ECO-OLIVES

INTEGRATING SCIENTIFIC EVIDENCE AND MANAGEMENT PERSPECTIVES TO ADVANCE BIODIVERSITY CONSERVATION AND SUSTAINABLE PRODUCTION IN OLIVE CULTIVATION LANDSCAPES

Project Partners & Fundings:

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PROJECT ECO-OLIVES

SCOPE & VISION

Biodiversity & Ecosystem Functions

Transfer & Application

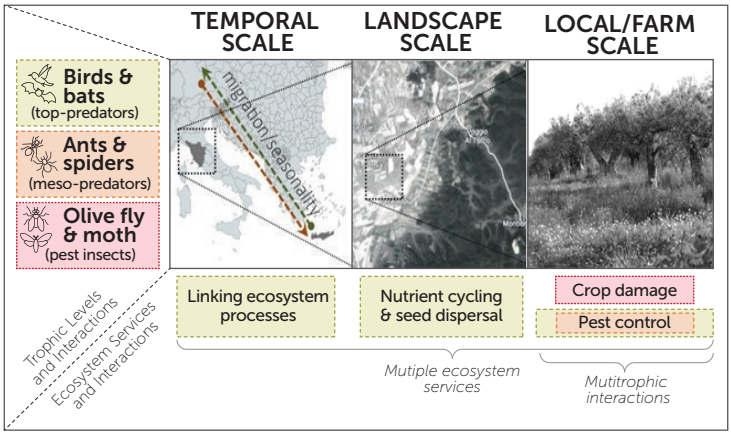
Implementation of New Sustainability Standards

All our projects aim to improve knowledge and implementation of sustainable land use systems.

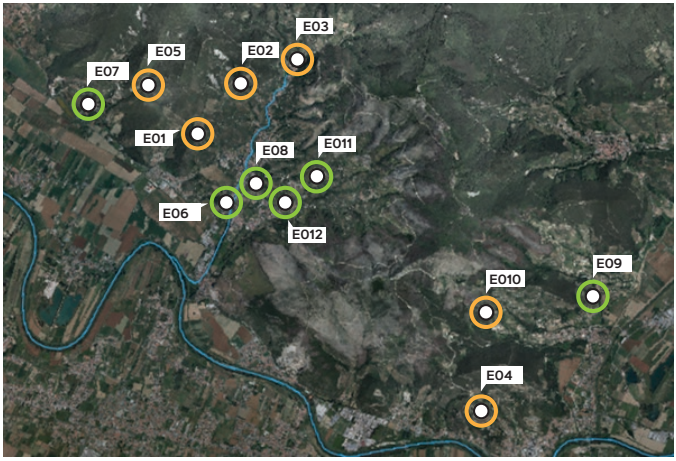
ECO-OLIVES investigates biodiversity and ecosystem services in 12 organic olive groves in Monte Pisano, Italy. We study birds, bats, arthropods, and vegetation under different local and landscape conditions, including seasonal change and pruning practices.

Our findings from 2022 until 2025 show that biodiversity supports pest control, resilience, and sustainable olive production.

We turn ecological insights into practical strategies – get in touch to learn more about biodiversity-friendly farming!



PROJECT AREA & STUDY DESIGN



○ *Study Sites* ○ *SNH < 30%* ○ *SNH > 30%*

At a **landscape scale**, we compared 12 organic olive farms in the Monte Pisano region - six of which were surrounded by a high amount of semi-natural habitat cover (>30%), and six by a low amount (<30%) within a radius of 500m.

At a **local scale**, we studied 16 olive trees per farm: four unmanipulated control trees (grey), four trees with bird and bat exclusions (red), as well as eight trees assigned to pruning treatments – four pruned in February (orange) and four in April (green).

DATA RECORDING & ANALYSES

Birds and bats were studied using point counts, acoustic monitoring, and mist netting. We recorded 59 bird species (about 60% insectivorous) and 25 bat species (100% insectivorous). We also studied their impact on herbivore suppression and olive yields using **exclusion experiments**.

Arthropods were studied with visual observations, three trap types, and canopy fogging. We recorded > 8000 individuals from 217 families, including 36 ant and 131 spider species. We also analyzed **arthropod-DNA** to better understand food webs.

Our analyses included **farm and tree** data to identify local-level effects on biodiversity and its functions.

We analyze **landscape-level** data such as the amount of surrounding urban and semi-natural habitats to understand their effects on biodiversity.

We studied the **effects of pruning** on olive yield and ecosystem services to identify applicable ways for more sustainable management.

Through **surveys and mutual exchange with diverse stakeholders**, we explored how ecological knowledge can inform biodiversity-friendly farming and real-world applications.

BIODIVERSITY, PRACTICES & PRODUCTION

Insectivorous birds can reduce pests across seasons and sites using different foraging level.

All bats eat arthropods - especially in farms surrounded by less complex landscapes.

Ants, spiders, and other beneficial arthropods respond to predator presence, farm vegetation and systematic pruning.

Absence (exclusion) of birds and bats increases pest levels and decreases olive yields.

Systematic pruning can support both olive yield and ecosystem services – but timing matters!

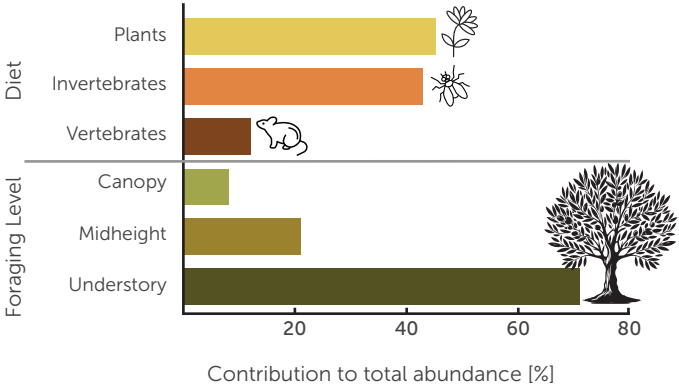
Olive yield clearly improved in response to biodiversity-related services and targeted local management.

Together, our findings show how farms can support both productivity and biodiversity – and how scientific evidence can guide more sustainable olive cultivation practices.

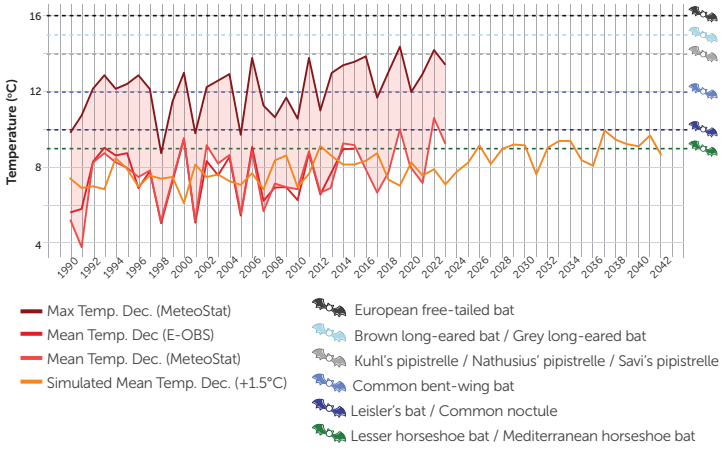
FIRST FINDINGS: BIRDS & BATS

The bird communities observed in ECO-OLIVES were dominated by insectivores feeding in the understorey and mid-height olive tree layers. These species play a key role in natural pest control by targeting different pest types and foraging level throughout the growing season.

Diet composition and foraging level of bird species observed in olive groves:



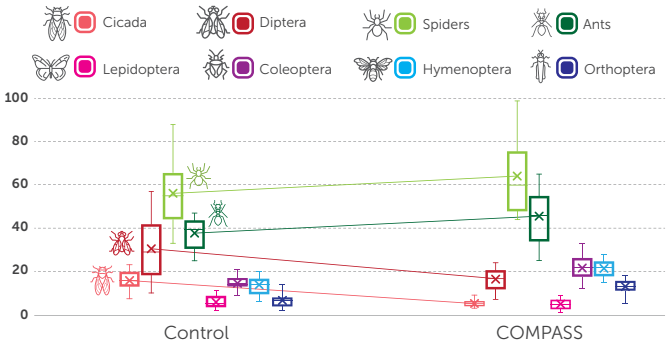
The observed bat communities showed high winter activity in olive groves, especially at sites with less surrounding semi-natural habitat. Our findings reveal that bats respond strongly to warmer night temperatures – suggesting that climate change may increase their winter foraging but also their energetic stress.



FIRST FINDINGS: EXPERIMENTAL TREATMENTS

Our field experiments showed that both **biodiversity and pruning** influence pest control and olive production in olive farms – depending on their local and landscape management.

Mean abundances of selected arthropod groups on unmanipulated control trees vs. pruned trees (COMPASS):



Mean olive harvest (in kg) and pest rates (in %) on controls, bird/bat exclusions and COMPASS trees:

Questions? Contact Us!

ECO-OLIVES connects ecological science with practical farming to support biodiversity and sustainability in Mediterranean olive landscapes.

Our international projects show how diverse, well-managed farms can benefit nature, people, and production - now and into the future.

ENVIRONMENTAL SUSTAINABILITY	SOCIAL SUSTAINABILITY	ECONOMIC SUSTAINABILITY
 Integrating Biodiversity in Land Management	 Community-Solutions for Ecosystem Health	 Promoting Ecosystem Resilience for Agricultural Viability
 Advancing Biodiversity Conservation Strategies	 Socially inclusive Sustainable Harvest Approaches	 Balancing Ecosystem Services & Agricultural Productivity
 Sustainable Landscape & Habitat Management	 Enhancing Stakeholder Engagement & Sustainability Awareness	 Strengthening Farmer Collaboration to Boost Implementation

Get in touch for more information, collaboration, presentations, or shared learning:

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