



Università
Ca'Foscari
Venezia

PROJECT ACRONYM AND TITLE: PollinAction - Actions for boosting pollination in rural and urban areas

FUNDING PROGRAMME: LIFE Nature and Biodiversity

CALL: LIFE Nature and Biodiversity 2019

SCIENTIFIC FIELDS: Biodiversity

HOST DEPARTMENT: DAIS – Department of Environmental Sciences, Informatics and Statistics

SCIENTIFIC RESPONSIBLE: Gabriella Buffa

FINANCIAL DATA:

Project total costs	Overall funding assigned to UNIVE
€ 3.293.690,00	€ 333.869,00

ABSTRACT:

Human-driven landscape modification and habitat fragmentation are negatively affecting all living organisms. In addition, biodiversity loss alters ecosystem processes, compromises the functioning of ecosystems and affects ecological services provided to humans. Species loss also affects species interactions, with effects increasing when strongly interacting organisms are involved.

Among the wide variety of biotic interactions, animal-mediated pollination is increasingly threatened giving rise to the “pollination crisis” phenomenon. According to a 2016 IPBES study, over 40% of invertebrate pollinators are at risk of extinction, mostly bees and butterflies. Losses of pollinating insects is particularly alarming because of the effects on plant reproduction. Nearly 4 out of 5 of both crops and wild plants depend on animal-pollination, often provided by wild, unmanaged, pollinator communities. Pollinator decline is thus expected to limit plant reproduction, ultimately affecting both natural ecosystems and crop production, thereby threatening food security for humans and wildlife as well as global economic stability. Although pollinator populations are affected by a range of factors, such as increasing use of agrochemicals, parasites and diseases, local and global environmental degradation and the loss of natural and semi-natural habitats appear to be of great importance in determining their decline. Several studies suggest that the destruction and fragmentation of natural or semi-natural habitats and the consequent reduction in wildflowers cause the loss of forage (i.e., nectar and pollen), breeding, nesting and overwintering habitats for pollinators, triggering their populations decline and subdivision. Local pollinator extinctions can in turn lead to the decline in pollination services for wild plants, thereby further reducing floral resources for pollinators. Syntheses of data across multiple taxa, crop species and biomes revealed that insect visitation, richness and stability increase with decreasing distance from natural or semi-natural habitats. Landscape composition, namely different landcover types, also influences the richness and abundance of insect populations, since all crop pollinators depend on diverse plant species found in diverse and complementary (semi-) natural habitats which provide diverse and complementary sets of resources, i.e. food, nesting material and nesting sites.

Both communities of pollinators and natural enemies are often more abundant in complex landscapes, where different semi-natural habitats with different vegetative and flowering phenology provide for higher and more stable availability of hosts, nectar and pollen resources, as well as overwintering refuges.

Alluvial plains dominate large tracts of the European space, representing one of the most distinctive landscape of great cultural and economic importance. Nowadays, flood plains are among the most altered landscapes worldwide, mostly to increase the production of crops, livestock, aquaculture, and urban development. Among alluvial plains, the eastern Po Plain in Italy (Veneto and Friuli-Venezia Giulia Regions) is one of the most populated and urbanized area in Europe. Here, intensive agricultural areas are seamlessly intermingled with urban fabric and industrial, commercial areas mostly developing along transport units. Rural and urban areas amount to about 60% of the total surface, leaving only 10-12% to natural, protected areas. The increase of land consumption since 2017 has reached the national record, with on average +0.45% of natural soil loss. In such highly intensified areas, anthropogenic changes in land use have resulted in formerly heterogeneous landscapes becoming progressively simplified. Natural or semi-natural habitats (e.g. forests, hedgerows, perennial grasslands, bare soil) have been largely lost and remnants are increasingly threatened by isolation and edge effect.

On the other hand, in the Aragón Region (Spain), marginal, less productive areas, suffer from abandonment which also results in the loss of landscape heterogeneity and biodiversity and leads to the development of dynamic phases dominated by shrub and woody communities, often poor in species, particularly animal-pollinated species. Both of the contrasting dynamics trigger cascading ecosystem changes (e.g. parallel declines in diversity of plants and invertebrates) and regime shifts in vital services such as nutrient cycling, biological N-fixation, soil and water conservation, carbon sequestration, biodiversity conservation, natural pest suppression and pollination. In such simplified landscapes even a small increase in habitat heterogeneity will have huge effects on the recovery of ecosystem functionality and the provision of services, including the pollination service that relies on the richness and abundance of plant and pollinator species, which are crucial determinants for productive farming.

Planned Start date	Planned End date
1st September 2020	31st March 2025

PARTNERSHIP:

1. Università Ca' Foscari	Venice (IT)	Coordinator
2. ALBATROS S.r.l.	Italy	Partner
3. Comune di Caldogeno	Italy	Partner
4. Concessioni Autostradali Venete - CAV S.p.A.	Italy	Partner
5. Centro de Investigación y Tecnología Agroalimentaria de Aragón	Spain	Partner
6. EcorNaturaSi SPA	Italy	Partner
7. Regione Autonoma Friuli-Venezia Giulia	Italy	Partner
8. Veneto Region – Directorate of agri-environment, planning and management of fishing and wildlife hunting	Italy	Partner
9. SELC soc. coop.	Italy	Partner
10. Agenzia veneta per l'innovazione nel settore primario	Italy	Partner