

Orle Nature Co-Creation Platform

Connecting people, science, and policy to restore and protect local water ecosystems



ORLE BLUE-GREEN LIVING LAB

RESTORING HYDRO-ECOSYSTEMS THROUGH
NATURE-BASED SOLUTIONS AND
COMMUNITY-DRIVEN INNOVATION

Local action for the EU Mission
Restore our Ocean and Waters by 2030

Our solution brings together nature, people, data and policy to protect biodiversity and build climate resilient communities in Orle.



WATER
HEALTH



BIODIVERSITY
PROTECTION



CLIMATE
RESILIENCE



COMMUNITY
ENGAGEMENT

OUR SOLUTION

THE CHALLENGE



Loss of biodiversity
and degradation of
local hydro-ecosystems



Impacts of climate
change: droughts,
floods, heatwaves



Weak connections
among stakeholders
and knowledge gaps



Limited capacity
and access to
innovation & data



**NATURE-BASED
SOLUTIONS**
Wetland restoration,
riparian vegetation,
green-blue
infrastructure



**SMART MONITORING
& DIGITAL TOOLS**
Drones, sensors and
citizen science for
real-time data and
better decisions



**COMMUNITY
ENGAGEMENT**
Local stakeholders,
schools, NGOs and
citizens co-creating
solutions



**EVIDENCE-BASED
MANAGEMENT**
Data-driven insights
to guide actions
and measure
impact



**POLICY & PARTNERSHIP
INTEGRATION**
Aligning local actions
with EU strategies and
national authorities

HOW IT WORKS: FROM KNOWLEDGE TO ACTION



1. CO-DESIGN
With local community,
experts and partners



2. ASSESS & MONITOR
Collect data, map
ecosystems, identify
priorities



3. IMPLEMENT NbS
Apply and adapt nature-
based solutions to local
needs



4. EVALUATE & LEARN
Measure results,
learn and improve
continuously



5. SCALE & SHARE
Share knowledge and
replicate success in
the wider region

OUR DEMO FOCUS



Priority site: Veleševac – an important
wetland for waterfowl and biodiversity
in the Danube River Basin



Restoring wetlands and riverscapes for
biodiversity, climate resilience and people.

OUR PARTNERSHIP STRENGTH



ORLE MUNICIPALITY

Strong policy support, local coordination,
links to national authorities (Croatian
Waters, Zagreb County, Natura 2000
management)



ADRIA INNOVATION HARBOUR

Scientific expertise, innovation,
international networks, digital tools,
and project management
Together we join science, policy,
and community for lasting impact.

IMPACT WE AIM FOR



Healthier water ecosystems
and richer biodiversity



Stronger climate resilience
for communities



Empowered citizens and
stronger local partnerships



A replicable model for other
rural regions in Europe



Local action for the EU Mission
Restore our Ocean and Waters by 2030



Local innovation.
Global impact.



Key Message

- Nature-based solutions can restore local hydro-ecosystems and strengthen climate resilience.
- Community engagement and data-driven tools enable effective, scalable ecosystem-based management.

Policy Relevance

International policy:

- EU Mission “Restore our Ocean and Waters by 2030”
- EU Biodiversity Strategy for 2030
- EU Water Framework Directive

National policy:

- Croatian Water Management Strategy
- Nature Protection Strategy and Action Plan of the Republic of Croatia

What is the Challenge

Orle Municipality is a small municipality located between the Sava and Odra rivers. The main challenges it faces are degradation of its hydro-ecosystems, including wetlands and small water bodies. This is driven by climate change impacts, especially floods, droughts and heatwaves, as well as insufficient ecosystem-based management, and limited coordination among stakeholders.

As a result, biodiversity is declining, which is especially problematic because of important waterfowl habitats that are in this area. Additionally, water quality is at risk, and the area overall is becoming more vulnerable to climate extremes. The lack of data, knowledge and community engagement further limits effective response and long-term resilience.

An Innovative Solution

Community-based Blue-Green Living Lab for nature restoration and environmental awareness

The proposed innovative solution for Orle Municipality is the gradual establishment of a Community-based Blue-Green Living Lab, focusing on involving the local population in the protection, restoration and sustainable management of local wetland and lake ecosystems. A special attention to the restoration activities will be on Lake Veleševac and other valuable waterflow areas in the municipality.

The main innovation of this solution is the restoration of degraded natural areas and the creation of a participatory model in which local people become active contributors to nature protection. The Living Lab would combine nature-based restoration measures, environmental education, citizen participation, intergenerational knowledge exchange and cooperation with experts from various institutions in the environmental protection field. In this way, restoration would be developed step by step together with the community, based on their local needs, habits and priorities.

A key part of the solution is raising awareness about environment among school children and younger generations. Through school activities, outdoor workshops, field visits, citizen science activities and practical learning in nature, children could learn about local ecosystems, biodiversity, water protection, waste reduction and the importance of wetlands. At the same time, awareness-raising activities should also include adults and older generations, through informal meetings, discussions, public workshops and community events. The aim is to create long-term communication and cooperation toward the environment through constant dialogue, education and practical involvement.

The focus group of the living lab are the residents, who often have valuable knowledge about the historical condition and events in the local area, traditional land use, former water flows, local species and community needs. Meetings with retired locals would be organized to present their memories, ideas and suggestions for the restoration of Lake Veleševac. They would also be actively involved in practical actions, such as cleaning the neglected shoreline, removing waste, improving access to the lake, supporting the control of excessive aquatic vegetation such as water lilies where ecologically justified, and helping organize local volunteer actions.

The Living Lab would also include cooperation with relevant institutions and experts, such as municipalities, schools, nature protection institutions, universities, NGOs, water management bodies, environmental experts and local associations. Their role would be to support planning, ensure that activities are legally and ecologically appropriate, and help design restoration measures that protect biodiversity in compliance with the needs of the local community.

Planned activities include lake and shoreline clean-up actions, educational workshops for children, intergenerational storytelling workshops, citizen monitoring of water quality and biodiversity, planting of native riparian vegetation, small habitat improvement actions, removal of waste and invasive or excessive vegetation under expert supervision, nature walks, photography and birdwatching days. These activities would be adapted to different groups of residents, including children, young people, retired citizens, local associations, families and farmers.

Another important component is the transfer of knowledge and best practices from other areas in Croatia and Europe. Orle Municipality would explore Erasmus+, Interreg, LIFE or similar exchange opportunities to connect with communities that have experience in wetland restoration, lake management, citizen science and nature-based solutions. Study visits, youth exchanges, expert workshops or partner meetings could help transfer practical knowledge and inspire locally adapted solutions.

The Benefits the solution produces

- Improved condition of Lake Veleševac and the surrounding areas
- Biodiversity protection and habitat improvement
- Raised awareness about the environment amongst school children and young people
- Involvement of residents in nature protection and restoration activities
- Involvement of retired residents in knowledge transfer and nature-based solutions
- Increased sense of local ownership and responsibility
- Cooperation between key stakeholders
- Organized and monitored restoration planning
- Improved capacity for future projects and funding
- Long-term sustainability and protection of various ecosystems

Where could also be applied to?

Area Characteristics	Intention for applying the solution
Small rural municipalities with neglected lakes, ponds or wetlands	To restore and clean degraded areas, improve water quality, improve local biodiversity and involve citizens in environmental protection
Communities located near rivers, canals or floodplain areas	To raise awareness of water ecosystems, organize monitoring and clean-up actions, and support nature-based solutions
Areas with abandoned or poorly maintained recreational areas	To reactivate the area for recreation, education, volunteering, community events and improve the condition of the area
Regions affected by climate risks (floods, droughts, biodiversity loss)	To implement adaptive, nature-based measures that reduce environmental risks and improve resilience
Communities interested in citizen science and environmental engagement	To involve citizens in data collection, awareness raising, and long-term protection and restoration of environment
Areas with strong elderly or retired local populations	To include retired citizens in restoration planning, storytelling, mentoring of younger generations and practical volunteer actions

Who is this relevant to?

- Orle Municipality
- Residents of Orle Municipality
- Retired residents and elderly population
- School children and young people
- Local schools and kindergartens
- Local associations and NGOs
- Fishing associations and recreational users
- Nature protection institutions and water management authorities
- Local and regional authorities
- Universities and research institutions
- Environmental experts and consultants
- Local and regional authorities

What do you need to have in place:

- Clear local coordination
- Stakeholder mapping
- Community interest and willingness to participate
- Basic legal and ownership clarification
- Support from relevant institutions
- Expert guidance
- A developed action plan
- Initial activities
- Educational programme
- Involvement of different resident groups
- Communication and raising awareness tools
- Financial resources
- Long-term maintenance plan

Key components of implementation:

Stakeholder mapping and engagement

Identify all relevant stakeholders, including residents, schools, retired citizens, associations, landowners, experts, institutions and municipal services. Define their interests, needs, roles and possible contributions to the restoration process.

Community consultation

Organize meetings, informal discussions and workshops with residents. Listen to their needs, concerns and ideas before defining concrete restoration activities.

Legal and institutional assessment

Clarify land ownership, responsibilities, permits and restrictions related to Lake Veleševac and surrounding areas and involve relevant institutions to ensure that all planned activities are legally and environmentally appropriate.

Expert support and ecological planning

Include ecologists, biologists, water management experts and nature protection specialists. Define suitable restoration measures, such as shoreline improvement, vegetation management, habitat enhancement and biodiversity monitoring.

Environmental education and awareness raising

Develop activities for school children, young people and the wider local community. Organize outdoor learning, workshops, awareness campaigns, citizen science activities and nature-based events.

Intergenerational knowledge exchange

Include retired locals and older residents in meetings and restoration planning. Use their knowledge of past landscape conditions, local traditions and historical changes around the lake.

Pilot restoration and clean-up actions

Starting with small, visible and realistic activities, such as waste clean-ups, shoreline maintenance, mapping of degraded areas and removal of excessive vegetation under expert guidance.

Citizen science and local monitoring

Involve citizens and schools in simple monitoring activities, such as observing biodiversity, recording waste problems, monitoring water quality or documenting seasonal changes.

Communication and visibility

Promote activities through municipal channels, schools, social media, posters and local events.

Partnership and knowledge transfer

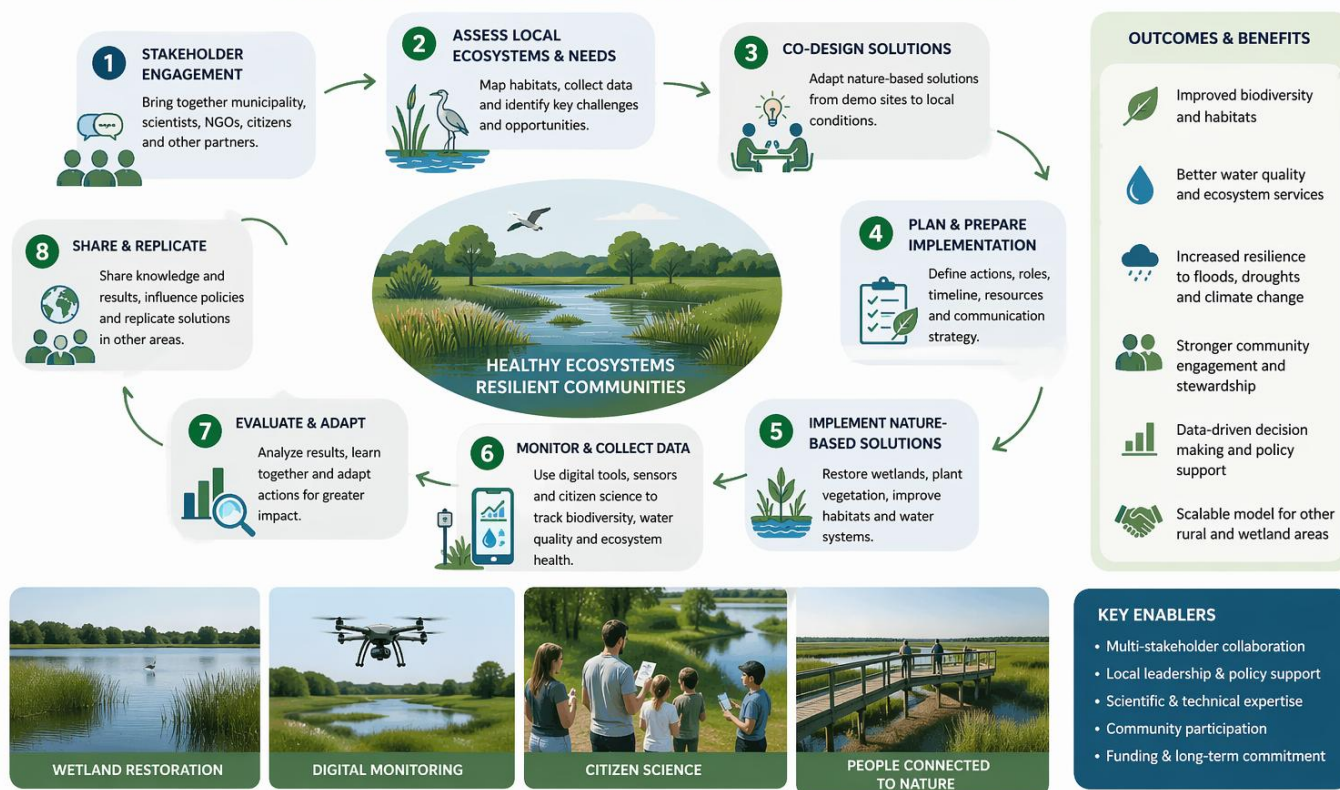
Connect with other municipalities, NGOs, universities and European projects with experience in wetland and lake restoration. Explore Erasmus+, Interreg, LIFE or similar programmes for exchange of knowledge and best practices.

Funding and resource planning

Identify financial resources for workshops, equipment, expert support, communication and restoration activities.

BLUE-GREEN LIVING LAB ORLE

WORKFLOW FOR NATURE-BASED SOLUTIONS



Monitoring your success:

What to monitor	What to monitor?
Biodiversity impact	Diversity of bird, insect, amphibian, fish and aquatic plant species observed in and around Lake Veleševac. Presence of key indicator species, such as waterfowl, amphibians, pollinators or wetland birds. Changes in plant diversity along the lake shore and surrounding green areas. Presence and spread of invasive or excessive plant species. Number of species observations recorded by experts, citizens and school children.
Habitat restoration	Area of cleaned, restored or improved shoreline. Condition of riparian vegetation and wetland habitats. Number of planted native trees, shrubs or wetland plants. Survival rate of planted native vegetation. Reduction of degraded, overgrown or inaccessible areas around the lake.
Waste and pollution reduction	Amount of waste collected during clean-up actions. Number of illegal dumping locations identified and removed. Type of waste found, such as plastic, glass, construction waste or organic waste. Improvement in cleanliness of the shoreline and access areas.
Community participation	Number of residents participating in activities. Number of volunteers involved in clean-up, restoration and monitoring actions. Participation of different age groups, including children, youth, adults and retired citizens. Number of community meetings, workshops and public consultations organized.

Stakeholder collaboration	Number and diversity of stakeholders involved. Participation of municipality, schools, NGOs, experts, institutions, landowners and local associations.
Legal and institutional progress	Clarification of land ownership and management responsibilities. Identification of required permits or restrictions for restoration activities. Involvement of relevant water management and nature protection bodies. Progress in preparing legal, technical or administrative documentation. Alignment of planned activities with environmental and spatial planning requirements.

The challenges you may encounter

Activity	Challenge 1	Challenge 2
Stakeholder mapping and coordination	Relevant stakeholders may be difficult to identify or motivate	Unclear roles and responsibilities between local authorities, institutions, landowners and community groups
Community engagement and awareness raising	Low initial interest or awareness among residents	Participation may decrease over time if activities are not continuous and visible
Legal and institutional preparation	Land ownership, permits and responsibilities may be unclear	Administrative procedures may slow down restoration activities
Ecosystem assessment and planning	Lack of baseline data on biodiversity, water quality and habitat condition	Limited technical expertise for selecting appropriate restoration measures
Implementation of restoration actions	Technical and logistical challenges during clean-up, vegetation management or shoreline improvement	Risk of conflicts between ecological protection and local recreational use
Education and citizen science	Schools and citizens may need support and training to participate effectively	Collected data may be inconsistent without simple methods and expert guidance
Funding and long-term maintenance	Dependence on short-term project funding	Volunteer motivation and maintenance responsibilities may decline over time
Knowledge transfer and replication	Good practices from other areas may not be directly applicable to Orle	Lack of strong partnerships may limit exchange opportunities and future project development

Key Contact – who to talk to about your application idea

Person 1: anja.cesarec@opcina-orle.hr

Person 2: hrvoje.mikulcic.aih@gmail.com