

### Groundwaters

The installation of three sensors inside the piezometers allowed to monitor in continuous the hydrometric levels and the chemical-physical parameters of water; in this way it is possible to intervene promptly on the sluice to maintain adequate levels in the aquifers and to facilitate the settlement and spreading of vegetations in the project areas.



### Surface waters

Three water depth sensors have been installed in the channels to continuously monitor the levels in order to adequately regulate them to facilitate the development of priority habitats and also to avoid the erosion of the banks and maintain constant circulation preventing anoxia phenomena. The periodical sampling made it possible to monitor the main chemical and physical parameters and to define the state of water quality (LIMECO index). At the sampling points, quality levels were observed to be unchanged or slightly improved over the years, confirming that the interventions carried during the project have triggered a positive process.



### Survey of wild vegetation and planted vegetation

To assess the status of plant species and the trend of the most widespread associations 40 phytosociological surveys have been carried out. Three aerial surveys were performed with a drone equipped with a camera with hyperspectral sensors, obtaining orthophotos with high resolution for the preparation of two maps of vegetation and habitats (2020 and 2023).

Thanks to these activities, it was possible to identify a previously unknown habitat (3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitriche-Batrachion vegetation), for which the Oasis of Valle Averte constitutes the only site in the entire lagoon of Venice. Regarding the planting vegetation 35 plots were installed in order to monitor the development of herbaceous, tree and shrubs. All plots were checked several times during the four-year project period.



### Avifauna

64 monitoring campaigns were carried out through fixed-radius point counts (20 stations), numerous censuses were carried out of nesting (May-August) aquatic avifauna and wintering (December-February). A total of 128 species were surveyed, constituting about 40% of all those known for the Venice lagoon, demonstrating the great value of the Valle Averte Oasis for avifauna. The number of species has been increasing during the four-year project period, as well as that of the individuals of various species of community interest, such as Common Tern, Greater Flamingo, red-crested Pochard and others. Specific campaigns have also been carried out both from boat and drone, to assess the reproductive success of the 30-70 pairs of Common Terns which nested annually in the 10 rafts provided at the beginning of the project.



### Dissemination, environmental education

Two workshops were organized with managing bodies of wetlands (at the Oasis of Vanzago and Orbetello) and two others with stakeholders of ecotourism (online and in Riviera del Brenta), both with the purpose of sharing knowledge, results and replicability and transferability activities of best practices. At the WWF Oasis, some 800 visitors have participated in the public open days while about 600 students were involved in the days dedicated to schools; there were organized visits with nature guides, educational workshops and environmental education activities to raise awareness of public and students on project issues, on environmental protection and to increase the knowledge of the Oasis and the Natura 2000 network. Visits were also conducted by experts (forestry experts, biologists, urban planners) to share the project aims and analyze the main results. Some scientific papers related to the avifauna of the Oasis have been published or are in the process of publication.

## Restoration of Alluvial Forests and *Cladium mariscus* habitats in Ramsar and Natura 2000 sites

### 2019-2024

Restoration of priority habitat 91E0\* alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* and 7210\* calcareous fens with *Cladium mariscus* and species of *Caricion davallianae*

### LIFE18 NAT/IT/001020

The project LIFE FORESTALL has received funding from the European Union's LIFE programme



[www.lifeforestall.eu](http://www.lifeforestall.eu)



CORILA - Consorzio per il coordinamento delle ricerche inerenti al sistema lagunare di Venezia  
Coordinatore del progetto



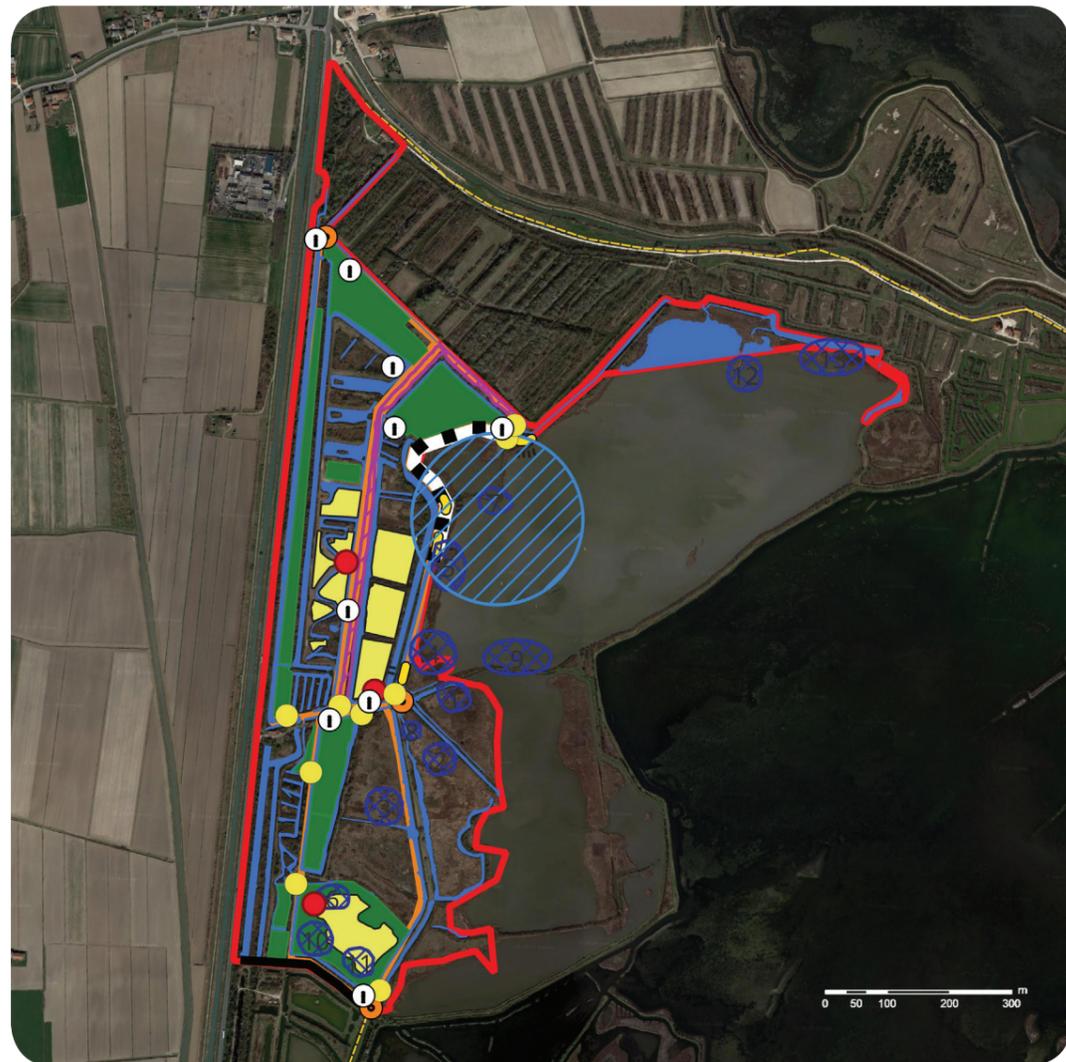
Proveditorato Interregionale per le Opere Pubbliche per il Veneto, Trentino Alto Adige, Friuli Venezia Giulia



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Fondazione WWF Italia



- Legend**
- Ramsar Site of International Importance
  - Project area - VALLE AVERTO OASIS
  - Action C1 activities**
  - Sluices
  - Depth sensors
  - Piezometers
  - Fascine
  - Waterways dredging (cleaning)
  - Hydraulic managed sectors
  - Action C2 activities**
  - Action C2
  - Action C3 activities**
  - Action C3
  - Action C4 activities**
  - Raft positioning areas
  - Action C5 activities**
  - Reduction of *Baccaris halimifolia*
  - Reduction of *Robinia pseudoacacia*
  - Action C6 activities**
  - Invasive fish species (*Silurus glanis*) control
  - Action C7 activities**
  - i Information panels
  - Reed screen

LIFE FORESTALL is funded by the European Union Programme for Environment and Climate Action (LIFE)

The project area is the WWF Oasis of Valle Averte (southern lagoon of Venice), 78 hectares owned by WWF Italy. The area is within two Natura 2000 sites (SPA IT 3250046, SAC IT 3250030) and a site included in the list of wetlands of international importance according to the Ramsar Convention.

The project activities had the advantage of contributing to vivifying an environment of extraordinary naturalistic interest; Valle Averte is a wetland of enormous importance, both for the vegetation and for the sedentary and migratory avifauna. Anthropogenic pressures and climate changes put the specific biodiversity of this environment at risk and active protection actions are necessary to preserve it.

LIFE FORESTALL has implemented the restoring and size increase of the habitats "7210\* Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*" and "91E0\*

Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*" considered as priority by the 92/43/EEC Habitats Directive.

Both the dredging of selected sectors of the existing canal network and the installation of new sluices were carried out in order to improve water quality and allow the regulation of water levels, to ensure optimal conditions for resting and feeding of birds during the winter and the migratory period and to encourage the natural expansion of the project habitats.

The containment of invasive alien species (IAS) was also implemented: *Robinia pseudoacacia* and *Baccharis halimifolia* (arboreal and shrubby plants) and *Silurus glanis* (known as "Wels catfish").

Some activities were carried out by a local social cooperative, demonstrating how environmental restoration can also promote the social and working integration of people.

We thank Veneto Agricoltura for the free supply of over 9000 plants.

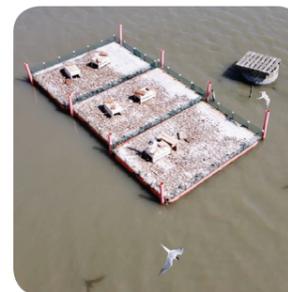
The concrete conservation actions are described here in summary. They are aligned with those listed in the "Conservation measures of the Special Conservation Areas (SAC)" approved by the Veneto Region (DGR n. 786, 05/27/2016). WWF Italy Foundation will guarantee, as part of its institutional activities, the sustainability of the long-term results after the completion of the project.

## C2 Restoration of *Cladium mariscus* habitat



Recovery, conservation and extension of priority habitat 7210\* Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* (cladiete) from 0.03 to 6.19 hectares. In the WWF Oasis of Valle Averte this habitat was present in limited areas, threatened by the excessive growth of *Rubus* spp. (brambles). A remodeling of selected surfaces and the lowering of their altitude allowed the planting of over 11,000 *Cladium mariscus* seedlings and thousands of other species of the same habitat.

## C4 Avifauna protection



Based on knowledge acquired from previous experiences, 10 floating rafts were created for the nesting of terns, waders and other species of community interest hosted in the Oasis. The rafts installed in April and removed in August each year have so far allowed the nesting of 26 to 68 pairs of Common Terns per year. Visitors have the opportunity to view the new colonies from specific observation points.

## C6 Counteracting invasive alien species (fauna)



Effective containment of more than 91% of the presence of specimens of *Silurus glanis* (Wels catfish), which dropped from 56 in 2020 to 5 in 2023. *Silurus glanis* is an alien species in Italy, native to Eastern Europe (Danube basin) which threatens the native fish community; this fish is an exceptional predator with an important impact on resident fish species. The strong reduction of *Silurus glanis* will in fact have benefits for the entire fish community of the Oasis.

## C1 Hydraulic works



Over 300 meters of internal channels have been dredged to improve the exchange of water with the large ponds of the Oasis; 9 sluices were replaced to improve water circulation; installed sensors to control water levels; install fascines to protect 500 meters of banks from erosive phenomena. Water control favors the project's priority habitats and regulated flooding will control the presence of *Rubus* spp. and *Robinia pseudoacacia*.

## C3 Alluvial forests restoration



Recovery, conservation and extension of the priority habitat 91E0\* Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*, which was extended from 1.25 to 11.60 hectares. Planting of over 23,000 trees, shrubs and herbaceous species, chosen from those typical of this habitat and actions to regulate the water level in the basins will stimulate their formation.

## C5 Counteracting invasive alien species (vegetation)



Containment of *Robinia pseudoacacia*, with the felling of 1,000 individuals and consequent planting of over 4,000 forest seedlings and eradication of specimens of *Baccharis halimifolia*, a species classified as alien and invasive of EU importance. This action was conducted using methodologies already applied in other LIFE projects. The reduction of these two species will benefit the native vegetation, in particular that of the priority habitats 7210\* and 91E0\*.

## C7 Visitor experience enhancement



About 1,500 people every year, most of them students, visit the WWF Oasis of Valle Averte. A project notice board and 9 new information panels relating to significant places and species in the area have been installed along the visit route. Furthermore, 100 meters of trails along the ponds have been protected and masked using reed screens to reduce human disturbance to the avifauna. A virtual visit to the Oasis was also made available via a dedicated page on the project website.