# Assessing Butterflies in Europe

# European Butterfly Monitoring Scheme

# Network development

## Technical report

Butterfly

CONSERVATION EUROPE

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Butterfly Conservation Europe | Butterfly Conservation | UK Centre for Ecology & Hydrology | Dutch Butterfly Conservation | UFZ Helmholtz Centre for Environmental Research

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# Network development
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## Citation

Sevilleja, C.G., Collins, S., Warren, M.S., Wynhoff, I., Van Swaay, C.A.M., Dennis, E.B., Schmucki, R., Barea Azcón, J.M., Bonelli, S., Bourn, N., Cassar, L.F, de Arce Crespo, J.I., Dziekańska, I., Faltynek Fric, Z., Kolev, Z., Krenn, H., Lehner, D., Monteiro, E., Munguira, M.L., Özden, Ö., Pavlíčko, A., Pendl, M., Rüdisser, J., Šašić, M., Sielezniew, M., Settele, J., Szabadfalvi, A., Teixeira, S.M., Tzirkalli, E. & Roy, D.B (2020). *Assessing Butterflies in Europe – European Butterfly Monitoring Schemes - Network development: Technical Report*. Butterfly Conservation Europe and ABLE/eBMS (www.butterfly-monitoring.net)

## Keywords

Butterfly, Insects, Pollinators, Monitoring, Scheme, transects, eBMS, Europe, European Union, Biodiversity, citizen science

November 2020

## Acknowledgements:

We thank the European Union for funding the ABLE EU Parliamentary Pilot project via a service contract with DG Environment (Contract no. 07.027742/2018/790285/SER/ENV.D.W).

The European Butterfly Monitoring Scheme (eBMS) is indebted to the constituent National Butterfly Monitoring Schemes, their funders and all volunteers who contribute data. At the time of producing this report, the eBMS is a partnership of the following organisations: the Natural Environment Research Council (acting through the Centre for Ecology & Hydrology), Butterfly Conservation UK, Helmholtz-Zentrum für Umweltforschung GmbH – UFZ, De Vlinderstichting, Catalonia BMS, Finnish Environment Institute (SYKE), Butterfly Conservation Europe (BCE), Research Institute Nature and Forest (INBO), Muséum National d'Histoire Naturelle (MNHN) CNRS-UPMC, Lund University, National Biodiversity Data Centre (NBDC) Ireland, Luxembourg Institute of Science and Technology (LIST), Asociación Española para la Protección de las Mariposas y su Medio -ZERYNTHIA, Universidad Autónoma de Madrid, University of Ljubljana, Hungarian Lepidoptera Monitoring Network as part of the Szalkay Hungarian Lepidopterist's Society, Zoolab Department of Life Sciences and Systematics, TAGIS – Centro de Conservacao des Borboletas de Portugal, Biodiversity Monitoring Switzerland, Czech Butterfly Conservation Society, University of Innsbruck - Butterfly Monitoring Viel-Falter, Croatian Natural History Museum.

The Austrian BMS is coordinated by Austrian Butterfly Conservation (ABC) in cooperation with the Municipal Department of Environmental Protection Vienna, the University of Vienna, the University of Salzburg, Haus der Natur (Salzburg), Nationalpark Neusiedler See - Seewinkel and Biologische Station Neusiedler See (Illmitz, Burgenland), Bio Forschung Austria and Arbeitsgemeinschaft Österreichischer Entomologen. ABC was founded thanks to the initiative and essential support of Andrea Grill and Daniela Lehner, together with the ABC co-founders Harald Krenn and Manfred Pendl.

Viel-Falter BMS, Austria is coordinated by the Department of Ecology at the University of Innsbruck and implemented together with the Natural History Collections of the Tiroler Landesmuseen Betriebsgesellschaft m.b.H, inatura and EURAC research. It is supported by the states of Tyrol and Vorarlberg and the Foundation Blühendes Österreich.

The Dutch BMS is a co-operation between Dutch Butterfly Conservation and Statistics Netherlands (CBS), part of the Network Ecological Monitoring (NEM) and financed by the Ministry of Agriculture, Nature and Food Quality (LNV).

The German BMS is a cooperation between the Helmholtz Centre for Environmental Research - UFZ, German Butterfly Conservation (GfS) and science4you.

The Irish Butterfly Monitoring Scheme is funded by the Heritage Council and the Department of Culture, Heritage and the Gaeltacht.

The Italian Butterfly Monitoring Scheme is a cooperation among the University of Turin, the University of Florence and the Council for Agricultural Research and Economics of Cosenza.

The Nature Conservation Agency of Latvia has kindly supplied the Latvian data.

The Spanish Butterfly Monitoring Scheme (BMS España) is partially supported by EBD (Estación Biológica de Doñana) and OAPN (Organismo Autónomo de Parques Nacionales) and it is a consortium with contributions by several research institutes, universities, National Parks and nature NGOs.

The ZERYNTHIA Butterfly Monitoring Scheme is supported by the Basque Country Government, Cantabria Government and Valle de Aranguren Council (Navarre).

Jacqueline Loos, Mikael Molander and László Rákosy were important contributors of the Romanian part of the AMIGA project.

The UK Butterfly Monitoring Scheme is organized and funded by Butterfly Conservation, the Centre for Ecology and Hydrology, British Trust for Ornithology, and the Joint Nature Conservation Committee. The UKBMS is indebted to all volunteers who contribute data to the scheme.

***Butterflies can be monitored everywhere by everyone motivated to do it.***

# Content

# Executive Summary

1. The ABLE EU Pilot Project was initiated in 2018 to collate butterfly monitoring data across Europe, to facilitate the start of new schemes in the EU, and to develop indicators to help policy evaluation. This report summarises the work on developing the monitoring network (Task 2).
2. There are some 451 butterfly species occurring in the Member States of the EU(27), breeding in a wide range of habitats. Butterflies react quickly to change and are considered to be good biological indicators, especially other insects and pollinators. Monitoring butterflies can help shed light on changes in these important groups.
3. Standard methods of monitoring butterflies are well established, based on fixed routes (transects), which allow citizen scientists to estimate the relative abundance of butterflies.
4. Prior to ABLE, several countries contributed butterfly monitoring data to the European Butterfly Monitoring Scheme (eBMS), but they were concentrated in central and western Europe. Large parts of southern and eastern Europe had no regular scheme. Three groups were prioritised for action: six to eight EU countries which had a good probability of establishing a scheme; recently started schemes that required further support; and countries where longer term activities were needed to develop monitoring.
5. As a result of the two-year project, ten EU(27) countries have started new citizen Science Butterfly Monitoring Schemes - Italy, Portugal, Hungary, Austria, Cyprus in 2019 and Poland, Bulgaria, Malta, Czech and Croatia in 2020; seven of these have joined the eBMS data network. Further details are in Annex 2.
6. A suite of support materials has been produced, including a Butterfly Transect Manual, which has been translated into six languages and a series of regional butterfly identification guides. Videos have been made explaining how to count butterflies on a transect and PowerPoint presentations have been made available in several languages.
7. More than 20 workshops and training seminars were held in ten different countries involving more than 750 people. During the Covid pandemic, these were held online.
8. To help monitor rare butterflies and those that occur in remote areas, a new ButterflyCount app was developed, based on standard 15-min counts. The app has an identification guide and lists of butterflies customised to each country to facilitate recording. This data will be assimilated into the eBMS to help extend coverage and make a more representative scheme.
9. Butterfly monitoring was promoted via social media as well as by articles in magazines and in EU level meetings. The eBMS website was used to host all materials and reports. A meeting was held of all coordinators in late 2019, attended by 59 people from 29 countries. A technical workshop was held online in March 2020, attended by 35 people, with a final meeting in October 2020.
10. Lessons learnt include the value of sharing knowledge from established schemes, ensuring broad involvement of citizens/stakeholders, and promoting the value of a Europe-wide scheme.
11. The eBMS provides an invaluable resource to inform EU policy development and evaluate the effectiveness of measures such as the CAP, Habitats Directive, Natura 2000, and the EU Pollinators Initiative. However, continuing financial support is needed from each Member State to develop capacity in existing schemes and start new schemes in countries which do not have one. This will help make a more complete scheme that accurately represents changes across Europe.

# Chapter 1 / Introduction

The purpose of the ABLE Project was to collate butterfly monitoring data across Europe, facilitate the start of new monitoring schemes across most of the European Union, and develop Indicators to help policy evaluation. This Project is an initiative of the EU Parliament, who voted €800, 000 over 2 years to support this.

EU Parliamentary Pilot Projects are designed to test out processes, with a view, if successful, to their further elaboration and adoption by the EU through a follow-on EU Parliamentary Preparatory Action and then mainstreaming by the EU and Member States, as appropriate. The Mandate and rationale from the EU Parliament for the Pilot Project was as follows:

> "The project aims at developing a suite of EU Lepidoptera indicators which can help improve conservation measure and assess progress in implementing EU policies and legislation such as the EU Biodiversity Strategy to 2020 and the EU Habitats Directive. Besides providing a highly relevant indicator for measuring progress in terms of managing and restoring Natura 2000 sites, it would also contribute to monitoring progress on Target 3 of the EU Biodiversity Strategy, which aims to increase the contribution of agriculture and forestry to maintaining and enhancing biodiversity. In particular, the pilot should deliver a representative indicator to help monitor the impact of the Common Agricultural Policy on grassland biodiversity. It will also provide data to produce a climate change indicator, thereby contributing to the ongoing revision of climate change adaptation strategies. Indicators will also be possible for woodland, wetland and urban habitats."

DG Environment issued a competitive call, in Summer 2018, for bids to fulfill this. BCE and its partners, in partnership with UFZ, de Vlinderstichting, BC(UK) and CEH were awarded a two-year contract to deliver and started work in November 2018.

In this report, we summarise the work of ABLE on developing the Butterfly Monitoring network across more EU Member States (Task 2 of the ABLE project). In this task we focused on supporting and developing a more unified and cost-effective European monitoring network, using accepted and standardized methodology, with reporting to a coordinated database. We based this on experience in 13 EU(28) Member States where BCE partners, working with CEH and volunteers, had over the years, established successful citizen science schemes, data collection and indicator development. The priority was to set up schemes in more countries so that the data collected was more representative of the whole of the EU and its eight Biogeographic zones and so, even more useful to policy makers. The aim was also to draw out lessons to help the implementation of monitoring of other wild pollinator taxa.

The challenge for ABLE in 2018/19 was to find talented coordinators, with the personal, communication and IT skills, aptitude and knowledge to initiate new citizen science schemes, in collaboration with the ABLE project team. The focus was on those EU Member States where there were no existing systematic butterfly monitoring schemes. Coordinators needed to recruit, retain, train and support volunteers; define new transect routes, and organize volunteers to identify and count the butterflies, regularly, along these routes and report their findings. They were responsible for translating into their language the Butterfly Monitoring manual, the eBMS website, the ButterflyCount App and the guidance the project provided centrally. This was a tall order and we were extremely fortunate to find dedicated and talented coordinators, willing to do all this. As a result, with the support of the ABLE Project, new Butterfly Monitoring Schemes have been started in 10 EU(27) Member States. Five of these began in 2019 and five more in 2020.

## Context

The nature of Europe consists of a huge variation in habitats, landscapes and climates. Europe's butterfly fauna is also highly diverse with, across the EU (27), 451 species, 17% of them endemics ie only occurring in Europe (European Red List of Butterflies, Chris van Swaay *et al.,* 2010). Habitats Directive Article 17 reports from EU Member States show that most butterflies of European importance, listed on the Directive, are in Unfavourable Conservation Status, many with a declining trend. Semi-natural grasslands, many of them important habitats and resources for butterflies and other pollinators, are also in Unfavourable Conservation Status.

The EU Biodiversity Strategy 2030, commits to reversing the decline in Pollinators and envisages Member State biodiversity Restoration Plans with binding targets; commitments to no deterioration of any Habitats Directive listed species or habitats; improvements in conservation status for 30% of those in unfavourable status; some additional Protected Areas; and effective management of all existing Protected Areas. Commitments to improving biodiversity measures through CAP reform are also planned in accordance with the EU Green Deal. Additional funding for Biodiversity monitoring is expected in the planned Horizon Europe programme.

*Butterfly monitoring is a fun and useful activity done in their majority by volunteers. Thousands of volunteers collect butterfly data every year.*

In addition to pressures from habitat loss and changing management, with consequent losses of habitat quality, climate change is having a profound effect on wildlife across Europe, including butterflies. A major objective of butterfly monitoring schemes is to help track the impacts of climate change and help develop mitigation measures. Many of the habitats used by butterflies, notably wetlands, grasslands, and woodlands, are important carbon sinks and can play a role in mitigation.

## Rationale for Butterfly Monitoring Schemes and Indicators

Monitoring butterflies is an important activity because butterflies are good indicators of biodiversity and their sensitivity makes them quick to react to environmental change (Thomas, 2005). The butterflies of Europe breed in a broad range of habitats including grassland, woodland, wetland and montane areas. They are frequently used by ecologists as model organisms to study the impact of habitat loss and fragmentation, plus climate change. Areas rich in butterflies typically have a wide range of other invertebrates, so they are indicators of a healthy environment and well-functioning ecosystems. Butterflies and associated species form a key part of the food chain, they are an important part of the prey for among others birds and bats. Butterflies also pollinate a large range of flowering plants including vegetables, giving them economic importance.

## Development of Butterfly Monitoring across Europe

Butterflies are one of the best monitored insect groups in Europe. Long-term monitoring has been running for decades in some countries. The first Butterfly Monitoring Scheme began in the United Kingdom in 1976 (UKBMS), since then, this methodology has been adopted in many other European countries to monitor butterflies. All use the same standardised survey method, designed by Ernie Pollard, of the Monks Wood Experimental Station in the UK (Pollard and Yates, 1983).

Since 1990, many other countries have joined in and they now submit data to the European Butterfly Monitoring Scheme (eBMS) database (see Task 3 report). The increase of butterfly monitoring

schemes and transects in Europe, has been most rapid in north-western Europe. In addition, there has been a long-established scheme in Catalonia, Spain. In 2015, BC Europe's, Spanish partner worked closely with National Park colleagues across Spain to expand the Butterfly Monitoring Schemes to all Spanish regions. This has been highly successful. It also gave confidence that even in countries where volunteering and active engagement in natural history by citizens was not so prevalent, that new, citizen science schemes, could thrive. Most Mediterranean and Eastern European countries generally lacked any systematic butterfly monitoring until the ABLE Pilot Project was able to facilitate new schemes and foster a more representative network across Europe.

This report presents the activities and resources developed and shared by the ABLE project to achieve this. As a result of ABLE, ten new eBMS have been started and fledgling schemes, (i.e., ones started before ABLE, but still relatively new) in some other Member States, have increased the number of transects, recruited new volunteers, learned more skills (e.g., National Indicator production and reporting) and shared more records. They have also raised the profile of butterflies and their value as indictors in their Member State.

**Consolidating learning and recommendations for further development beyond ABLE**

The experience gathered during ABLE enables us to share some lessons about how to set up successful, effective, and high-quality, volunteer based schemes and to make recommendations for action to support the continued growth of eBMS (see Chapter 5). The ultimate aim is to put all schemes on a sustainable basis and to work in an integrated way with the planned EU Pollinator Monitoring Framework to deliver a pollinator Indicator for CAP evaluation and help reverse the declines in all wild insect pollinators. The Parliamentary Preparatory Action (Pollinator PPA), endorsed by the EU parliament in 2019, recognizes the importance of building on ABLE and has voted €5m for the next two years to start monitoring solitary bees, bumble bees, hoverflies and moths and to consolidate and strengthen butterfly monitoring.

# Chapter 2 / Butterfly Monitoring Schemes in Europe

## Introduction to Butterfly Monitoring Methodology

Butterfly Monitoring Schemes (BMS) record butterflies every year, by counting them along fixed routes called transects. This vital information is gathered mainly by citizen scientists (volunteers) who have been trained (or are self-taught) to recognise and identify species and follow the protocols of monitoring along butterfly transects. The transects (fixed routes) are counted repeatedly through the butterfly season, ideally every week but often less frequently due to availability of volunteers or due to unsuitable weather. Statistical modelling techniques have been developed to account for uneven sampling and enable standardized assessments of changes in abundance over time. The methodology provides robust data to identify population trends and assess the status of butterfly species. In this chapter we will explain how the Butterfly Monitoring Schemes started and the current situation.

**The Growth of eBMS**

The Netherlands (NLBMS) was the first country after the UK to start transects in 1990, followed one year later by the Flanders region of Belgium (BEBMS). The first BMS set-up in a Mediterranean region was the Catalonian BMS (ES-CTBMS), which started in 1994. Then the first BMS in a boreal zone, Finland, started to count butterflies in 1999. Already in the new century two large countries, Germany (DEBMS) and France (FRBMS) established their own BMS in 2005, followed by Slovenia (SLBMS) in 2007 and Ireland (IRBMS) two years later in 2009. In 2010 Sweden (SEBMS), Luxembourg (LUBMS) and the Basque Country of Spain (ES-CBBMS) set-up their own schemes, adding more than 200 transects from the three schemes together. In 2014, the data from all these schemes were

brought together as part of the recently created European Butterfly Monitoring Scheme- eBMS, run by Butterfly Conservation Europe in collaboration with the UK Centre for Ecology and Hydrology. The same year, the third BMS was initiated in Spain, the Spanish BMS (ESBMS), this time covering regions outside of Catalonia and the Basque Country.

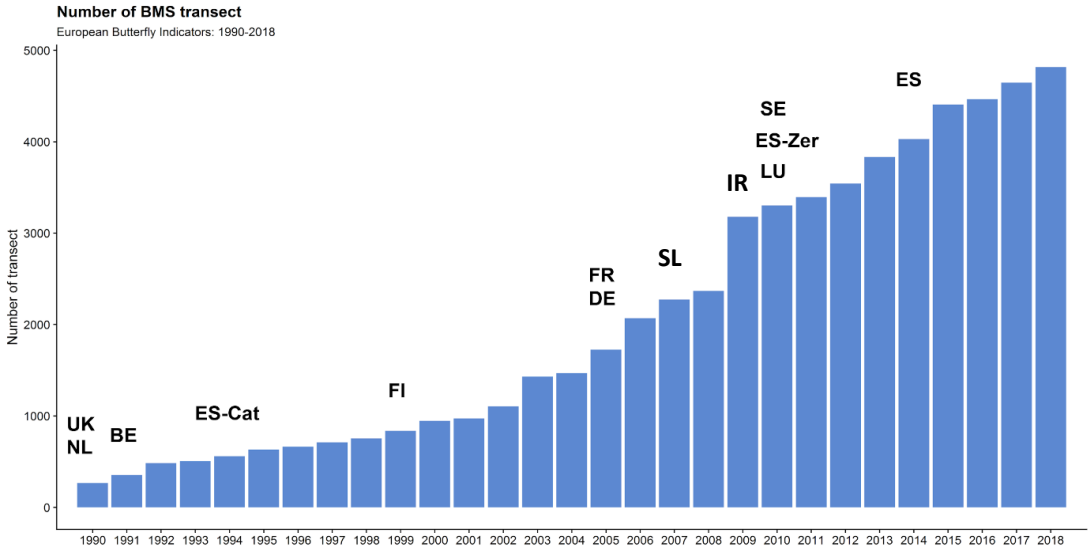


Figure 1. Number of transects sampled each year in Europe from 1990 until 2018. Labels indicate the year of establishment for new BMS; the UK BMS started in 1976.

In 2015, twelve EU(28) countries (including the UK) were counting butterflies with the same methodology every year covering a large area of Europe. Of these schemes, eleven reported their data to the eBMS database, covering almost 5000 transects, the majority done by volunteers. New countries were adopting the popular methodology and at the same time, countries with running BMS were growing and including more transects expanding to more habitats and territories of their nations (Fig.1).

## Progress in expanding butterfly monitoring: developments through ABLE

Prior to the start of the ABLE project in late 2018, several EU countries and regions were monitoring butterflies through their long-term butterfly monitoring schemes. Overall, existing schemes are sampling almost 5000 transects and reporting on close to 300 butterfly species.

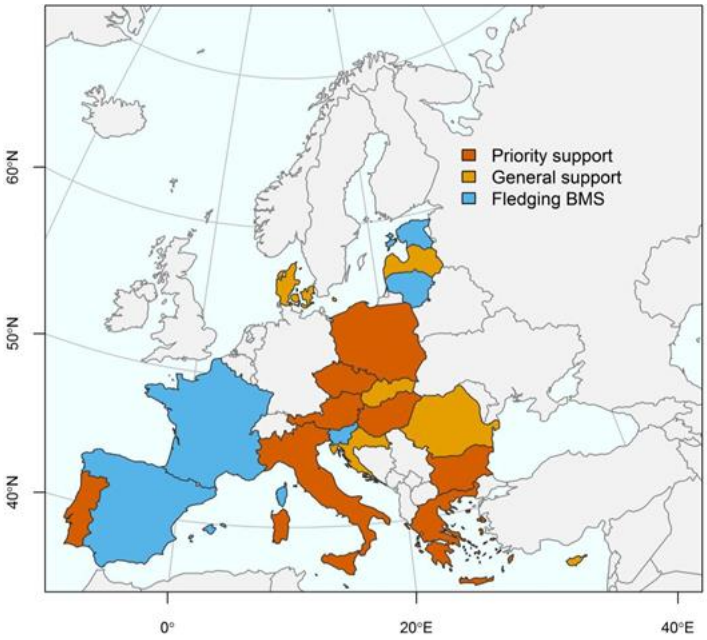


Figure 1. Classification of EU Member States by the status of a Butterfly Monitoring Scheme, as of 2018. Member States with an established BMS are not shown.

The existing monitoring schemes were concentrated in central and western Europe, while large parts of southern and eastern Europe had no regular, frequent field monitoring schemes for butterflies, (though some had targeted surveys, every 6 years of rare species listed in the appendices of the Habitats Directive). To improve the representativeness of butterfly monitoring in the EU, a major element of the ABLE project was to expand monitoring to countries lacking a scheme or where its BMS was at an early stage of development.

**ABLE Priorities**

The ABLE project identified priorities for action (Figure 2). Countries in southern and eastern Europe were classified into three groups: Priority support for six to eight EU countries which had a good probability of establishing a BMS (shown in dark orange); specific support for growth of fledgling schemes, which were in relatively early stages of development (blue); and general support for countries with less monitoring activity (pale orange/yellow).

**ABLE Successes**

The ABLE project has been highly successful in supporting the creation of new butterfly monitoring schemes across the EU and in expanding the European Butterfly Monitoring Scheme data network (eBMS).

During 2019, work was focused on five countries: Italy, Portugal, Hungary, Austria and Cyprus. Help and support was given to them to establish their BMS, by confirming coordinators, recruiting volunteers, training them and designing new transect routes, encouraged by workshop activities and materials. During 2020, the project helped to set up new BMS schemes in a further 5 EU countries – Bulgaria, Poland, Croatia, Czech Republic and Malta. We continued to support the development of the BMSs which were started in 2019, increasing the number of volunteers and transects in this second year.

During the ABLE project seven EU(27) countries joined the eBMS data network - Austria (the Viel-Falter BMS in the west of the country), Croatia, Czech Republic, Hungary, Italy, Portugal and Slovenia, signing the data sharing Agreement of eBMS and submitting transect data. Switzerland and Norway, where BMSs have been in place for many years, also joined the eBMS data network. Much data from many new butterfly transects was shared, increasing both eBMS coverage and the total number of transect monitoring sites (see Task 3 report).

*The essentials features of Butterfly Monitoring Schemes are:*

- *Standardised methodology*
- *Identification by trained citizens*
- *Validation of observations*
- *Counting of butterfly abundance (not just presence)*
- *Frequent monitoring - up to fortnightly throughout the season, every year*
- *Methodical reporting*
- *Capturing data in a single database*
- *Calculating indicators*
- *Disseminating results*
- *Feedback to volunteers*
- *Providing data for research*

***Box 1: Essentials features of BMS:***
*Pyrgus malvae is a species monitored thanks to Butterfly Monitoring Schemes in Europe*

**Adjustments in the face of Covid-19**

Despite serious disruption by the Covid-19 pandemic in 2020, we re-planned our work and continued to develop new schemes. Increased focus was placed on activities that remained feasible during lockdown restrictions, such as preparing materials like regional identification guides, translating, using online platforms and developing other tools, as well as increasing dissemination via social media. Some countries that had decided to start their BMS had to postpone their face to face Workshop plans and this slowed down the process. Poland, Malta, Croatia and Bulgaria had all planned to run workshops and announce the creation of a BMS, but they had to put these on hold during lockdowns and focused instead on preparing, translating, and developing materials for future monitoring activities and most were able to set up online Workshops. Despite the pandemic, we managed to organise several workshops online; and some in the field following the partial lifting of social restrictions. In Italy, Malta, Bulgaria, Czech Republic and Poland we organised workshops during

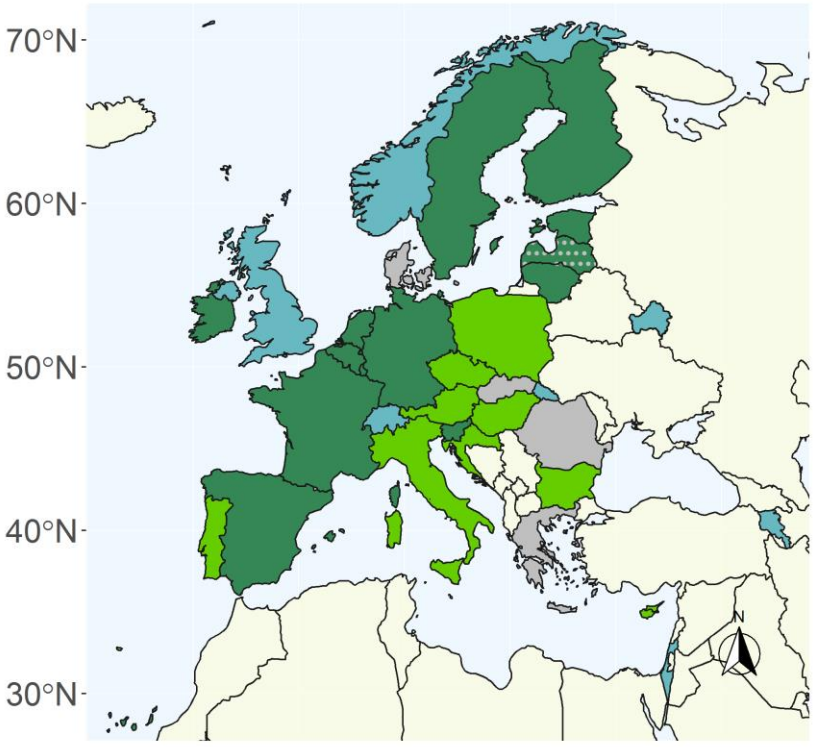


Figure 2. Map of Butterfly Monitoring schemes in the EU(27) and non-EU countries with transects in 2020.

Key:

Dark green - EU(27) countries with BMS data

Light green - EU(27) countries with BMS established through support of ABLE in 2019 and 2020

Grey - EU(27) countries requiring a citizen science BMS

Blue - Non-EU countries with transect data.

Summer and Autumn 2020 to broaden the audience, and continue to promote butterfly monitoring, training and transect creation.

## Country details

*Countries with new Butterfly Monitoring Schemes and transects on eBMS website:*

- Italy: monitored 119 species in 57 new transects
- Portugal: monitored 82 species in 44 new transects
- Austria: monitored 44 species in 17 new transects in the Eastern region
- Cyprus: 1 transect and several 15-min counts
- Bulgaria: 4 transects
- Poland: 3 transects
- Hungary: monitored over 130 species, including over 30 day-flying moths, in 31 general and 4 targeted transects and by extensive 15-min counts (soon to be added to eBMS website).
- Czech Republic: several transects (to be added to the eBMS website)
- Croatia and Malta are developing the their BMS page on eBMS website and will include transect locations in due course
- Spain: 20 new transects have been added since the start of ABLE. Spain already had an existing scheme in 2018 but migrated all its data to the eBMS online platform in 2019 to provide a more suitable platform for the scheme.

### Countries with BMS created under ABLE

*Italy:* This is the richest country in terms of the number of butterfly species in Europe, containing a wide range of different habitats and several bioclimatic regions. Establishing a monitoring network was therefore vital to make the eBMS more representative of the EU. There are many butterfly experts and lepidopterists in Italy doing in depth butterfly studies; for example, a Red List of Italian Butterflies has been established (Bonelli *et al.,* 2018) and genetic research and targeted surveys of threatened species is being performed.

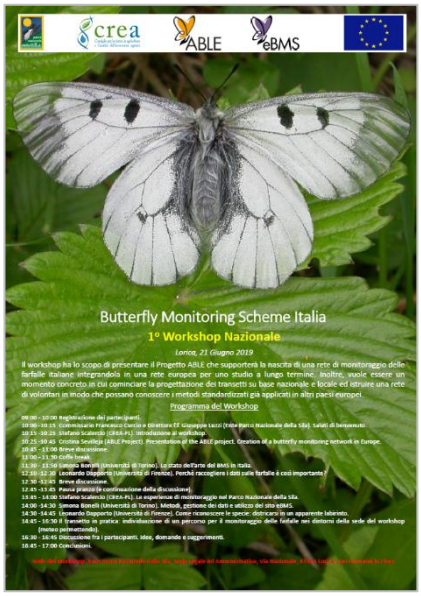

Figure 4. Program 1st BMS Workshop in Italy

Prior to the ABLE project, BCE was in contact with experts interested in promoting butterfly monitoring in Italy and, thanks to their collaboration, it was possible to create the Italian BMS in 2019. For such a large and diverse country, it was important to divide the coordination by regions (North, Central and South Italy) to ensure efficient coordination and encourage local people to start butterfly monitoring. Within each region, workshops were run to train volunteers and specific materials such as regional identification guides were developed. This inclusiveness of culture and environmental diversity is the pillar of the Italian BMS which provided good results in a short time. The regional coordination approach is proving successful with an expanded coordination network beginning to develop (e.g. in the islands and in Eastern Italy).

*Austria:* This country in the middle of Europe has interesting and particular ecosystems with a great diversity of butterflies. Large parts of its territory are dominated by the Alps containing four different

regions. Austria can be considered as a European biodiversity hotspot with around 210 butterfly species. There are many butterfly experts in the country and Lepidoptera have been well-studied, including in-depth knowledge of butterfly ecology and distribution (Höttinger *et al.,* 2013). Despite this, there was no national organization to gather these experts and manage a butterfly monitoring scheme. In 2018, within the project Viel-Falter Tagfalter Monitoring, a systematic butterfly monitoring started at 200 stratified sites in Western Austria. Viel-Falter combines professional butterfly surveys with observations of committed volunteers (Rüdisser *et al.,* 2017). It joined the eBMS in 2019 to share its monitoring data.

In September 2020, Austrian Butterfly Conservation (ABC) was created after previous initiatives and the discussion of its necessity in the ABLE workshops. This group started with the idea of having coordinators of butterfly monitoring in each Austrian region. Student projects have been conducted in cooperation with the Integrative Zoology Unit in the Faculty of Life Sciences (University of Vienna) during the last three years. Ten butterfly transects using the standards of the eBMS are established in various habitats of Vienna. A collaboration for butterfly monitoring started in Naturpark Neusiedler See – Leithagebirge, National Park Neusiedler See Seewinkel and Biologische Station Illmitz (Burgenland). Several people in the geographically more central areas of Austria (Salzburg and Uppwe Austria) have expressed their interest in conducting transects. Due to the pandemic, new transects in Salzburg were delayed, instead distribution maps were made available online (Gros, 2020). ABC has been coordinating work to include other regions of Austria for butterfly monitoring. The schemes, Viel-Falter BMS and Austrian BMS, will work together closely in the future to assure the butterfly monitoring in the whole country.

*Portugal*: TAGIS - Centro de Conservação das Borboletas de Portugal (Portuguese Butterfly Conservation Center) is the coordinator of the BMS in Portugal. This association is running for many years aimed at conserving butterflies and other insects. TAGIS' network covers many areas of the country helping to disseminate the need for conservation and find volunteers for monitoring butterflies. Thanks to the network and collaboration of TAGIS, establishing the Portuguese BMS was relatively straightforward. Since the beginning of ABLE, TAGIS started to establish close relations with protected natural areas and especially with the Institute of Nature and Forest Conservation (ICNF, Instituto da Conservação da Natureza e das Florestas) to create long term transects. In addition, TAGIS has the network of amateurs and people interested in nature that could be potential volunteers to monitor butterflies. This BMS was created immediately and following two years of development now has many transects running, covering a good variety of butterfly species.

Figure 5. Announcement of training seminars for butterfly monitoring in Portugal

On the Madeiran islands, Madeira Fauna & Flora (MF&F), a local SME working on Ecotourism, Environmental monitoring and Awareness, has started a local BMS with tourists as well as a few volunteers from the University. MF&F contacted the governmental department of Nature Conservation and Forestry (IFCN – Instituto das Florestas e Conservação da Natureza) to include the island's butterflies in their conservation priorities, since Madeira is home to the three of the most endangered species of butterflies in Europe (*Gonepteryx maderensis*, *Pararge xiphia* and *Pieris wollastoni*). In 2019 the IFCN has asked Madeira Fauna & Flora to run a course on butterflies and their monitoring to governmental staff. It was scheduled for May 2020, but was postponed due to the pandemic. The local butterfly scheme has a few volunteers, mostly nature guides from the local university. In 2020 BC Europe, MF&F and IFCN have submitted a proposal for a small grant to fund a

network cooperative project on further developing the volunteer network of Madeira BMS, setting up new transects and capacity building for government nature rangers.

*Cyprus*: The island of Cyprus is located within the Mediterranean Basin biodiversity hotspot. Despite the Cyprus political issues, butterfly experts from the Greek Cypriot and Turkish Cypriot communities agreed to collaborate in the creation of a common monitoring scheme for the island, having one coordinator for each community. In 2019, 26 people from both communities of the island gathered for a workshop. A good and stable collaboration between the coordinators was established to set up the Cyprus BMS. For May 2020 another workshop was planned but unfortunately had to be cancelled due to the Covid19 pandemic. The coordinators initiated the creation of a field guide to help volunteers identify the many unique species that can be found in the island. Thanks to work done under the ABLE project, the coordinators were encouraged to look for future funding possibilities and are now applying for grants to further develop the Cyprus BMS and establish a sustainable monitoring scheme.

*Bulgaria:* An Eastern-European country with a large number of butterfly species (nearly 220) where the level of institutionalized butterfly research as well as the culture of citizen science are lagging significantly behind other eBMS countries. Nationally, "butterfly monitoring" has been applied only to several Habitats Directive species. A true monitoring scheme for common species has been missing, and the need for it has not been recognized nationally until now. As a result, Bulgaria has been a particular challenge for the ABLE project. But thanks to the Bulgarian BMS coordinator who has been independently promoting butterflies and capacity-building with volunteers, we started establishing the Bulgarian BMS.

One of the most crucial actions as per ABLE's best practices was to identify and attract effective and key stakeholders that could support us in promoting the need for monitoring and establishing a scheme. In 2020, the Bulgarian coordinator contacted the management of the three National Parks in the country as well as other stakeholders to develop a network of transects across key habitats. He also trained rangers and other experts working for the parks. Fortunately, the management of the National Parks had simultaneously recognized the need to train their personnel in identifying and monitoring less-well known groups of organisms under their care, and were enthusiastic to co-operate with ABLE. Thus, in the summer of 2020, the first workshop on butterfly identification and monitoring was held in the Pirin National Park, highlighting the importance of butterfly monitoring and facilitating the creation of transects there.

To help broaden engagement a series of PowerPoint presentations is in preparation and the *Butterfly Transect Count Manual* and the *Butterfly Count* app have been translated into Bulgarian. Social media has also been used to find, encourage and educate motivated people to begin recording butterflies. Assistance with butterfly identification and other information are being constantly provided, leading to a substantial rise in member enthusiasm and activity. In 2020, the Bulgarian BMS has registered with the eBMS database and volunteers are conducting the first transect counts. The coordinator is continuing the dialogue with the National Parks in order to be able to establish transects and begin counts in the 2021 butterfly season.

*Poland*: For several years the butterfly monitoring in Poland has been done for the Habitat Directive species only, but a stable monitoring scheme for common species was lacking. Since the country is large and comprises many different habitats and landscapes with a high number of butterfly species it was important to include Poland into the eBMS. In 2020, a very successful two-day workshop was attended by 80 people. In that workshop, the basis for the monitoring scheme was established and the first transect walkers have already registered their sites on the eBMS website. Using the examples of schemes in other countries, the importance of butterfly monitoring and the participation in a wider European network was explained and future steps discussed. Poland also makes good use of social media to promote butterfly conservation. In a Facebook group, information on events about butterflies, but also butterfly pictures and various information about their life cycle and distribution is shared. Overall, a good start has been made, but Poland still needs further support of the eBMS to develop a sustainable scheme.

Figure 6. Program 1st BMS Workshop Poland

*Hungary*: In Hungary, there is a great culture of entomology and there are many people and experts interested in insects and especially in butterflies. The Jozsef Szalkay Hungarian Lepidopterists' Society groups many of these experts that promote the conservation and study of butterflies and moths of the country. This society was the main support for the creation of the Hungarian Lepidoptera Monitoring Network in 2016. Since then, butterflies have been monitored and registered with some transects distributed over the country. However, some aspects of the network were necessary to improve and ABLE wanted to support the further development of this BMS. The collaboration started early in the project, in March of 2019 joining the national workshop of butterfly monitoring and identifying the weak parts of the network. During the project, the ABLE team together with the Hungarian coordinator have been determining how the Hungarian database could be transferred to the eBMS platform and what help was needed in the data collection process. Hungary has been a great support in testing the new methodology of 15-min counts created under ABLE to see how the app could be improved.

*Croatia:* This country had several attempts at starting a long-term monitoring scheme but motivating citizens proved to be a hard goal to achieve. In 2020, Croatia started a professional monitoring system, based on ninety sites, that is funded for the next three years. This scheme established a base for a Croatian BMS but there was an urgent need to establish a network of citizen scientists. The Croatian coordinator together with ABLE decided to prepare materials to involve citizens in the monitoring including regional identification guides, translating online platforms and the eBMS app, and developing other tools. These materials will help the Croatian BMS to expand by explaining the importance of butterfly and biodiversity conservation via monitoring.

*Malta*: It is a small country, but a possible stopover for many butterflies migrating to and from Africa. Malta requires proper monitoring to study this migration, identify possible new species colonisations, and spot the vulnerable habitats of butterflies. Working with such islands is important for the eBMS in order to understand differences in their biodiversity, compared to the mainland. The ABLE team has been in discussion with butterfly experts of Malta, determining the best approaches to set up their BMS and cover different habitats. A national workshop will be held on 23rd of November involving different parts of the country, the National Museum of Natural History, the University,

nature photographers and people committed to better understand the biodiversity of Malta and identify areas with the potential to restore habitats for butterflies.

*Czech Republic*: this country has a great culture of entomology with many experts in Lepidoptera. The butterfly monitoring started in this central country many years ago, in 2010, running some transects by professionals and volunteers. This activity was coordinated by the Czech Society for Butterfly and Moth Conservation (Společnost pro ochranu motýlů, SOM) increasing the number of transects every year but without achieving a representative numbers for covering the whole country. The Czech Republic was one of our priority countries to give support, organize workshops and provide a coordination. After two years of contact with the Czech coordinators, the monitoring Czech data has been incorporated to the eBMS database and used for the butterfly indicators; the ButterflyCount app has been translated into Czech and promotional material of ABLE and eBMS has been distributed among volunteers to promote butterfly monitoring and extend the BMS. For 2020, we planned two workshops to motivate Czech volunteer and join the network, however the coronavirus restrictions canceled them. At the end, we managed to do a workshop in the beginning of October together with SOM and gather some volunteers. Still some work is needed to increase the number of transects on this BMS.

**Support to Fledgling BMS under ABLE**

Fledgling countries have been running their schemes for several years but often with major limitations. These could be for example a bias in transect distribution, low numbers of transects or a low frequency in transect visits per year. Within the ABLE project, we worked with Spain and Slovenia to address these limitations and support the development of their schemes.

*Spain:* The Spanish BMS started in 2014. In 2015 it received the support of the central co-ordination of Spanish National Parks (with monitoring transects from Doñana and Sierra Nevada National Park from 2005 and 2008 respectively). They started by establishing transects in each of their 15 National Parks and in a small network of sites outside the parks over the following years. Having established this strong base, they began to expand the scheme further. It now has 170 transects in the country and is still working to expand the network involving volunteers.

A major development of the Spanish BMS within the ABLE project was the migration of their data from a platform hosted at the Biological Station of Doñana to the eBMS, including adopting the central data entry platform to collect data. This avoids duplication of effort and saves the Biological Station time and funds in developing a parallel system. Other advantages are that the central eBMS platform allows new transect routes to be defined easily as new volunteers come forward. It also helps with the standard reporting and analysis of the transect data by individual recorders and trend calculation for the whole country by coordinators. Butterfly monitoring is done by the Spanish BMS and two separate BMS (Catalan BMS and Basque country BMS), which have run successfully for many years and give a better picture of butterfly trends in the country.

*Slovenia*: Until now, the monitoring of butterflies in Slovenia was limited to species listed in the Habitat Directive and rare species, within a scheme that was started in 2007. This monitoring system depends on funding which is difficult to secure. Together with the national coordinator, we worked on the extension of the system using trained volunteers. To help engagement, the eBMS website and ButterflyCount app were both translated into Slovenian. A Field Guide to Slovenian butterflies was also produced to help volunteers with butterfly identification.

*Latvia* has a professional BMS with a number of transects. We had some contact with a possible coordinator of the citizen science BMS to supplement the professional collected data. In *Lithuania* the BMS is dormant and needs further support in the future.

# Chapter 3 / Actions to expand butterfly monitoring

## Introduction

In order to support butterfly monitoring in new countries, we conducted workshops to explain the methods, including standard transects and conducting 15-minute counts via a smartphone app (see Task 3 report). Materials were also produced to help volunteers identifying butterflies in their regions and conduct standardised counts. Also, to help coordinators set up their scheme and identify relevant stakeholders. In this chapter, we explain how we have supported countries during this project.

## Two years of support: materials

**Butterfly Monitoring Manual**

In new schemes, one of the essential materials is a manual clearly explaining the standardised butterfly monitoring methodology. This is aimed at both coordinators and volunteers. The methodology is described in the Manual for Butterfly Monitoring produced by BC Europe in 2012, but this manual needed to be updated and expanded through the ABLE project. The resulting *Butterfly Transect Count Manual* explains the rules of how to determine a butterfly transect and start systematic monitoring in a simple and clear way. Under the ABLE project, the manual has been translated into six languages, Portuguese, Polish, Spanish, Italian, Croatian and Bulgarian. All versions can be freely downloaded as pdfs on the eBMS website.

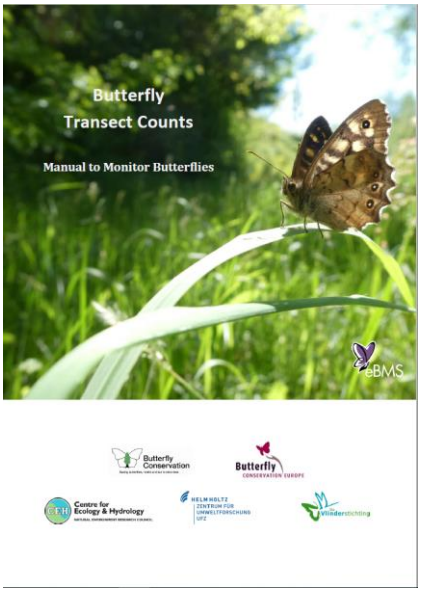


Figure 7. Cover of Butterfly Transect Count Manual

**Butterfly identification material – targeted Field Guides**

Accessible and readily available identification guides are essential to develop Butterfly Monitoring Schemes in new regions. Many European countries have this information in existing Butterfly Atlases, which describe both the species distribution and usually their conservation status. However, national butterfly atlases or identification guides were lacking in several Member States, providing a substantial barrier to the involvement of volunteers in butterfly monitoring.

To address this problem, we created a series of regional Field Guides of butterflies, showing just the species found in each area. The leaflets show the main butterfly species and basic information such as flight period, scientific and common names, size and identification features. These leaflets are available online and can be printed or shared to order.

Italy, the richest country for butterfly species (close to 300 species), does not have a national butterfly guide. Thanks to the collaboration with Italian butterfly experts, we created four field guides covering 72 relatively common species based on the climatic regions of Italy: Mediterranean, Apennines, Padana Plain and Mediterranean islands. The Alps are already well covered by a specific book of the Italian alpine butterflies. Thousands of copies of the field guides were printed and delivered to coordinators in order to distribute among volunteers, stakeholders, protected area staff, and anyone interested in monitoring butterflies in Italy.


Figure 8. Example Field Guide pages created by the ABLE project. From left to right: Andalusia (Spain), Mediterranean islands and Apennines (Italy).

Regional field guides were also produced to promote butterfly monitoring in Spain. Although national books are available, these are expensive and cover many species, so regional guides were developed to encourage volunteers and reduce misidentifications. Two regional field guides were produced, one for the region of Andalusia showing the 93 most common species of the region which is available in Spanish and English and can be downloaded or printed. A second guide deals with the region of Castilla-La Mancha, covering 72 of the more common species. For Portugal, a field guide was produced covering 60 common species. Many hard copies of this booklet have been distributed during workshops and training seminars to support the new Portuguese recorders. A more complete summary of field guides is given in Annex I.

To support the production of further field guides, we have compiled a database of butterfly images, edited from real pictures, that covers more than 200 European species. With this database of images, we can create bespoke guides for any region in Europe to help expand participation in the eBMS. The latest field guides developed by the ABLE project are for Vienna, Slovenia (basic and expert species), Poland, Madeira and Cyprus (under revision, to be placed on eBMS website). In 2020, Madeira Fauna & Flora will be distributing the new Madeira Field Guide funded by ABLE in schools, City Departments and IFCN Nature rangers. This should increase the number of volunteers and counts on this archipelago as well as help the volunteers already doing surveys.

**Photographic Guide and other supporting material**

Other materials produced under the ABLE project include an online pdf to help coordinators teach beginners how to identify different European butterfly families and the species in their area. To help ensuring the correct identification of difficult species, hard copies of the booklet *A Photographic Guide - Butterflies of Central Europe & Britain by Peter Gergely*, were distributed to many country coordinators. This detailed booklet describes how to identify 269 butterfly species occurring in western and central Europe. Copies were distributed to schemes in Bulgaria, Croatia, Austria, Italy, Germany, Poland, Slovenia, Hungary, Czech Republic and Slovakia.

**Butterfly Nets**

In addition to identification material, it was important to provide butterfly nets to help volunteers catch and identify butterflies that need to be examined closely. In most western European countries, there are relatively few butterfly species and volunteers can mostly learn to identify butterflies easily as they walk a transect, but in species rich countries of southern and eastern Europe, where up to

220 species occur over the course of a year, butterfly nets are almost essential to ensure correct identification. Under the ABLE project, 170 butterfly nets were bought and distributed to Italy, Portugal, Cyprus, Bulgaria, Hungary, Poland, Austria, and Croatia.

**Videos**

Because Covid restrictions made it impossible to meet volunteers during the beginning of the 2020 butterfly season, we decided to approach the volunteers in another way. Instead we produced, four videos together with the local BMS coordinators. Two videos were produced in Italian and saved on YouTube. The first video explains the Italian BMS and the eBMS methodology and a second video explains how to use the eBMS website for drawing the transect route and entering the data of the visits. Another video was done in Portugal and promoted via the TAGIS Facebook page, covering in a few minutes how to do transects, why and what you need to do.

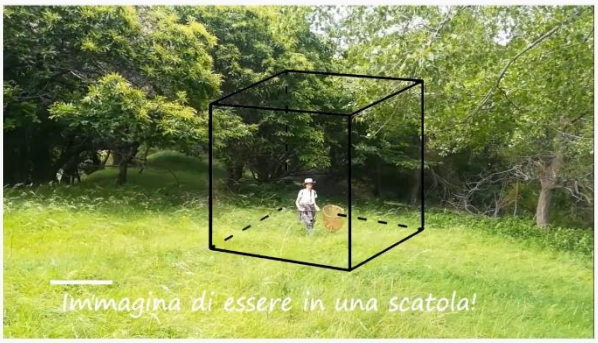


Figure 9. Screenshot of the Italian BMS video

The last ABLE workshop of the Italian BMS will be held online on the 25th of November, a more practical session for volunteers will close the year of butterfly monitoring and another video will be published explaining how to identify *Erebia* butterfly species that occur in the Alps. All the videos will be placed on the eBMS website.

**Direct support**

Some countries required support letters from the ABLE consortium to establish the bona fides of their monitoring networks. Letters were sent to administrative bodies and national institutions in Bulgaria, Portugal, Austria and Hungary to explain the importance of butterfly monitoring and show our support for new monitoring transects.

***Butterfly Count App – complementary methodology of 15-min counts***

The traditional monitoring of butterflies has been done by walking transects, fixed routes visited frequently. However, in some areas and regions this methodology is demanding and cannot be applied easily (e.g., in remote areas, high mountains or areas with low butterfly abundance). A method was needed to fill the gap between rigorous transects and opportunistic records of butterfly locations. Consequently, we developed a new methodology, 15-min counts, based on the highly successful popular scheme running in the UK. The method simply involves counting butterflies for 15 minutes while the app (ButterflyCount) registers your position, either drawing the route walked or manually entering the area monitored. This methodology opens many possibilities of monitoring incorporating new areas and improving BMS together with transects. During the two years of the project, we disseminated the 15-min count app as widely as possible.

The launch of the **ButterflyCount app** was planned for the Future of Butterflies symposium, in April 2020 where the majority of European butterfly experts and scientists were due to be gathered. This symposium was postponed one year and instead, the ButterflyCount app was launched virtually on the website of UKCEH (Centre for Ecology & Hydrology) and spread via social media - Facebook and Twitter BCE account, CEH Twitter account and the website of BCE. We also translated the official launch into three languages, Italian, Spanish and Portuguese and sent it by email to encourage take-up by local volunteers in many countries.

More details of these materials are explained in the Annex I.

## Two years of Workshops, Training Events and Outreach activities

Workshops and meetings were arranged in several countries to help explain the method and advantages of butterfly monitoring, giving guidance on how to establish new schemes and encourage participation. Over the two years more than 20 workshops and training seminars were held in ten different countries involving more than 750 people. Conferences and congresses were also attended to spread our message and participate in discussions at local and European level. Constructive discussions were held with key stakeholders, including Europarc, European Citizen Science Association (ESCA) and European Landowner Organization (ELO). Also, important contacts were made with National Parks and protected areas in target countries to support coordinators and help establish local relations.

**Activities held in countries**

In the first year of the project, workshops were focused on target countries to explain the project and recruit volunteers and scientists to help establish new schemes in Member States. During 2019, eleven workshops and three training seminars were held, with a combined attendance of over 400 people. Some workshops were at a national level to create and announce the creation of the BMS, while others were at the local level to reach a specific audience and committed volunteers. Many workshops were planned for 2020, but several had to be cancelled due to the Coronavirus pandemic. At the beginning of the butterfly season, three training seminars were held in Portugal and one workshop in Italy. After that, despite disruptions due to the Coronavirus pandemic, we worked with coordinators to adapt our plans for developing schemes. For example, we made increased use of virtual and online tools. In the summer and autumn of 2020, seven workshops in five different countries (online/onsite workshops) and four training seminars were held, with reduced numbers of participants in attendance combined, in some cases, with virtual attendance.

The ABLE workshops and other projects were extremely well supported by BC Europe partners and national BMS coordinators, and were greatly appreciated in recipient countries. Over the two years of the project, activities were held in a total of nine countries: Italy, Portugal, Austria, Hungary, Cyprus, Spain, Malta, Poland and Czech Republic.

Figure 10. Participants of the 3rd BMS Workshop Italy in Gran Paradiso National Park

*Italy:* Italy was one of the most active countries and started the Italian BMS early in 2019. Seven regional workshops were organized with the coordinators and one online workshop was held in 2020. Workshops were often held in National Parks, Regional Parks or protected areas to establish a good relationship with these institutes and help to train rangers in monitoring butterflies. Italy is a diverse and long country, so workshops were located from the north to the south and included some of the islands (Elba island and Sicily).

*Portugal*: TAGIS – Portuguese Butterfly Conservation Center held the first National Workshop of butterfly monitoring in Lisbon in May 2019. Here they announced the creation of the Portuguese BMS and gathered together 82 interested people, comprising butterfly experts, volunteers, nature rangers and various governmental and non-governmental institutions. The second national workshop was cancelled due to coronavirus restrictions, so the Portuguese BMS has focused on conducting training seminars to volunteers and rangers. TAGIS started productive collaborations with the Institute of Nature and Forest Conservation (ICNF, Instituto da Conservação da Natureza e das Florestas) in order to promote transects in protected areas. Several seminars were held in the north, center and south of the country, gathering rangers and volunteers from surrounding protected areas. The ABLE project provided the material, butterfly nets and Portuguese butterfly booklet together with the training session run by TAGIS. Also, three training workshops were held for the general public early in 2020.

Figure 11. Participants of training seminar Alentejo e do Algarve (Portugal)

*Hungary:* In 2019, ABLE joined the Hungarian Butterfly Monitoring Workshop in the Cserhát mountains on March 30-31. The event also hosted the annual season-opening field training for the HuBMS transect walkers. It was a great success with over 70 participants from National Parks, other conservation professionals and interested enthusiasts. It was also a good opportunity for the ABLE team to give a presentation on the Project and the current results and status of the European BMS. This event gave us the opportunity to discuss in detail the migration of the HuBMS data to the eBMS database that we are currently trying to achieve. Early in 2020, ABLE provided HuBMS volunteers with butterfly nets. An annual season-opening meeting and workshop was also planned in March involving Hungarian National Parks and ABLE but it had to be cancelled due to the covid pandemic. In addition, HuBMS has actively participated in the testing of the new eBMS ButterflyCount app, an useful tool with great potential provided by the ABLE project. As a result of the collaboration, 15-minute counts are now incorporated in the protocol of Hungary's reporting system to the EU on Natura 2000 species.

Figure 12. Participants of the Hungarian BMS Workshop (Szendehely)

*Austria:* The ABLE project organized two national workshops in Salzburg during 2019, gathering butterfly experts and interested people from the East and West parts of the country. During these meetings, the cooperation with two National parks and other parts of Austria was discussed to establish butterfly transects. As a result of the workshops, a selection of participants gathered together to form the BMS in Austria and decided how best to develop it. A follow-up workshop was planned in March 2020 to present the monitoring program to the public and to launch the BMS in Vienna. Unfortunately, it had to be cancelled because of the Covid-19 pandemic. Despite this, the motivation to develop the BMS continued, and from what had started as a personal initiative by a

few people who wanted to study and preserve butterflies in Austria, they decided to formally establish Austrian Butterfly Conservation (ABC) as a "Verein" (a legally registered society) in September 2020. This group primarily developed activities in and around Vienna and plans to have coordinators in each Austrian region. The work of the group was boosted when they were awarded a grant (innovate4nature) from the Federal Government (BMLRT and BMK), WWF Austria, Impact Hub Vienna and the European Union to protect insects in the country. During the summer of 2020, the grant facilitated several workshops to organize (e.g. business & financial planning) butterfly monitoring in Austria and enabled new connections with important stakeholders in the country. Currently, more transects are planned for next season and more volunteers are getting part of Austrian BMS.

Figure 13. 2nd National Workshop Austrian BMS (Salzburg)

*Cyprus:* The first butterfly monitoring workshop was held in Cyprus in 2019, gathering people from the Turkish Cypriot and the Greek Cypriot communities and with the support and presence of ABLE team. The ABLE project gave the opportunity to involve both communities of the region and bring together people interested in monitoring butterflies to help in the knowledge of Cypriot biodiversity. From that workshop was set-up the Cypriot BMS and starting to create butterfly transects in diverse areas of the island. A second workshop was planned for May 2020 involving BCE member and ABLE team, which was cancelled for the social restrictions applied due to the pandemic.


Figure 14. Participants Cyprus BMS Workshop

*Spain:* A national seminar on butterfly monitoring was held in Spain with the organization of the central co-ordination of Spanish National Parks (IX Seminario de Seguimiento a largo plazo en la Red de Parques Nacionales. Lepidópteros diurnos: aprendiendo sobre el cambio global con las mariposas) on 26-27 September 2019. During this meeting, an update of eBMS and the use of butterfly data was presented, and every National Park involved in Spain BMS showed their advances and challenges to maintain a long-term monitoring system. Furthermore, some thematic sessions were carried out to show practical study cases based in the management of the generated information, application to ecological studies and management actions. Finally, a Newsletter was produced covering the topics included in the seminar. Other workshops were planned in 2020 but had to be cancelled due to coronavirus: for example, in the south of Spain, on 14th March with the transect volunteers of Sierra Nevada National Park, two workshops in the Castilla-La Mancha region for a volunteer audience (Talavera de la Reina and Albacete cities), and the annual entomological conferences of Castilla-La Mancha and Serranía de Cuenca.

Figure 15. IX Seminar butterfly monitoring in National Parks, Valsaín, Spain.

Another action in Spain was the migration of the BMS Spain system hosted in EBD (Estación Biológica de Doñana) to the European BMS system. We made this transfer at the end of 2019 and the beginning of 2020. This task was developed in two phases. First, we transferred all the information from transects to the new system. This allowed the transects to be ready during 2020 to upload counts recorded during this year. In the second phase, we migrated all the butterfly data of the years 2015 to 2019 to the new platform. The new system makes easier the correction of data, the creation of new transects and the use of data for further analyses.

*Bulgaria*: The first workshop for butterfly identification and monitoring training for National Park field staff was held on 20th of July 2020 in the Bansko visitor centre of Pirin National Park. The workshop was attended by rangers, biodiversity experts and the Park's director. In view of the COVID-19 situation, training for monitoring will continue via virtual meetings and lectures, with the goal of starting field trials on established vegetation plots monitored by park staff. The management of the National Park, in common with the management of the remaining two parks, is interested to explore the possibilities of butterfly monitoring for their own biodiversity monitoring obligations as well as for attracting the interest of increasing numbers of visitors. Accordingly, starting 2021 this workshop model will be disseminated to the other two National Parks in Bulgaria (Central Balkan NP and Rila NP), in order to build their in-house capacity for butterfly monitoring.

Figure 16. Participants Czech Workshop October 2020

*Czech Republic:* During 2020, we planned a workshop for the spring before the butterfly monitoring season started. Unfortunately, this had to be canceled due to Covid-19 restrictions. We tried to organise another after the butterfly season and, finally, the Czech BMS workshop was done on 1st of October 2020, in the Eagle Mountains near Deštné. 15 people from Czech Republic and Slovakia gathered together to discuss butterfly monitoring of that year and further promotion in the future. The ABLE team participated online, welcoming the volunteers to the meeting and presenting information on the project and use of butterfly data and Indicators at EU level. The ABLE project covered the cost of the meeting that was organised by the Czech Lepidoptera Society (SOM). They printed promotional material of ABLE and eBMS to be delivered to the BMS volunteers; helped ABLE with translation into Czech of ABLE support materials and the ButterflyCount app; and published ABLE support material and disseminated butterfly monitoring information through the Facebook Page of the Czech Society for Butterfly and Moth Conservation (SOM).

*Poland:* after two years of hard work to get the butterfly monitoring scheme running in Poland, we managed, together with the Polish coordinators, to run the first Polish BMS workshop, online on 23rd and 24th of October 2020. After the cancellation of the workshop earlier in spring in Bialystok, we decided to move the workshop to an online platform provided by the University of Bialystok and invite butterfly experts and amateurs willing to join the project. The Facebook page of Polish butterflies was used to spread the message. The workshop was run twice on two separate days, repeating the same program to maximize participation A total of 80 participants joined over the two days, enjoying and discovering about butterfly monitoring in Europe (presentations of the ABLE team), butterfly's studies and monitoring done in Poland together with the explanation of methodologies and how to submit data to the eBMS website or via the ButterflyCount app. Thanks to this workshop, the Polish BMS was established and several volunteers in Poland have already registered on the eBMS website and promised to monitor butterflies next season.

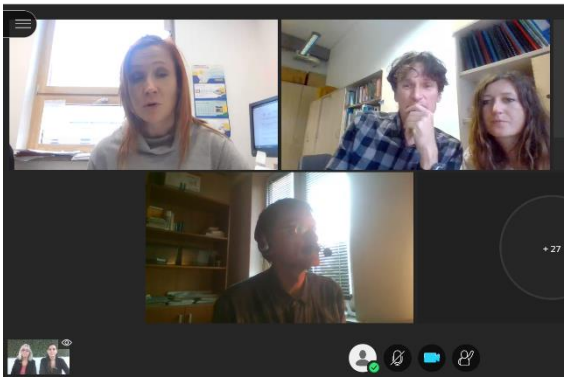

Figure 17. 1st BMS Workshop Poland held online

More details of these activities are explained in the Annex II.

## Dissemination

A crucial element of the project is to disseminate the results to a wide range of groups and stakeholders. The ABLE Project Dissemination Plan is attached at Annex III. To encourage ownership of the results and willingness to use them in policy evaluation and land management for nature, it was essential to communicate with key stakeholders: to listen to their needs and concerns and seek to develop ABLE products in a way which enable them to be used effectively by stakeholders. In pursuit of these aims, ABLE project team members and BCE partners have contributed to meetings and conferences held at EU level throughout 2019 and 2020, mostly online since March 2020, due to Covid-19 restrictions. As part of ABLE, we will be publishing a set of Policy and Information Briefs with conclusions and recommendations for EU and Member States. BC Europe will continue to promote these after the project ends.

Significant meetings, where we have shared knowledge about butterfly monitoring and Indicators, have included the EU Parliament, the ABLE Steering Group, the EU Coordinating Group on Biodiversity and Nature (CGBN), informal meetings of EU Nature Directors and the EU Stakeholder Conference on the Evaluation of the EU Biodiversity Strategy 2010. Subject focused meetings have been held with DG Environment and DG Agriculture, in particular on Monitoring; data analysis; linking data from different sources, including satellite imagery; and using data in policy evaluations and development. Further details are included in Annex III.

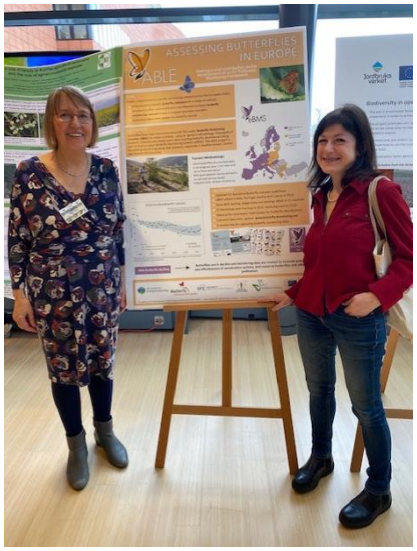


Figure 18. Sue Collins and Simona Bonelli with the ABLE poster in the Pollinator Conference in Brussels

**Conferences**

Participation and presentations by ABLE team members in Conferences have included:

1. Sue Collins gave a presentation to the ELO Conference on Biodiversity in Brussels in

December 2018 and has discussed progress with the Pilot Project on butterfly monitoring with Marie Alice Budniok, Legal Officer of ELO and other colleagues. Dirk Maes has discussed butterfly monitoring with Belgian ELO members and contacts are being followed up with ELO Estate Owners in Austria, Italy and Portugal.

2. Sue Collins participated in the High-Level meeting on the post 2020 EU Biodiversity Strategy in Brussels, May 2019, and highlighted the importance of field monitoring of Biodiversity in the Stakeholder Conference reviewing progress with implementing the EU Biodiversity Strategy 2020, in Brussels, May 2019. This was attended by a wide range of stakeholders including from the agriculture sector and representatives of ICLEI, representing local municipalities and the EU Committee of the Regions. Sue briefed both these representatives on the ABLE project, in the margins of the meeting.
3. Halting the loss of pollinators – Brussels 2020. A poster was presented explaining the eBMS network and the development of the ABLE project. Sue Collins and Simona Bonelli, BCE Partner from Italy gave interview on butterfly conservation and the ABLE Project. These were videos and are available on You Tube and the EU Pollinators Hub on the Web.
4. ECSA Conference – September 2020. Online conference of 5 days with more than 500 participants and 200 speakers. The ABLE project was presented by Cristina G. Sevilleja in the E-poster session, Ecology II: *Consolidating butterfly monitoring with citizen science in Europe: lessons learnt from the Assessing ButterfLies in Europe (ABLE) project*
5. Citizen Science SDG Conference – October 2020. Online and onsite Conference in the Natural History Museum of Berlin. In the session Citizens in biodiversity monitoring, Cristina G. Sevilleja, ABLE network development officer, gave a presentation drawing on experience in the ABLE project: *Engaging citizens will preserve butterflies in Europe: lessons learnt from the ABLE Project*

Butterfly data collected by volunteers has been used to produce the Butterfly Grassland Indicator, which has been published in several international reports, such as the Sustainable Development Goals in EU (SDGs EU, edition 2020) and the Living Planet Index 2020 (WWF, 2020) showing the big decline of grassland butterfly species over almost three decades. The integration of butterfly monitoring data into relevant international reports together with the explanation of eBMS and its growth has been spread and shared in all the ABLE events, seminars and workshops, international conferences, in the media and other platforms as social media and our own newsletters.

**Examples of events for the public include**

- Dissemination of the butterfly monitoring network in Portugal with a short talk "*Censos de Borboletas de Portugal (Portuguese Butterfly Monitoring Scheme*" at the 2nd National Meeting of Citizen Science at Academia das Ciências, Lisboa 24-25.10.2019 (done by the Portuguese BMS coordinator).
- The Butterfly Day in the Netherlands (Vlinderdag, 07/03/2020) is the big event of butterfly monitoring in the country and all volunteers and partners of Dutch Butterfly Conservation are gathered in a theater to present all the updates related to the Dutch monitoring. This year, one of the talks was done to promote the new methodology of butterfly monitoring, 15-min counts and possibilities in the Netherland for an audience of 550 people. Thanks to this event, the 15-min counts are running in the Netherlands and more areas are covered.

**Media**

Two newsletters have been produced under the ABLE project, spreading news and achievements of the project to the BC Europe partners, stakeholders, and BMS coordinators. The first newsletter was published in the autumn of 2019 reaching an audience of 137 subscribers. The second newsletter

was published in spring 2020 reaching 164 subscribers and many more through dissemination via our social media accounts and coordinators who sent copies to their volunteers.

Articles were written in partner newsletters, including in the EBCC Newsletter and the Autumn newsletter of Butterfly Conservation UK. Other articles included one in the Netherlands, Nature Today with an article in English and Dutch, and an article in the magazine Artropos (number 65, 2019). The scheme coordinators did a good job in disseminating the project, eBMS and butterfly monitoring in their countries. In Portugal, there were several reports of butterfly monitoring in local and national newspapers: "*É um "censos para borboletas" e todos podem ajudar a contar. Basta sair à rua*" Público, 03.05.2019 (fig 19); *"Insetos estão em declínio alerta associação que prepara Censos de Borboletas"* SIC notícias, 04.05.2019 ; "*Vai haver um censo de borboletas. E todos podem participar*" Diário de Notícias, 04.05.2019; "*Procuram-se voluntários para contar borboletas em Portugal*" Jornal de Notícias, 05.05.2019, and "*Os Censos de Borboletas à conversa com Edgar Canelas amanhã*" Os dias do Futuro, Antena 1, 29.02.2020. In Italy a news related the new project developing butterfly monitoring in the country was published in a national newspaper, la Repubblica (fig 19). In Spain, a news of butterfly monitoring done with transects under the Spanish BMS appeared in a local newspaper, the richest transect of species of this BMS. In Poland, several articles in national and local journals explaining Butterfly Monitoring Scheme and BCE work: "*Motylowy spacer*" Przyroda Polska, March 2020; butterfly migration " "*Wiedza I Życie, July 2020;* and an interview with the Polish coordinators in the newspaper Polityka "*Szlaczkon na szczodrzencu*", 23.06.2020.


CIÊNCIA

É um "censos para borboletas" e todos podem ajudar a contar

Projecto vai levar as pessoas às ruas para "caçar" borboletas – no bom sentido –, para se analisar a qualidade dos habitats e os impactos das alterações climáticas e se verificar se os insectos estão mesmo a diminuir

Biodiversidade
Cláudia Carvalho Silva

Se as condições certas deixarem de existir, as borboletas vão desaparecer
Eva Montoiro

Retino in spalla Parte la caccia alle farfalle

Figure 19. Two articles of butterfly monitoring in newspapers (upper news in Portugal and bottom news in Italy)

**Social Media**

In Twitter, we promoted the ABLE project via personal accounts of BC Europe partners and from the ABLE team. For example the leader of the project, David B. Roy in his Twitter account created a twitter thread on butterfly monitoring and the use of ButterflyCount app. From the BC Europe Twitter account, we created two campaigns: one in February to highlight the coming butterfly season (*#FebruaryButterflyMonth)* and another campaign during April (*#AprilButterflyMonth*), to motivate people at the start of the European lockdowns. During both months, a butterfly species was published each day, explaining the ecology of the species, special details and population trends. We encouraged people to post pictures of that butterfly with the hashtag we created. The campaigns were a great success with a lot of participation, that allowed us to gain more followers and disseminate better our messages of butterfly monitoring.

In Facebook, the ABLE project was promoted mainly in the BC Europe account, creating posts of news, updates in the website, events or material created. Moreover, other BC Europe partners and BMS schemes with their own account made many posts explaining the eBMS network, helping volunteers with butterfly identification and spreading ABLE events. For example, TAGIS made more than 500 posts on Facebook about butterfly monitoring, focusing on training workshops, transects, volunteer profiling and butterfly species. The Italian BMS was actively promoting eBMS and ABLE

events in several Facebook pages, at regional or national level, with more than 10 posts: ALI- Associazione Lepidotterologica Italiana, Farfalle in Tour, and Lepidotteri di Maremma. Other BMSs disseminated butterfly monitoring and butterfly identification including the Polish page, Bulgarian page, Slovenian page, Czech page, Cyprus Study Butterfly Group page and Spain BMS page.

**Websites**

News about the project, including pdfs of all the materials, was hosted on the BC Europe and eBMS websites. Other partner websites posted information related to butterfly monitoring and the eBMS network, for example:

- Page of the project Censos Borboletas de Portugal, the Portuguese BMS, at the TAGIS site http://www.tagis.pt/portuguese-butterfly-monitoring-scheme.html
- Regional collaborator Italian BMS: https://www.museonaturalemaremma.it/ebms-monitoraggio-farfalle/
- ALI- Associazione Lepidotterologica Italiana: https://www.lepidoptera.life/ali-supporta/
  Regional collaborator Italian BMS: https://www.unagarlanda.it/

More details of the dissemination actions are explained in the Annex III.

## ABLE meetings for BMS coordinators

**Laufen Meeting**

The first meeting of the partners in the project was held at the conference center in Laufen (Germany) from 3rd to 5th of December, 2019, courtesy of ANL (Bavarian Institute of Landscape and Conservation). The meeting brought together 59 people from 29 countries and a mix of talks and workshops to share information on ABLE and monitoring across Europe. Talks were also given on related activities such as the new EU Pollinator Initiative and the Pan-European Common Bird Monitoring Scheme. The meeting was a great success and helped build momentum to develop butterfly monitoring across Europe.

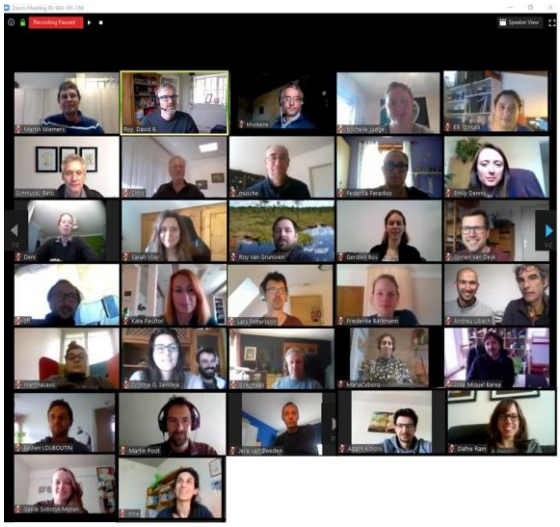

Figure 20. Participants in the online workshop "Calculating butterfly trends, indexes and indicators"

**Technical workshops for BMS Coordinators**

We were due to hold a pre-meeting at the Future of Butterflies Conference in the Netherlands in 2020, but this was postponed due to the Coronavirus restrictions. Instead, we held a virtual workshop on the 1st of April 2020, called '*Calculating butterfly trends, indexes and indicators*' with 35 attendees to learn about the new R package (rbms) that has been developed under the ABLE project to calculate population trends from butterfly transect data. The workshop was held by Zoom, which enabled us to record the session and share the guidance materials online. All the details of the workshop, including recordings are available via the eBMS website. This workshop helps to build the community of BMS coordinators across Europe as well as share ideas and suggestions for the schemes.

**BMS Coordinator Workshop – ABLE online meeting**

At the end of the ABLE project, another workshop was held to share the final ABLE results and get feedback from the coordinators. The workshop was called "*BMS Coordinators Online Workshop*", and was held on the 28th and 29th of October 2020with over 50 participants from 25 different countries. We prepared two days of presentations showing the final results and objectives achieved in the ABLE project. It was a successful meeting, using break-out group sessions to receive feedback from the participants and identify actions and needs for the future. All the presentations of the workshop can be found on the eBMS website.

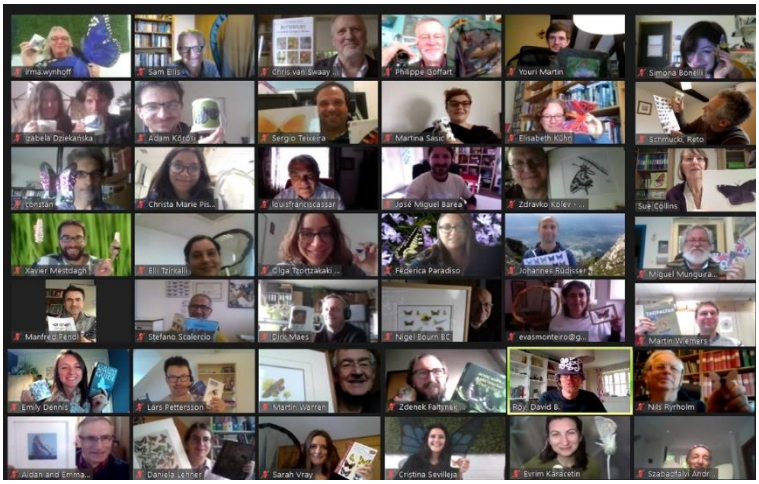

Figure 21. Participants in the final ABLE online workshop

More details of these meetings/workshops are explained in the Annex IV.

# Chapter 4 / Lessons learnt – success factors for developing citizen science monitoring schemes

## Capacity Building

A crucial part of developing a stable and sustainable cost-effective butterfly monitoring scheme in Europe is to build capacity in all countries and regions. This encourages countries to be independent, and supported wherever possible by regional/national administrations, institutions or other funds to cover the minimum costs of a BMS. It is important to communicate that running a monitoring scheme by volunteers does not mean that it is free of any cost. Effective monitoring needs a professional coordinator to help and support the volunteers, promote the scheme, collect the data in an efficient way, give feedback and produce national trends and indicators. Several points are crucial for the creation of a sustainable monitoring scheme:

- Apply the knowledge from existing BMSs, sharing best practice but combining knowledge and experience of differences in cultural identity and habits between countries and regions. The popularity of citizen science has been a crucial starting point for countries like the United Kingdom and the Netherlands, however, the same culture doesn't occur in central and eastern countries, where the involvement of the general public in environmental problems is different. In these countries, far more effort is needed to identify and support citizen scientists.
- Identify the starting point to set-up a BMS, listening to the coordinators and local people. In order to start a new BMS, it is vital to distinguish the current status of the country/region based on the knowledge of local people and butterfly experts in the area. The best actions can then be identified to establish a Butterfly Monitoring Scheme.
- Involvement of everyone. To avoid sensitivities and future problems, it is recommended to include all people who show interest in participation and anyone who has been working a long time with butterflies or any other part of nature. That could include scientists, butterfly experts, professionals, photographers, amateurs, NGOs, and nature associations.

- Celebrate and encourage every step forward. Every country is starting at a different point in the creation of a BMS, therefore it is essential to recognise and celebrate every step forward.
- Working in a coordinated way across the EU. The strength of the eBMS is that it brings together information from across Europe. Data from every country is vital to make representative European trends. By working together, we can share information on how to analyse data, create robust indicators, and how to develop the quality and quantity of national schemes.
- Coordination and support from the ABLE project team has been essential to engage Member State coordinators and put their experiences and results in a European context.

**Ensuring scientific credibility in monitoring schemes**

European Butterfly Monitoring Schemes (eBMS) have several important features which are essential to their scientific validity, quality and usefulness. These are:

- Standardised methodology
- Identification by trained citizens
- Validation of observations
- Counting of butterfly abundance (not just presence)
- Frequent monitoring - up to fortnightly throughout the season, every year
- Methodical reporting
- Capturing data in a single database
- Calculating indicators
- Disseminating results
- Feedback to volunteers
- Sound data sharing agreements
- Providing data for research

Wherever possible these features need to be included in the development of new citizen science monitoring schemes for other pollinators.

# Chapter 5 / Conclusions

**Conclusions - Butterfly Indicators can support the transition to a healthier environment**

The EU State of Nature Report shows that biodiversity and ecosystem health are in a poor state, and at risk of further declines. No EU Member State Government has carried out long term, systematic and frequent field monitoring of insects. Research shows that insects and the habitats they depend on are declining and under pressure. Pollination services are also at risk.

Citizens across Europe have been studying and systematically monitoring butterflies in the field for many years. The eBMS database bringing together this data and produces indicators that are an invaluable resource for research and policy evaluation. Butterflies are charismatic insects and a good proxy for the state of insect biodiversity.

Recognition of the importance of eBMS data is growing. The ABLE project, supported by €800,000 of funding, voted by the EU Parliament, has helped BC Europe and its partners to recruit and train coordinators and volunteers, to provide support via materials and tools (such as the innovative ButterflyCount App), calculate Indicators, and raise the profile of the value and usefulness of butterfly monitoring.  The project has helped establish Butterfly Monitoring Schemes in ten

additional EU(27) Member States, bringing the total of EU(27) BMS to 22 EU Member States. These schemes supply quality data and, by using trained citizen scientists, offer excellent value for money.

Further developments are required to sustain schemes, especially the ten schemes newly created in ABLE. Action is also needed to fill data gaps, develop additional tools for analysis and data integration and ensure existing data is used in policy evaluation at EU and Member State levels.

Continuing financial support is needed to sustain and enhance butterfly monitoring at MS level and produce representative trends for more species. Citizens have shown they are willing to step up and give their time freely to walk transects, count butterflies and report data in a coordinated way to serve the public interest. However, four EU Member States - Denmark, Greece, Romania and Slovakia have no BMS scheme at present and Latvia would like to establish a volunteer based scheme to add more transects to the data collected by professionals.

The EU court of Auditors calls for pollinator monitoring to check the effectiveness of policy measures and incentives, particularly in the agriculture sector where both intensification and abandonment drive losses. Butterfly monitoring results can be used to inform the needs analysis and measures to restore biodiversity and ecosystems in MS's future CAP Strategic Plans. Forestry Strategy needs to embrace measures to help butterflies and other pollinators, such as including more sunny rides, open grassland areas and biodiversity edges to support butterfly recovery.

There have been huge declines in butterfly abundance over many decades. Surveys show most butterflies of European importance are now in unfavourable conservation status and are at risk of further declines. Semi-natural grassland habitats of European importance are also mostly in unfavourable conservation status according to EU MSs' Article 17 Reports. It is important to note therefore that the 1990 baselines for eBMS Indicators were already at a low level of population abundance and the Indicators are tracking declines at the tail end of this long history of declines, or indicating the start of recovery from this very low base

Furthermore, the eBMS trends are highly likely to underestimate the declines in butterflies overall; particularly trends for rare and threatened species and for those species dependent on agroecosystems. This is due to a deficiency in data for both rare species and farmland transects. We recommend investment in filling these data gaps urgently and investing in developing tools and expertise to gather and integrate data from various sources. This requires support from EU MSs to build on the ABLE project, extending volunteer butterfly monitoring schemes (eBMS) and investing in the planned implementation of the overarching Pollinator Monitoring Framework implementation.

It may be good news if indeed we have reached the bottom of the declines in some areas. What is now required is to reduce the pressures and threats (which are well documented in research and EU MS's own Art17 Reports) and to make significant investments to ensure the positive management of all Protected Areas. Well-designed restoration efforts are also needed to achieve a real recovery of butterfly and other insect populations to a safe and resilient level across all habitats.

Experience demonstrates that effective conservation and recovery of butterflies, moths and other pollinators and their habitats is enhanced where citizens come together in NGOs and work positively with landowners, municipalities and Agencies, including National Park Authorities. During ABLE two new Butterfly Associations have been established in Italy and Austria. More are in development.

## Recommendations for EU and MSs

1. Use eBMS butterfly data and indicators for EU policy design; to inform resource planning, especially MSs' Prioritised Action Frameworks (PAFs); and to track, evaluate and adjust EU and MSs policy implementation to help reverse pollinator declines.
2. Use MS and Article 17 data on butterflies to design effective CAP Strategic Plans; to ensure Forestry plans include more grassland refuges and herb rich rides and edges; and that urban planning and regional developments invest in pollinator habitats.
3. Use available eBMS data to strengthen the quality of assessments of conservation Status of Habitats Directive listed Habitats and species in meeting mandatory reporting requirements under Art 17 of the Directive
4. Invest in linking butterfly data with land use and management data, including implementation of Natura 2000 Management Plans, Land Parcel Information system and Satellite data to help evaluate conservation effectiveness
5. Support additional monitoring of rare and vulnerable butterflies (including endemics and those not listed on the Habitats Directive) and designate some additional Protected Areas to sustain and enhance the quality of remaining areas that are important for these Red Listed butterflies and so prevent further extinctions
6. Invest in further capacity building and cooperation among citizen scientists, professionals, farmers and authorities to monitor and record abundance of butterflies, moths and other pollinators, including supporting coordination, training and growth of citizen science eBMS schemes (as recommended by EU Pollinator Expert Group); filling data gaps and developing tools and expertise to gather and integrate data from various sources.
7. New citizen science Butterfly Monitoring Schemes are needed in Denmark, Greece, Latvia, Romania and Slovakia. Together with further support for the ten schemes newly created in ABLE.

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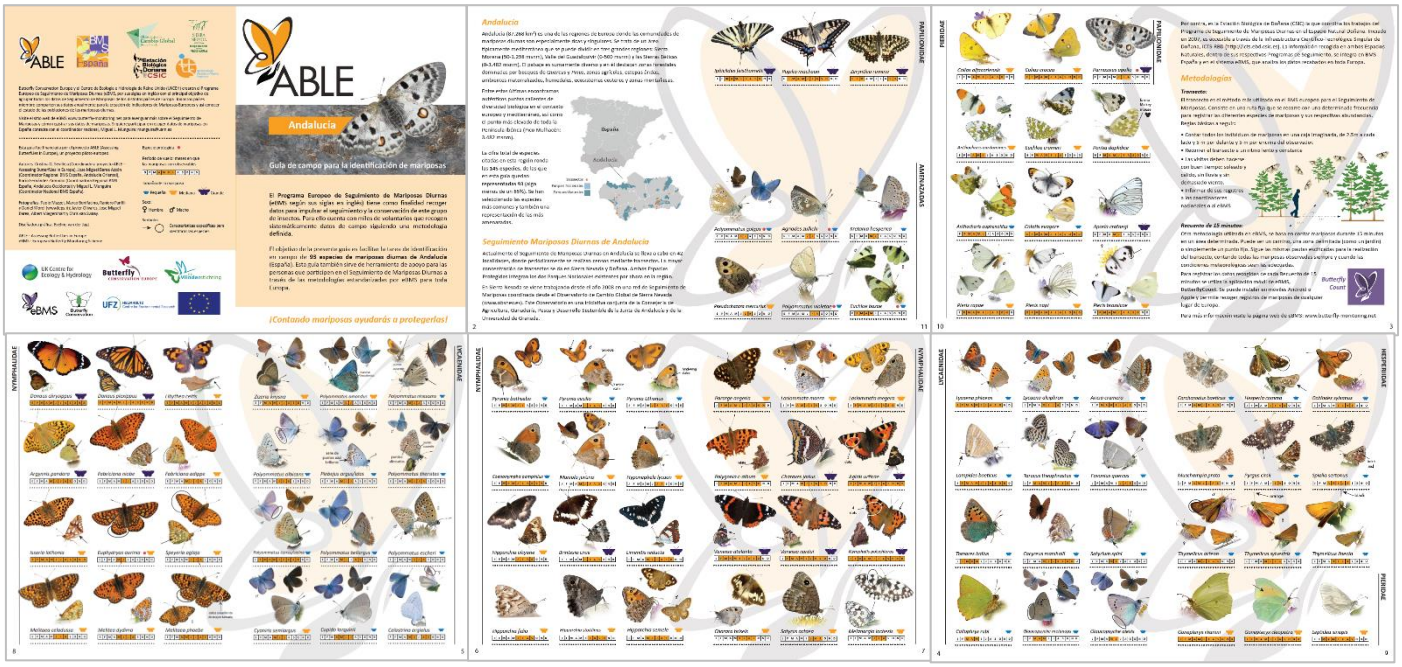
# Annex I / Materials

List of all materials produced in the ABLE project:

1. **Eleven Field Guides**: 6 regional Field Guides completed (Spain: Castilla-La Mancha and Andalusia and Italy: Mediterranean, Padana plain, Mediterranean islands and Apennines) and 5 under revision to be finished in November 2020 (Poland, Slovenia, Cyprus, Madeira and Vienna).

Field Guide of Andalusia: available in English and Spanish





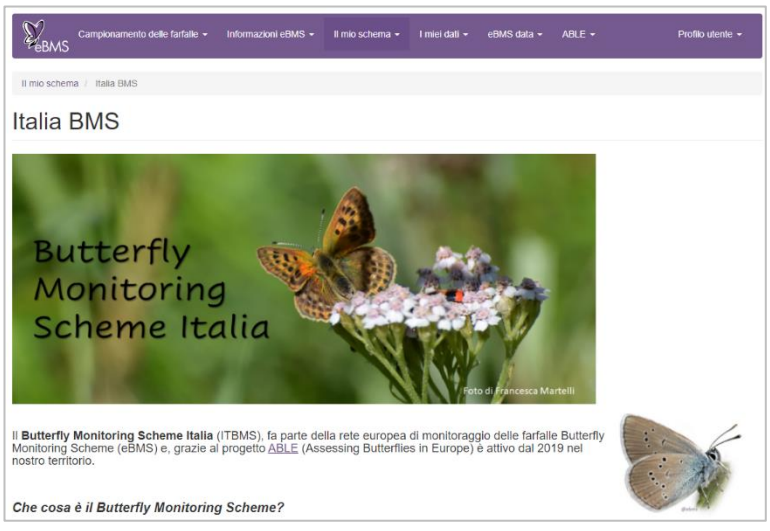





Field Guide of Castilla-La Mancha: available in English and Spanish

The four field Guides of Italy by regions: available in Italian


2. The **booklet** of "Guia das Borboletas Comuns de Portugal Continental" - Common Species of Portugal (Mainland)
3. Power point ***Discovering the Butterfly World*** for teaching and training volunteers in butterfly identification and monitoring.
4. The **ABLE project** **has dedicated pages** in a section on the long established eBMS website showing all the results and news of what has been achieved during the two years of the project.
5. Country Scheme Webpages: **National BMS pages** on the eBMS website were produced in English and translated into the mother tongue for Austria, Bulgaria, Croatia, Czech Republic, Cyprus, Hungary, Italy, Luxembourg, Portugal, and Spain.
6. **Monitoring Manual**
   - English
   - Portuguese
   - Polish
   - Italian
   - Spanish
   - Bulgarian
   - Croatian

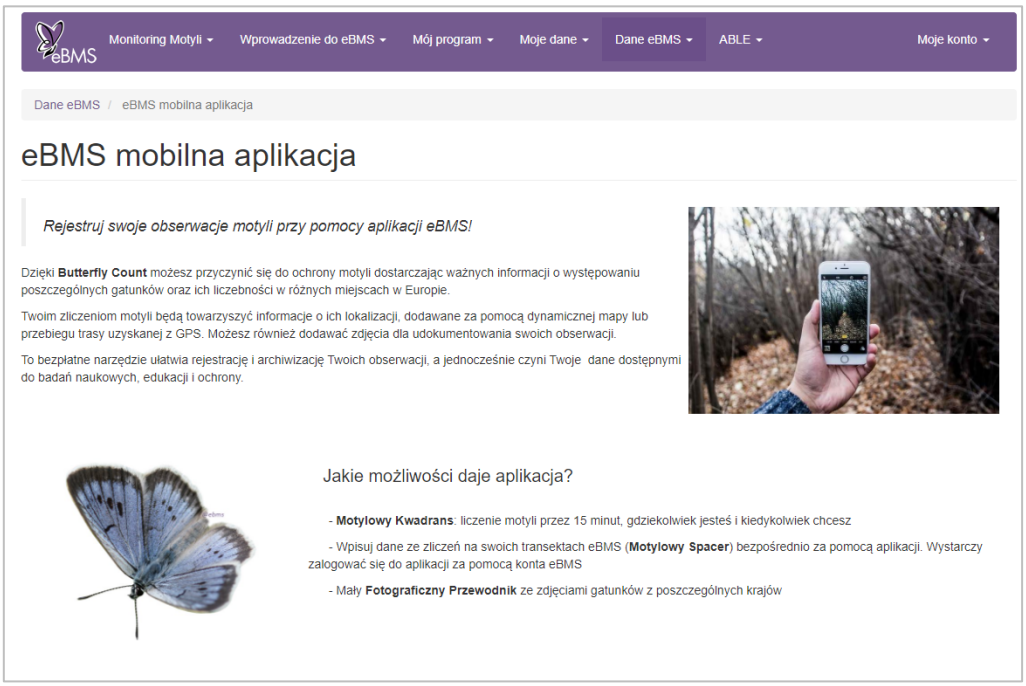


Screenshot of the Italian BMS page on the eBMS website

7. Guidance: several guidance documents were created to explain better the use of the eBMS website (how to create transect routes, input visit data and visualise the data) and the use of the new eBMS ButterflyCount App. The guidelines were translated into several languages for a better comprehension by the volunteers and to facilitate the data collection.

- **eBMS input data Guidelines are now in**: Italian, Portuguese, Spanish, and Slovenian
- **ButterflyCount App Guidelines are now in**: Italian, Portuguese, Spanish, Polish and Slovenian

Screenshot of the ButterflyCount app Guidelines translated into Polish




8. Three **Training Videos**: two in Italian; explaining the Italian BMS & methodology and registrations of data in eBMS) and one explaining the BMS in Portuguese
9. Butterfly Count App translated into **17 languages** in the website Transifex to track the translation process and include the translations in the App: German, Bulgarian, Croatian, Czech, Hungarian, Italian, Portuguese, Spanish, French, Dutch, Serbian, Lithuanian Swedish, Finish, Russian, Polish, and Turkish.
10. We bought **170 butterfly nets** and delivered to nine countries: Italy, Portugal, Cyprus, Bulgaria, Hungary, Poland, Austria, Croatia, and the Czech Republic.
11. We made **1250 buttons** of European Butterfly Monitoring Scheme and delivered in different events and to BMS coordinators and volunteers.
12. General information **eBMS leaflet**: we printed 1500 hard copies of leaflet in English, 250 hard copies in Italian, and 250 hard copies in Greek. This leaflet was also translated into Spanish and German.
13. The ABLE project bought **200 hard copie**s of the excellent booklet "A Photographic Guide - Butterflies of Central Europe & Britain" by Peter Gergely and we delivered this guide to the collaborating countries (Italy, Portugal, Cyprus, Bulgaria, Hungary, Poland, Slovenia, Austria, Croatia, and the Czech Republic) to aid volunteers with identification.


Design printed on the eBMS buttons

# Annex II / Activities held or planned during the ABLE project

Workshops and meetings were arranged in several countries to help explain the method and advantages of butterfly monitoring, giving guidance on how to establish new schemes and encourage participation. We had extensive contact with coordinators by email and Skype meetings to track the process of the activities and to approach the development of butterfly monitoring. We supported coordinators and gave advice on best practice on running schemes and sharing successes.

Adjustments to the Programme of Volunteer recruitment and training in 2020 due to Covid-19 restrictions and to keep participants safe

Field training of volunteers in butterfly identification took place in several countries during the 2019 butterfly season and new transects were set up and butterfly abundance recorded. From February 2020 the effect of the Covid-19 virus in Europe began to become apparent; leading first to restrictions in Italy on gatherings and meeting individuals from other households and later to lockdowns nearly all over the EU. We had to adapt our modus operandi accordingly – moving meetings on line, making training virtual through both videos and on-line events and accepting that fewer transects could be walked in 2020, because of the restrictions. Despite these limitations, many volunteers stepped up to learn about butterfly identification, monitoring and reporting and went out into the field to practice their skills and report data, whenever this sort of activity was permitted within their areas or countries.

**Progress with establishing BMS scheme across the EU(27)**

New BMS schemes begun during ABLE

| | Coordinator | Workshops | Translated Material | Webpage on eBMS | Volunteers | Transects | Data collected | Data Shared | Butterfly NGO |
|---|---|---|---|---|---|---|---|---|---|
| **Austria** | x | x | x | x | x | x | x | | x |
| **Bulgaria** | x | x | x | x | x | x | x | | |
| **Croatia** | x | | x | x | x | x | x | | |
| **Cyprus** | x | x | x | x | x | x | x | | x |
| **Czech Rep.** | x | x | x | x | x | x | x | x | x |
| **Hungary** | x | x | x | x | x | x | x | x | x |
| **Italy** | x | x | x | x | x | x | x | x | x |
| **Malta** | x | x | x | x | x | | | | |
| **Poland** | x | x | x | x | x | x | x | | x |
| **Portugal** | x | x | x | x | x | x | x | x | x |

New Schemes still needed

| | Coordinator | Workshops | Translated Material | Webpage on eBMS | Volunteers | Transects | Data collected | Data Shared | Butterfly NGO |
|---|---|---|---|---|---|---|---|---|---|
| **Denmark** | | | | | | | | | |
| **Latvia** | | | | | | x | x | | |
| **Greece** | | | | | | | x | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Slovakia** | | | | | | | | | |
| **Romania** | | | | | | | x | | |

NB. 12 EU(27) Member States had already stablished or fledgling BMS: Belgium, Estonia, France, Finland, Germany, Ireland, Lithuania (dormant), Luxembourg, Netherlands, Slovenia, Spain, Sweden plus, in the EU(28), United Kingdom.

## Workshops and training seminars in 2019-2020

*Table 1. Summary of workshops/seminars planned, held or attended in 2019.*

| Country | Place | Attendees | Date | Description/ approach | Outcome |
|---|---|---|---|---|---|
| Hungary | Szendehely, Hungary | 32 | 30/31-03 - 2019 | 1st Workshop, National Butterfly Monitoring Programme to encourage volunteer. It was attended for the presentation of the ABLE project. | Better relation was stablished with the national coordinator and some Hungarian National Parks in order to share data to eBMS. |
| Austria | Salzburg University, Salzburg | 26 | 30-04-2019 | 1st Workshop Austrian Butterfly Monitoring Scheme. Gathering for first time butterfly experts from all regions, improving the relation and collaboration between them. | The workshop brought the aspiration for a butterfly monitoring in Austria and established connection internationally |
| Portugal | Stadium José Martins Vieira, Almada, Portugal | 82 | 04-05-2019 | Workshop ABLE: Avaliar BorboLetas na Europa. More than 80 people among experts, volunteers, nature rangers, administrations…. to present Portuguese BMS and eBMS. | Disseminated the idea of participation in a European butterfly community with eBMS. Improved relations with regional stakeholders |
| Italy | Sila National Park, Calabria, south Italy | 34 | 21-06-2019 | 1st National Italian BMS Workshop. Announce in the douth of Italy the new creation of the Italian BMS and the possibilities of participation. | Encourage Sila National Park to adopt butterfly monitoring and gather volunteers from the area. |
| Portugal | Paisagem Protegida da Arriba Fóssil da Costa de Caparica (protected area) | 13 | 29-06-2019 | Training seminar for rangers of protected areas surrounding. Portuguese coordinator (TAGIS) provided the seminar teaching methodology and butterfly identification | Creation of butterfly transects in four different protected areas surrounding Lisbon. |
| Italy | University of L'Aquila and National Park Gran Sasso e Monti della Laga, central Italy | 20 | 08-07-2019 | 2nd National Italian BMS Workshop. Make the Italian BMS known in the center of Italy, involving the National Park Gran Sasso e Monti della Laga as well the University of L'Aquila | Encourage the National Parks from the area to monitoring butterfly and motivate potential volunteers of the surroundings. 2-3 transects created |
| Italy | Cogne, Aosta Valley, National Park Gran Paradiso, Alps area | 25 | 19-07-2019 | 3rd National Italian BMS Workshop. First Italian Transect of the BMS. Gather rangers from the surrounding National parks and train them in but. identification | Give support to the first Italian National Park involved in the BMS and promote more monitoring in the Alps. |
| Italy | Botanic Garden Calabria | 6 | 24-07-2019 | A miniworkshop was held on the local botanic garden to teach local volunteers butterfly monitoring methodology. | As a result, a few transects are running in Calabria, one in this botanical garden |
| Cyprus | 'The Home for Cooperation', Nicosia | 26 | 04-09-2019 | 1st Workshop of the Cyprus Butterfly Monitoring Scheme. Gathering for first time butterfly experts from all regions. | Disseminate the BMS among amateurs and interested butterfly people. This gave the opportunity to participate in eBMS and take part in the European |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | butterfly community. Support 2 transects to be established |
| Italy | Elba Island, Arcipelago Toscano National Park | 25 | 04-09-2019 | Promote more monitoring in the islands. 4th National Italian BMS Workshop | Encourage Arcipelago Toscano National Park for butterfly monitoring and the president of Fedeparchi (manager of all National Parks in Italy). 2 new transects |
| Italy | Ticino Regional Park, north Italy | 50 | 10-09-2019 | Encourage Regional Park of the area for butterfly monitoring and gather volunteers from the area. 5th National Italian BMS Workshop | 2 transects created inside the park by the rangers who coordinate other volunteers outside the park. Thanks to this synergy other transects have been drawn outside of the park (6-7). |
| Portugal | Vila Real, Natural Park do Alvão | 13 | 16/17-09-2019 | Training seminar for rangers of protected areas of the north. Portuguese coordinator provided the seminar teaching methodology and butterfly identification | Creation of butterfly transects in five different protected areas surrounding Vila Real (north Portugal). |
| Austria | Salzburg University, Salzburg | 20 | 18-09-2019 | 2nd Workshop to define the final methodology, dissemination plan and materials to provide to the volunteers. | Austrian BMS was created defining the organization group and a draft of 2020 actions. |
| Spain | National Education Center, CENEAM, Valsaín, Segovia | 35 | 25/27-09-2019 | 1st Seminar of Butterfly Monitoring in Spanish National Parks organised by National Institution of National Parks. ABLE project was presented and different challenges in butterfly monitoring were approached. | Disseminate eBMS and ABLE project. Better relations established with the Spanish regional coordinators to help in the expansion of the BMS Spain. |

*Table 2. Summary of workshops/seminars planned, held or attended physically or online in 2020.*

| Country | Place | Attendees | Date | Description/ approach | Outcome |
|---|---|---|---|---|---|
| Portugal | Parque Ambiental de Santa Margarida | 19 | 29-02-2020 | Training seminar for volunteers of the center of Portugal in order to impulse the monitoring in the area. | Several transects have been set up on the surroundings |
| Portugal | Reserva Natural das Lagoas de Sto André e da Sancha | 15 | 03/04-03-2020 | Training seminar for rangers of the surrounding area, in the south and west of Portugal. Portuguese coordinator provided the seminar teaching methodology and butterfly identification | Some transect has been created in this reserve and rangers of surrounding areas will plan other transects in their reserves. |
| Portugal | Quinta do Peral, Sao Brás de Alportel. Alentejo e do Algarve | 24 | 07-03-2020 | Seminar for rangers and volunteers in the south of Portugal. | This event helped to |
| Italy | Museo di Storia Naturale della Maremma,Grosseto | 14* | 07- 03 -2020 | 6th Workshop, National Butterfly Monitoring Program to encourage local volunteers. The ABLE project was presented, together with presentations from National and regional coordinators | Support and establish a better relationship with a new regional coordinator and train committed volunteers in butterfly methodology and submission of data to eBMS platform. |
| Portugal | Museu Oceanográdico, Portinho da Arrábida | - | 14-03-2020 | Cancelled due to Covid-19 | |
| Spain | Parque National Sierra Nevada, Granada | - | 14-03-2020 | Cancelled due to Covid-19 | |

| | | | | | |
|---|---|---|---|---|---|
| | Jardín Botánico de Albacete | - | 28-03-2020 | Cancelled due to Covid-19 | |
| | Reserva Fluvial del Guadyerbas. Talavera de la Reina | - | 02-04-2020 | Cancelled due to Covid-19 | |
| Austria | Vienna | - | 20-03-2020 | Cancelled due to Covid-19 | |
| Hungary | Budapest | - | 27/29-03-2020 | Cancelled due to Covid-19 | |
| Bulgaria | Pirin National Park | 15* | 20-07-2020 | The park staff step forward, as well as the basic methodology and goals of transect butterfly counts. A selection of butterfly species characteristic for the park were presented. | The management of the National Park gave possibilities of butterfly monitoring for their own biodiversity monitoring obligations and the involvement of visitors |
| Italy | Cascina Piemonte, Turin, Piedmont | 25 | 12-09-2020 | Mini training seminar for local citizen with practical activities to show the Pollard walk method and the App potentiality. | Disseminate the project, the method and the 15 minutes count in an urban park in which are already active 2 BMS transect. Involve and encourage citizens to count butterflies in their garden, balcony etc. |
| Italy | Ente Parco Regionale delle Madonie, Sicily | 16* | 21-09-2020 | 7th Workshop, National Butterfly Monitoring Programme to encourage local volunteers. ABLE/eBMS and National BMS presentations were streamed by an online platform. The rest of the coordinators were present. | Disseminated the idea of participation in a European butterfly community with eBMS and Italian BMS. Good connection done with local stakeholders in Sicily. 4 new transects will start next season counting butterflies in Sicily. |
| Czech Republic | Deštného, Plasnice | 15* | 2-10-2020 | People from Czech Republic and Slovakia gathered together in the annual meeting the Czech Lepidoptera Society prepared every year. ABLE covered the costs. | In this workshop, eBMS website and app functionality was explained to promote an easier way to collect data and spread 15-min counts in Czech Republic. |
| Poland | Bialystok (online workshop) | 80 | 23/24-10-2020 | The First National Polish BMS Workshop was held online, in two days where the program was the same. This online workshop allowed the participation of Polish from the whole country spreading better our message. | A great participation and enthusiastic from the participants showing willingness of starting butterfly counts in Poland and registering data on the eBMS website and app. Polish BMS was set up. |
| Malta | National Museum of Natural History (onsite and online participation) | 32 | 23-11-2020 | The First National Malta BMS Workshop was organized by the Institute of Earth Systems of the University of Malta and the natural history museum of Heritage Malta. It will be held at the National Museum of Natural History and various participants could join online. | The importance of monitoring butterflies in Malta is established and some transects and monitoring counts will commence during the next butterfly season. |
| Italy | Dolomiti Bellunesi National Park (online Workshop) | 78 | 25-11-2020 | 8th Workshop, National Butterfly Monitoring Programme to encourage local volunteers. presentations were streamed by an online platform. | Practical part dedicated to *Erebia* identification, transect selection, data entering to the website and the app. |

**Reduced number of attendees due to Covid-19 restrictions.*

Hungary

Cyprus

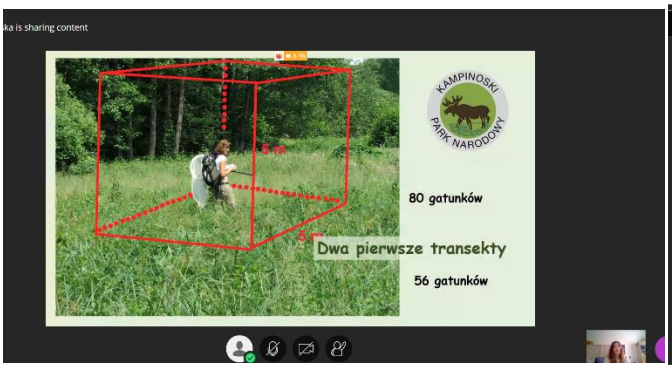
Italy

Austria



Portugal


## Poland




## Czech Republic

## ABLE team

# Annex III / Dissemination

Dissemination plan for ABLE

A crucial element of the project was to disseminate the results to a wide range of groups and stakeholders. To encourage ownership of the results and willingness to use them in policy evaluation and in reflecting on land management for nature, it was essential to communicate with key stakeholders from the outset of the project. To listen to their needs and concerns and seek to develop ABLE products in a way which enable them to be used effectively by stakeholders. The ABLE Dissemination Plan is shown below.

Kick-off meeting of the ABLE project (Brussels January 2019)

These goals were met by contributing to meetings and conferences held at EU level, including the EU ABLE Steering Group, the EU Coordinating Group on Biodiversity and Nature (CGBN), informal meetings of EU Nature Directors and subject focused meetings with DG Environment and DG Agriculture, in particular on Monitoring, data analysis, linking data from different sources, including satellite imagery and using data in policy evaluations and development. Participation and presentations in Conferences have included.

**Main target audiences**

| **Audience** | **Details** |
|---|---|
| BC Europe partners and existing eBMS organisations | Currently 38 organisations in 35 countries plus GBIF, EU BON, BIP |
| EU and international officials and Agencies | MEPs, DG Env, (Biodiversity, Nature, LIFE, Pollinators, Agriculture, Sustainable Development) DG Agri, DG Clima, EEA, EU Biodiversity Topic Centre JRC, Council of Europe, BIP/CBD Secretariat, Eurostat |
| Key stakeholders | Eg European Habitats Forum (NGO networks); Natura 2000 Users Forum |
| Monitoring volunteers | Over 5,000 current volunteers plus new volunteers |
| Scientific community | Eg EU Expert Group on Pollinators |
| EU Member States | EU MS Nature Directors and MS Nature Agencies. EU Agriculture Ministries |
| National Park Authorities | EU MS National Park officers and national NP coordinators |
| Public | European citizens demonstrating interest through Facebook, and Twitter use, |

| | |
|---|---|
| Press | Press Releases circulated |

**Key messages**

ABLE's range of Dissemination Activities

Knowledge about the project and its progress and products has been disseminated via the following methods:

1. Creation and maintenance of a dedicated ABLE website (www.europebutterfly.net).
2. Creation landing pages on the BC Europe website to take readers to the ABLE site.
3. Production of ABLE newsletters sent to partners and stakeholders. Also made available to all via the ABLE and BC Europe websites. Promotion on social media.
4. Briefing sessions with key stakeholders including representatives of DG Environment, DG Agriculture and Rural Development and in due course, if possible, with DG Clima and others eg the EU Joint Research Centre (JRC), Eurostat, EEA, Council of Europe, CBD Secretariat.
5. Meeting with key MEPs to report progress on the project
6. Presentations about ABLE, by invitation, at key meetings and conferences
7. Production of scientific reports and papers.
8. Meetings of ABLE partners, including new Butterfly Monitoring scheme coordinators, in Laufen, near Salzburg, 4-6 December 2019. And online in April and October 2020
9. Feedback, including summaries of progress, learning and results, for volunteers, to be published in annual monitoring reports of ABLE partners.
10. Use of existing BC Europe Twitter and Facebook accounts to promote the project as well as those operated by BC Europe partner organisations. These collectively have a reach of over 180,000 people on Facebook and over 65,000 people on Twitter.
11. Production of occasional press releases and briefings at the start of the project and as opportunities arise

The ABLE dissemination aims, outlined above, have been met, including by contributing, throughout the project to meetings and conferences held at EU level. These have included the EU ABLE Steering Group, the EU Coordinating Group on Biodiversity and Nature (CGBN), informal meetings of EU Nature Directors and subject focused meetings with DG Environment and DG Agriculture, in particular on Monitoring, data analysis, linking data from different sources, including satellite imagery and using data in policy evaluations and development. We plan to continue to brief citizens and a wide group of potential users of ABLE project results by email and through social media and meetings over the coming months, after the ABLE project ends.

Examples of participation and presentations in EU level stakeholder meetings and Conferences, held from December 2018 to 2020 include:

**EU Parliament**

Presentations on ABLE were given by Josef Settele, Chris van Swaay, David Roy and Sue Collins to EU Parliament MEP Gerbrandy and MEP assistants, in Brussels on 19 March 2019. We discussed relevant policy issues, including the importance of biodiversity monitoring and indicators and the necessity of CAP reform shifting more resources into supporting environmentally friendly farming and securing recovery of butterflies and other pollinators.

**EU Commission and EU Presidency chaired meetings with EU Member States and Stakeholders**

The EU Coordinating Group on Biodiversity and Nature (CGBN) on 13 March 2019, Item 5 discussion of the DG Environment Paper on "Addressing biodiversity data and information gaps to support the post-2020 agenda". Sue Collins briefed the EU Member State officials, the EU Presidency, EU

Commission representatives, the EEA and stakeholders present about the ABLE project and the importance of supporting butterfly abundance monitoring; the need for monitoring of other pollinators; and the relevance of butterfly indicators for policy evaluation.

Sue Collins participated in the High-Level meeting on the post 2020 EU Biodiversity Strategy in Brussels, May 2019, and highlighted the importance of field monitoring of Biodiversity in the Stakeholder Conference reviewing progress with implementing the EU Biodiversity Strategy 2020, in Brussels, May 2019. This was attended by a wide range of stakeholders including from the agriculture sector and representatives of ICLEI, representing local municipalities and the EU Committee of the Regions. Sue briefed both these representatives on the ABLE project, in the margins of the meeting.

Sue Collins talked about ABLE and the importance of extending butterfly monitoring schemes across the EU and using the data and indicators in policy evaluation and improving land management, with a number of EU Nature Directors individually and with representatives of the Natura 2000 Users Forum, in the Workshops and in the margins of the EU Nature Directors Informal meeting in Helsinki on 2-4 Oct 2019.

Sue Collins has stressed the importance of field monitoring of biodiversity and the use of butterfly indicators and Article 17 results in EU level discussions leading up to the publication of the EU Biodiversity Strategy 2030 and the reform of the CAP.

**DG Environment**

Memers of the ABLE project have been in regular contact with Vujadin Kovacevic, DG Environment's EU Pollinators Initiative lead.

Sue Collins has discussed butterfly monitoring, conservation, Natura 2000, pollination and ABLE with Jeremie Crespin of DG Environment, in the context of both implementing the EU Pollinators Initiative and ABLE sub task D17 on Conservation Effectiveness.

We had an online meeting in August 2020 with Bruno Combal and Frank Vassen, of DG Environment about the COP4N2K project on satellite monitoring of grassland and the scope for overlaying butterfly transect data on grassland sites prioritized in the project to help evaluate the impacts of land use and management changes and we are following this up.

**DG Agriculture**

Chris Van Swaay, Sue Collins, Martin Warren and Lars Petersson had a meeting and gave a Presentation on ABLE to Zelie Peppiette, Olivier Diana and colleagues, including experts on Remote Sensing, at DG Agriculture on 28 March 2019. We explored the current and planned capabilities of remote sensing and the availability of land use and management data, to open the discussion relevant to Deliverable D17 (*Scoping report on use of butterfly monitoring data to assess the effectiveness of conservation measures*). We are developing a Paper, for peer group review and Journal Publication in due course, on this issue.

**DG Research and Innovation**

Sue Collins discussed progress with ABLE and the need for more EU support for systematic biodiversity monitoring with Marco Fritz of DG Research and Innovation.

**EU Expert Groups and Workshops**

David Roy gave a Presentation to the EU Expert Group on reporting under the EU Nature Directives on 26th March 2019 and discussed monitoring issues with a number of MS officials.

Josef Settele, David Roy and Bas Otteman, all members of BCE partners, have participated as experts in the EU Expert Group on Pollinator Monitoring. Josef briefed the initial meeting of this group on the ABLE project. Bas Otteman from ABLE project partner de Vlinderstichting has led the Expert Group work stream on sampling methods.

Chris van Swaay gave a Presentation on ABLE and butterfly monitoring to the EU Working Group on Mapping and Assessment of Ecosystem Services (MAES) in Brussels. This was chaired by DG Env; EU MSs and stakeholders participated.

Irma Wynhoff, of ABLE partner Vlinderstichting, gave a Presentation on ABLE to the EU Workshop on Pollinators, held in Brussels on Nov 13th 2019

**Land Management Stakeholders**
Cristina Sevilleja and Irma Wynhoff had a meeting in Brussels with Stephania Petrosilla of Europarc and BCE partners have had a number of discussions with National Park officers in their own EU Member States, including in Italy.

Sue Collins gave a Presentation to the ELO Conference on Biodiversity in Brussels in December 2018 and has discussed progress with the Pilot Project on butterfly monitoring with Marie Alice Budniok, Legal Officer of ELO and other colleagues. Dirk Maes has discussed butterfly monitoring with Belgian ELO members and contacts are being followed up with ELO Estate Owners in Austria, Italy and Portugal.

**EU-wide Conferences**
Presentations and interviews on ABLE were given at EU wide Conferences on Pollinators; on Biodiversity Strategy; and at two Conferences on Citizen Science.

<u>Other Dissemination Activities.</u>

First ABLE Newsletter - 2019

ABLE

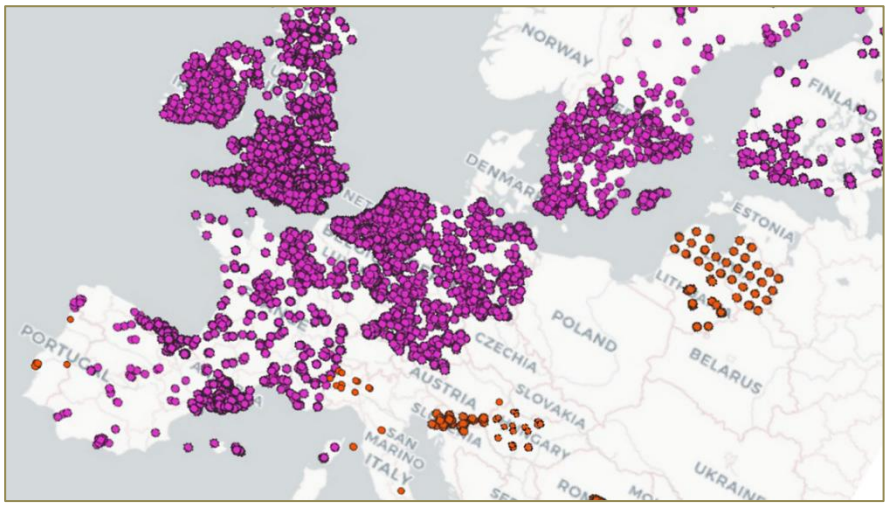
Assessing ButterfLies in Europe

# ABLE Newsletter 2019

Welcome to the first newsletter of the ABLE project. There has been a great deal of activity since the project started in December 2018 and thanks to the enthusiasm of our partners we have made good progress against the project objectives. This newsletter aims to give updates on the project to ABLE partners and to anyone interested in butterfly monitoring.

**Please forward the newsletter to friends and colleagues interested in butterfly monitoring. You can use the links below**

Share Tweet Share Pin




## eBMS Network

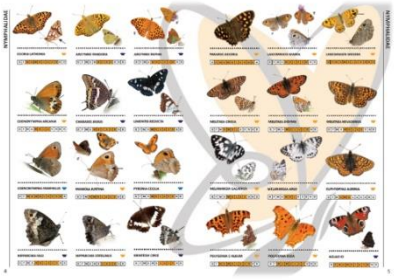
The European Butterfly Monitoring Scheme (eBMS) started in 2014 to bring together data from existing monitoring schemes into a central database and create a big butterfly community. It also provides support and materials via its website **www.butterfly-monitoring.net**

So far **16 schemes** have joined the eBMS from 14 countries. We are very grateful for their co-operation and support, with thousands of volunteers counting butterflies and huge effort from the coordinators. With the ABLE project, we managed to include more countries, more schemes and the network grows every day. Italy, Portugal, Austria, Cyprus, Hungary... continue reading to discover the news from them.

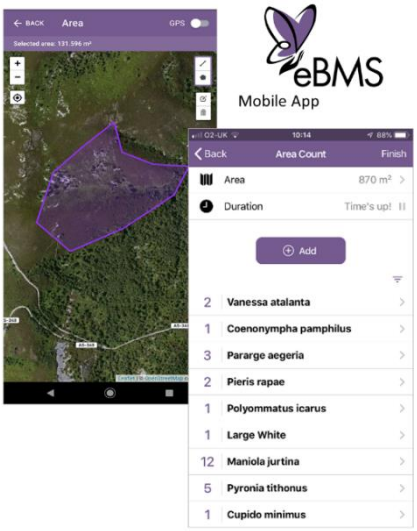
**Read more...**

## Materials & Tools


From the ABLE project, we produced new materials to help new Monitoring Schemes to start and to assist recorders in the field. You can find a new **Transect Manual**, an **eBMS leaflet** and **Field Guides** for regions in Italy. We have developed a website to support butterfly monitoring that is being actively used to help run new schemes in Italy and Portugal.



We have also developed a **new mobile application** for collecting butterfly abundance data in the field, based on 15 minutes counts. The eBMS Butterfly Count App, available for iPhone and Android devices. It is designed for use in areas where weekly transect counts are not possible (eg remote areas, or urban areas, or where people do not have time to run a weekly transect). It is also easy for new volunteers to use.




**Read more...**

## Discover the eBMS community:

***Profile of a new BMS coordinator***

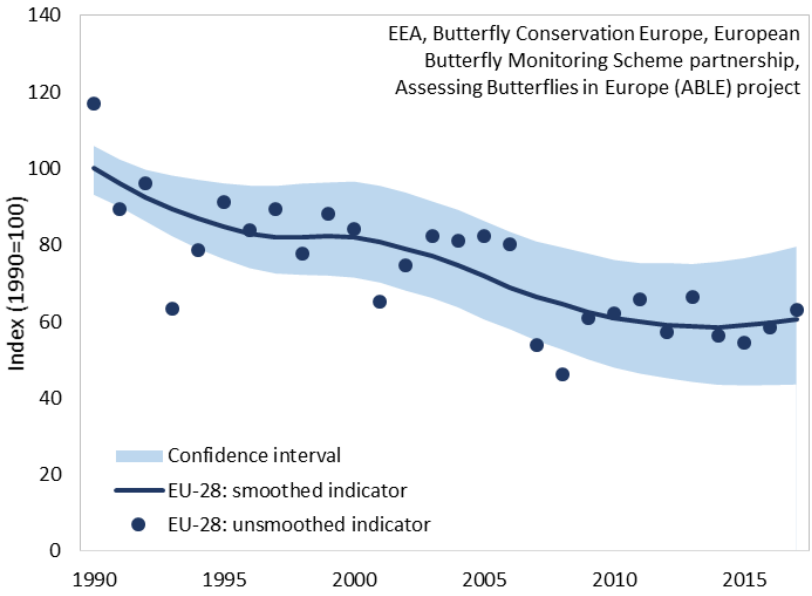
An interview with one of the new BMS coordinators in Europe, **Simona Bonelli** from Italy. She tells us how this first year was preparing and organising the Italian BMS and which positive results could motivate other countries to join and start a BMS.
**Read more...**

*For the next Newsletter, we would like to show more about the eBMS community. Take a picture of you in your transect to show the variety of volunteers that help counting butterflies in Europe!*

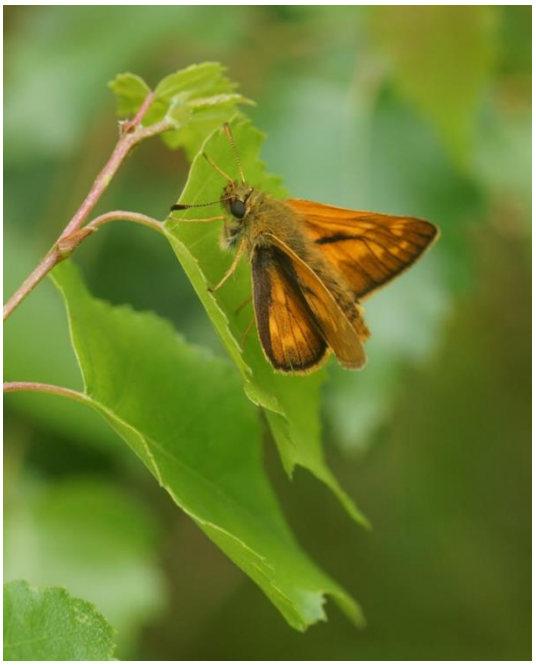
*Send it to cristina.sevilleja@vlinderstichting.nl*

## Results

We are already beginning to get some important new results from the data gathered by the eBMS. A new **Butterfly Grassland Indicator** shows a **39% decline** of grassland butterflies since 1990, suggesting a serious decline of grassland habitats. We also have some fascinating examples of **species trends** across Europe. We are now working on a new suite of indicators that will help us understand the changing fortunes of butterflies across Europe and provide data to improve European policies for protecting the environment.
**Read more...**




**Butterfly Grassland Indicator: 39% decline of grassland butterflies in Europe**



## Future Plans

Our main priorities for the coming year are to continue adding data into the eBMS for more countries and produce a suite of **policy-relevant indicators** for a range of butterfly habitats as well as assessing climate change impacts. We will also work with partners to develop schemes in new countries and continue to provide support and materials for all countries with schemes. A final priority is to apply for funds to continue the project beyond 2020 to ensure we have a robust and sustainable system of gathering butterfly monitoring data in the long term.

**Read more...**

**"Workshop Calculating butterfly indexes, trends and indicators"**

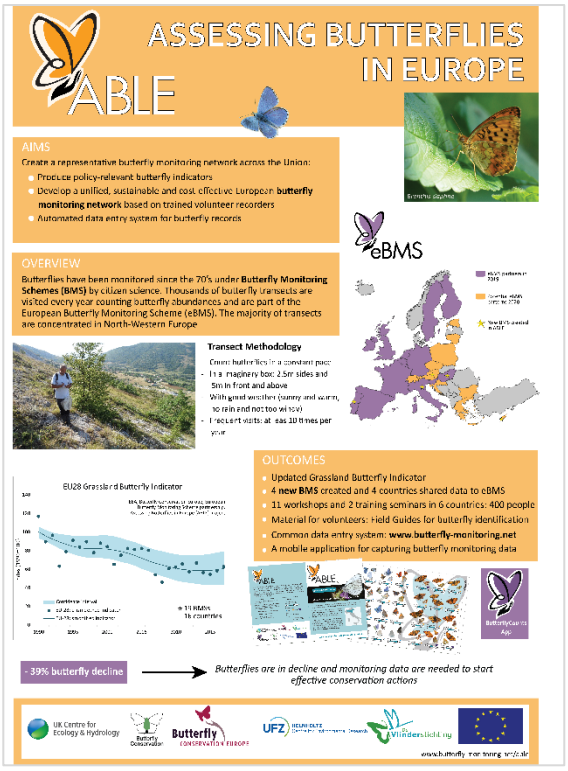
For BMS coordinators, Wednesday 1st April 2020, Wageningen

In the ABLE project, new tools have been developed to make it easier for regional and national coordinators of Butterfly Monitoring Schemes to calculate indexes and trends as well as build indicators. This workshop will focus on the background of the method and learning how to use the tools.

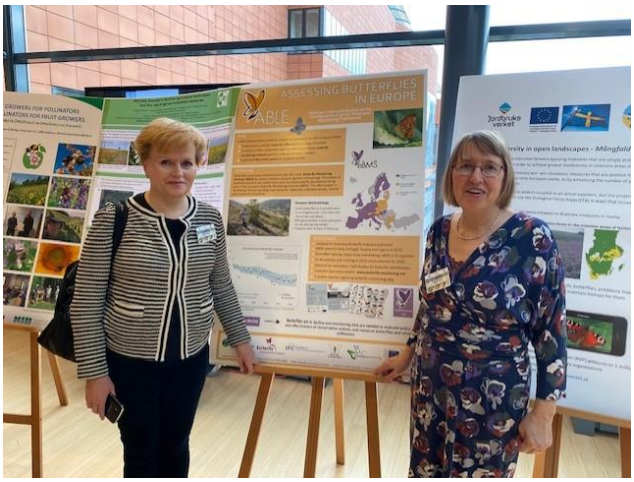
The workshop will be on the day before the symposium **Future of Butterflies,** thus reducing travel expenses and time. For the workshop itself, no costs will be involved. Participants should have at least a basic understanding of R, and have it installed on their laptop, which they should take to the workshop. The workshop will be given by Reto Schmucki, Emily Dennis, David Roy, Chris van Swaay and others. You will receive an email soon with the details.

**Acknowledgments: for the EU support, all the volunteers, coordinators and collaborators that made possible this network**

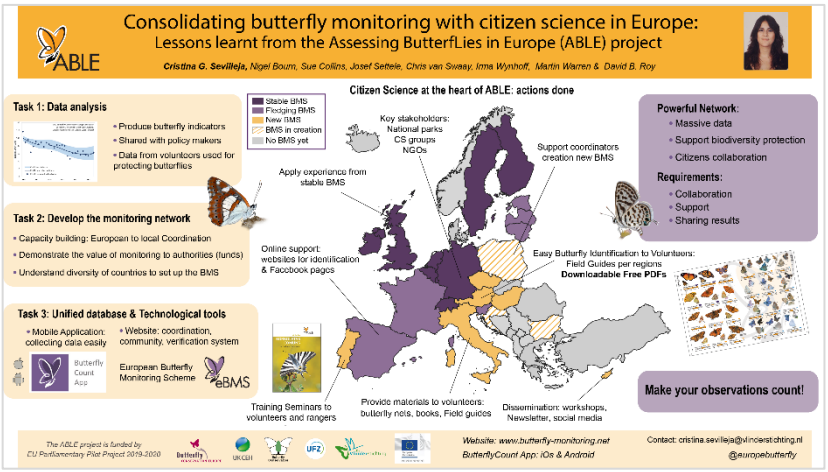
## *Dissemination in Conferences*




Poster of the ABLE project – presented at the Conference Halting the loss of pollinators (Brussels 2020)



Poster presented at the ECSA Conference (8th of September 2020).




## *Dissemination in Magazines*

CONTRIBUTING TO THE LONG-TERM MONITORING OF INSECTS: THE ASSESSING BUTTERFLIES IN EUROPE (ABLE) PROJECT

by Cristina G. Sevilleja, Nigel Bourn, Sue Collins, Josef Settele, Chris van Swaay, Martin Warren & David B. Roy

INTRODUCTION

There are an increasing number of articles reporting major declines in insect numbers. Most notably has been the UN Environment Foresight report that highlights that we are losing the "Little things that run the world" (Gordon *et al.*, 2019). The global media have greatly added to the raised awareness of the current plight of insects, referring to an insect 'apocalypse' or 'Armageddon'. Such alarming headlines have resulted from several scientific papers, including in the journal *Biological Conservation* (Sánchez-Bayo & Wyckhuys, 2019) which warns about 41% of insect species in decline in the last decade, twice the rate of loss among vertebrates.

The review undertaken by Sánchez-Bayo & Wyckhuys included 73 reports of declining entomofauna mainly in Europe and North America, using data across terrestrial and freshwater ecosystems. The review found that well-studied taxa—Lepidoptera, Hymenoptera and dung beetles—had declined most markedly. Declines were attributed



Wall *Lasiommata megera*. Declining not just in the UK but across Europe, of the 17 species that make up the EU Grassland indicator it is the most rapidly declining (Photo: M. Warren).

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Scarce Large Blue *Phengaris teleius* is relatively widespread in Europe, and was successfully re-introduced to the Netherlands, but new monitoring schemes in Poland and Slovakia are essential to help monitor this species in Europe (Photo: M. Warren).

to three main causes: the increase of intensive agriculture, land use change and fragmentation of the habitat, and climate change. This review has received much criticism (e.g. Thomas *et al.*, 2019; Simmons *et al.*, 2019) for its extrapolations of rates of insect extinction and only considering studies reporting decline; its strength is in bringing together a range of individual studies reporting insect declines.

The Sánchez-Bayo & Wyckhuys review followed an earlier report that also generated considerable media attention. This study, reported by Hallman *et al.* (2017) was notable in two respects. Firstly, the scale of the 76% decline in biomass of flying insects over a 27-year period (a metric rarely reported), and secondly, the sites sampled for the analysis were protected areas. But again this study has been heavily criticised, biomass and abundance are different and many of the sites were sampled only once. Although evidence from tropical areas is typically scarce, a recent study from the rainforests of Puerto Rico (Lister & Garcia, 2018) found a huge decline of tropical arthropods between 1975 and 2012—a 98% loss of ground-dwelling species and a 78% loss of canopy species. Their analyses revealed synchronous declines in the lizards, frogs and birds that eat arthropods. They attribute these losses to a 2°C rise in temperature over the study period, leading to disrupted life cycles, although this conclusion has been criticised as the link is circumstantial and the area experiences frequent hurricanes such that the area is never in any species equilibrium.

The media attention given to these recent studies has highlighted the growing recognition of the importance of insects within ecosystems. Evidence of the status of insect populations remains largely restricted to specific case studies, and as demonstrated above there is a lack of really good, scientifically robust data over much of the world. As

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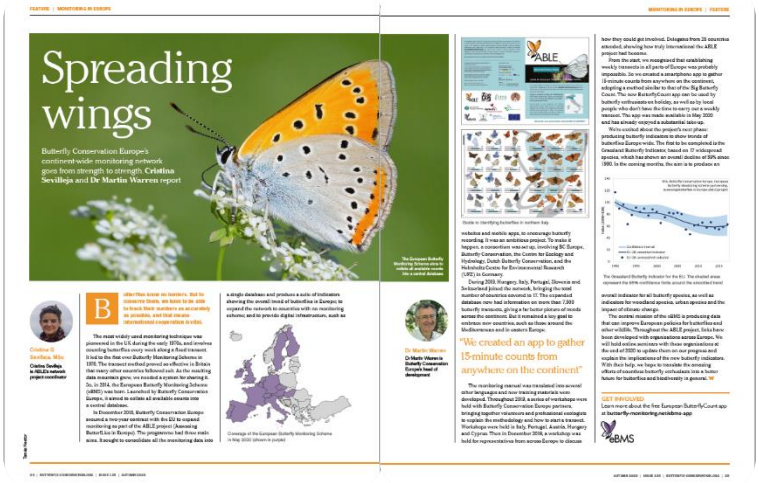
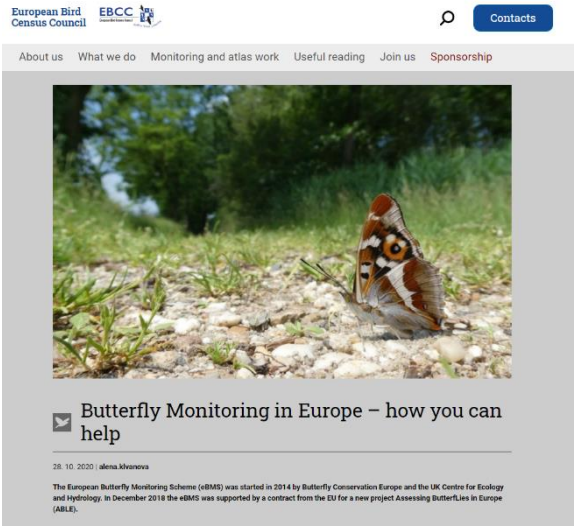


Spreading wings

Butterfly Conservation Europe's continent-wide monitoring network goes from strength to strength. Cristina Sevilleja and Dr Martin Warren report

"We created an app to gather 15-minute counts from anywhere on the continent"

Article of eBMS and ABLE in the Butterfly Conservation Newsletter, Autumn 2020

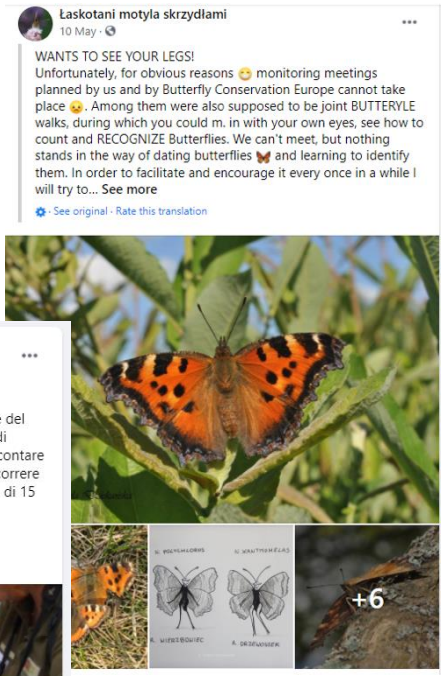



Promotion butterfly monitoring in Europe in the EBCC Newsletter (European Bird Census Council)

*Dissemination in social media*

- In Facebook different pages from coordinators and BMS promoting butterfly monitoring and different events of ABLE.






- In Twitter the two campaigns done by the BCE account (@europebutterfly) with the hashtag
*#FebruaryButterflyMonth*
*#AprilButterflyMonth*


# Annex IV / ABLE Coordinators Meetings

Three meetings with established, new and potential eBMS coordinators were held – the first face to face.

The subsequent two – in April and October 2020 were organized on line to ensure the safety of participants and compliance with essential Covid – 19 restrictions on gatherings. We rapidly developed online resources – delivering presentations on line, organizing breakout groups online for small group discussions and recording meetings for further dissemination.

Laufen Meeting: Annual ABLE meeting for scheme coordinators and other stakeholders. 3-5 December 2019


**Assessing ButterfLies in Europe (ABLE)**

**ANL conference centre, Laufen**

**3-5 December 2019**

**Aims of the seminar**

1. To update partners on progress, midway through the ABLE project
2. To get feedback on tools available and in development
3. To share best practice in developing schemes

## Draft Programme

**Tuesday 3rd December**

**14.00 – 17.3 Delegates arrive**

17.30 Welcome by Chris van Swaay, Chair BC Europe and Dieter Pasch, Director of ANL

17.35 Update on BC Europe and outline of meeting - Sue Collins, Policy Advisor, BC Europe

17.50 Introduction from each delegate (round table)

18.10 The EU Pollinator Initiative – Vujadin Kovacevic, DG Environment (tbc)

18.40 Update on eBMS and ABLE and potential for using the butterfly data and indicators for agriculture policy evaluation and conservation effectiveness – David Roy, Centre for Ecology and Hydrology (UK) and Sue Collins, BC Europe

19:00 Q & A session

**19.30Dinner**

**Wednesday 4th December**

**Session 1: Monitoring tools and their development (CHRIS TO LEAD)**

09.00 eBMS data entry website – David Roy, Centre for Ecology and Hydrology, UK

09.20 Using the eBMS website in Luxembourg – Xavier Mustagh, Luxembourg BMS

09.40 New app for fixed effort counts – Karolis Kazlauskis, CEH, UK

10.00 Summary of eBMS database – Reto Schmucki, CEH, UK

10:20 Q & A

**10.30 Coffee/tea**

**Session 2: eBMS results**

11.00 The new indicators – Chris van Swaay, Dutch BC

11.30 Potential for other new indicators + biogeographical/phenology analysis

– Reto Schmucki,  CEH, UK
12.00 Integrating datasets: future plans – Emily Dennis, BC, UK and David Roy, CEH, UK
12.30 Q & A
**12.40 – 14.00  Lunch**

**14:00 Session 3: Discussion sessions**
**Discussion 1: Developing new monitoring networks** (Cristina Sevilleja & Irma Wynhoff)
Short presentations to include Italy, Portugal, Austria, Hungary
Discussions on shared problems and solutions

**Discussion 2: Analysing monitoring data** (David Roy/Reto Schmucki/Emily Dennis)
In depth discussion on:
How to make best use of small datasets
What analytical tools do schemes want?
Tutorials on using R packages
Proof of concept

**15.45 Coffee/tea**
**16.15 Session 4: Looking ahead**
16.15 Developing the bird monitoring network. Alena Klvaňová, PECBMS – Pan-European Common Bird Monitoring Scheme
16.45 New monitoring systems in Baden-Württemberg and Bavaria. Matthias Dolek and Adam Korozi, UFZ
17.15 eBMS and ABLE Next Steps – Sue Collins/David Roy + panel
- to include how we might incorporate other pollinators and possible recommendations to the EU Parliament and the Commission for the future
17.45 Q&A

19.30 Dinner

<u>Thursday 5th December</u>

Breakfast and depart

**Laufen eBMS Meeing 2019 -**
**Delegate list**

| | | | |
|---|---|---|---|
| Karen | Aghababyan | TSE Towards Sustainable Ecosystems NGO | Armenia |
| José Miguel | Barea-Azcón | Environment and Water Agency of Andalusia | Spain |
| Fontaine | Benoît | Muséum national d'Histoire naturelle | France |
| Simona | Bonelli | University of Turin | Italy |
| Nigel | Bourn | Butterfly Conservation UK | UK |
| Yannick | Chittaro | National Data and Info Center on Swiss Fauna | Switzerland |
| David | Číp | JARO Slovakia | Slovakia |
| Sue | Collins | BCE | UK |
| Emily | Dennis | Butterfly Conservation | UK |
| Matthias | Dolek | ANL | Germany |
| Goran | Dusej | Swiss Butterfly Conservation | Switzerland |
| Sam | Ellis | Butterfly Consevation | UK |
| Zdeněk | Faltynek Fric | Biology Centre CAS | Czech Republic |
| Andrea | Grill | University of Berne, Switzerland | Austria |
| Janne | Heliola | Finnish Environment Institute | Finland |
| Evrim | Karacetin | DKM and Erciyes University | Turkey |
| Vasiliki | Kati | University of Ioannina | Greece |
| Karolis | Kazlauskis | Flumens | UK |
| Alena | Klvaňová | Czech Society for Ornithology, EBCC | Czech Republic |
| Zdravko | Kolev | National Museum of Natural History - Sofia | Bulgaria |
| Adam | Korosi | ANL | Germany |
| Vujadin | Kovacevic | European Commission | Belgium |
| Daniela | Lehner | Bio Forschung Austria | Austria |
| Liam | Lysaght | National Biodiversity Data Centre | Republic of Ireland |
| Dirk | Maes | Research Institute for Nature and Forest (INBO) | Belgium |
| Xavier | Mestdagh | Luxembourg Institute of Science and Technology | Luxembourg |
| Yeray | Monasterio León | Asociación ZERYNTHIA | Spain |
| Eva | Monteiro | Tagis (Centro de Conservação das Borboletas de Portugal) | Portugal |
| Miguel | Munguira | Universidad Autónoma de Madrid | Spain |
| Özge | Özden | Near East University | Cyprus |
| Federica | Paradiso | University of Turin | Italy |
| Alois | Pavlíčko | Společnost pro ochranu motýlů / SOM (BCS) | Czech Republic |
| Manfred | Pendl | Wiener Umweltschutzabteilung | Austria |
| Lars | Pettersson | Swedish BSM, BCE | Sweden |
| Miloš | Popović | University of Niš | Serbia |
| Mike | Prentice | European Butterflies Group | UK |
| David | Roy | Centre for Ecology and Hydrology (CEH) | UK |
| Johannes | Rüdisser | Institut of Ecology, University of Innsbruck | Austria |
| Martina | Sasic | Croatian natural history museum | Croatia |
| Stefano | Scalercio | Research Centre for Forestry and Wood | Italy |
| Reto | Schmucki | Centre for Ecology and Hydrology | UK |
| Josef | Settele | UFZ | Germany |
| Cristina | Sevilleja | De Vlinderstichting | Netherlands |
| Marcin | Sielezniew | University of Bialystok/Ass. Butterfly Conservation | Poland |
| Christian | Stettmer | ANL | Germany |
| András | Szabadfalvi | HBMS / Hungarian Lepidopeterists Society | Hungary |
| Sérgio | Teixeira | Madeira Fauna & Flora | Portugal |
| Elli | Tzirkalli | Cyprus Butterfly Study Group | Cyprus |
| Olga | Tzortzakaki | Department of Biology, University of Patras | Greece |
| Chris | van Swaay | Vlinderstichting | Netherlands |
| Rudi | Verovnik | Biotechnical Faculty, Department of Biology | Slovenia |
| Kristaps | Vilks | University of Latvia | Latvia |
| Martin | Warren | BC Europe | UK |
| Martin | Wiemers | Senckenberg Deutsches Entomologisches Institut | Germany |
| Irma | Wynhoff | De Vlinderstichting | Netherlands |
| Konstantina | Zografou | Institute of Ecology and Evolution | Switzerland |

Technical workshop for BMS Coordinators: Calculating butterfly trends, indexes and indicators Online, 1st April 2020

A technical workshop organised for BMS Coordinators had the objective to explain how to calculate the butterfly trend, indexes and indicators done during the ABLE project. The ABLE team explained the new R package developed for these calculations and the methodology made for the indicators made (Task 1 report).

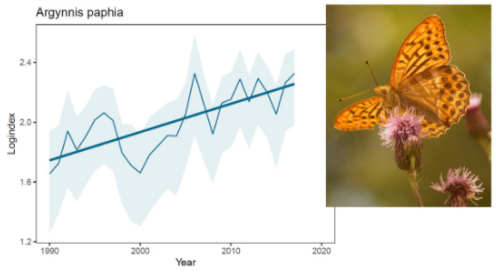
All the information of the workshop is placed on the eBMS website: https://butterfly-monitoring.net/ebms-outputs

**1. Workshop 'Calculating butterfly trends, indexes and indicators'**

In the ABLE project new tools have been developed to make it easier for regional and national coordinators of Butterfly Monitoring Schemes to calculate indexes and trends as well as build indicators. This workshop focuses on the background of the method and learning how to use the tools.

*Preparation:*

- Install the latest version or R.
- Install the latest version of RStudio.
- Install Rtools, not a package but some updated tools for windows, from https://cran.r-project.org/bin/windows/Rtools/
- Then open R, and install:
- install.packages("devtools")
- install.packages("sf")
- install.packages("data.table")
- install.packages("speedglm")
- install.packages("ggplot2")
- install.packages("mapview")
- Then do: library(devtools) and then:
- devtools::install_github("RetoSchmucki/rbms")
- devtools::install_github(repo = 'biologicalrecordscentre/BRCindicators')




*Workshop website*

Go to **https://butterfly-monitoring.github.io/bms_workshop/** and find all necessary information, including the full R-code and an explanation.

All presentations (including a transcript) are available at:

Link video explanation WK1: **BMS and count data in R, data wrangling and mapping** (Reto Schmucki)

Link video explanation WK2: **Modelling Butterfly Abundance (GAI and rbms package)** (Emily Dennis & Reto Schmucki)

Workshop website: https://butterfly-monitoring.github.io/bms_workshop/

BMS Workshop

Home | WS1 | WS2 | WS3 | WS4

- Motivation
- Schedule
- Before the workshop
- Computer and software
- Download Data
- Reading

## Calculating butterfly trends, indexes and indicators

Reto Schmucki, Emily Dennis, David Roy and Chris Van Swaay

April 1st, 2020

### Motivation

In the ABLE project new tools have been developed to make it easier for regional and national coordinators of Butterfly Monitoring Schemes to calculate indexes and trends as well as build indicators. This workshop will focus on the background of the method and learning how to use the tools. This workshop is open by invitation only to all co-ordinators of European Butterfly Monitoring Schemes as well as other people actively involved in the analysis and assessment of butterfly monitoring.

### Schedule

| Time | Topic | Instructor |
|---|---|---|
| 9:30 - 9:40 | login to virtual workshop (Zoom meeting) | David |
| 9:40 - 10:00 | Introduction and participant presentation | Chris |
| 10:00 - 11:00 | BMS and count data in R, data wrangling and mapping | Reto |
| Break | | |
| 11:15 - 12:15 | Modelling Butterfly Abundance (GAI) | Emily |
| Lunch | | |
| 13:30 - 14:30 | Flight curve and Site & collated indices | Reto |
| Break | | |
| 14:45 - 15:45 | Trends and Multi-Species Indices | Emily |
| Break | | |
| Q&A (30 min) | | Reto, Emily, David & Chris |

**Each session will be structured with a short presentation, a guided example and an exercise for participant to practice.**

# Assessing ButterfLies in Europe (ABLE)

Final workshop with Country Coordinators (online)
28-29 October 2020

**Aims of the meeting**

1. To update partners on outputs and conclusions of the ABLE project
2. To share best practice and identify future needs of partners
3. To update partners on future plans, including ABLE 2

## Draft Programme (all times CET)

### Wednesday 28th October

09.15 Delegates arrive online and get familiar with using the platform

**09.30 – 10.30 Session 1: Tools and products**
(Chris van Swaay and Emily Dennis answering chatline)

09.30 Meeting management – David Roy, UK Centre for Ecology and Hydrology

09.35 Welcome and introduction - Sue Collins, BC Europe

09.40 Summary of tools and products produced under ABLE – David Roy and Reto Schmucki, UK Centre for Ecology and Hydrology

10.15 Q & A

***10.30 – 10.45 Short break***

**10.45 – 11.45 Session 2: Developing the monitoring network**
(Martin Warren and Nigel Bourn answering chatline)

10.45 Overview of actions done for the network development in ABLE – Cristina Sevilleja and Irma Wynhoff, Dutch Butterfly Conservation

11.00 – 11:30 Many countries, many customs: issues, experiences and solutions showing examples from Italy, Austria, Spain, Bulgaria and Hungary (Interactive discussion).

11.35 Q & A

***11.45 – 12.00 Short break***

**12.00 – 13.00 Session 3: Discussion session in break-out groups**

12.00 Introduction to breakout groups – Sue Collins

12.05 Breakout group to discuss suggestions and improvement for ABLE 2 (c 4 groups of 10 each).

12.45 Feedback session (plenary) Facilitators summarise the key points from each group

13.00 CLOSE

## Thursday 29th October

09.15 Delegates arrive online and get familiar with using the platform

**09.30 – 10.30 Session 4: Results of the new indicators**

(Reto Schmucki and David Roy answering chatline)

09.30 Meeting management (reminder) – David Roy, UK Centre for Ecology and Hydrology

09.35 The new indicators and their implications – Chris van Swaay, Dutch BC and Emily Dennis, UK BC

10.15 Q & A

***10.30 – 10.45 Short break***

**10.45 – 11.45 Session 5: Disseminating the results and influencing conservation action**
(Cristina Sevilleja and Irma Wynhoff on chatline)

10.45 Meetings, messages & opportunities – Sue Collins and Martin Warren, BC Europe

11.15 Breakout session to discuss how to disseminate results at the country level

(c 4 groups of 10 each)

11.45 Feedback session (plenary) Facilitators summarise the key points from each group

***11.55 – 12.00 Short break***

**12.00 – 13.00 Session 6: Future plans** (Martin, Nigel and Cristina on chatline)

12.00 The new Pollinator Monitoring Framework - Vujadin Kovacevic, DG Environment (or Simon Potts)

12.15 ABLE 2: outline of plans - David Roy, UK CEH

12.30 The EU Biodiversity Strategy - Sue Collins, BC Europe

12.45 Celebrating the success of ABLE and group picture online

12.55 Closing remarks – Sue Collins

13.00 CLOSE