

- To provide raw data to eBMS in agreed format

- To respond to data request

- To decide whether to agree to data requests

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- **Designed and populated a standardised database from National BMSs**

- Constructed a unified database for BMS data across Europe
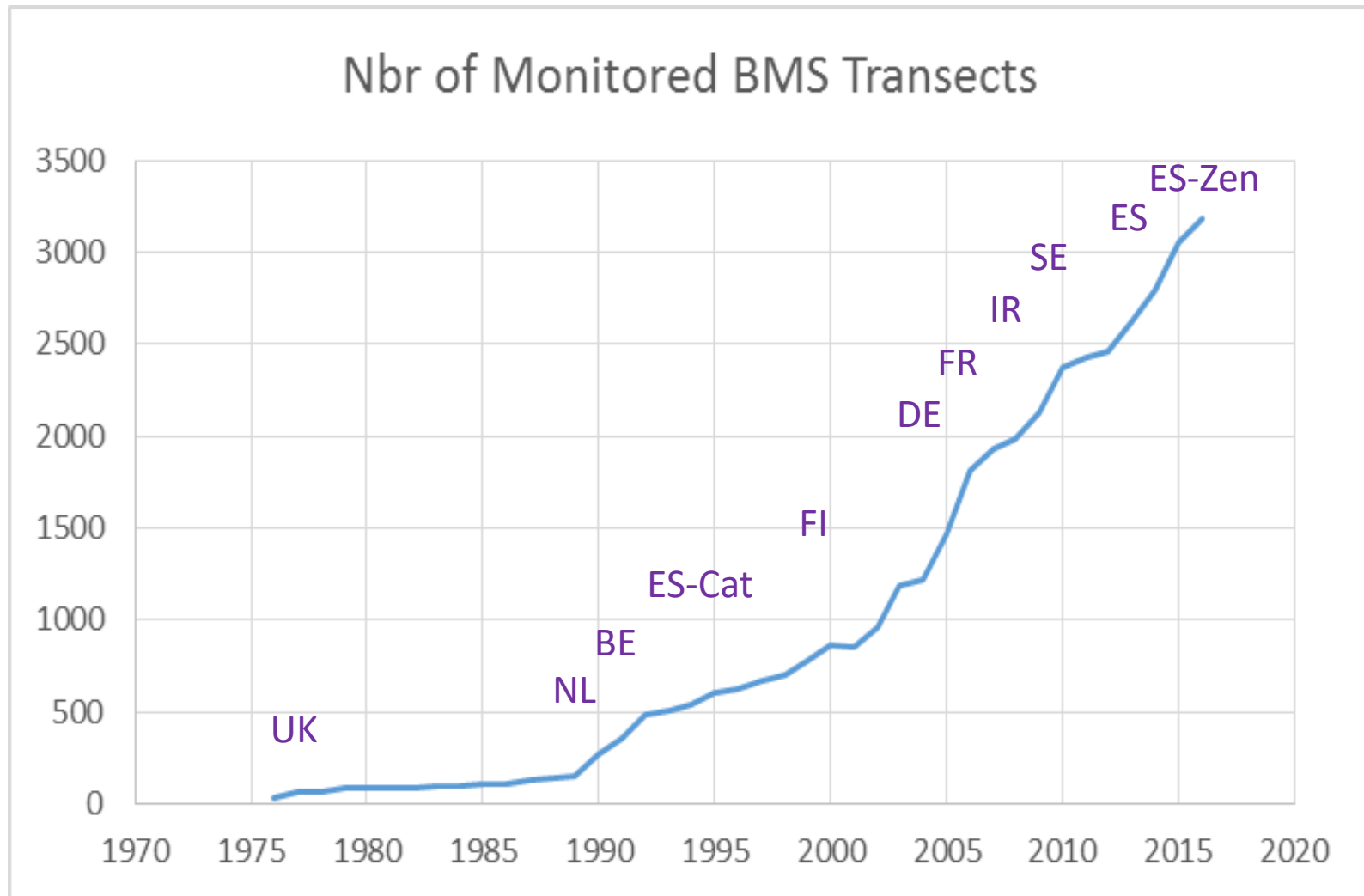- Populated for 12 schemes
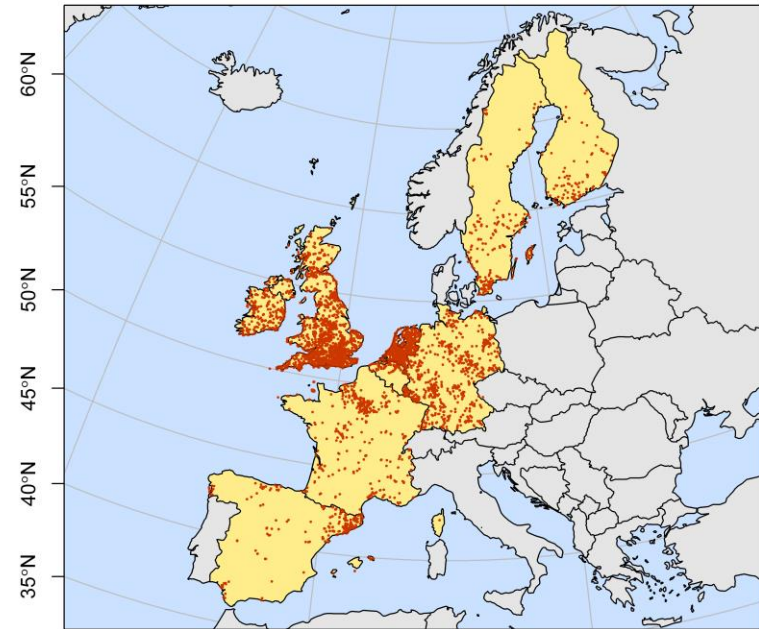
6,071 sites
a gradient of ca. 6,800 Km (SW-NE)

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Progress so far – eBMS database

Nbr of Monitored BMS Transects

Progress so far – eBMS database

BMS scheme	Nbr Record	Nbr Visit	Nbr Site	Nbr Site least 5 years
UKBMS	2,219,814	364,370	2,377	1,291
NLBMS	664,151	140,810	1,433	736
DEBMS	345,354	68,939	935	427
FRBMS	62,091	5,930	356	127
SEBMS *	39,494	3,503	267	75
IRBMS *	60,445	10,398	234	122
FIBMS	90,282	9,890	101	76
BEBMS	40,394	7,246	104	40
LUBMS *	6,283	1,046	30	29
ESBMS-catalonia	350,623	29,804	141	92
ESBMS	9,233	999	81	0
ESBMS-zerynthia	414	54	12	0
Total	3,888,578	642,989	6,071	3,015

1 year estimate (recent 2014 -2016)

Nbr Record	Nbr Visit	Nbr Site
705,959	139,219	3,600

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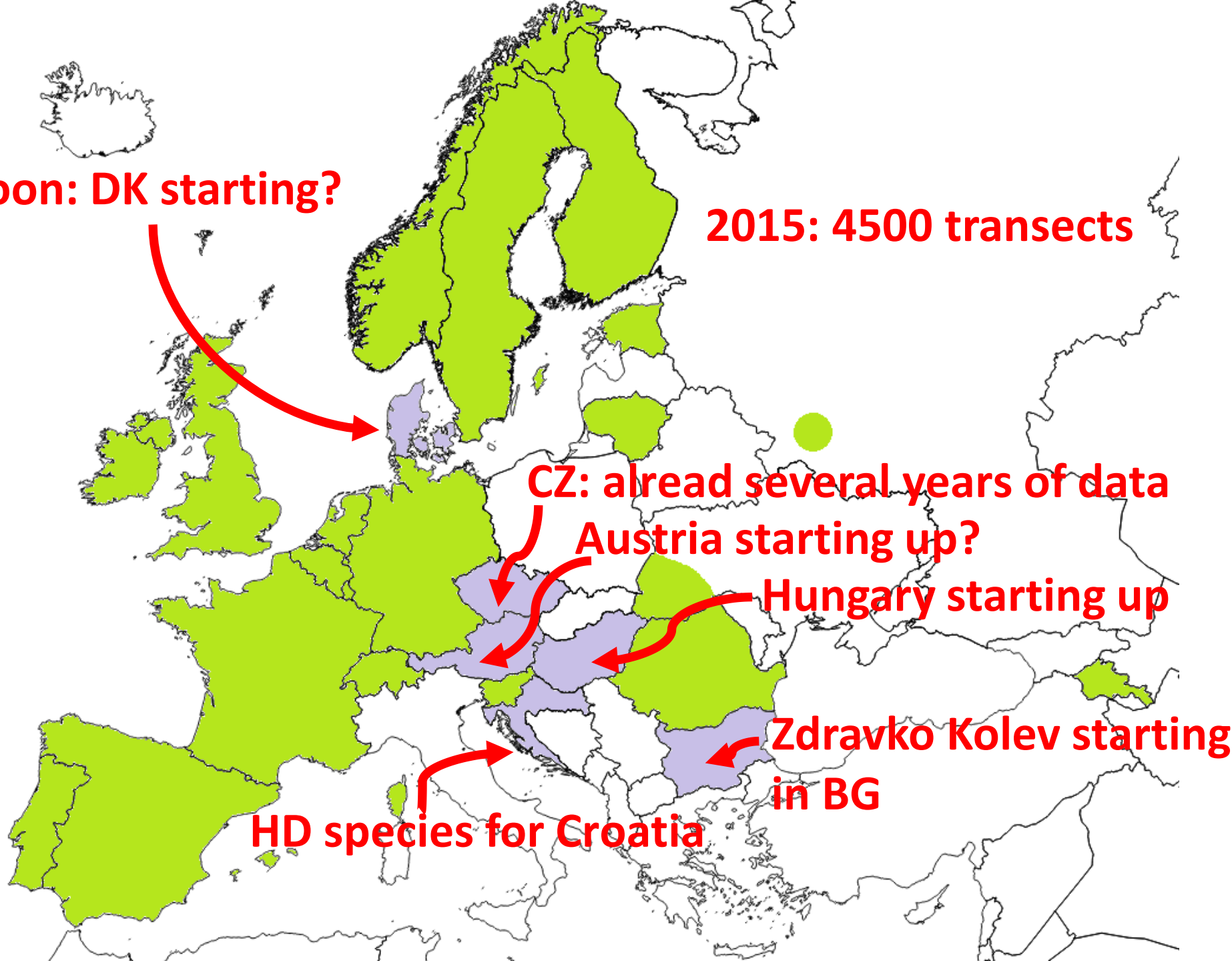
Soon: DK starting?

2015: 4500 transects

CZ: alread several years of data
Austria starting up?

Hungary starting up

Zdravko Kolev starting in BG

HD species for Croatia

Progress so far – eBMS database

Hours walked	329,982
Days walked	43,419
Years walked	167
Euros (cost in time – walked)	3,299,820
Time walked to the moon	2.15
Time walked around the earth	20.59
Time walked from South to North (Europe)	106.7

Parameters used

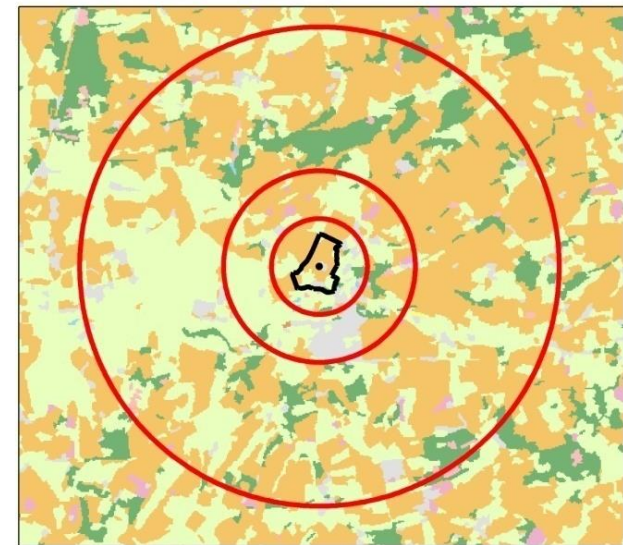|	
Walking pace (Km/Hour)	2.5
Hour/Day (working)	7.5
Day/Year (working)	260
Wage	10 Euros/Hour
Distance to Moon	384,400 km
Earth Circumference	40,075 km
Gibraltar to Nuorgam (South-North)	7,730 km

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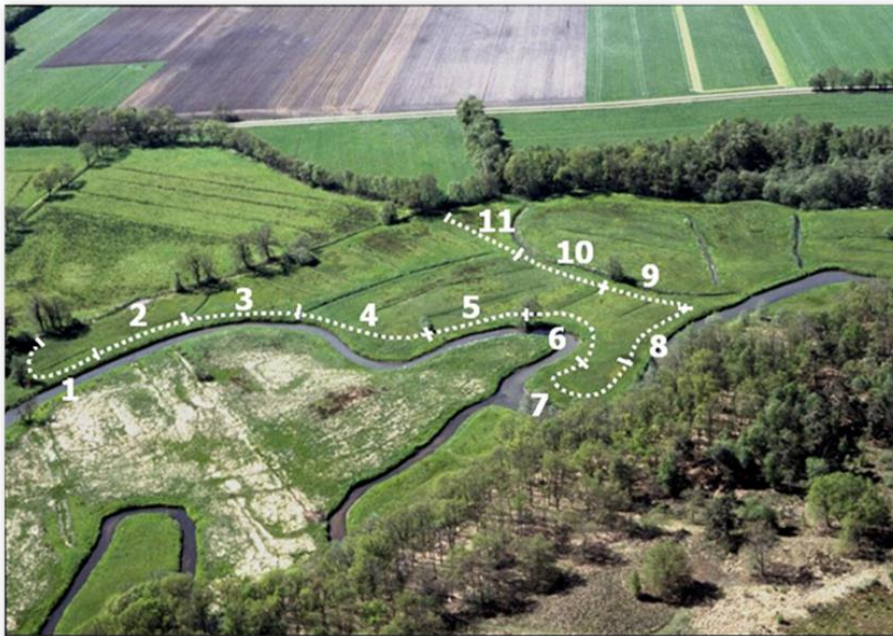
- Expand database and partnership ….towards a *more* representative database for Europe

  – To support butterfly indicators

  – To support wider use, to raise the profile of butterflies

  – To aid butterfly conservation

- Populate database for all current (*and future*) BMSs in the partnership, update for 2017

- Extend data to include detailed spatial information (where available) and habitat categorisation for transects

Next steps

- Analysis tools and support for national co-ordinators

- More metrics from the data – phenology, community measures etc

- Linking to environmental data – climate, land-use, protected areas

- Extended indicators
  - Improve existing indicators
  - Extend to more habitats
  - Indicator for the impacts of climate change
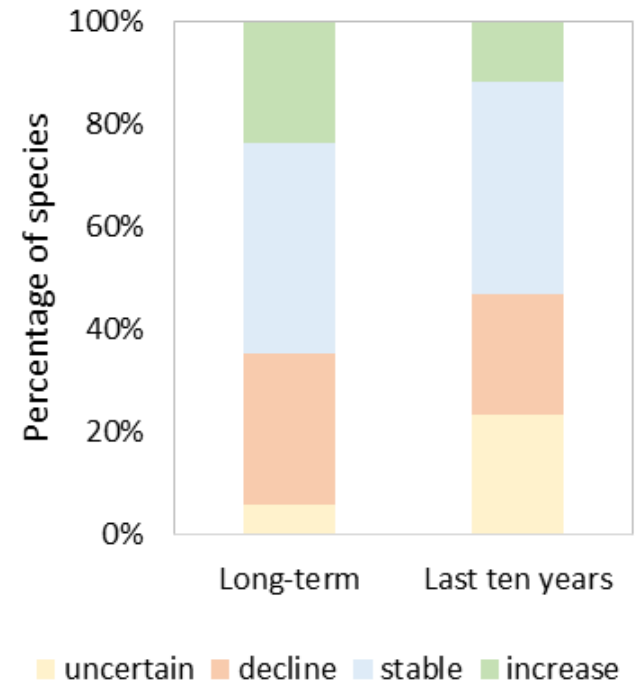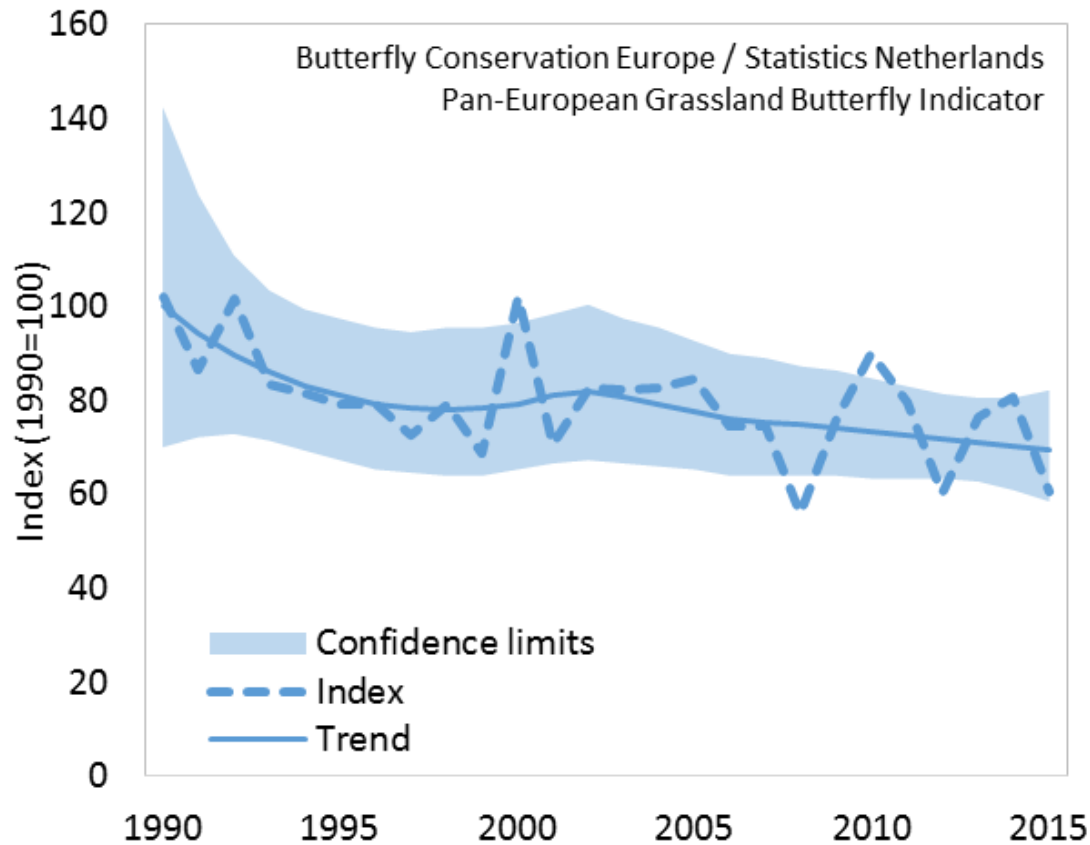
European Grassland Indicator

Widespread species

Specialists

European Grassland Indicator

Areas for discussion

- Who could join the eBMS partnership
- What would be of value to participants, e.g.
  - Regional flight period curves
  - Species abundance indices by region
  - Other metrics (e.g. phenology)
  - Climate summaries for monitoring sites
  - Land cover summaries for monitoring sites
- How to standardise transect information (e.g. habitat descriptions of sections)
- How to improve the online capture system and its uptake

Acknowledgements

- BC Europe
- For funding:

    CEH (NERC), Luxembourg Museum

- For advice and support:

    Martin Warren and Chris van Swaay;

    Liz Stansfield (CEH contracts);

    National Co-ordinators

- For database support:

    Reto Schmucki