

11-12 FEBRUARY 2025

RABAT, MOROCCO

Institut Agronomique et Vétérinaire Hassan II



WEFE NEXUS INTERNATIONAL CONFERENCE

**EXPLORING AND BRIDGING NEXUS FOR
A SUSTAINABLE FUTURE**



These projects are part of the
PRIMA programme supported
by the European Union.



WEFE NEXUS INTERNATIONAL CONFERENCE

Day 2 – 12th February 2025

PILLAR 3: WEFE NEXUS SOLUTIONS

INNOVATIVE SOLUTIONS SHOWCASING DEMONSTRATION CASES FROM BONEX/SURENEXUS



DP Portugal
Alqueva Multi-Purpose Project

Paulo Pereira
Chief Operating Officer
Natural Business Intelligence- Portugal



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BONEX CASE STUDIES – NATURE- BASED SOLUTIONS

Paulo Pereira



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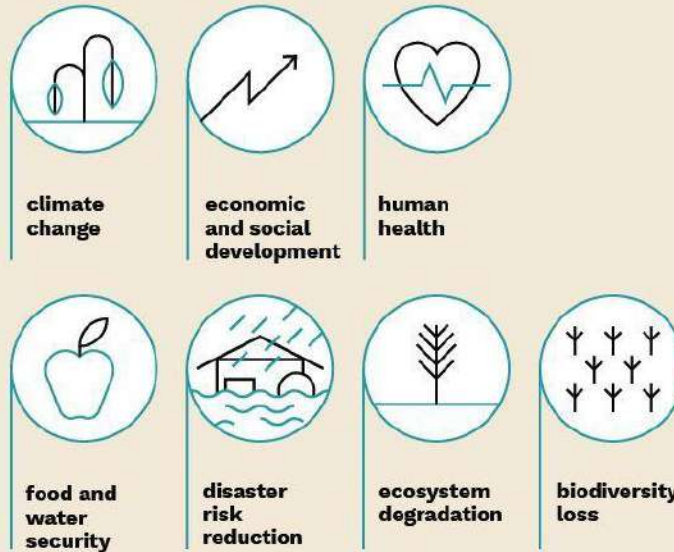
What?

Nature-based solutions (NBS) in the agricultural context are practices that use natural processes to improve productivity, the resilience of agricultural systems and environmental sustainability. These solutions mimic or **restore natural ecosystems** to provide services such as **soil improvement**, **water retention** and **pest control**, reducing the need for artificial inputs.

What are Nature-based Solutions (NbS)?

NbS are defined by IUCN as “actions to **address societal challenges** through the protection, sustainable management and restoration of ecosystems, benefiting both biodiversity and human well-being.” They use the power of nature and functioning ecosystems as infrastructure to provide natural services to benefit society and the environment.

NbS have prime potential to help address global challenges such as:



NbS can provide long-term environmental, societal and economic benefits:



Why?

Cover crops, hedgerows and the restoration of **water lines** and **temporary ponds** play a fundamental role in retaining water in the landscape and balancing the water cycle, especially in water-scarce regions.

By implementing these solutions, the landscape becomes more resilient to **drought**, keeping **water available** for longer and ensuring a more **sustainable agricultural system**.

Cover crops:

- Reduce surface runoff by allowing water to slowly infiltrate the soil;
- Increase moisture retention capacity, reducing evaporation and improving water availability for crops;
- Reduce soil erosion by preventing the loss of organic matter and nutrients that are essential for water retention.

Restore water lines and temporary ponds:

- Function as natural reservoirs, storing water during wet periods and gradually releasing it in dry times;
- Recharge underground aquifers, promoting a more balanced water cycle;
- Act as natural filters, improving water quality by trapping sediment and pollutants.

How?

Cover crops



Planning and
management

Seed mix
purchase

Soil preparation

Sowing

Mechanical
management or
grazing

Monitoring

Water line restoration

Planning and
management

Purchasing
plants

Soil preparation
and plantation

Management of
spontaneous
vegetation

Watering

Monitoring and
re-plantation of
dead plants

How?

Scientific name	Common name	N. plants
<i>Arbutus unedo</i>	Strawberry tree	150
<i>Cistus crispus</i>	Curled leaf rock rose	60
<i>Crataegus monogyna</i>	Common hawthorn	320
<i>Daphne gnidium</i>	Flax-leaved daphne	40
<i>Erica scoparia</i>	Green heather	150
<i>Fraxinus angustifolia</i>	Narrow-leaved ash	500
<i>Lavandula pedunculata</i>	Spanish lavender	50
<i>Myrtus communis</i>	Common myrtle	60
<i>Nerium oleander</i>	Oleander	500
<i>Olea europaea var. sylvestris</i>	Wild Olive	260
<i>Phillyrea angustifolia</i>	Narrow-leaved mock privet	100
<i>Pistacia lentiscus</i>	Mastic tree	20
<i>Rhamnus alaternus</i>	Italian buckthorn	100
<i>Rhamnus lycioides subsp. oleoides</i>	Mediterranean buckthorn	100
<i>Rosa canina</i>	Dog rose	190
<i>Rosmarinus officinalis</i>	Rosemary	190
<i>Ruscus aculeatus</i>	Butcher's-broom	100
<i>Salix atrocinerea</i>	Large gray willow	150
<i>Salix salviifolia</i>	Sage-leaved willow	150
<i>Tamarix africana</i>	African tamarisk	400
Total		3590

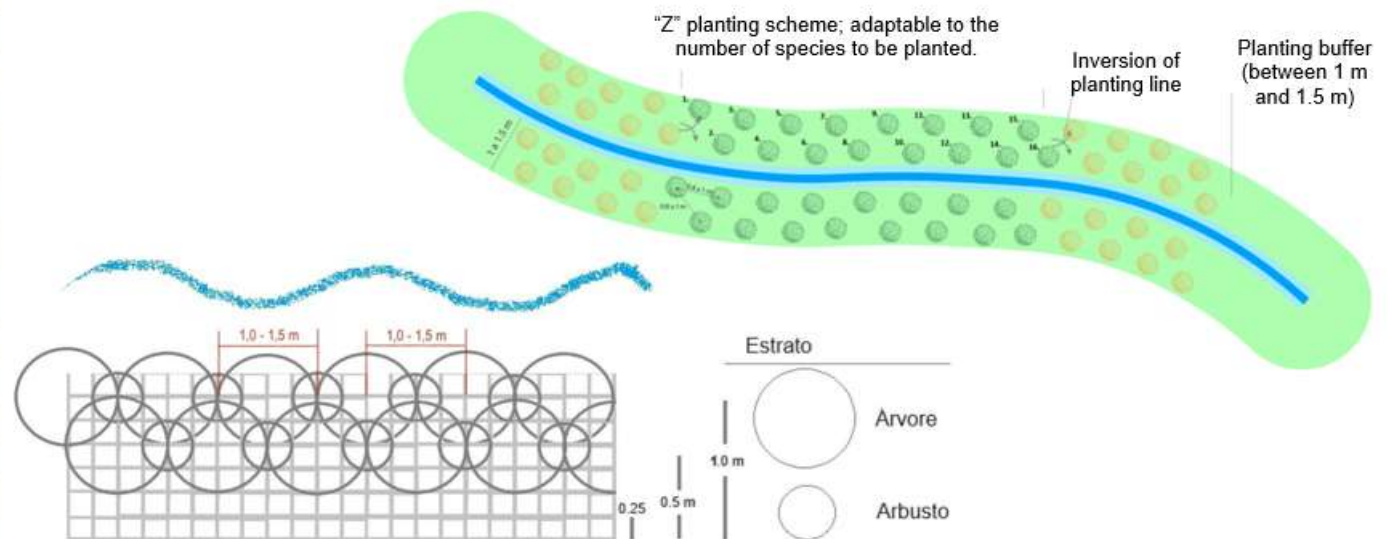
20 species

2919 plants / Hectare

2 plant lines on each side of the water course. "Z" planting scheme.

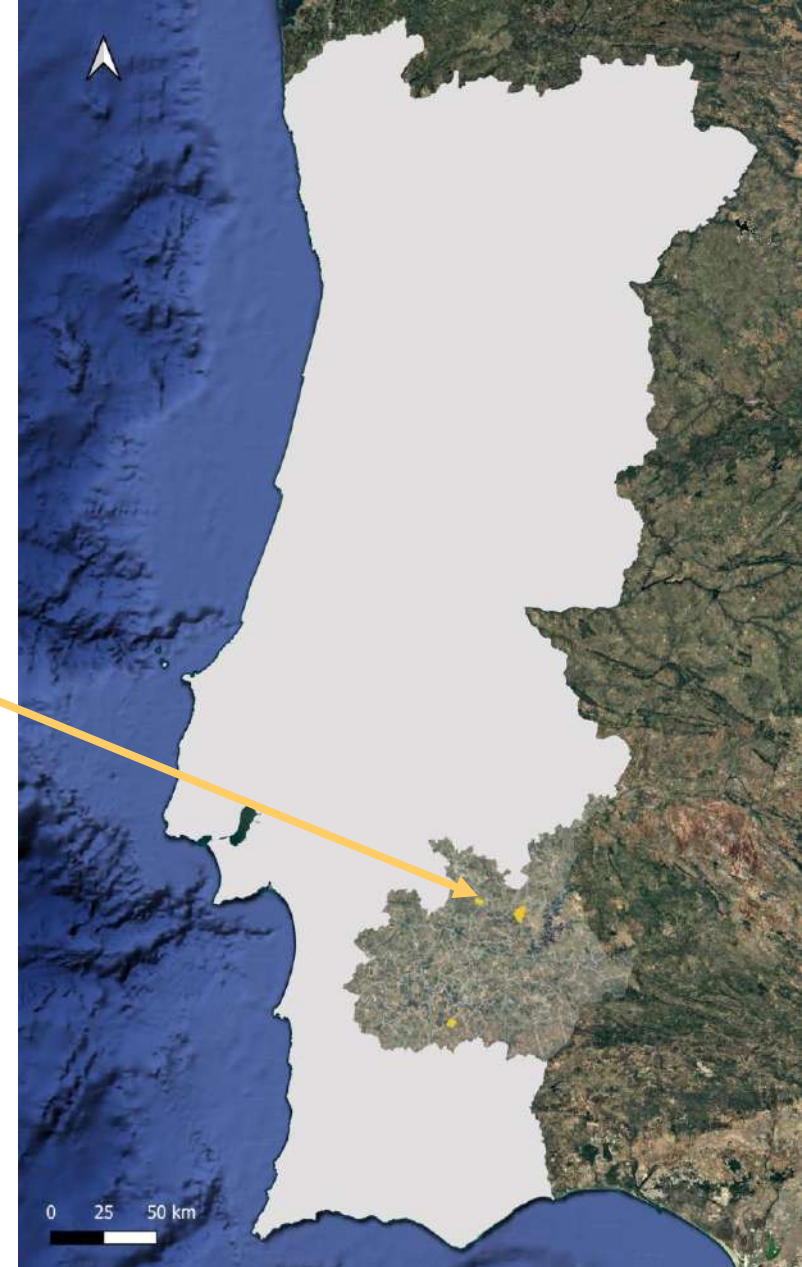
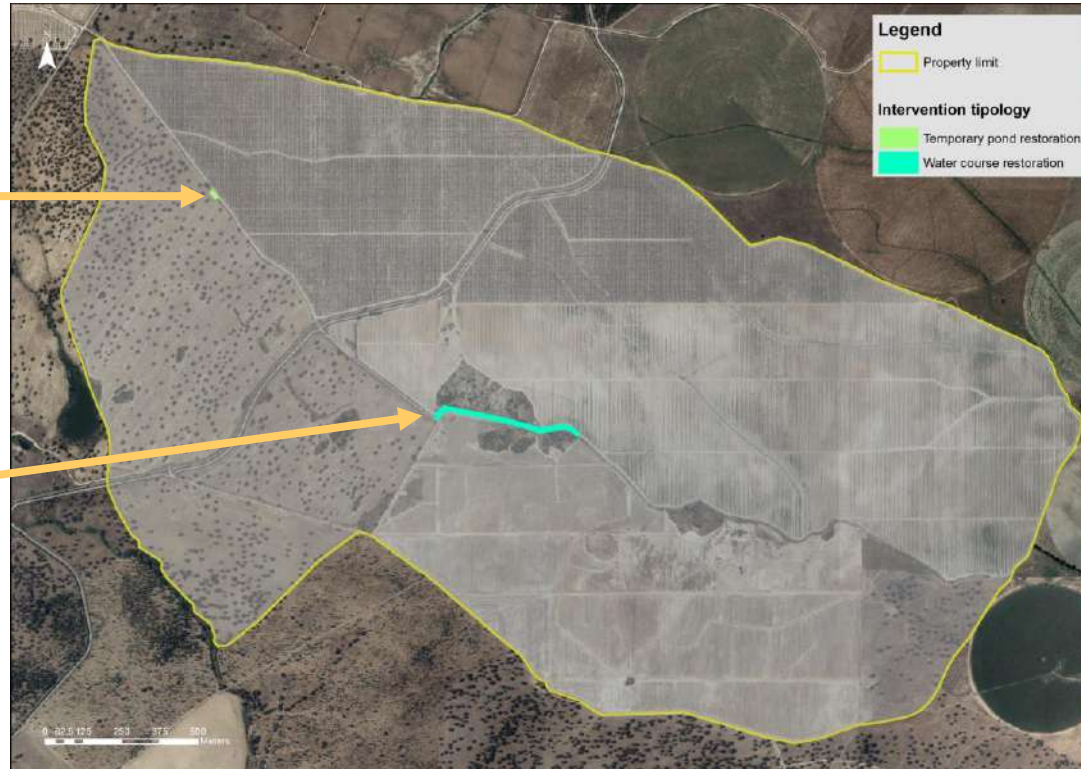
No irrigation

Protective tubes on 10% of individuals to assess survival rates under different conditions



Where?

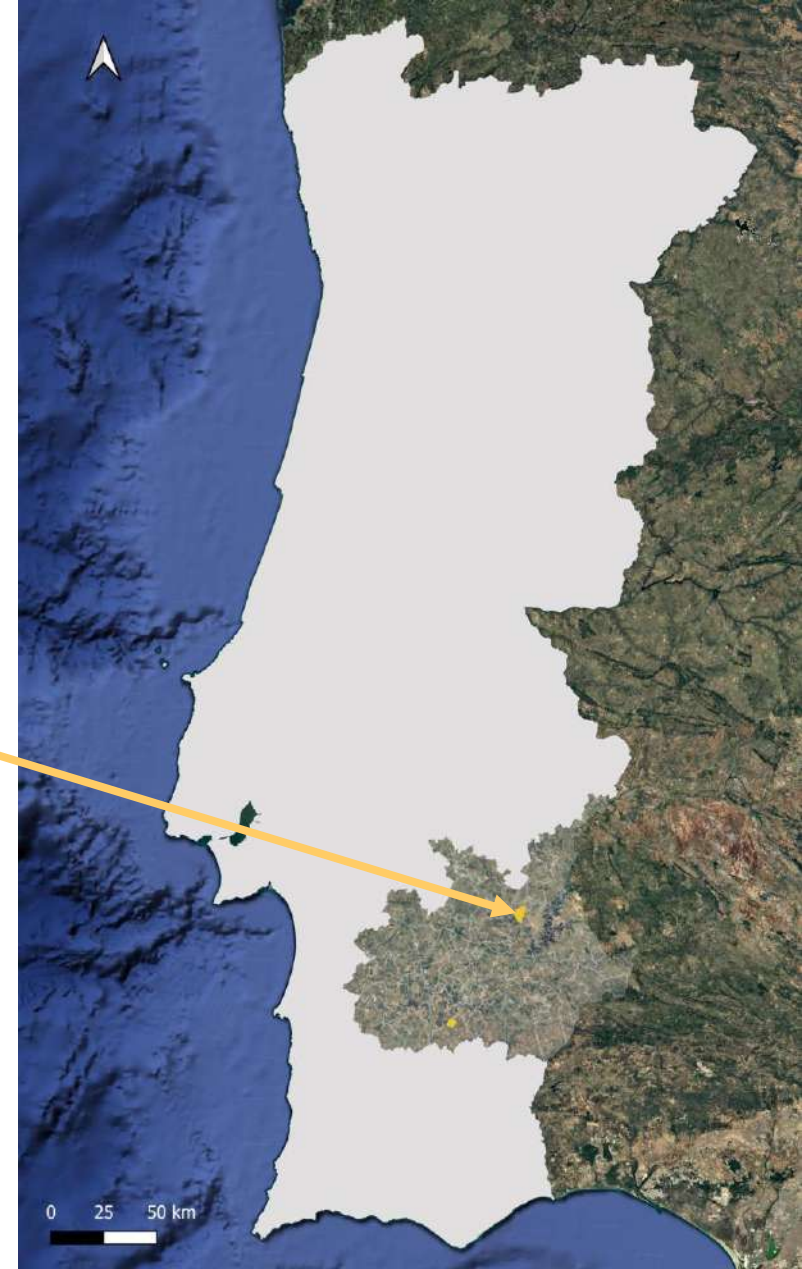
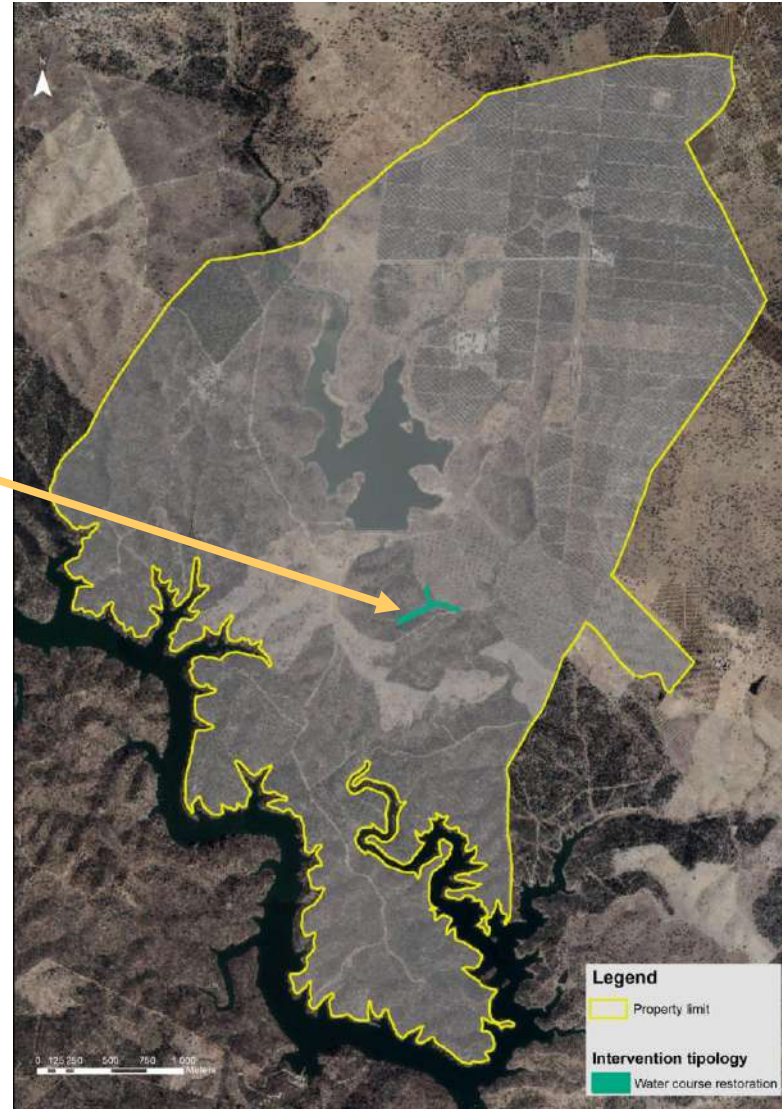
- Mediterranean water pond restoration (habitat 3170*)
- Water line restoration with biodiverse hedgerows (500 m)





Where?

- Water line restoration (1,23 ha)





EN



VU

Anacamptis laxiflora –
100 to 250



EN

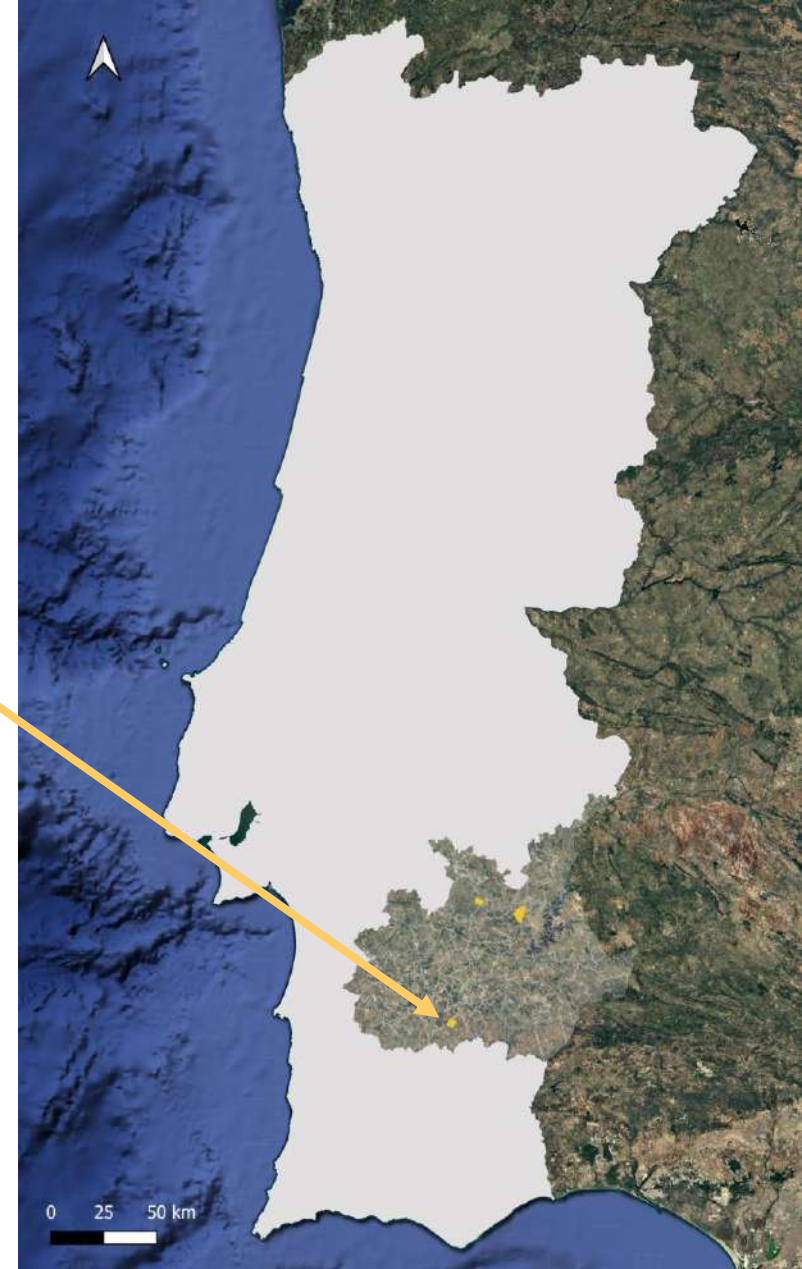
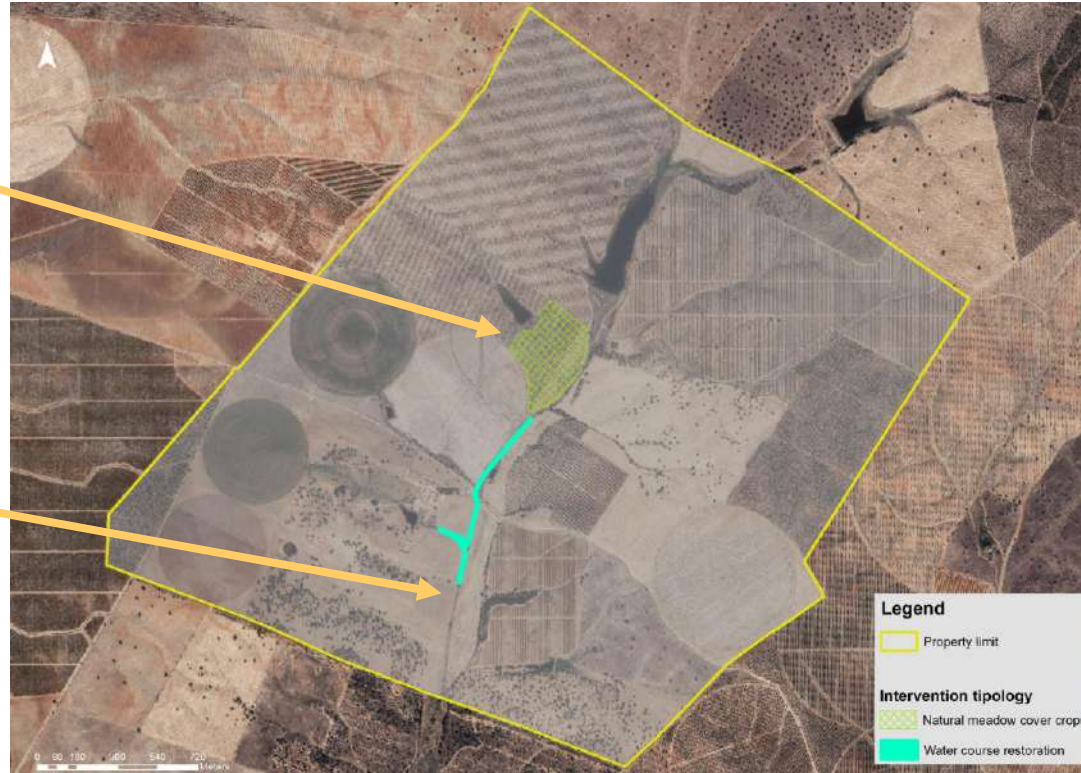


VU

Triglochin laxiflorum
– new population

Where?

- Cover crops (10 ha)
- Water line restoration with biodiverse hedgerows (1100 m)





/Benefits

- Better passability for agricultural **machinery**;- Promote **biodiversity** (flora, fauna);
- Promote **pollinators** and helpers;
- Improve **soil** structure, promoting microbiological health and increasing organic matter;
- Reduce **erosion**;
- Fix **nutrients**;
- Compete with undesirable species such as invasive exotic species;
- Increase infiltration capacity and water retention in the soil;
- Contribute to increasing the quality and yield of production.

/Challenges

- **Competition** with crops for water and nutrients;- Loss of strength (beginning);
- Loss of **production** (beginning);
- Can encourage the development of cryptogamic **diseases**.



Cover crops

Water retention area in the new Marzalonas olive grove with cover crop installation,

Increased the retention of water in 40413 m³ in 37ha:

➡ 1085 m³/ha



Winter 2023 (before cover crop)

Winter 2024 (after cover crop)

The need of olive tree cultivation is 3400 m³/ha/year;

Water line restoration with biodiverse hedgerows

/Benefits

- **Erosion control:** plant roots stabilize the soil on the banks of watercourses;
- **Filtration of sediments and pollutants,** they act as natural barriers that retain sediments and filter out excess nutrients and pollutants;
- **Biodiversity,** they provide habitat for functional biodiversity;
- **Microclimate regulation,** they reduce water temperature and evaporation;
- **Landscape beauty,** they contribute to the aesthetic enhancement of the area;
- They compete with undesirable species such as **invasive** exotic species;
- **Flood reduction,** they slow down surface run-off, favoring the infiltration of water into the soil.

/Challenges

- Intense **initial maintenance**, close monitoring is necessary to ensure the hedge's success;
- **Establishment time**, it can take years for hedges to reach sufficient maturity to offer all the desired benefits;
- **Implementation costs**;
- **Ongoing maintenance (first 3 years)**, pruning, removal of competing spontaneous species or invasive exotics and control of overgrowth are necessary to maintain ecological functionality.



Mediterranean water pond restoration (habitat 3170*)

/Benefits

- **Biodiversity Conservation**, these are priority habitats with legal protection that constitute breeding and feeding areas for various threatened species;
- **Ecological resilience**: they act as 'islands of biodiversity', increasing connectivity between habitats and strengthening the resilience of local ecosystems;
- **Regulation** of the hydrological cycle, promoting the infiltration of water into the soil during periods of flooding, helping to recharge aquifers and regulate water;
- **Ecosystem services**, contributing to flood control, sediment retention and water purification;
- **Scientific and educational value**, they are important resources for ecological studies, environmental education and raising awareness about rare habitats.

/Challenges

- **Vulnerability** to drought and climate change, may dry out more quickly due to reduced rainfall or rising temperatures, harming dependent species;
- **Pressure** from human activities, agricultural and livestock management (grazing) can conflict with the conservation area;
- **Maintenance and monitoring**, require continuous follow-up at an early stage to ensure that the habitat develops as desired.





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THANK YOU FOR YOUR ATTENTION

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