Annual Report 2024

Italian Butterfly Monitoring Scheme

Annual Report
Italian Butterfly Monitoring Scheme

Authors
Federica Paradiso, Leonardo Dapporto, Stefano Scalercio, Cristina G. Sevilleja, Simona Bonelli

Photos
Giancarlo Zaccalà (foto di coopertina), M. Giovanna Casanova, Paolo Mazzei e Simona Bonelli

National coordinator
Simona Bonelli (simona.bonelli@unito.it)

Regional coordinators
Northern Italy: Simona Bonelli (simona.bonelli@unito.it)
Central Italy: Leonardo Dapporto (leondap@gmail.com)
Southern Italy: Stefano Scalercio (stefano.scalercio@crea.gov.it)

Assistant coordinator
Federica Paradiso

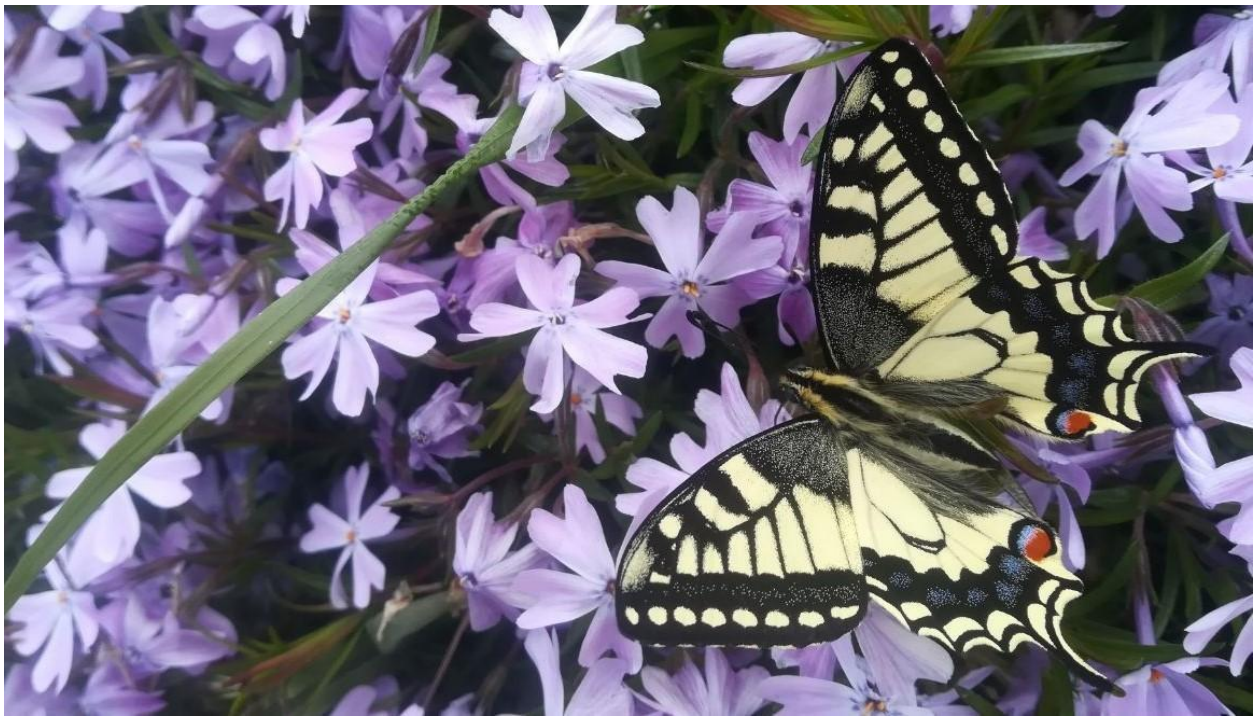
Publication Date
11/11/2025

Report Number
ITBMS.004

Citation
Paradiso, F., Dapporto, L., Scalercio, S., Sevilleja, C., & Bonelli, S., (2025). Annual Report 2024. Italian Butterfly Monitoring Scheme. Report ITBMS.004

Online resources
Further information on the Italian Butterfly Monitoring Scheme, support materials, and how to participate in the butterfly monitoring scheme can be found at:
https://butterfly-monitoring.net/it/italy-bms
Link to the Italian Lepidopterological Association (ALI): **https://www.lepidoptera.life**
For online data entry: **https://butterfly-monitoring.net/mydata**
For any questions or inquiries, write to: **help.itbms@gmail.com**

Index



Summary

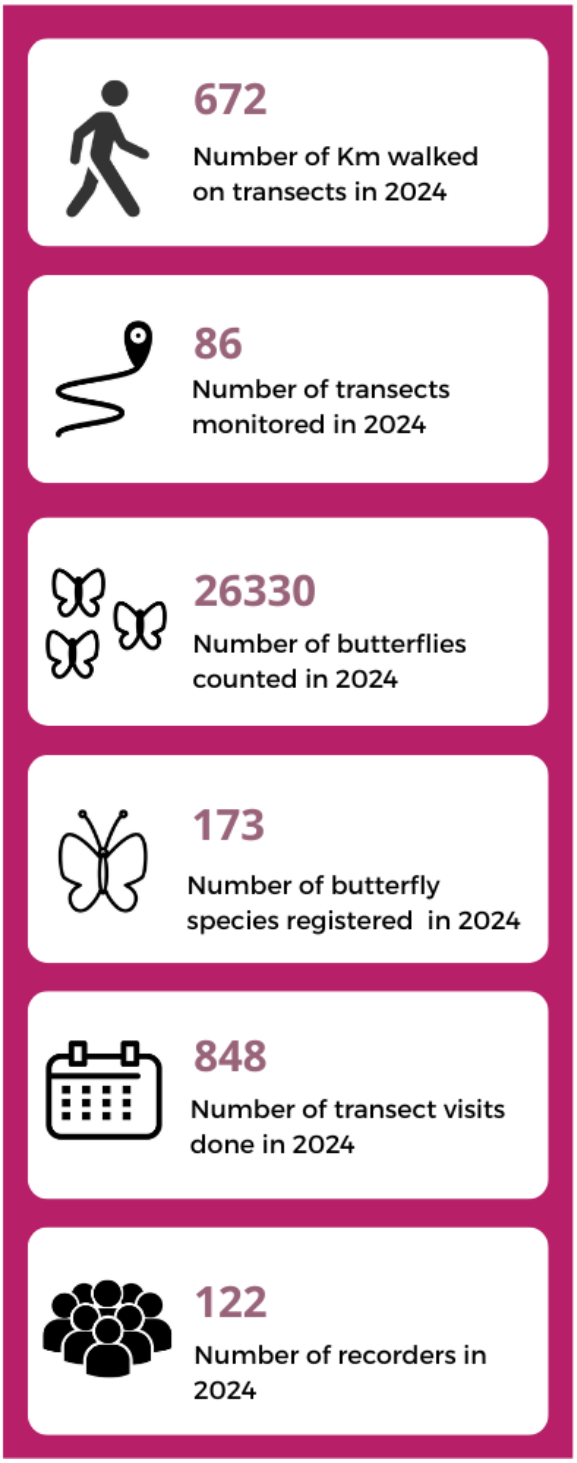
The Italian Butterfly Monitoring Scheme (ITBMS) was launched in 2019, although for some transects the first monitoring data dates back to 2016.

This document is the fourth report of the Italian BMS project, summarizing data from monitoring conducted from 2019 to 2024. At the end of 2024, there are 86 active transects within the national territory, monitored by 122 volunteers, with a total of 672 km covered on transects during 848 visits. Since 2019, the ITBMS has followed a standardised methodology for butterfly monitoring and in 2024 achieved an average of more than 9 visits across all monitored transects.

The butterfly biodiversity of the Italian peninsula is very high. In 2024, 173 butterfly species were recorded on Italian transects, for a total of 26,330 butterflies.

The ITBMS community continues to grow increasingly, as demonstrated by the expansion of the monitoring network in almost all regions of Italy and even outside the national territory, including the State of San Marino, which has been active with one transect since 2022.

Italian volunteers are making an excellent effort to better understand their natural heritage and the pressures affecting butterflies. Thanks to their contribution to data collection, the European BMS and the Italian BMS can support the conservation of butterflies and other pollinators, as well as their habitats.



1. Butterfly monitoring

Recent years have seen a global decline in the diversity and abundance of terrestrial insects (Van Swaay et al.,2020). Because insects constitute more than half of all described species and play vital roles in ecosystem functioning, assessing their conservation status is essential for planning and monitoring specific conservation objectives over time (VanSwaay et al., 2020, Warren et al., 2020). For this purpose, butterflies seem to be perfect biological indicators, as they are widely studied and respond quickly to environmental changes (Thomas, 2005). There are 501 butterfly species in Europe. Butterflies represent one of the best-monitored insect groups in Europe thanks to monitoring programs that have been active in some countries for decades. The first Butterfly Monitoring Scheme (BMS) was established in the United Kingdom in 1976 (UKBMS). Since then, the same objective has been pursued by many other European countries, particularly encouraged by Butterfly Conservation Europe (BCE) and its partners, enabling the collection of essential data on butterflies. Standardised data is stored in a central database, the European Butterfly Monitoring Scheme (eBMS)- created by BCE and the UK Centre for Ecology & Hydrology (UKCEH) - and used to assess population dynamics of monitored species and develop useful indicators for planning and evaluating conservation policies. This contributes not only to reducing biodiversity loss but also to increasing public awareness of the importance of butterflies and biodiversity in general. All general information on butterfly monitoring is available on the eBMS website (www.butterfly-monitoring.net). The eBMS is a powerful network created by over 20 partners, collecting standardised data from 36 BMS in 31 European countries. So far, the database has collected nearly 58 million butterflies over 34 years (1990-2024) from more than 15,000 transects (Van Swaay et al., 2025). In 2018, a pilot project called Assessing Butterflies in Europe (ABLE) was launched with the aim of expanding the eBMS network and creating new BMS throughout Europe. Italy was one of the first countries to launch its own national BMS (ITBMS) with the help of ABLE. Indeed, thanks to an extensive coordination structure, supporting materials, and the organization of workshops and seminars across many regions of the country, Italy has developed a solid network of volunteers, enabling the design of a national scheme for systematic butterfly monitoring. Effective field monitoring and comprehensive volunteer training have been crucial for guaranteeing the reliability of counts, especially when complemented by field guides and a robust online data recording system. The purpose of this report is to present the 2024 data collected by the Italian Butterfly Monitoring Scheme, including information on monitoring activities and results concerning the richness and abundance of the main butterfly species. The findings also indicate that monitoring activity has been steadily increasing over the years.

Butterfly counting transects

The transect method for counting butterflies is the main sampling tool used by Butterfly Monitoring Schemes (BMSs). It is a standardised method, developed by Ernie Pollard in the United Kingdom in 1974 (Pollard and Yates, 1993), which consists of counting butterflies along fixed routes (transects), with frequent visits (ideally weekly) in good weather conditions. Transects are typically 1 km long and are divided into sections representing different habitats or simply separate components of the same site. During the walk along the established route, only individuals sighted within an imaginary cube of 5 m width, 5 m height, and 5 m distance in front of the observer are counted. The period during which monitoring is performed varies between different European regions based on regional variability in the butterfly flight period (i.e., the length of the local flight season). If weekly monitoring is not possible, it is recommended to visit transects every ten or fifteen days. If monitoring cannot be carried out during the entire flight period, summer should be at least covered as butterfly abundance is at its maximum. Butterfly observation can be recorded on field directly through the ButterflyCount app or on a field sheet and entered in the eBMS website. The manual with information on the transect monitoring method can be downloaded in Italian from www.butterfly-monitoring.net/bms-materials. For an extensive description, refer to Sevilleja et al. (2019).

ButterflyCount app and 15-minute counts

The new multilingual ButterflyCount app, for Apple devices (iPhone, iPad) and Android, is now available for download in the major digital App Stores. The app has been launched by Butterfly Conservation Europe and the UK Centre for Ecology &Hydrology as part of the ABLE project, it offers many features to users:

- A new method for butterfly monitoring: the *15-minute count*. This option is equipped with a timer and GPS tracking system that automatically records the route during the monitoring period. Observations can be easily added by typing the species name and selecting "+1" each time a new individual is spotted. Additionally, the app record coordinates for each individual, allowing data download;
- The ability to apply the 15-minute count to a single species to support monitoring of protected or threatened species;
- Access to your own eBMS transects simply by logging into the app with your eBMS account;
- A complete list of different butterfly species present throughout Europe (501 in total) and guides for each country also available offline.

The app is still under development with plans to include new and improved features. The recorded data is extremely useful to scientists and other professionals as a tool for conducting ecological analyses and conservation actions. Furthermore, the eBMS also contributes to assessing the conservation status of other insect groups. In the updated version of the ButterflyCount app, it is also possible to select from moths, bumblebees, and dragonflies. The group to monitor can be easily selected in the app settings. It is also allowed to simultaneously monitor multiple groups within the same 15-minute

count. However, it is recommended to select a maximum of 2 groups for practical reasons, especially when monitoring occurs in areas with high biodiversity.

2. Italian Butterfly Monitoring Scheme

The Italian Butterfly Monitoring Scheme (ITBMS) is part of the European Butterfly Monitoring Scheme (eBMS), contributing valuable data and expertise to assess the status of European butterflies. Established in 2019 through the collaboration of expert lepidopterists and the European project ABLE (Assessing Butterflies in Europe), the ITBMS continues its vital pollinator monitoring work under the coordination of the SPRING project (Strengthening Pollinator Recovery through Indicators and Monitoring). The diversity of habitats in Italy is also reflected in its diversity of butterfly species. After Turkey, Italy hosts the second highest butterfly species richness in Europe (293 species; Balletto et al., 2021), of which 17 (6.0%) are endemics and 20 sub-endemics (7.1%) with very restricted ranges. The country's extensive latitudinal span—from 47°29' N to 35°29' N—and its considerable altitudinal range (from sea level to 4,810 m a.s.l. at Mont Blanc) result in pronounced climatic and environmental variability. Moreover, Italy's central position within the Mediterranean basin promotes the coexistence of species originating from different zoogeographic subregions. At the national scale, butterfly diversity is highest in northern Italy, where the Alpine regions host a wide range of habitats. Consequently, butterfly richness is not uniform across the Italian territory and varies among different transects. The number of species recorded along a given transect also depends on the sampling effort and, ultimately, on the observer's ability to correctly identify each species.

Italy's Mediterranean climate means that the butterfly monitoring season is quite long, lasting in some areas from February all the way to October.

To cover the entire latitudinal range, scheme coordination was established in the North, Centre, and South of Italy. As part of the project, several workshops were organised to train volunteers on butterfly identification and transect design. Workshops often took place in National and Regional Parks, or protected areas, to strengthen relationships with these institutions and involve park rangers in monitoring. A national workshop was organised on February 10th , 2024, in Pineto during the WWF Oases annual meeting. A local workshop was promoted by a beekeeping company already partners of the ITBMS and took place in Lugnacco (Val Chiusella) on April 5th , 2024. ITBMS participated in two editions of EntoModena fair, held in Modena in April and September 2024 together with the Italian Lepidopterological Association's exhibition. Finally, the project took part in several meetings and seminars. In particular, Leonardo Dapporto and Simona Bonelli organized a workshop on citizen science and butterflies in Florence, with Chris Van Swaay as guest speaker, as part of the activities of the Italian National Entomology Academy (ANIE). To support volunteers, region-specific field guides were provided to help with butterfly identification. In addition, a trained technician was available to assist in designing transects and identifying species. Furthermore, a system for evaluating species identifications was established. Through an iNaturalist project, the ITBMS involved expert taxonomists from the Italian Lepidopterological Association (ALI) to validate the identifications made by volunteers. Collaboration among different stakeholders, including institutions, associations, and NGOs, has been essential to the success of the ITBMS. Broad public participation and Italy's extraordinary biodiversity form the two pillars of the

project and are the main reasons behind its impressive achievements in such a short time. The keys to its success lie in strong regional coordination and a continually growing network of dedicated volunteers.

Figure 1 IV IncontrAli. June 2024, ALI iis once again committed to supporting BMS Italia.

3. Monitoring activities

Transect

In Italy, butterfly communities have been monitored in the eBMS since 2016, starting with some transects located in northern Italy. However, only since 2019 butterfly counts have been carried out following BMS standardised method. Therefore, 2019 is considered the official start of ITBMS activities.

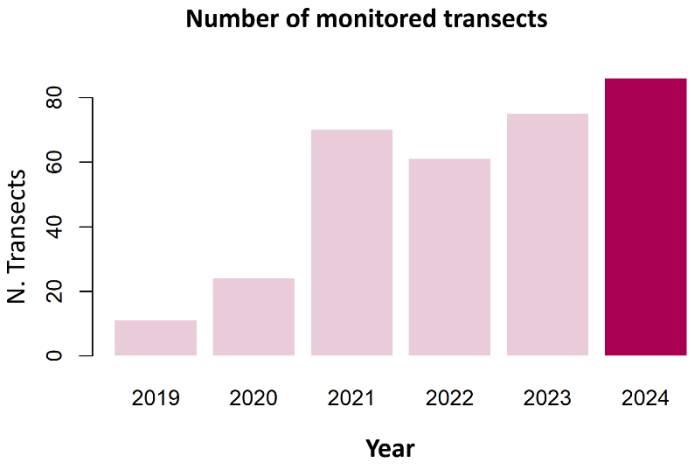


Figure 3 Number of monitored transects each year in the Italian BMS

In 2024, a total of 86 transects were consistently monitored (Figure 2), continuing the positive trend observed since 2019. This represents an increase from 75 transects in 2023 and nearly eight times the number monitored in the project's first year, when only 11 transects were active. The number of monitored sites is expected to keep growing as more volunteers join the initiative. In fact, the number of registered participants has almost doubled over the past three years, rising from 63 in 2021 to 122 in 2024 (Figure 3). As shown in Figure 4, nearly all regions of Italy now include at least one monitored transect, with a higher concentration in the northwestern part of the country.

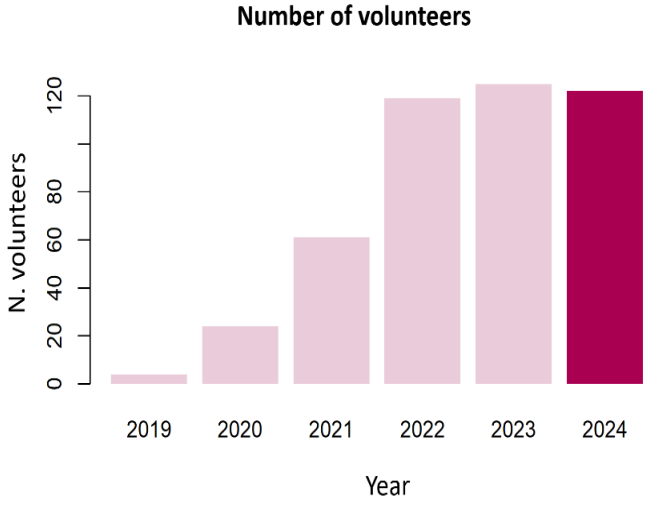


Figure 2 Number of registered volunteers each year in the Italian BMS

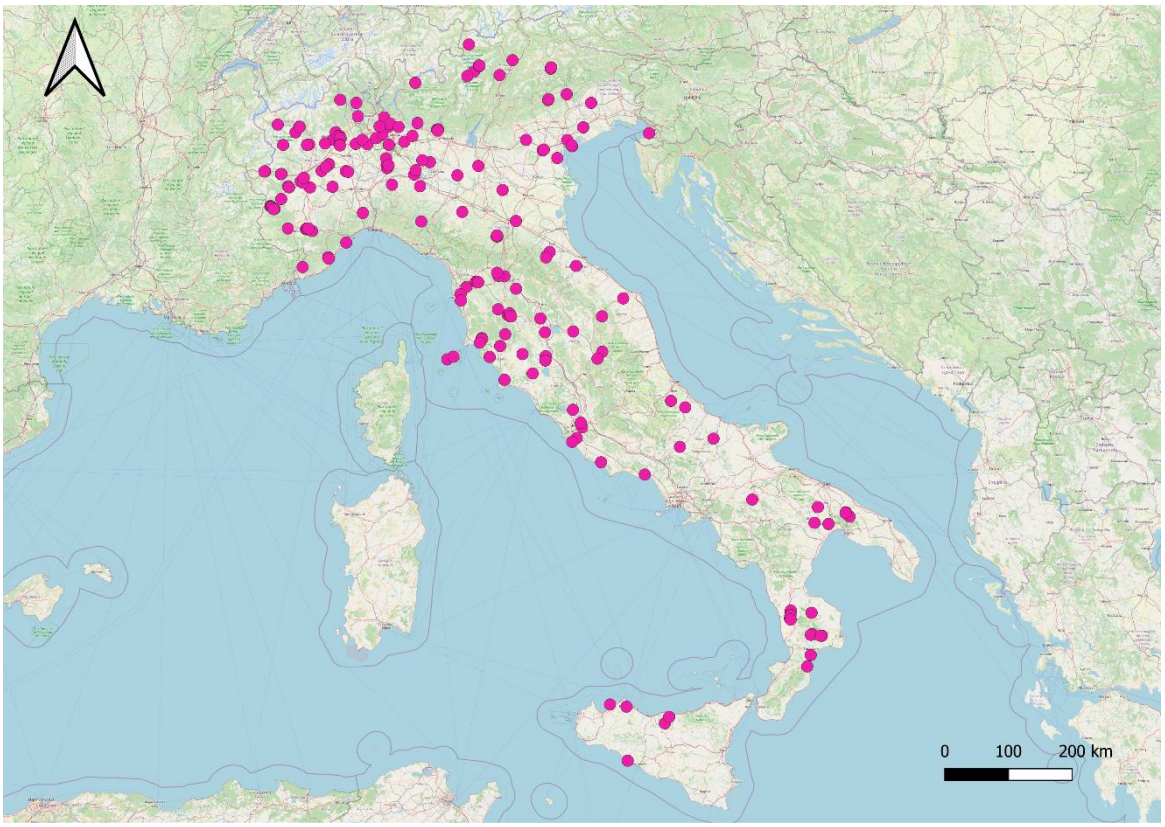


Figure 4 Distribution of Italian BMS transects

Compared to 2023, 2024 saw a significant increase in sampling effort by volunteers, covering the entire year. Monitoring took place over 52 weeks, with the first survey recorded on January 1st and the last on December 31st. Since the launch of the ITBMS, many new transects have been established and regularly monitored. The complete list of registered participants and the sites they surveyed is provided in **Appendix II**.

As mentioned earlier, Italy's diverse geology and climate result in a wide variety of habitats across the country. The range of habitats represented in the transects is shown in Figure 5. The most frequently recorded types are ecotones (23.1%), followed by agricultural areas (20.8%) and meadows (19.9%), which are often the most suitable environments for conducting transect monitoring. Wetlands, home to several rare species such as *Lycaena dispar*, make up only 4.2% of the total. A more even distribution of transects among Italian regions will help provide a clearer picture of national habitat representation.

In terms of land management (Figure 6), protected natural areas are the most represented (20.8%), followed by public areas (17.6%) and agricultural lands (13%).

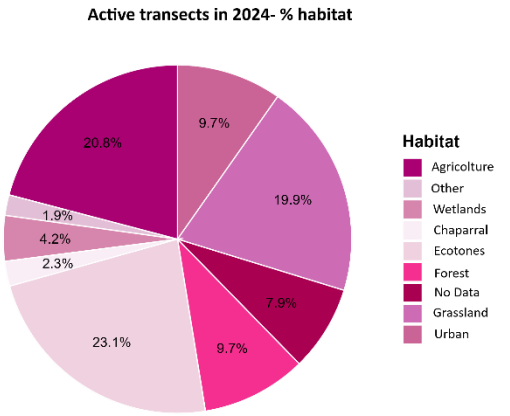


Figure 5 Primary habitat of ITBMS transects in 2024

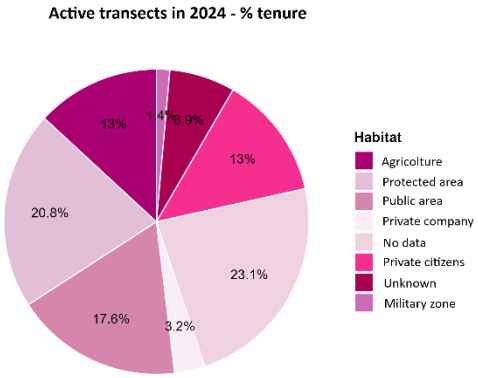


Figure 6 Land tenure of ITBMS transects in 2024

Number of visits

The number of transect visits, and the corresponding average across all transects each year, provide valuable insights into the ITBMS sampling effort. On average, each transect was visited 9.87 times per year (SD = 8.05), reflecting considerable variability between transects (Figure 7). This meets the BMS protocol requirement of at least 10 visits per butterfly flight season. Two transects: Meisutera and Canale del Granduca were monitored more intensively, with 35 and 34 visits, respectively.

In 2024, the butterfly monitoring season lasted nearly the entire year, with a peak between February and October and more occasional visits outside this period. Visit frequency varied over the season (Figure 8), peaking between April and August (weeks 20–35), when butterfly species richness is at its highest.

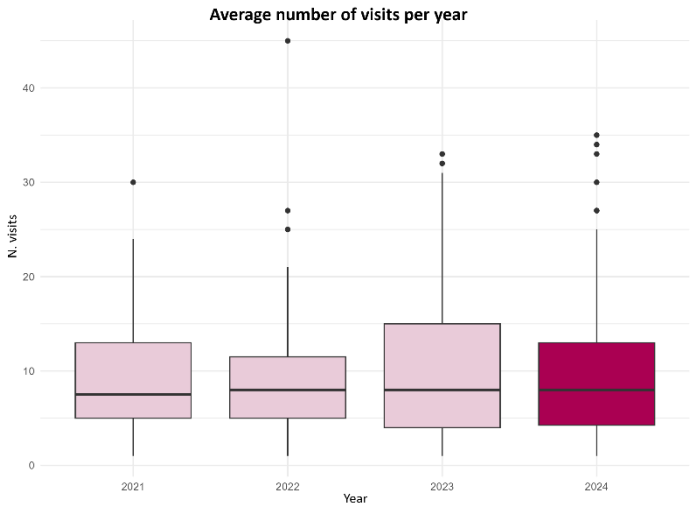


Figure 7 Average number of visits per transect in each year from 2021 to 2024

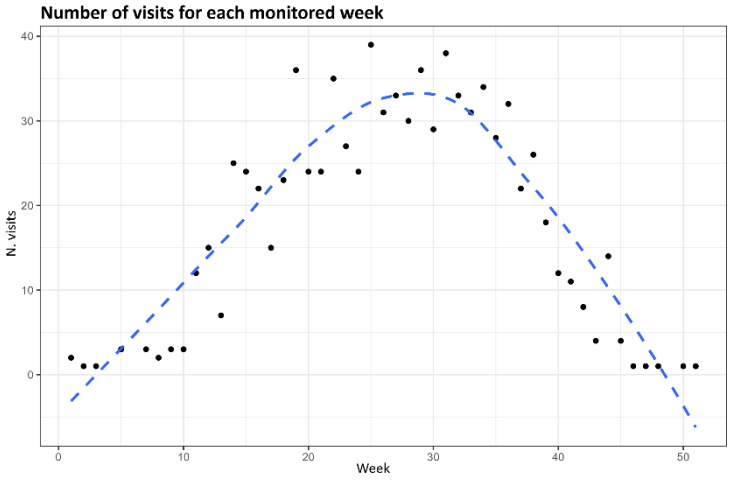


Figure 8 Number of visits for each monitored week

Butterfly in Numbers

In 2024, butterfly species richness increased slightly, while the total number of individuals was a bit lower than in 2023 but still higher than in earlier years (Figures 9 and 10). A total of 173 species were recorded, with more than 26,000 individual butterflies counted. Over the past two years, the monitoring network has not expanded substantially; however, the addition of new transects has slightly increased the number of species observed compared to 2023, when 166 species were recorded.

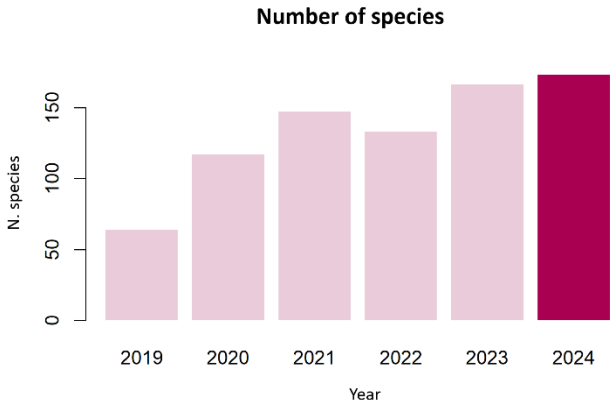


Figure 9 Number of butterflies species recorded each year from 2019 to 2024

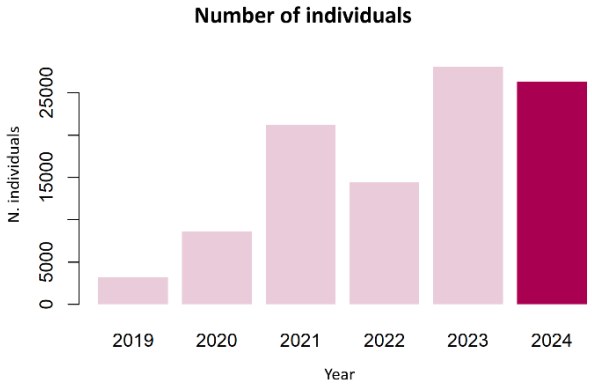
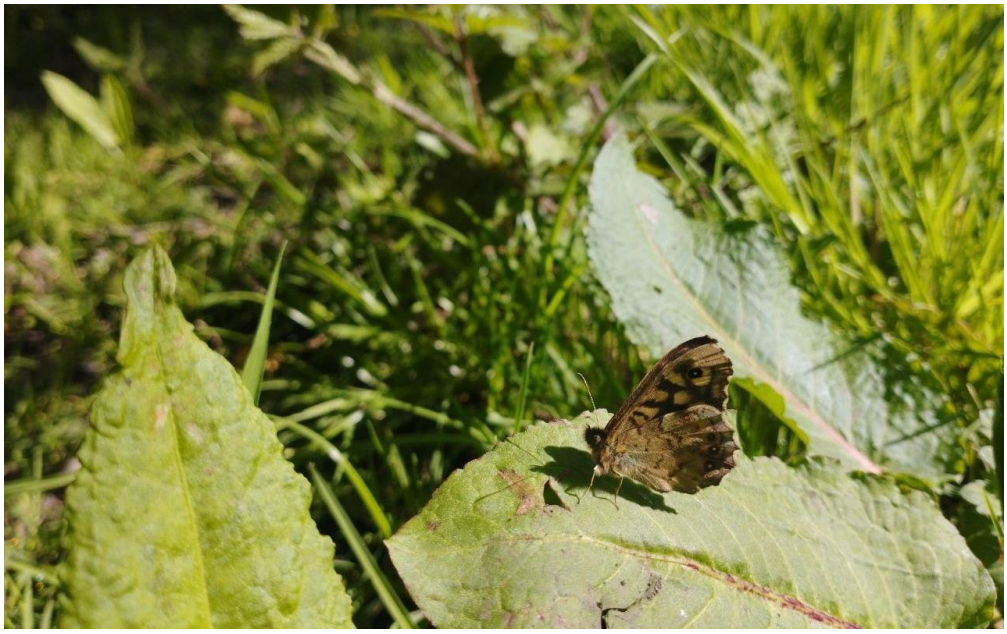


Figure 10 Number of individual butterflies counted each year from 2019 to 2024



Species richness

Graphs in Figures 9 and 10 summarize the total number of butterfly species and individuals recorded between 2019 and 2024. Transects across Italy, covering a variety of habitats, show considerable variability in both species richness and abundance. In 2024, an average of about 26 species was recorded per transect. This average is considered reliable, as transects with lower species numbers (i.e. in urban or agricultural areas) were also included.

Species richness varied widely among transects in 2024. As shown in the map in Figure 11, some transects recorded a high number of species (up to 70), while others had relatively low species counts. Areas with the highest richness are mainly located in the Alps, with additional hotspots in central and southern Italy. These results highlight high butterfly biodiversity across the Italian peninsula. Monitoring was conducted in both species-rich and species-poor areas, as both types of sites are equally important for the conservation of butterfly communities.

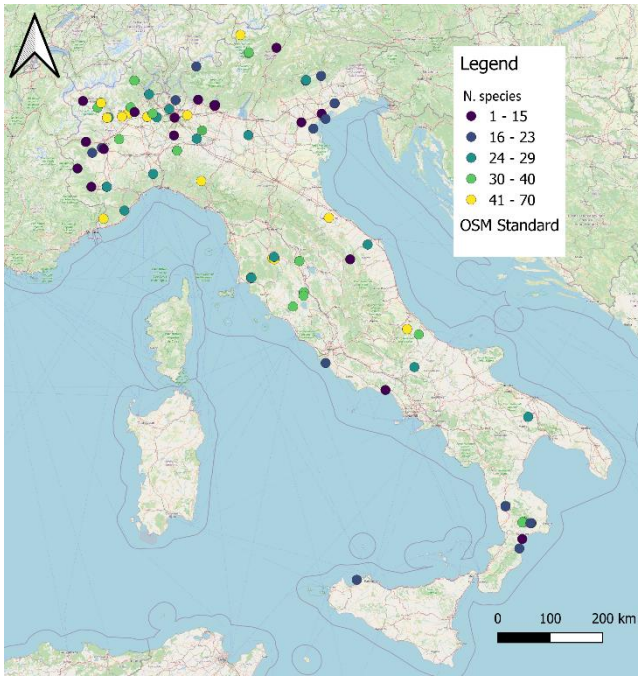


Figure 11: Distribution and species richness of each transect in 2024

The number of species observed at each transect varies considerably throughout the butterfly monitoring season. The highest species counts were recorded between June and July (weeks 25–35), while fewer species are seen towards the end of summer. It is important to note that the trend shown in Figure 12 reflects the differing flight periods of various butterfly species. Some species produce multiple generations per year, while others have a single generation in spring or summer. For this reason, frequent visits to transects are essential to capture the full diversity of species throughout their flight periods.

Figure 12 shows the number of individual butterflies observed each monitoring week. The trend is similar to that in Figure 13, which tracks the number of species observed, with a peak occurring mainly during the summer months. The curve illustrates how the number of individuals increases steadily until reaching the peak early in the monitoring season, then declines rapidly afterward.

Appendix I provides the complete list of species recorded in 2024. Table 1 offers an overview of the 10 most commonly observed butterfly species over the past six years (2019–2024). The most frequent species have remained largely consistent over time, with *Pieris rapae, Polyommatus icarus, and Maniola jurtina* consistently appearing at the top of the list.

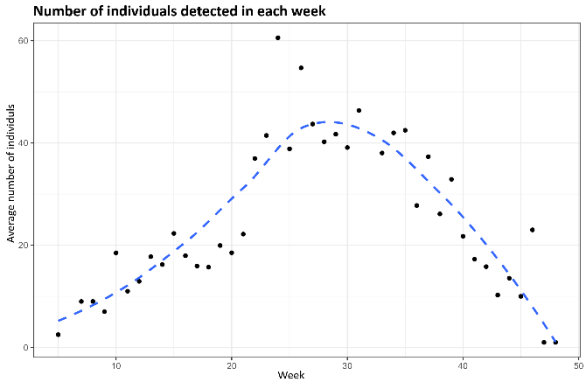


Figure 12 number of individuals detected in each butterfly monitoring week in 2024

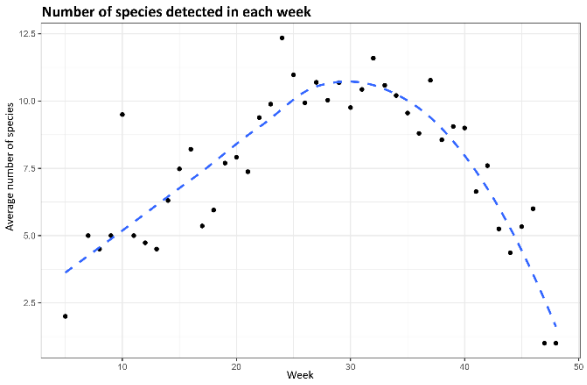


Figure 13 Number of species counted in each butterfly monitoring week in 2024

Table 1. Ten most common species from 2019 to 2024

2024	2023	2022	2021	2020	2019
Maniola jurtina	*Pieris rapae*	*Polyommatus icarus*	*Polyommatus icarus*	*Polyommatus icarus*	*Polyommatus icarus*
Polyommatus icarus	*Polyommatus icarus*	*Maniola jurtina*	*Pieris rapae*	*Coenonympha pamphilus*	*Pieris rapae*
Pieris rapae	*Coenonympha pamphilus*	*Coenonympha pamphilus*	*Maniola jurtina*	*Pieris rapae*	*Coenonympha pamphilus*
Coenonympha pamphilus	*Maniola jurtina*	*Pieris rapae*	*Coenonympha pamphilus*	*Melanargia galathea*	*Colias crocea*
Melanargia galathea	*Colias crocea*	*Melanargia galathea*	*Pieris napi*	*Maniola jurtina*	*Cupido argiades*
Pieris napi	*Lasiommata megera*	*Lasiommata megera*	*Colias crocea*	*Lasiommata megera*	*Pieris napi*
Lasiommata megera	*Melanargia galathea*	*Melitaea didyma*	*Pieris*	*Colias crocea*	*Melitaea didyma*
Melitaea didyma	*Melitaea didyma*	*Aricia agestis*	*Lasiommata megera*	*Pieris napi*	*Thymelicus lineola*
Colias crocea	*Lycaena phleas*	*Colias crocea*	*Melanargia galathea*	*Cupido argiades*	*Maniola jurtina*
Melitaea celadussa	*Aricia agrestis*	*Pieris napi*	*Aricia agestis*	*Papilio machaon*	*Vanessa cardui*

Maniola jurtina: the most sampled species of 2024

In 2024, the most frequently recorded species in the Italian Butterfly Monitoring Scheme was *Maniola jurtina*, with 2,526 specimens observed along national transects. This butterfly belongs to the family Nymphalidae, subfamily Satyrinae, and is common across Italy, including the islands, as well as across Europe. *Maniola jurtina* is univoltine, but its flight period is fairly long in summer, with adults visible from mid-May to August or September. This species overwinters as larvae, which pupate in late spring. Its larvae feed on various grass species, including *Poa*, *Lolium*, and *Bromus*.

Males and females exhibit sexual dimorphism: females are lighter than males and have fulvous markings on the underside of the wings that accentuate the eyespot near the forewing apex. Local populations may show variations in wing patterns; for example, ocelli may be absent or the markings on the underside may be more or less pronounced.

According to the IUCN (International Union for Conservation of Nature*), Maniola jurtina* is classified as Least Concern both in Italy and Europe. The species is generally easy to identify, though it resembles *Hyponephele lycaon*, from which it can be distinguished by the absence of a serrated margin on the hindwing. In Italy, the only closely related species is *Maniola nurag*, an endemic butterfly found only in Sardinia.

Photo M. Giovanna Casanova

4. Achievements of 2024

The ITBMS is making significant efforts to expand the monitoring scheme to cover all Italian regions and a wide range of habitat types. In 2024, new transects were added in many areas, bringing the total number of transects in the Italian scheme to 210. Most regions and autonomous provinces are now participating, with the exception of Sardinia and Campania.

Despite these achievements, the monitoring network continues to grow, with plans to cover the entire national territory while maintaining existing transects. Volunteer engagement remains very high, and in 2024, sampling began earlier than in previous years, starting in January. The scheme's success is also evident beyond Italy: in San Marino, monitoring began in 2022 with support from the ITBMS, demonstrating the broader influence of the project.

A major driver of network expansion has been the series of national workshops held throughout the country to recruit new volunteers, supported by local authorities and associations. Thanks to these efforts, several Forest ranger stations and some WWF Oases have also been included in the monitoring scheme, further strengthening the network.

Workshop at the WWF oasis annual meeting

5. Grassland Butterfly Indicator

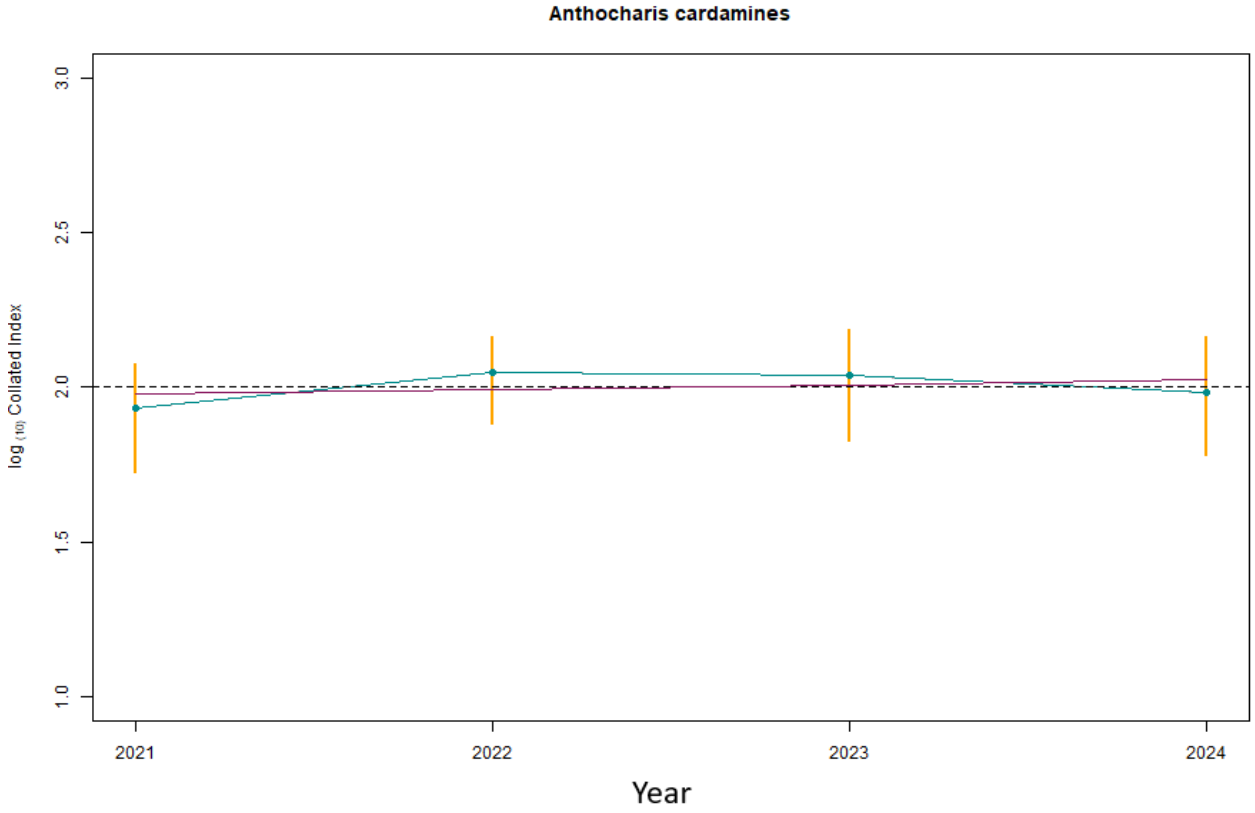
Since 2023, it has been possible to calculate the Grassland Butterfly Indicator for Italy. This indicator tracks the population trends of butterflies typical of grassland habitats. At the European level, the Grassland Butterfly Indicator is based on 17 species and reflects population changes either across Europe as a whole or within the 27 EU Member States. Trends for each species are calculated using a weighted combination of all available data, with 1990 as the baseline year, and data collected through the European Butterfly Monitoring Scheme (eBMS).

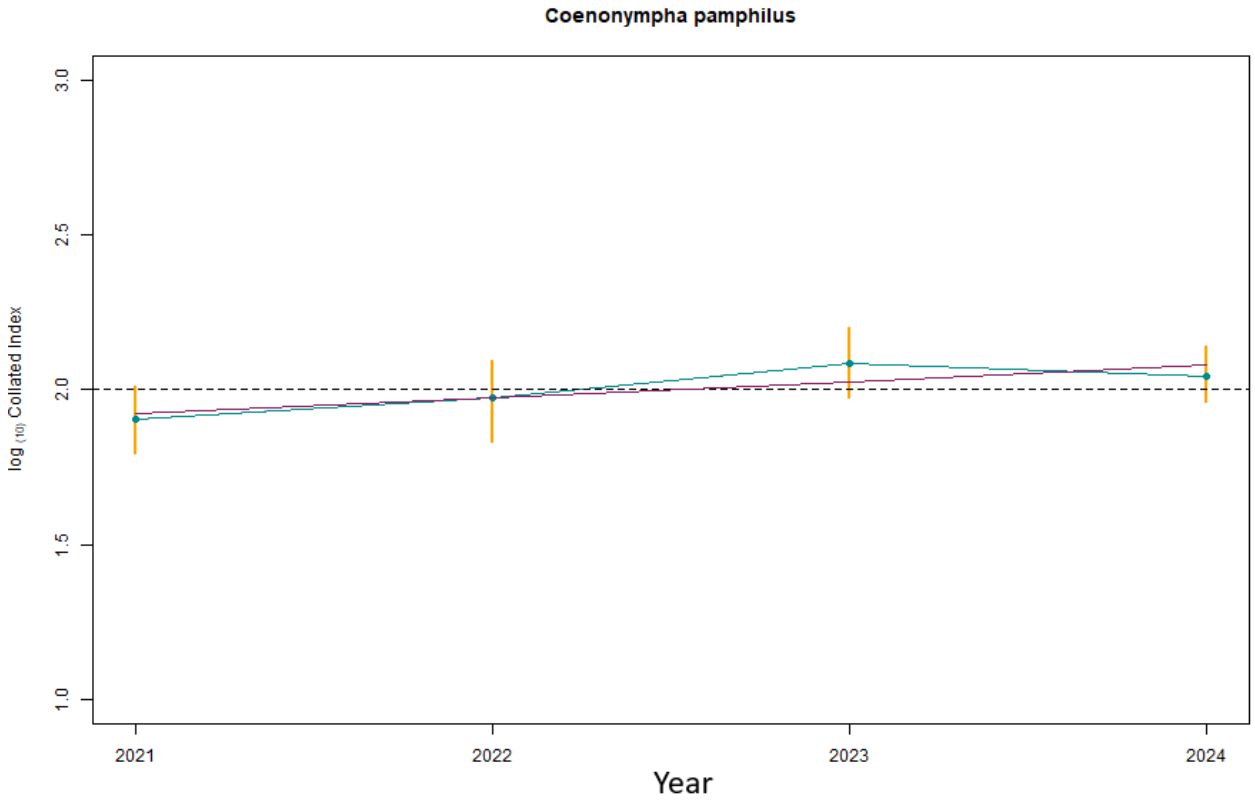
The indicator is important for assessing the health of butterfly populations and guiding conservation policies for both butterflies and their habitats. Across Europe, the Grassland Butterfly Indicator has declined by 36% since 1990, and by 32% within the EU27 over the same period.

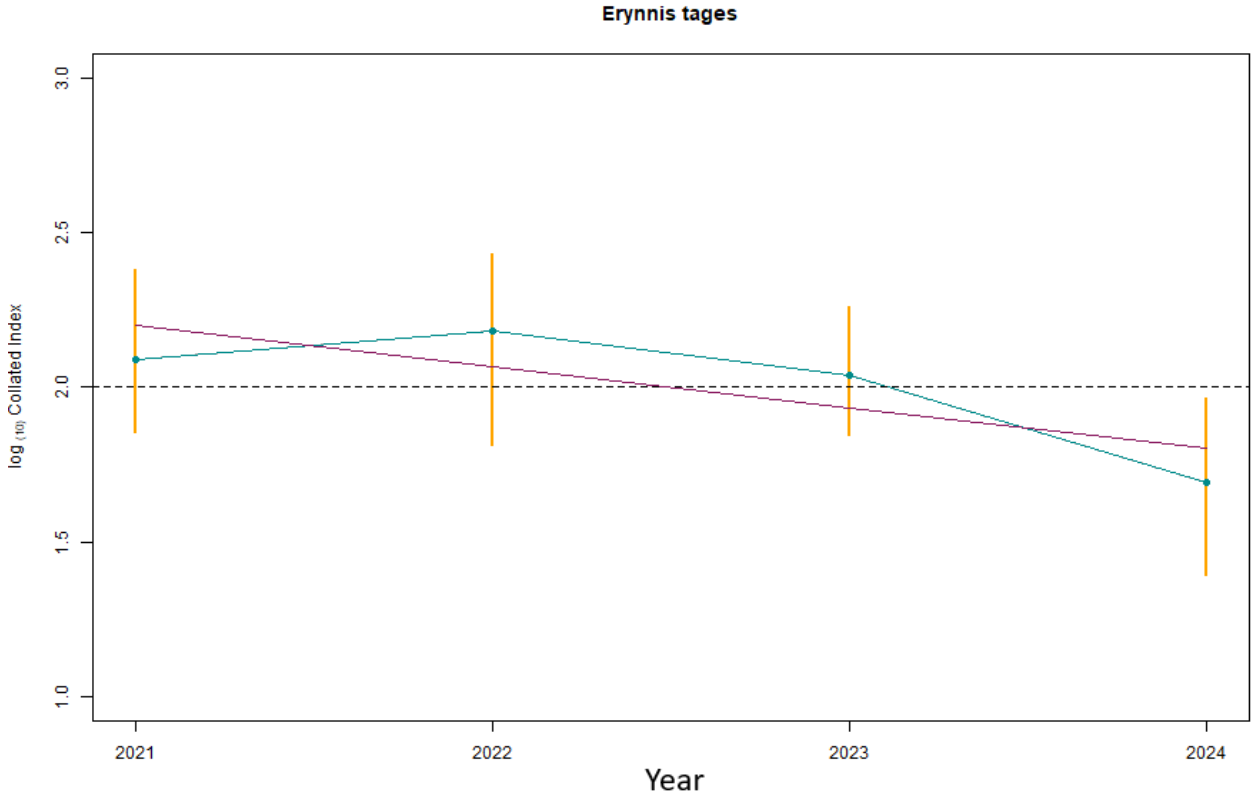
The 17 species used for the European indicator include seven generalists *Ochlodes sylvanus, Anthocharis cardamines, Lycaena phlaeas, Polyommatus icarus, Lasiommata megera, Coenonympha pamphilus, and Maniola jurtina*; and ten specialists including *Erynnis tages, Thymelicus acteon, Spialia sertorius, Cupido minimus, Phengaris arion*, *Phengaris nausithous, Polyommatus bellargus, Cyaniris semiargus, Polyommatus coridon, and Euphydryas aurinia*.

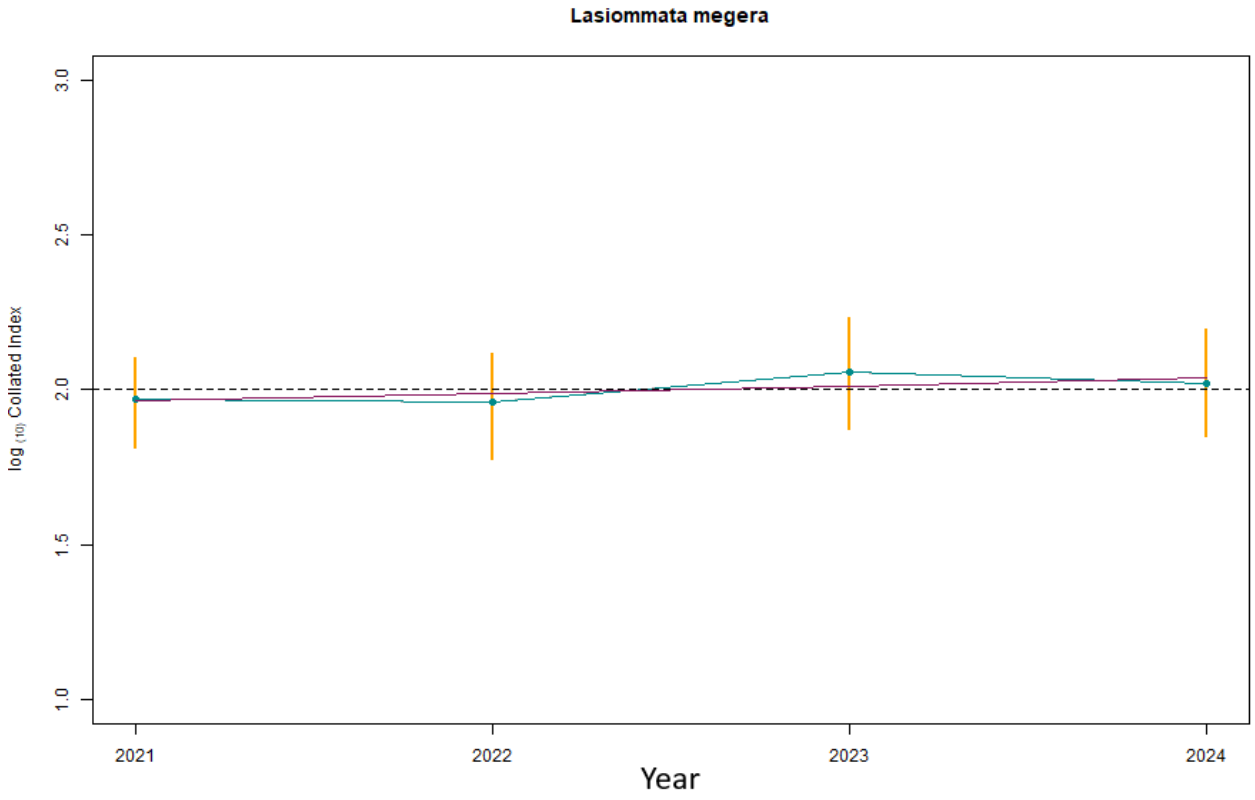
Thanks to data collected through the ITBMS, the first Italian Grassland Butterfly Indicator was calculated in 2023 using data from 2021 onward. For Italy, only 10 of the 17 European species could be included due to insufficient data for the remaining seven: *Cupido minimus, Cyaniris semiargus, Euphydryas aurinia, Lysandra bellargus, Lysandra coridon, Spialia sertorius, and Thymelicus acteon.*

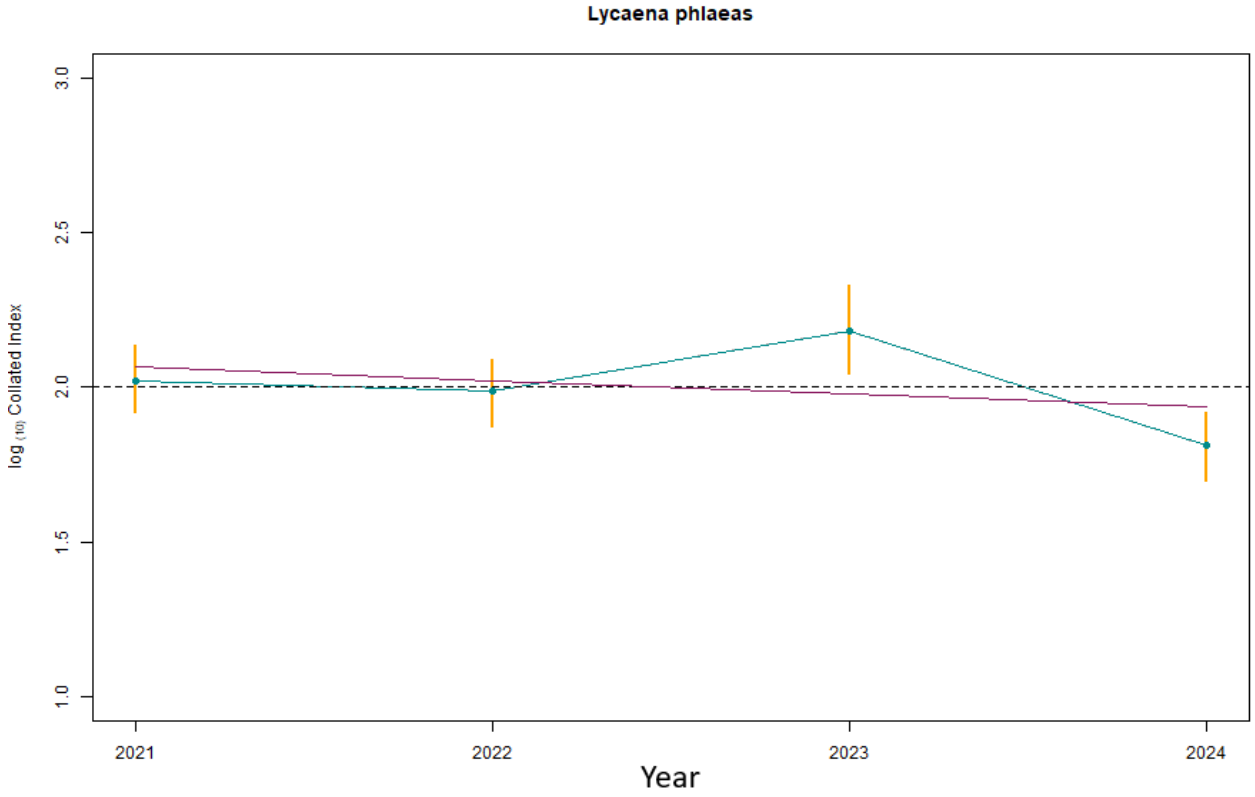
The trends of the 10 Italian species from 2021 to 2024 are shown in the graphs below, where the vertical axis represents the Collated Index (the estimated number of individuals for each species) and the horizontal axis represents the monitoring year. Four species: *Anthocharis cardamines, Coenonympha pamphilus, Lasiommata megera, and Polyommatus icarus* have remained stable. *Maniola jurtina* and *Ochlodes sylvanus* show slight increases, likely due to the growing amount of ITBMS data. In contrast, *Erynnis tages, Lycaena phlaeas*, and *Pieris rapae* show declining trends, indicating reductions in their populations in 2024 compared to previous years.

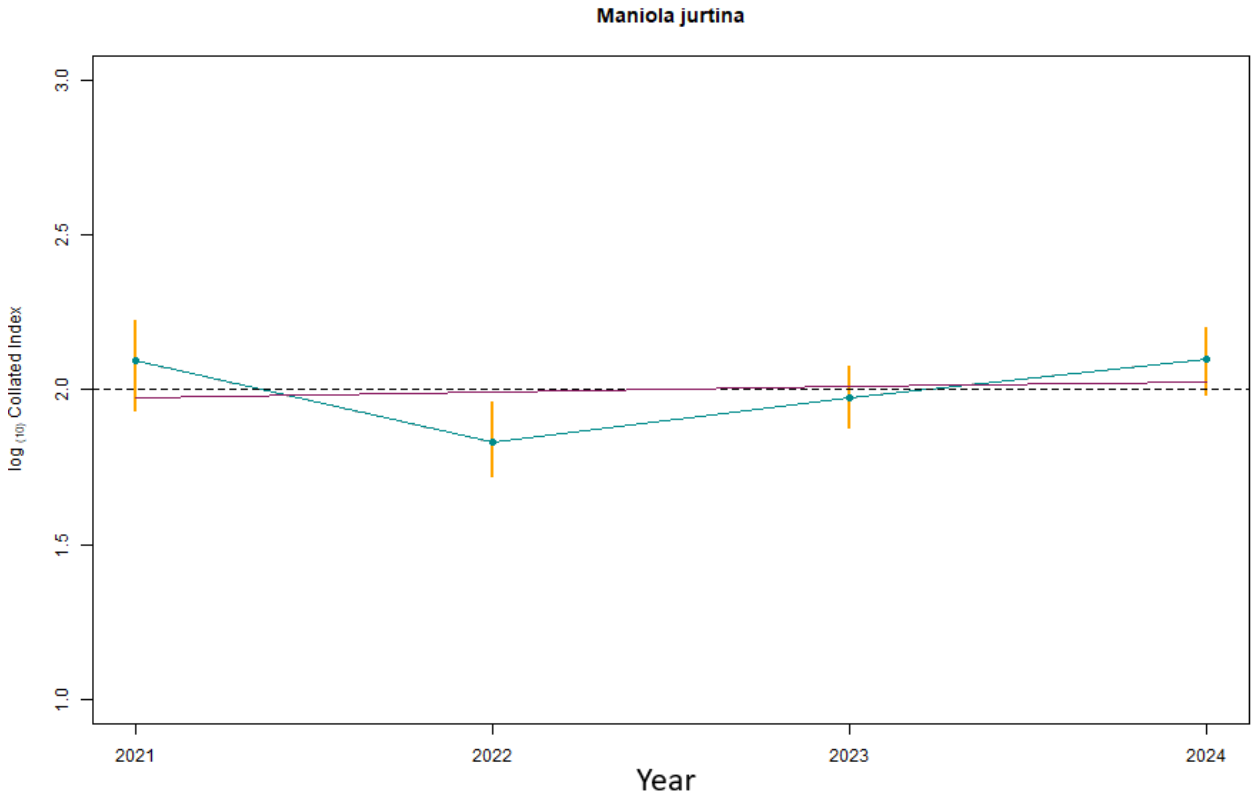

Anthocharis cardamines
log (10) Collated Index
3.0
2.5
2.0
1.5
1.0
2021
2022
2023
2024
Year

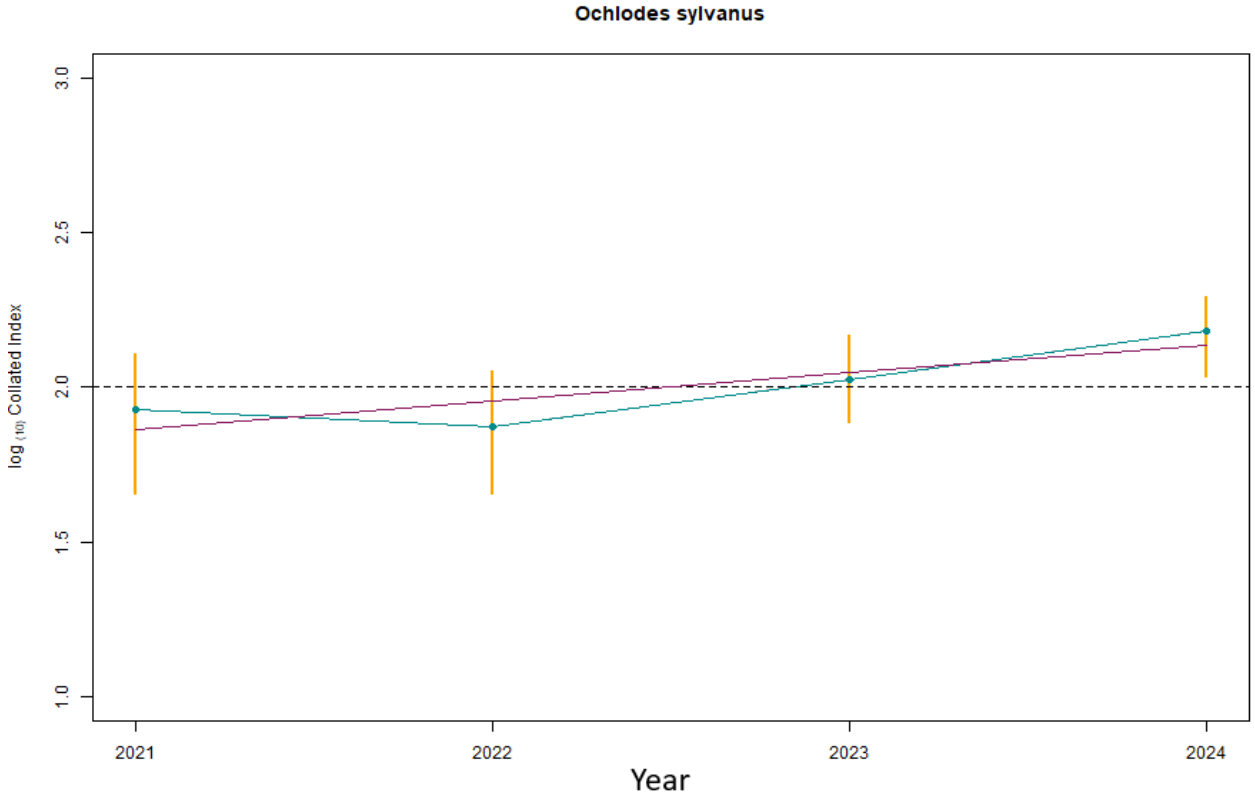

Coenonympha pamphilus
log (10) Collated Index
3.0
2.5
2.0
1.5
1.0
2021
2022
2023
2024
Year

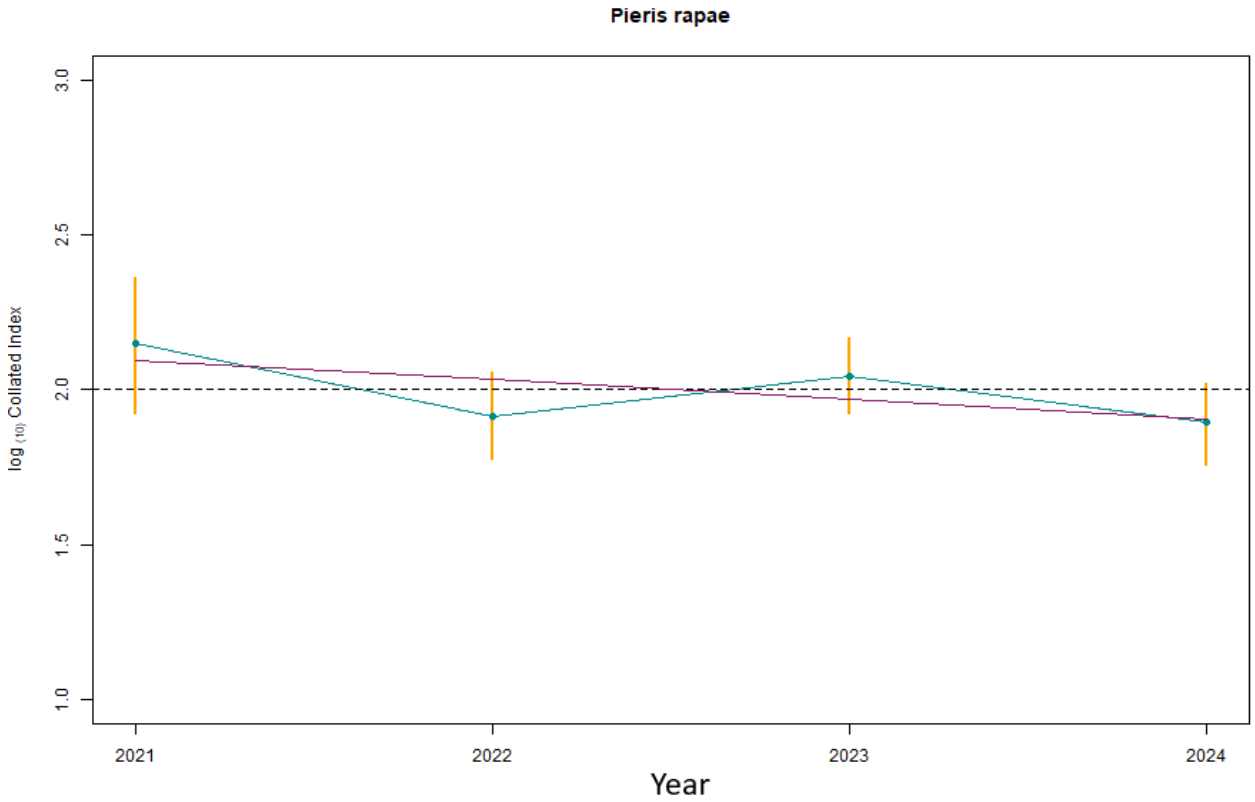

Erynnis tages
log (10) Collated Index
3.0
2.5
2.0
1.5
1.0
2021
2022
2023
2024
Year

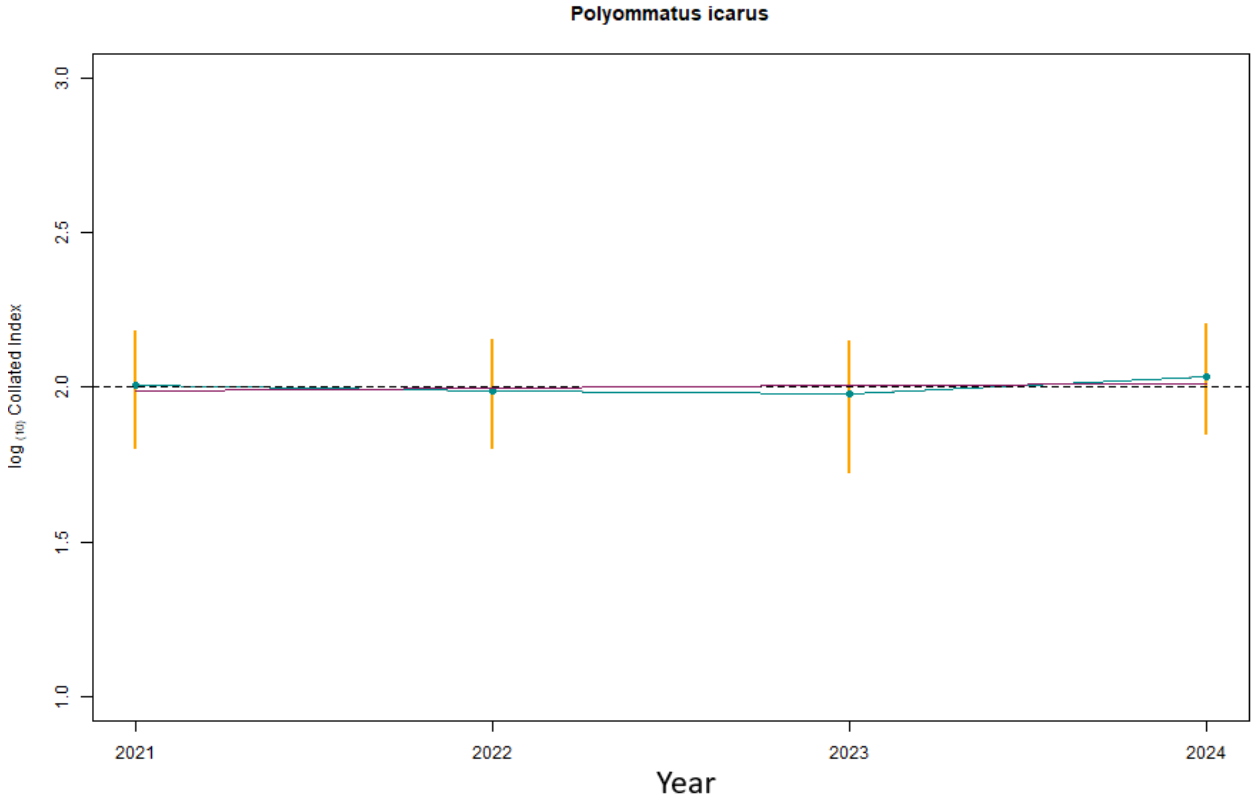

Lasiommata megera
log (10) Collated Index
3.0
2.5
2.0
1.5
1.0
2021
2022
2023
2024
Year


Lycaena phlaeas
log (10) Collated Index
3.0
2.5
2.0
1.5
1.0
2021
2022
2023
2024
Year


Maniola jurtina
log (10) Collated Index
3.0
2.5
2.0
1.5
1.0
2021
2022
2023
2024
Year


Ochlodes sylvanus
log (10) Collated Index
3.0
2.5
2.0
1.5
1.0
2021
2022
2023
2024
Year


Pieris rapae
log (10) Collated Index
3.0
2.5
2.0
1.5
1.0
2021
2022
2023
2024
Year


Polyommatus icarus
log (10) Collated Index
3.0
2.5
2.0
1.5
1.0
2021
2022
2023
2024
Year

Join the Italian Butterfly Monitoring Scheme

If you enjoy spending time in nature and love butterflies, you are welcome to join the Italian Butterfly Monitoring Scheme! Participating is easy:

1. Visit our website (https://butterfly-monitoring.net/it) to create your personal account.
2. Choose a location near your home or another convenient site where you can observe butterflies.
3. Contact your national coordinator and propose your transect by emailing **help.itbms@gmail.com**.
4. Design your transect together with our technicians.
5. Download our App.
6. Download our manual and species identification guides.

If you encounter any issues with the website or app, don't hesitate to contact us at **help.itbms@gmail.com**.

Enjoy your time in nature while helping to monitor Italy's beautiful butterfly populations!

Acknowledgements

The ITBMS coordination team sincerely thanks everyone who contributed to the creation and growth of the national scheme. The excellent results achieved are the result of the dedication and support of volunteers, institutions, and other partners.
Special thanks go to the Italian Lepidopterological Association, which sponsors every BMS Italy national workshop.

References

Balletto E., Dapporto L., Bonelli S., 2021. Insecta Lepidoptera Papilionoidea, Hesperioidea. In: Bologna M.A., Zapparoli M., Oliverio M., Minelli A., Bonato L., Cianferoni F., Stoch F. (eds.), Checklist of the Italian Fauna. Version 1.0. Last update: 2021-05-31. Available at: https://www.lifewatchitaly.eu/en/initiatives/checklist-fauna-italia-en/checklist/

Pollard, E., & Yates, T. J. (1994). Monitoring butterflies for ecology and conservation: the British butterfly monitoring scheme. Springer Science & Business Media.

Sevilleja, C. G., van Swaay, C. A. M., Bourn, N., Collins, S., Settele, J., Warren, M. S., … & Roy, D. B. (2019). Butterfly transect counts: manual to monitor butterflies. Wageningen: Butterfly Conservation Europe & De Vlinderstichting/Dutch Butterfly Conservation.

Thomas, J. A. (2005). Monitoring change in the abundance and distribution of insects using butterflies and other indicator groups. Philosophical Transactions of the Royal Society B: Biological Sciences, 360(1454), 339-357.

Van Swaay C.A.M., Schmucki R., Roy D.B., Dennis E.B., Collins S., Fox R., Kolev Z.D., Sevilleja C.G., Warren M.S., Whitfield A., Wynhoff I., Arnberg H.J.H., Balalaikins M., Barea-Azcón J.M., Boe A.M.B., Bonelli S., Botham M.S., Bourn N.A.D., Cancela J.P., Caritg R., Dapporto L., Ducry A., Dušej G., de Flores M., Dopagne C., Escobés R., Eskildsen A.E., Fric Z.F., Fernández-García J.M., Fontaine B., Glogovčan P., Gohli J., Gracianteparaluceta A., Grill A., Harpke A., Harrower C., Heliölä J.K., Høye T.T., Judge M., Kati V., Krenn H.W., Kühn E., Kuussaari M., Lang A., Lehner D., Lysaght L., Maes D., McGowan D., Melero Y., Mestdagh X., Middlebrook I., Monasterio Y., Monteiro E., Montes A., Munguira M.L., Musche M., Olivares F.J., Ozden O., Pladevall C., Pavličko A., Pettersson L.B., Rákosy L., Roth T., Rüdisser J., Šašić M., Scalercio S., Schönwälder M., Settele J., Sielezniew I., Sielezniew M., Sobczyk-Moran G., Stefanescu C., Švitra G., Svabadfalvi A., Tiitsaar A., Titeux N., Tzirkalli E., zortzakaki O., Ubach-Permanyer A., Vičiuvienė E., Vray S., Zografou K. (2025). EU Grassland Butterfly Index 1991-2023 Technical report. Butterfly Conservation Europe & EMBRACE/eBMS (www.butterfly-monitoring.net) & Vlinderstichting report VS2025.014. https://doi.org/10.5281/zenodo.16281872

Van Swaay, C. A., Dennis, E. B., Schmucki, R., Sevilleja, C. G., Aghababyan, K., Åström, S., … & Roy, D. B. (2020). Assessing Butterflies in Europe-Butterfly Indicators 1990-2018: Technical report.

Warren, M. S., Maes, D., van Swaay, C. A., Goffart, P., Van Dyck, H., Bourn, N. A., … & Ellis, S. (2021). The decline of butterflies in Europe: Problems, significance, and possible solutions. Proceedings of the National Academy of Sciences, 118(2).

Annex I: 2024 species list

Species found in 2024		
Aglais io	*Erebia tyndarus*	*Nymphalis polychloros*
Aglais urticae	*Erynnis tages*	*Ochlodes sylvanus*
Agriades glandon	*Euchloe ausonia*	*Ochlodes venata*
Agriades optilete	*Euchloe crameri*	*Oeneis glacialis*
Agriades orbitulus	*Euphydryas aurinia*	*Papilio machaon*
Anthocharis cardamines	*Fabriciana adippe*	*Pararge aegeria*
Apatura ilia	*Fabriciana niobe*	*Parnassius apollo*
Apatura iris	*Glaucopsyche alexis*	*Phengaris alcon rebeli*
Aphantopus hyperantus	*Glaucopsyche melanops*	*Phengaris arion*
Aporia crataegi	*Gonepteryx cleopatra*	*Pieris brassicae*
Arctia villica	*Gonepteryx rhamni*	*Pieris bryoniae*
Argynnis pandora	*Hamearis lucina*	*Pieris mannii*
Argynnis paphia	*Heteropterus morpheus*	*Pieris napi*
Aricia agestis	*Hipparchia fagi*	*Pieris rapae*
Aricia artaxerxes	*Hipparchia fidia*	*Plebejus argus*
Boloria dia	*Hipparchia semele*	*Plebejus argyrognomon*
Boloria euphrosyne	*Hipparchia statilinus*	*Plebejus idas*
Boloria pales	*Hyponephele lycaon*	*Polygonia c-album*
Boloria selene	*Iphiclides podalirius*	*Polygonia egea*
Boloria titania	*Issoria lathonia*	*Polyommatus amandus*
Brenthis daphne	*Lampides boeticus*	*Polyommatus celina*
Brenthis hecate	*Lasiommata maera*	*Polyommatus dorylas*
Brintesia circe	*Lasiommata megera*	*Polyommatus eros*
Cacyreus marshalli	*Lasiommata paramegaera*	*Polyommatus escheri*
Callophrys rubi	*Lasiommata petropolitana*	*Polyommatus icarus*
Carcharodus alceae	*Leptidea sinapis/juvernica/reali*	*Polyommatus thersites*
Carcharodus floccifera	*Leptotes pirithous*	*Pontia daplidice*
Carterocephalus palaemon	*Libythea celtis*	*Pontia edusa*
Celastrina argiolus	*Limenitis camilla*	*Pseudophilotes baton*
Charaxes jasius	*Limenitis reducta*	*Pyrgus alveus*
Chazara briseis	*Lopinga achine*	*Pyrgus armoricanus*
Coenonympha arcania	*Lycaena alciphron*	*Pyrgus carthami*
Coenonympha corinna	*Lycaena dispar*	*Pyrgus malvae*
Coenonympha gardetta	*Lycaena hippothoe*	*Pyrgus malvoides*
Coenonympha pamphilus	*Lycaena phlaeas*	*Pyrgus onopordi*
Colias alfacariensis	*Lycaena thersamon*	*Pyrgus serratulae*
Colias crocea	*Lycaena tityrus*	*Pyronia cecilia*
Colias hyale	*Lycaena virgaureae*	*Pyronia tithonus*
Colias palaeno	*Lysandra bellargus*	*Satyrium acaciae*
Colias phicomone	*Lysandra coridon*	*Satyrium ilicis*
Cupido alcetas	*Lysandra hispana*	*Satyrium spini*
Cupido argiades	*Maniola jurtina*	*Satyrium w-album*
Cupido minimus	*Melanargia arge*	*Satyrus ferula*
Cupido osiris	*Melanargia galathea*	*Scolitantides orion*

Cyaniris semiargus	*Melanargia russiae*	*Spialia sertorius*
Erebia aethiops	*Melitaea athalia*	*Thecla betulae*
Erebia albergana	*Melitaea britomartis*	*Thymelicus acteon*
Erebia arvernensis	*Melitaea celadussa*	*Thymelicus lineola*
Erebia epiphron	*Melitaea cinxia*	*Thymelicus sylvestris*
Erebia euryale	*Melitaea deione*	*Vanessa atalanta*
Erebia ligea	*Melitaea diamina*	*Vanessa cardui*
Erebia manto	*Melitaea didyma*	*Zerynthia cassandra*
Erebia medusa	*Melitaea ornata*	
Erebia melampus	*Melitaea phoebe*	
Erebia mnestra	*Melitaea varia*	
Erebia montana	*Minois dryas*	
Erebia pandrose	*Neptis rivularis*	
Erebia pronoe	*Nymphalis antiopa*	

Annex II: List of volunteers from 2019 to 2024

Transect	Volunteers
Acque Dolci	Lorenza Borsarelli
Allacciante di sinistra	Leonardo Favilli
Annicco Cremona	Marco Ghisolfi
Area di Castelsecco	Progetto IDEAr Arezzo
Area Naturale Protetta della Selva di Meana	Massimo Luciani
Argenta	Paolo Mazzei
Attiggio Cesi	Tania Pecci
Battaglietta	Grazia Militello,Laetitia Bourget
Belagaio_Marsiliana5	Progetto LIFE ESC 360
Bernate Ticino MI - IOLAS 02	Associazione Iolas
Bianello	Lorenzo Meglioli
Biolago	Antonio Zurlo, Beatrice Gammino, Dina Goletto , Paolo Mancardi
Bolzano Eurac Research	Eurac Research
Borgata Piane	Roberto GALATI
Bosco Campagnazza	Vanni Polo
Bosco della Castagnola	Marco Pietroni
Bosco di Agognate	E.G.A.P. Ticino e Lago Maggiore, Cecilio Uglietti, Marco Ricci
Bosco di Fornace vecchia	Alberto Ambrogio
Bosco Fontana I	Sönke Hardersen
BOSCO GRANDE DI PAVIA	Valentina Giordano
Bosco Vedro	E.G.A.P. Ticino e Lago Maggiore, Karen Contu, Paola Trovò, Marco Ricci, Simone Trabattoni, Giancarlo Zaccala, Alessandra Serini, Antonio Gennaro, Cecilio Uglietti
Brughiera Briantea	Dario Donzelli
Calvario di Pretoro (CH)	Giuseppe Marcantonio
Canale Acque Alte	Fausto Leandri
Canale del Granduca	Leonardo Favilli
Canapre	Cristiana Cerrato, Roberto Bolzanello
CantonTea1	Simone Bocca
Capo Rama	Grazia Militello, Laura Genco
Carrozzella	Emiliano Cistaro
Cascata	Chiara Furlan
Cascina Lai	Associazione Natura Cascina Bellezza
Castelleone	Marco Ghisolfi
Celarda 1	Marialuisa Dal Cortivo
Celarda 2	Marialuisa Dal Cortivo
Ceriolo	Alice Burchielli
Cinin	Diego Massalongo
Cirimilla	Daniela Roveda, Mara Calvini, Giacomo Gola
Cittadella	Paola Pilotto
Coldemies	Chiara Furlan
Colla di Ortovero (monte Chiesa)	Matteo Serafini
Colle di Val d'Elsa	Elena Dionori

Cornalin	Cecilia Noce
Corso Lodi Miglio delle Farfalle	Andrea Cipriani
Costa del Vento, Montalto Pavese PV - IOLAS 01	Associazione Iolas
Costaz 1	Alessandro Durando, Gianna Bosio, Giada Cignetti
cupolone	Alessandro Salemi, Grazia Militello
Curino, ex miniera a cielo aperto	Lucio Bordignon
Da Santa Giustina a Santa Croce	Associazione Comitato Mura di Padova
Davoli	Margherita Lombardo
della Zerynthia	Elvire Laurens
Elba 1	Zen Lab
Fianco funicolare Piazza Mondovì	Bruno Regis
Fogliano LIFE_ESC360	Progetto LIFE ESC 360
Foresteria dell'Oasi	Alma Cozzolino, Beatrice Gammino, Laura Martinelli, Mario Dalmasso, Simone Gautero
Fossa della Garofala	Grazia Militello, Sara Chiarello
Fraina	R.C.B. Catanzaro, Carmine Lupia
Galeone 3	Progetto LIFE ESC 360
Galeone LIFE_ESC360	Progetto LIFE ESC 360
Galeone LIFE_ESC360 T2	Progetto LIFE ESC 360
Gaudella	Michele Presacane
Gianola archeologica	Simona Zirletta
Giardino Botanico Alpi Orientali	Marialuisa Dal Cortivo
GOLENA BASTIONI BUOVO E CORNARO	Associazione Comitato Mura di Padova
Gorgofreddo 1	Progetto LIFE ESC 360
Grotta Sant'Antonio	M.Giovanna Casanova
Grotticelle 1	Raffaella FANELLI
I Galli	Simona Zaghi
Infusino Taverna	Marco Infusino
Isola clodia	Pamela Rustici
Isola di Sant' Erasmo	Carlo Marinello
IT5190008 Lago di Montepulciano	Leonardo Favilli
JRC Ispra	Maria Luisa Paracchini
La Cassinazza 1	Roberto Garavaglia
La Raganella	Alberto Ambrogio
La Rosa	Leonardo Favilli
Lago della vernavola	Gabriele Benassi
Lama lunga	Gianluca Stasolla
L'Ape Regina Monte Rufeno	R.N. Monte Rufeno
Lazzaretto Nuovo	Lazzaretti Veneziani, Carlo Marinello, Francesca Guarnotta,
Località Anzan Vervò	Elisa Zadra
LTER - Muntatschinig	Eurac Research
Maleda - Forborida	Luca Pedrotti
Maresana Centro Parco	Alessandro Mazzoleni
Mars1	Progetto LIFE ESC 360
Marsiliana_ESC360	Progetto LIFE ESC 360
Marsilianaesc360_2	Progetto LIFE ESC 360

Marsilianaesc360_3	Progetto LIFE ESC 360
Meisutera	Elio Giuliano
Monte labbro	Pamela Rustici
Monte Mao	Marco Bonifacino
Montemanna	Grazia Militello, Laetitia Bourget
Montioni_pievaccia_LifeEsc360	Progetto LIFE ESC 360
Museo Scienze Naturali E. Noussan	Beatrice Gammino, Francine Valerie Navillod
Nuovi Stagni	Alma Cozzolino, Beatrice Gammino, Laura Martinelli, Mario Dalmasso, Simone Gautero
Oasi I Valloni	Oasi Valloni
Oasi Lipu Bosco Negri PV - IOLAS 03	Associazione Iolas
Oasi Naturalistica della Martesana	Isabella Negroni
Oasi Ripa Bianca Jesi	Noemi Pollonara
OASI WWF LAGO DI SERRANELLA	Oasi WWF Lago di Serranella, Sante Ceriola
Oasi WWF Stagni di Casale	Giacomo Gasparini
Oasi wwf valmanera	Chiara Pertosa, Denis Nikolli, Marta Bandiera, Chiara Pertosa
Orto Botanico Università della Calabria	Antonio Mazzei
Orto via Famolasco	Michela Daraio
Parco Colle del Pionta	IDEAr Arezzo
Parco Collodi - Transetto 1	Clarissa Puccioni
Parco della Vernavola	Gabriele Benassi
Parco della Vernavola - Da Acerbi-Bardotti alla tangeziale	Gabriele Benassi
Parco Nazionale Val Grande	Ente Parco Nazionale Val Grande, Alessandra Pollo, Irene Piccini, Andrea Mosini
Parcomurgia	Vito Santarcangelo
Pejo paese	Luca Pedrotti
Percorso Domagnano	Luca Maccapani
Pertusella/Cesate	Dario Donzelli
Pian del Re, RF2	Marco Rastelli
Pian Fiorenza, RF1	Marco Rastelli
Pian Grande delle Tampe, RV1	Marco Rastelli
Pian Grande delle Tampe, RV2	Marco Rastelli
Pian Inseta	Gianna Bosio
Pian Sengio	PNGP, Cristiana Cerrato, Emanuel Rocchia, Ylenia Sartorello, Silvia Ghidotti
Pod.Serra	Giuseppe Molinari
Ponton	Gianna Bosio
Pravedela	Luca Pedrotti
Premeno	Andrea Mosini
PSK 1	R.C.B. ISERNIA
Radicchia	Fulvia Benetello
Regione Issoglio	Marianna Boi
Renovapark	Marcello Fattori
Riserva di Decima Malafede 1	Arianna Giannini, Giulia Bacco
Riserva naturale Bessa	E.G.A.P. Ticino e Lago Maggiore

Riserva naturale Bosco Casale	Carlo Meo
Riserva Naturale Murge Orientali sezione Galeone	Reparto Biodiversita' Martina Franca
Riserva Naturale Orientata Monticchie	Alice Locatelli, Angelo Dadda, Giulia Mazzocchi, Tiziana Impollonia, Laura Codeca', Linda Mazzoleni, Lorenzo Mazzocchi, Marco Piacentini, Matteo Grechi, Marco Polonioli, Silvia Ghidotti, Simone Majocchi
Riserva Naturale Regionale Oasi WWF dei Ghirardi	Guido Sardella
Riserva Naturale Statale di Montecellesi, progetto APINCITTA'	Leonardo Favilli
Riserva Naturale Statale Montefalcone 1	Francesca Ruggeri
Riserva Naturale Statale Montefalcone 2	Francesca Ruggeri
Riserva Naturale Statale Montefalcone 3	Francesca Ruggeri
Riserva Naturale Valle dell'Aniene	ALPEREN YAYLA
Risorgive del Vinchiaruzzo	Niccolò Fagotto
Rocca Bianca, AB1	Marco Rastelli
Rocca Bianca, AB2	Marco Rastelli
Rocca Bianca, AF1	Marco Rastelli
Rocca de Baldi_Campo Alessandro Gioda	Comizio Agrario di Mondovì
Rocca Delle Caminate	Silvia Versari
Roccelletta	Giuseppe Rijllo
Roccelletta_2	Giuseppe Rijllo
Roncino	R.C.B. Catanzaro, Carmine Lupia
Saffignano	Alessandro Pastori
San Donà di Piave (Grassaga)	Raffaella Marcon
Santa Lucia Portoferraio	Giulio Colombo
Santa Teresina Via Grassaga	Raffaella Marcon
Sant'Angelo	Emiliano Cistaro
Scacciavolpe def	Francesca Ruggeri
Selva del Lamone - Cavicchione	Selva Lamone
Sentiero delle lavandaie	Filippo Bargelli
Sentiero natura del fiore - RN Monte Rufeno	Antonella Lisi
Sentiero Natura del fiore Monte Rufeno	Antonella Lisi
Serra Spiga	Marco Infusino
SIC Fontana del Guercio	Parco Groane
SIC pineta di Cesate	Parco Groane
Sperandie di sotto	Leonardo Favilli
Stablet - TN	Luca Pedrotti
Sticciano scalo	Pamela Rustici
StradaSorgenti_Colognole	Alessandro Cini
Tontola01	Giuseppe Molinari
Tor Paterno	Marica Furini

Torbiere nord est	Gabriele La Grasta
Torbiere nord ovest	Gabriele La Grasta
Torbiere stagni	Gabriele La Grasta
Torbiere sud	Gabriele La Grasta
Torre Salsa	Torre Salsa
Transetto EF - Valli Mirandolesi	Elia van Tongeren
Traversata Muggesana	Simone Ghassempour
Turin - Parco Piemonte	Orti Generali, Frabncesca Sardella, Biren Rathod, Marta depetris, Simona Alberti, Nicolò Chiappetta, Lorenzo Bianco, Gianluca Chieppa, Francesca Martelli
Turin Mirafiori	Lorenzo Bianco, Marta Depetris, Simona Alberti, Francesca Martelli
Una Garlanda	Una Garlanda
Vaie	Valentina Bollo
Val di Viso	Lucrezia Lorenzetti, Luca Pedrotti
Val Masino	Barbara Giuliani
Valle del cagnolino Gaia	Elvire Laurens
Valle della Nava	Laura Farina
Valle Morosina - Ghebo storto	Luca Sattin
Vallere	Simona Zaghi
Vallone dell'Alpetto, AF2	Marco Rastelli
Veulla	Gianna Bosio
Via Juglaris	Exodomus
Via Venola e Stagno	Elvire Laurens
Villa Severi	Progetto IDEAr Arezzo
Vivaio a Cirimido	Dario Donzelli
VIVERE IL PO A CASALE MONFERRATO - Oltreverde	Maria Teresa Bergoglio
Zoom Torino	Yari Roggia
Zoom Torino Parco	Yari Roggia