Dear olive farmers and stakeholders participating and interested in our project ECO-OLIVES!

We thank you very much for your collaboration and support of our project! With this report we want to give you an update of what has been done in ECO-OLIVES during the field season in spring 2023 and what project activities are upcoming until the end of this year.

Table 1:

Overview of completed and upcoming project activities described in this report

Surveys & Activities	**✓ Completed** (all 12 farms; since 2022)	**→ Upcoming** (until end 2023)
Birds (per farm)	- 6 x Point counts *** - 2 x Mist netting * - 2 x Sound recordings * - 1 x Predation experiments *	- 3 x Point counts **** - 2 x Mist netting ** - 2-3 x Sound recordings ** - 1-2 x Predation experiments **
Bats (per farm)	- 2 x Sound recordings * - 1 x Habitat monitoring *	- 2 x Sound recordings ** - 1 x Habitat monitoring ** - 2 x Mist netting *
Arthropods (2022: 8 trees/farm; 2023: 12 trees/farm)	- 2 x Visual observations *** - 2 x Pitfall traps *** - 2 x Winkler traps *** - 2 x Honey traps *** - 1 x DNA & Lab work *	- 2 x Visual observations **** - 2 x Pitfall traps **** - 2 x Winkler traps **** - 2 x Honey traps **** - 1 x DNA & Lab work **
Farms (2022: 8 trees/farm; 2023: 16 trees/farm)	- 1 x Farm measures (detail) * - 1 x Harvest quantity/quality *	- 1 x Farm measures (detail) * - 1 x Harvest quantity/quality **° - 1 x Landscape mapping * - 1 x Vegetation monitoring *
COMPASS Partnerships	- 2 x Pruning (Feb. & Apr.) * - University of Würzburg - IZW Berlin - SOUNDS WILD project	- 1 x Microclimate surveys * - University of Florence - COMPASS Indonesia - BiovEXO

** The number of these symbols indicates the number of covered seasons (spring and autumn).*
The nets of exclusion experiments will be removed during the upcoming harvest in 2023.

Table of contents:

Birds

There are 551 bird species known in Italy, including about 360 resident and 190 migratory species. Due to their high mobility and diverse feeding behaviors, they contribute to many ecosystem services of high economic importance. For example, seed eaters like finches contribute to restoration of forests, carnivores like crows support environmental hygiene and insectivores like tits control arthropod populations, including many species that are considered as agricultural pests. So far, we observed 56 bird species in our project (56 species via points counts and 26 species via mist netting).

Our project is designed to improve our understanding of (a) how local management of olive groves and the surrounding landscape composition influence the occurrence and activity of birds and (b) how this knowledge can be implemented into biodiversity conservation and sustainable management of olive cultivation landscapes. We aim to identify key species that play a major role for the ecosystem and/or pest suppression in our study area – and how these species and their functions can be better preserved and managed (for example, by providing natural or artificial resources that support their breeding and foraging). To do this, we use a combination of different observation and research approaches:

Point counts are used to record all birds our experts can see and hear within a defined time standard (10 minutes per survey and farm) and observation radius (50m and 100m) from a defined observation point within each farm. This method provides very good information about the overall occurrence of different species on each farm and within the study area.

Mist netting is used to obtain life history information from the bird community in our study area. Per each farm and survey, we use a total length of 66m "mist net" (a very fine, scientific bird catching net of 2,5m height) to measure all captured birds in detail, mark them with a uniquely numbered metal ring and release them after the process. This method provides important information about the physiological variation and fitness of birds that are captured and recaptured (for example, on their survival, fitness, and distribution in relation to many body measures such as size, weight, and fat). It also complements our data set through the capture of species that are not so easy to detect only by sounds. Capturing birds allows us to take fecal samples and analyze their diet in relation to the DNA-database of arthropods we obtained from the canopy fogging in 2022. This approach helps us to better understand which bird species are feeding on which arthropods and how to better manage this ecosystem service.

Sound recordings of birds are used to obtain additional information about bird species richness, activity, and behavior. Through an equipment grant from "Wildlife Acoustics", we can work with the best possible tools to record bird sounds (two hours around sunrise and sunset for three consecutive days per farm and survey). This method allows us to better understand their activity and interactions (for example, by analyzing the duration and type of calls).

Predation experiments complete our study of birds by providing quantitative information about their predation activity on each farm. We use green plasticine to model standard-sized, artificial caterpillars (30 x 5 mm), of which we apply six to each of eight study trees per farm and survey (4 ECO-OLIVES controls and 4 COMPASS trees). Predation marks are counted and documented 3-4 days after application, which provides us valuable information about pest suppression of insect eating birds and other predators in the study area.

UPCOMING → The combination of all above-described methods was first conducted in spring 2023 and will be repeated in the same way in autumn 2023 (September to November).

Bird survey gallery

Point Counts & Mist netting






Sound recordings


Predation experiments




Bats

There are 34 different bat species in Italy, all of which are feeding on insects only. Through our sound recordings, we can already confirm the occurrence of about 22 bat species in our study area – maybe even up to 25 bat species (only to be confirmed after manual validation).

Bats play a major role for controlling arthropod populations in the ecosystems in which they occur – including pests like the olive fruit fly (*Bactrocera oleae*) and olive moth (*Olea europaea*). As both birds and bats are highly mobile organisms and connect resources within and between all kinds of habitats across landscapes, our study design for bats also aims to improve our understanding of (a) how local management of olive groves and the surrounding landscape composition influence bat occurrence and activity; and (b) how this knowledge can be implemented into biodiversity conservation and sustainable management of olive cultivation landscapes. Like for birds, we will identify key species that play a major role for ecosystems and pest control in our study area, as well as approaches to protect and promote these services (for example, through natural or artificial resources that support bat activity). We use the following combination of approaches to achieve these goals:

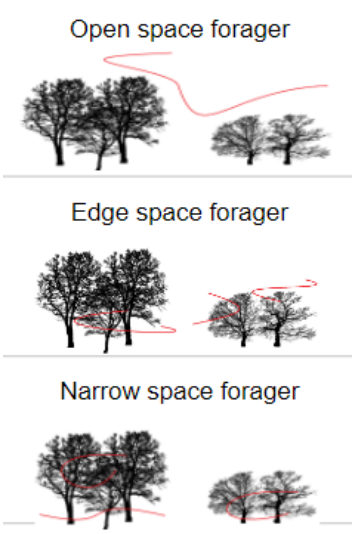
Sound recordings of bats present a state-of-the-art method to study their species richness, activity, and behavior. We are using so-called "BATLOGGERS" with which we record bat sounds twice per survey and farm during 3 consecutive nights (always one hour centered around sunrise/sunset). The recordings are analyzed to identify bat species according to their species-specific sound patterns, as well as special sounds they do during feeding on arthropods (feeding buzzes) and in their interactions with other bats (social calls). Due to analyses of sound, frequencies and call durations, we also get important information about the activity of bats per farm and for the whole study area.

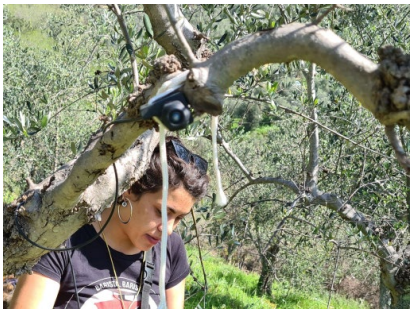
Habitat monitoring of bats is important to understand their current distribution in the study area, as well as to identify challenges in their future population development and conservation. For example, trees provide food and shelter for bats, who use different parts for feeding and roosting depending on the season and temperature. Therefore, we conduct a fine-scale monitoring of all kind of important habitats in our study area: We record (a) the occurrence of micro-habitats in each project farm - for example, cracks in olive trees are sometimes used as roosts by bats, if human disturbance is not too high; (b) the occurrence of bats in habitats around the farms - for example in dry walls; and (c) the occurrence of bats in caves within the study area - which are sometimes used as hibernation sites in winter. This monitoring is done partly by our team and partly by our certified conservation dog Watson, who will help us to do the bat monitoring by olfactory detection of bat feces and bat roosts. We also plan to train other dogs in our team to support this task.

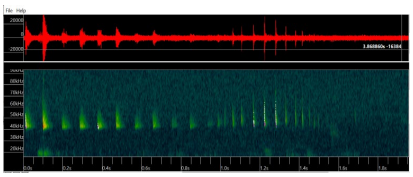
UPCOMING → The sound recordings and (extended) habitat monitoring will be repeated in the autumn season from September to November. We also plan to perform 1-2 rounds of mist netting of bats in autumn 2023 – which will be similar to the mist netting approach for birds, but conducted between one hour before sunset and midnight.

Bat survey gallery

Sound recordings







Sound pattern of foraging bats

Bat sounds will be analyzed with respect to different foraging modes and types

Habitat monitoring

Arthropods

Arthropods include both insects and spiders (in Italy: > 37.000 known species of insects and 1705 known species of spiders). The vast majority of these large species groups provide functions that are only neutral or even highly beneficial to us, for example yield-promoting pollination or pest control in agricultural systems. High diversity of arthropods (which is mostly related to high diversity of plants) supports more diverse ecological and agricultural systems that are more resilient to pests and other challenges (such as extreme weather events) than less diverse systems, because higher biodiversity provides a natural buffer against disturbances.

We have recorded more than 500 species of insects and 106 spider species in our project so far – while many groups are still processed and identified in the laboratory work of our team and partners. For example, our partners at the University of Florence have already identified more than 50 species of ants from our samples (out of 258 ant species in Italy.)

We use the following combination of methods and approaches to study arthropods:

Visual observations of arthropods are done by Andrea Piccinini, who is counting and documenting all insect and spider species per survey tree within a 10-minute time standard. In 2022, we took these data three times for 8 trees per farm (once in spring and twice in autumn). We could increase our observation effort to 12 study trees and three surveys per farm in 2023, thanks to the extension of our project through COMPASS. This method allows us to study arthropods in the tree and its canopy, including main olive pests.

Pitfall traps are used to study ground-dwelling arthropods. Per farm, we use four traps (glasses) buried in the ground and covered by black roof that are kept in the field for one week per survey. Like for the other surveys for arthropods, we completed 6 of these surveys so far per farm (total of 288 traps, including 267 "successful" traps that were not destroyed or empty).

Winkler traps and honey traps are used to set a focus on ants in our project. Ants are highly active and impactful organisms that provide relevant ecosystem services by defending their colonized trees and trophobionts (aphids and cicada they keep for harvesting honey dew) from other arthropods. Winkler traps are white cotton bag constructions used to filter arthropods from a litter sample taken around the study trees. Honey traps are little sample tubes including a mixture of honey and rum that attracts ants, but also other insects such as beetles and flies. Our project partners in Florence provide great support with the sorting and identification of ants taken from these sticky samples, which is a very challenging task.

DNA samples and laboratory work are required to process the large amount of data taken in the arthropod surveys. Since many species can only be identified under a microscope, it requires many hours in the lab to sort and identify our samples from the field. In addition, we have taken a large arthropod sample through canopy fogging in 2022 (which allows to also sample flying species, including major olive pests) and analyzed the overall DNA of arthropods on each farm, as well as the DNA of 6749 individuals and at least 319 species of more than 500 single-sorted key species (including major providers of pollination and pest control services as well as pests). This DNA-database of arthropods will be linked to the DNA-samples of birds (and maybe bats) to understand pest control services of birds and bats on a very advanced, species-specific level.

UPCOMING → The combination of all above-described methods was first conducted in spring 2022 and will be continued in the same way until autumn 2023 (September to November).

Arthropod survey gallery

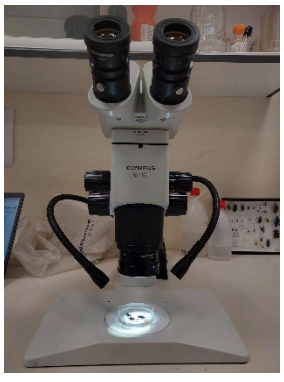
Visual observations

Longhorn beetle
(*Vesperus sp.)*

European dwarf mantis
(*Ameles spallanzania)*

Pitfall traps, Winkler traps & Honey traps

DNA samples and laboratory work



Our laboratory work on DNA samples led to the first record of the spider species Phaeocedus vankeeri in Italy

Summary of species observations

Table 2:

Overview of arthropod abundance

Methods & Seasons *(including number of completed surveys)*	Numbers of observed individual numbers of arthropods (estimated minimum) for each method and season – including estimates of total observed individual numbers and the respective proportion of predatory species that potentially contribute to ecosystem services such as pest control				
	Spring 2022 *(1 survey)*	**Autumn 2022** *(2 surveys)*	**Spring 2023** *(2-3 surveys)**	**Total**	**Predators**
Visual observations *(5 surveys)*	350	600	650	1000	400
Pitfall traps *(6 surveys)*	300	450	600	700	350
Honey traps *(6 surveys)*	150	300	400	600	200
Winkler traps *(6 surveys)*	20	30	50	70	30
Laboratory sorting *(4 surveys)*	500	700	500	1200	500

* Spring 2023 includes 2 visual surveys, 3 trap surveys and 1 laboratory run (in progress)

Table 3:

Overview of observed species numbers per group (species richness)

Arthropods

With visual observations and traps on our 12 project farms, we have recorded and identified more than 500 species of insects so far (including over 50 species of ants), as well as 106 spider species.

In addition, we could build a species-specific DNA database for 319 arthropod species from all farms, as well as general DNA databases for the arthropod diversity on each farm where we could complete the canopy fogging experiment in 2022 (10 out 12 farms).

Approximately 40-50% of our recorded arthropod species are predators and thus potentially contribute to economically important ecosystem services such as suppressing agricultural pests.

Birds

With point counts and mist netting surveys, we already record 56 different bird species in our project – as well as 188 fecal samples that will be analyzed to detect arthropod DNA and thus find out which bird species contribute how much to pest control services.
About 50% of our recorded bird species feed on arthropods.

Bats

With sound recordings, we have recorded 25 bat species. All of these species feed on arthropods and we will analyze the recordings with a focus on so-called feeding buzzes (sounds that bats make when they are hunting and eating arthropods). In addition, we will try to also do mist-netting and fecal sampling of bats for DNA analyses.

Analytic approaches

We will analyze all biodiversity data of birds, bats and arthropods with statistical state-of-the-art approaches (for example, Bayesian modelling and time-series-analyses) that allow us to link data of species richness and abundance to biological parameters at different scales (see Table 4). In addition, we will analyze data from socio-ecological surveys to better understand how different perspectives and results on biodiversity-friendly management (for example, tree pruning approaches – see Table 5), may affect the practical implementation of data-based techniques in different olive cultivation systems.

Table 4:

Biodiversity data will be analyzed in the relation to the following scales and parameters:

	Bio-temporal scales	**Landscape scale**	**Local farm scale**
			
Considered parameters:	- Seasonal effects - Activity range of species (e.g., migration distances)	- Landscape composition - Landscape connectivity (see Farm section below)	- Farm parameters - Tree parameters (see Farm section below)

Table 5:

Overview of COMPASS data taken in April 2023

Showing the mean weight of total, as well as minimum and maximum weights of pruned biomass per tree (in kg); the minimum and maximum flowering stage in April (reaching from 0 to 3), the mean soil pH per farm (pH values below indicate acidity) and the mean soil moisture per farm (% volumetric water content).

Farm ID	Total cuts (kg)	Min. cuts (kg)	Max. cuts (kg)	Flowering (min.)	Flowering (max.)	Soil pH (0-14)	Soil moisture (%)
EO1	15,9	10,6	24,7	0,2	2,5	4,9	258,7
EO2	17,4	6,6	33,2	0,5	1,2	4,8	355,3
EO3	13,9	5,4	22,2	1,3	2,7	4,5	205,3
EO4	8,4	3,1	15,5	1,4	2,2	4,8	374,6
EO5	4,6	3,2	7,5	0,8	2,3	4,5	305,7
EO6	4,4	3,0	5,9	1,2	2,4	5,0	104,4
EO7	46,2	26,2	77,8	1,8	2,7	5,3	314,5
EO8	10,9	9,9	13,2	1,2	2,6	4,6	180,0
EO9	47,1	33,9	61,2	1,7	2,3	4,6	457,2
EO10	22,4	11,9	39,9	1,2	2,4	4,8	312,4
EO11	12,5	3,4	26,4	1,5	2,6	4,6	476,5
EO12	14,2	6,9	21,9	0,6	2,3	5,9	302,5
Mean	**18,8**	**11,3**	**29,0**	**1,1**	**2,3**	**4,8**	**284,0**

Farms

The local and landscape conditions in and around agroecosystems such as the olive farms in our project define how much biodiversity and associated ecosystem services they can support. Assessing factors such as local management, plant diversity, climate, weather and microclimate conditions of each farm, as well as the composition and amount of habitats in the surrounding landscape are crucial to understand the interactions of biodiversity and environment.

In addition to local and landscape surveys, we also conduct targeted experiments and surveys to study the impact of birds, bats, and arthropods (as well as their interactions) on the health, resilience, and yield of olive trees – for which we are using the following approaches:

Farm measures taken in our project include (a) farm measurements such as farm size, tree density and general management information on farm management history and practices from our interviews; (b) tree measurements of trunks, main branches, canopy height and expansion; (c) soil measurements such as pH and moisture levels; (d) climatic and microclimatic data taken from climate data bases as well as in the field (see COMPASS for details); (e) harvest data taken for every individual tree to assess the variation of olive harvest quantity and quality – including measurements of fruit size and infestation rates (see our yearly report of 2022 for details). The integration of data on tree biomass, structure, and productivity into our statistical analyses help us to understand if and how they are related to biodiversity-mediated ecosystem services.

Exclusions of birds and bats (netted trees) are installed for one year in our project to better understand their effects on arthropod populations and associated ecosystem services relevant for olive harvest quality and quantity. In the analyses of all project data combined in several statistical models, we will be able to identify and better understand how birds, bats and arthropods interact in olive groves (with focus on biodiversity-mediated pest suppression services and yields) depending on the many local and landscape management that we consider.

UPCOMING → In 2023 and 2024, we will continue with the completion of local and landscape data relevant to our project and research questions by continuing the above-described approaches and adding several additional surveys:

We will complete our local and landscape data by extensive habitat monitoring (mapping of all natural, agricultural, and human habitat structures within the whole study area), as well as by vegetation monitoring on each farm (identification of plants within 2x2 m grids in both autumn 2023 and spring 2024). In addition, we currently plan a pre-experiment with vegetation and flowering strips to promote biodiversity-mediated ecosystem services (information will follow).

Olive harvest data will be taken a second and last time in autumn 2023 (mostly October) and combined with the take-down of exclusion experiments (nets) from all trees. We will study harvest quantity and quality for 16 study trees per farm (8 ECO-OLIVES + 8 COMPASS trees) with an improved approach that allows us to collect additional and thus stronger olive harvest data.

In order to allow the collection of the best-possible harvest data, we kindly ask all participating olive farmers and managers in our project to communicate expected harvest dates as soon as possible to us. We also kindly ask you to communicate and/or allow us some time flexibility in the return (or refund, if necessary) of the harvested olives so that we can successfully implement the scientific study and individual harvesting of the 192 olive trees in our project.

Farm survey gallery

Farm measures



Exclusion experiments



Olive harvest



COMPASS

With COMPASS (under the co-lead of pruning expert Tommaso Nardi), we extended our project by very promising and crucial research approaches and questions aiming at a better understanding on the effects of olive tree pruning on productivity and biodiversity. Olive tree pruning, which is done in various ways across all managed olive groves (but never has been studied systematically and quantitatively like in COMPASS), presents a major opportunity to work towards our project goals because it contributes to all three main pillars of sustainability (combined benefits for society, environment, and economy). From a management perspective, olive tree pruning is important to improve the resilience and harvesting of olive trees by supporting an efficient flow and distribution of nutrients, light and air within the trees. However, these managing scopes are also highly interesting and relevant from a biodiversity conservation and management perspective, because the increased availability of space for air and light may also promote the access of predatory species that provide pest suppression services within olive trees – and consequently improved harvest quantity and quality.

To study the interrelationship of olive tree pruning, biodiversity and yield-promoting ecosystem services, we perform a systematic olive tree pruning approach on an additional 8 study trees per farm in our project. Out of these trees, 4 trees are pruned in February and 4 trees in April, respectively, to also study the effects of pruning timing and approaches (rather major reduction approaches of canopy tops and branches in February versus rather minor selection of canopy tops and branches in April). In our study and analyses of pruning effects, we will compare the data of all 16 study trees per farm with respect to each of their four selected purposes (each four trees per farm serve as (a) unmanipulated control trees representing the status-quo per farm; (b) experimental exclusion trees responding to the absence of birds and bats; (c) February pruning effects; and (d) April pruning effects). Additionally, we will integrate data from our arthropod surveys and predation experiments in these analyses (see sections above for details).

With this approach, we will be able to better understand how systematic olive tree pruning (considering a large set of various biotic and non-biotic factors on tree and farm level), can contribute to improved olive tree resilience, harvesting and biodiversity-mediated ecosystem services that potentially improve yields. Already in this first project year, we were able to document several data and developments in the project trees of COMPASS that demonstrate the large variability and positive effects of pruning approaches (please see pictures and overview tables on the following pages for details).

UPCOMING → We aim to continue COMPASS for at least three more years (until 2026) in order to obtain statistically robust data on the multiple impacts of tree pruning.

In August 2023, we will complement our COMPASS data (including continuous measures of soil pH, soil moisture and temperature data from i-buttons since April 2023) by microclimatic measures of light intensity, humidity, and temperature in direct response to pruning activities. For this, we aim to conduct some minor selection pruning approaches in selected project farms and measure direct microclimatic effects. We will contact you in July to obtain your confirmation for taking this additional data and thank you very much in advance for your cooperation and support.

COMPASS gallery









Impressions of olive tree pruning (before-after) and our weight measurement method

Partnerships

We are proud and grateful to work in collaboration with several, excellent partners to achieve our ambitious project goals. Please see our yearly report of 2022 and the workshop handout from April 2023 for an overview of partnerships associated with our project. Here, we provide some additional insights into these corporations and their respective tasks.

The University of Würzburg in Germany (lead by Prof. Jörg Müller) presents one of the first and a very crucial partnerships to our project as it has supported the entire canopy fogging experiment in 2022, as well as the associated DNA-analyses metabarcoding analyses in 2023. We received the results of this analyzes in May 2023, through which we could identify the DNA of arthropods on the best possible levels (Total of 2025 DNA reference points in our database: 1105 were identified to the family; 601 to the genus and 319 to species level – including major predatory and pest species).

The Institute of Zoo and Wildlife Research in Germany (IZW Berlin; lead by Prof. Christian Voigt) provides major support to our project not only by providing BATLOGGER devices for the sound recording of bats, but also by providing highly valuable expertise and advise on our study design for birds and bats – including the co-supervision of our PhD student Msc Tara Hanf-Dressler.

The SOUNDS WILD project (co-lead by our PhD student MSc Rym Nouioua) was designed to improve our understanding of the perceptions of school children, their families and teachers towards the conservation and management of birds and bats; as well as to promote increased awareness and mutual understanding related to these topics. As part of this project, we will conduct > 100 workshops with school children between 6 and 18 years in Austria, as well as creative competitions and a large outreach and communication strategy that will also support ECO-OLIVES and COMPASS – for example by resulting handbooks about bats in Italy and Austria.

UPCOMING →

The University of Florence (led by Prof. Giacomo Santini and Dr. Alberto Massoni) already supports our project from the beginning with their outstanding expertise on ants. Together, we will not only supervise Master students that help us with the advanced identification and analyses of our ant data, but also aim at developing joint funding applications for the improved study of research questions related to ants and COMPASS.

The University of Tadulako in Indonesia (lead by Prof. Aiyen Tjoa), the main partner of our associated research projects on cacao agroforestry systems in Indonesia (lead by Dr. Bea Maas), expressed great interests in the aims and scope of our COMPASS project. Therefore, we built a collaboration and will adapt our approaches of COMPASS to Indonesian cacao farms – starting in January 2024. The parallel study of pruning effects on olive and cacao trees will provide us with further, highly interesting insights on the potential of using and improving tree pruning as a major management tool to increase the resilience and sustainability of agroforestry systems.

The BiovEXO project (lead by Dr. Jonathan Clark) approached us in May 2023 to build international collaborations in the study of *Xylella fastidiosa* – both from a biodiversity research perspective (for example, by extending our arthropod surveys by studying major vectors of this plant pathogen, such as cicada species), as well as from a practical management perspective (for example, by training and using dogs in the early detection of this pest).

Partnership gallery

The ECO-OLIVES project is financed by a research grant of Austrian Science Fund dedicated to Dr. Bea Maas at the University of Vienna. www.beamaas.com/projects

Sant' Anna is a main partner of ECO-OLIVES, working closely with the group of Dr. Camilla Moonen. www.santannapisa.it/it/anna-camilla-moonen

The team of the field station Frabikschelichach at the University of Würzburg supports our DNA-based research such as canopy fogging and metabarcoding. www.biozentrum.uni-wuerzburg.de

The Bat Lab at IZW Berlin supports our study of bats by providing research equipment and expert advice on DNA analyses of birds and bats. www.batlab.de

As part of ECO-OLIVES, SOUNDS WILD is focused on socio-ecological research and science communication targeting schools in Austria. www.soundswild.eu

The University of Palu supports an expansion of our COMPASS project to Indonesian cacao agroforestry systems on Sulawesi. https://untad.ac.id/en/

The research group of Prof. Giacomo Santini cooperates with us in the study of ants and research grant applications. www.ecologyandbiodiversity.unifi.it

The research group of Danilo Russo provides important expertise and advice on our study of Italian bats. www.ecoap.unina.it

ECO-OLIVES, COMPASS and SOUNDS WILD are closely connected to several other projects and institutions in Europe, who provide us advice, equipment, access to large stakeholder networks and partnerships.
www.olivaresvivos.com
http://bioecolab-aegean.blogspot.com
https://www.biology.ox.ac.uk/people/ricardo-rocha
https://www.uni-bremen.de/popecol
https://www.wildlifeacoustics.com
www.rtds-group.com/services/projects-biovexo/
https://beslab.net/
https://cibio.up.pt/en/

Our team of ECO-OLIVES

is very grateful for your interest and support!

We are especially grateful for the trust and the inspiring, instructive exchange with the olive grove owners and managers who participate in our project and let us do research on their fields.

→ We are glad to announce a second project workshop this year in which we would like to exchange with you about our project and ideas for further collaboration. The workshop will take place on one of our project farms in **Calci on Sunday, the 10th September in the afternoon** (further information follow).

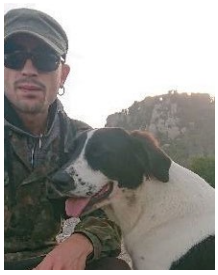
Please save the date in your calendars.

EVENTO DI SCAMBIO RECIPROCO
10 Sep 2023 | 16-20 pm | Calci

ECO-OLIVES


Bea


Virginia


Tommaso


Rym


Andrea


Luca


Tara


Maurizio

CONTACTS

Lead of ECO-OLIVES, COMPASS & SOUNDS WILD:
Dr. Bea Maas
Email: bea.maas@univie.ac.at
Mobile/WhatsApp: +43 650 4200 494

Co-lead of COMPASS and pruning expert/contact:
Tommaso Nardi
Email: ilpendolino1993@gmail.com
Mobile /WhatsApp: +39 348 419 3298

Local communication/coordination contact:
Virginia Bagnoni
Email: Virginia.Bagnoni@santannapisa.it
Mobile /WhatsApp: +39 340 679 783