



LAYMAN'S REPORT

LIFE RINASCERE - LIFE13 ENV/IT/000169

NATURALISTIC RESTORATION
FOR THE INTEGRATED
HYDRAULIC-ENVIRONMENTAL
SUSTAINABILITY
OF THE EMILIAN CANALS



LIFE RINASCCE



NATION

ITALY

REGION

Emilia-Romagna

MUNICIPALITY

Carpi (MO), Novi di Modena (MO), Gualtieri (RE)

COORDINATING BENEFICIARY

Consorzio di Bonifica dell'Emilia Centrale

ASSOCIATED BENEFICIARY

Regione Emilia-Romagna

DURATION

02/07/2014 – 30/09/2020

TOTAL BUDGET

2.076.390 €

EU FINANCIAL CONTRIBUTION

941.390 €

COORDINATING BENEFICIARY'S CONTRIBUTION

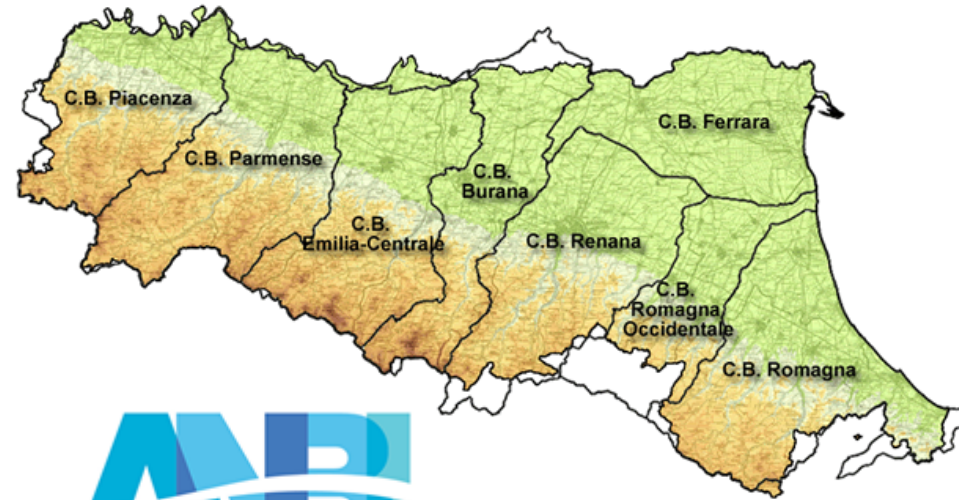
975.000 €

ASSOCIATED BENEFICIARIES' CONTRIBUTION

160.000 €



CHANNELS IN EMILIA-ROMAGNA

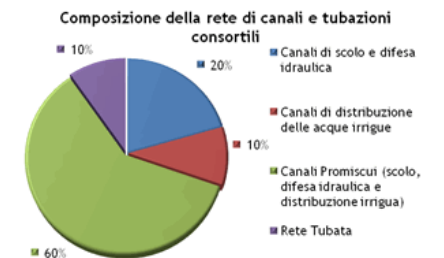


Superficie totale	22'926.49 km ² (2'292'649 ha)
Superficie di pianura	11'004.98 km ² (1'100'498 ha)
Superficie collinare e montana	11'921.51 km ² (1'192'151 ha)
Superficie urbanizzata in Emilia-Romagna (2003)	1'505.11 km ² (150'511 ha)



RETE DI BONIFICA

Rete di scolo e difesa idraulica	4'250.0 km
Rete di distribuzione delle acque irrigue	2'174.8 km
Canali Promiscui (scolo, difesa idraulica e distribuzione irrigua)	12'424.1 km
Rete tubata	2'008.2 km
Estensione della Rete	20'857.1 km



Incluso C.E.R.

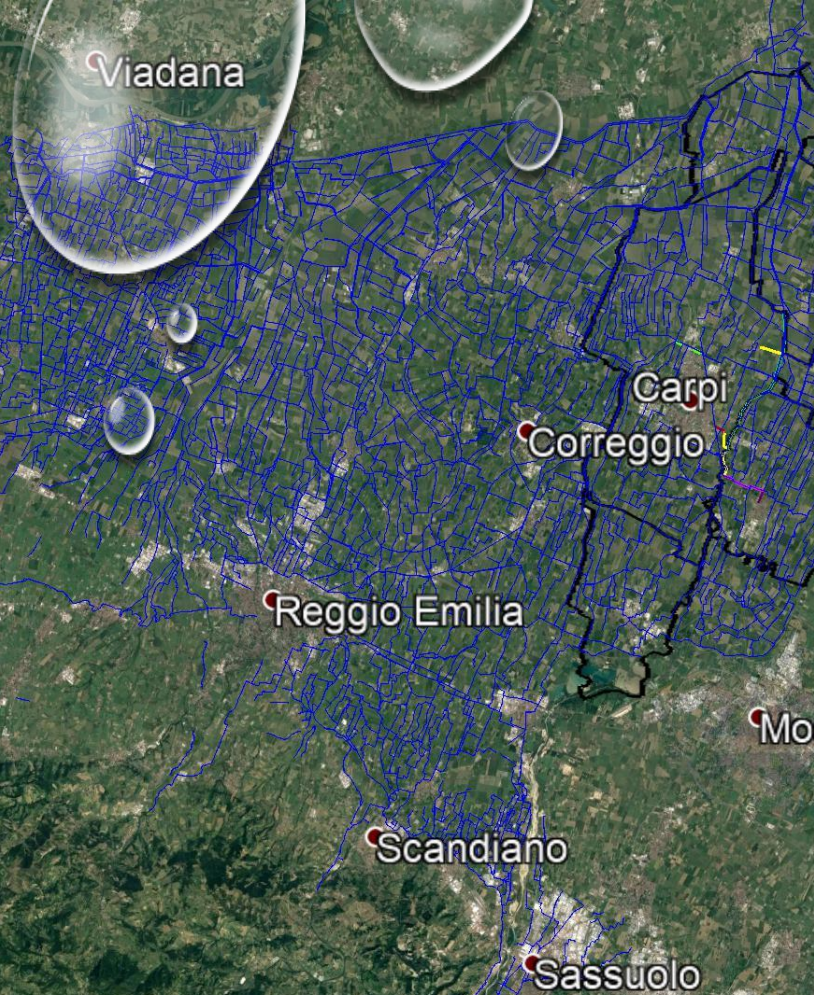
IMPIANTI DI BONIFICA

Impianti di sollevamento	Num.	Potenza (kw)	Portata (m ³ /s)
Impianti di scolo e difesa idraulica	199	89'419	1'345.1
Impianti Irrigui	380	78'410	640.9
Impianti Invertibili	3	10'030	144.9
Totale	582	177'859	2130.9

Incluso C.E.R.

DIGHE E CASSE DI ESPANSIONE

Tipo	Num.	Portata deriv. (m ³ /s)	Invaso (m ³)
Dighe	2	3.90	18'100'000
Casse di espansione	53	-	66'126'231



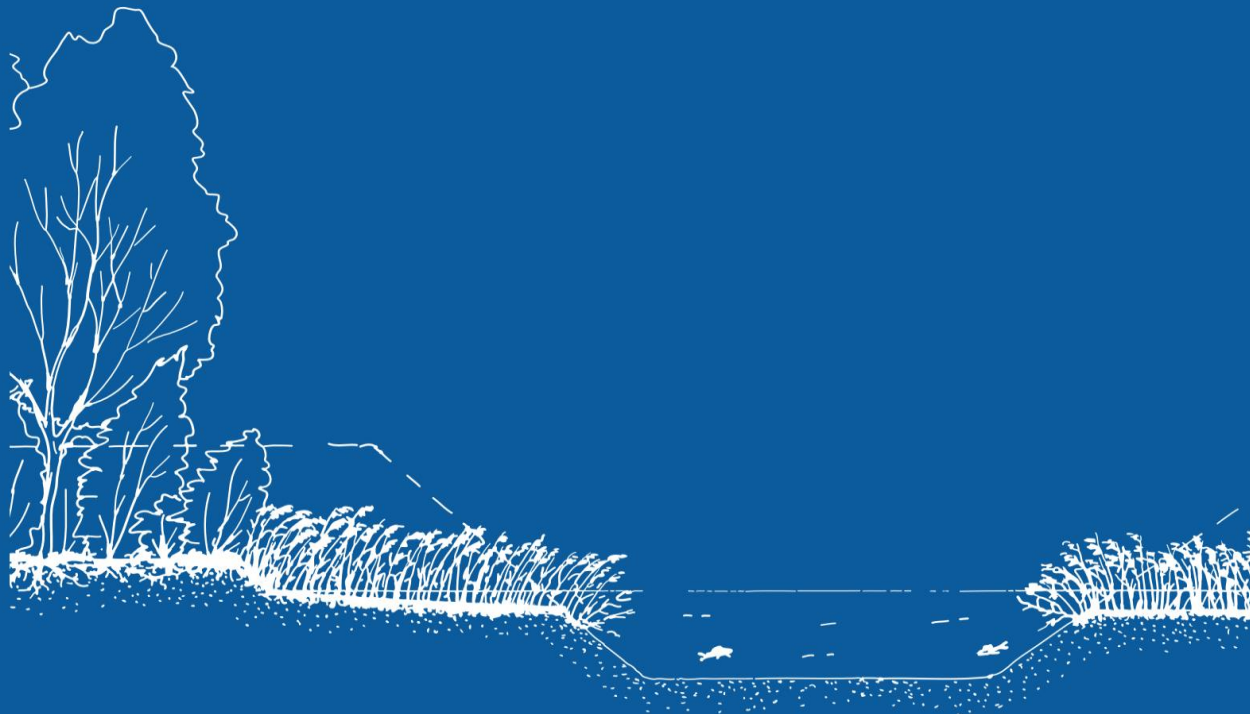
CONSORZIO DI BONIFICA DELL'EMILIA CENTRALE

- Total area: **3.122 kmq**
- Plain surface: **1.309 kmq**
- Hill / mountain surfaces: **1.812 kmq**

- Channels: **3.144 km**
- Drain pumps : **5**
- Irrigation pumps : **51**
- Expansion areas: **9**



Linee guida per la riqualificazione ambientale dei canali di bonifica in Emilia-Romagna



STRATEGY

The LIFE RINASCE strategy envisages **"making room for canals"** in accordance with the *"Guidelines for the environmental requalification of artificial canals in Emilia-Romagna"* ([Download¹](#))

¹ <https://ambiente.regione.emilia-romagna.it/it/suolo-bacino/servizi/pubblicazioni/servizio-difesa-del-suolo-della-costa-e-bonifica>

STRATEGY

NATURALISTIC RESTORATION FOR THE INTEGRATED HYDRAULIC-ENVIRONMENTAL SUSTAINABILITY OF THE EMILIAN CANALS

The project “LIFE RINASCE” has been approved by the European commission on July 2014, and it proposes to realize for demonstrative purposes the hydraulic-environmental restoration of some drainage canals in the Emilia-Romagna region, in Northern Italy.

The “Consorzio di Bonifica dell’ Emilia Centrale (the local land reclamation authority of central Emilia) is the promoter of the project, in cooperation with Emilia Romagna administrative Region.

The project aims to show that the key concepts of the “floods” (2007/60/EC) and “water framework” 2000/60/EC directives, concerning the need to reduce flood risk, at the same time improving the ecological status of the water courses, can also be applied to the artificial water network. In this sense, new typologies of interventions will be experimented, in order to apply these concepts to the specific state of drainage canals.

The Emilian Plain is crossed by a dense network of artificial canals, built by man in the course of centuries, for the hydraulic drainage: in the artificial network, waters flow not only because of gravity, but also thanks to pumping stations which drain the territories situated sometimes below the level of the receiving river beds; therefore malfunctions of a system so distinctly artificial can cause catastrophic damages. Thus is essential to increase the levels of flood safety. At the same time, the ecological restoration of the drainage canals represents an important opportunity for the joining of the ecologic network and the improvement of the quality of the environmental.

The canals selected for the interventions suffer in similar degree of environmental and hydraulic problems.

Currently in fact they characterize themselves for a rectilinear course and a geometrical section of trapezoidal shape; there are no floodable areas linked to them, so excess flows are drained by a water scooping system. Besides, floodable areas, if present, are in concession to farmers, for the cutting of the herbaceous vegetation.

Presence of aquatic and bank vegetation is anyway periodically controlled by machine-operated recurring maintenance, on behalf of the Consorzio.

It is important not to forget that the development of urban settlements of the last decades, has further increased the flow in outflow, leading to an efficiency crisis of the various hydraulic networks. In the case of the Consorzio di Bonifica dell’Emilia Centrale and the areas of the examined canals, recent hydraulic analysis point out a high risk possibility of flooding situations.

Add to this the problems of the wastes from the purification plants and from the filling channels, which put into the canals great quantities of polluting substances, thus worsening the quality of the waters.

On the whole, the interventions consist of the requalification of about 7 km of canals, by creating 3 hectares of floodable naturalistic areas along the banks (“space to canals”), the forestation of 2 km of banks and the creation of an expansion area destined to become a naturalistic humid zone for the accumulation of flood and the phyto-depuration of the water, for an extension of about 3 hectares.

STRATEGY

NATURALISTIC RESTORATION FOR THE INTEGRATED HYDRAULIC-ENVIRONMENTAL SUSTAINABILITY OF THE EMILIAN CANALS

Now the competent agencies are pondering on the transformation of this artificial water network, to evaluate if a water-management system based mostly on ecological standards can give better results also in terms of a reduction of hydraulic risk, considering that so far the problem of floods is far from being resolved; on the contrary, in many cases it has worsened, and the frequency and intensity of floods increased in Europe and Italy.

Besides, the project is meant to set up and apply a “soft” management of the aquatic and riparian vegetation of the canals, comparing different cutting methods, in relation to ecological, hydraulic and economic effects (in term of costs of maintenance).

The substantially innovative feature of the project “LIFE RINASCE” is not only given by the different intervention typologies created to resolve hydraulic and environmental problems, but also by the whole planning course, which involve a multidisciplinary working group and local actors, involved through a “participatory process”.



Carabidae



Macroinvertebrate



Odonata

ECOLOGICAL OBJECTIVES

Habitat improvement for:

- Amphibians
- Fishes
- Macroinvertebrates
- Carabidae
- Odonata



Amphibians



Fishes

ECOLOGICAL OBJECTIVES

Increase of:

- Riparian strips
- Wetlands
- Helophytes
- Water quality
- River functionality



Riparian strips



Wetlands



Water quality



River functionality



Helophytes

HYDRAULIC OBJECTIVES

Reduction of flooded areas by accumulation of water in:

- floodable banks
- humid lowlands
- restored riverbed
- multi-objectives expansion areas



Floodable banks



Humid lowlands

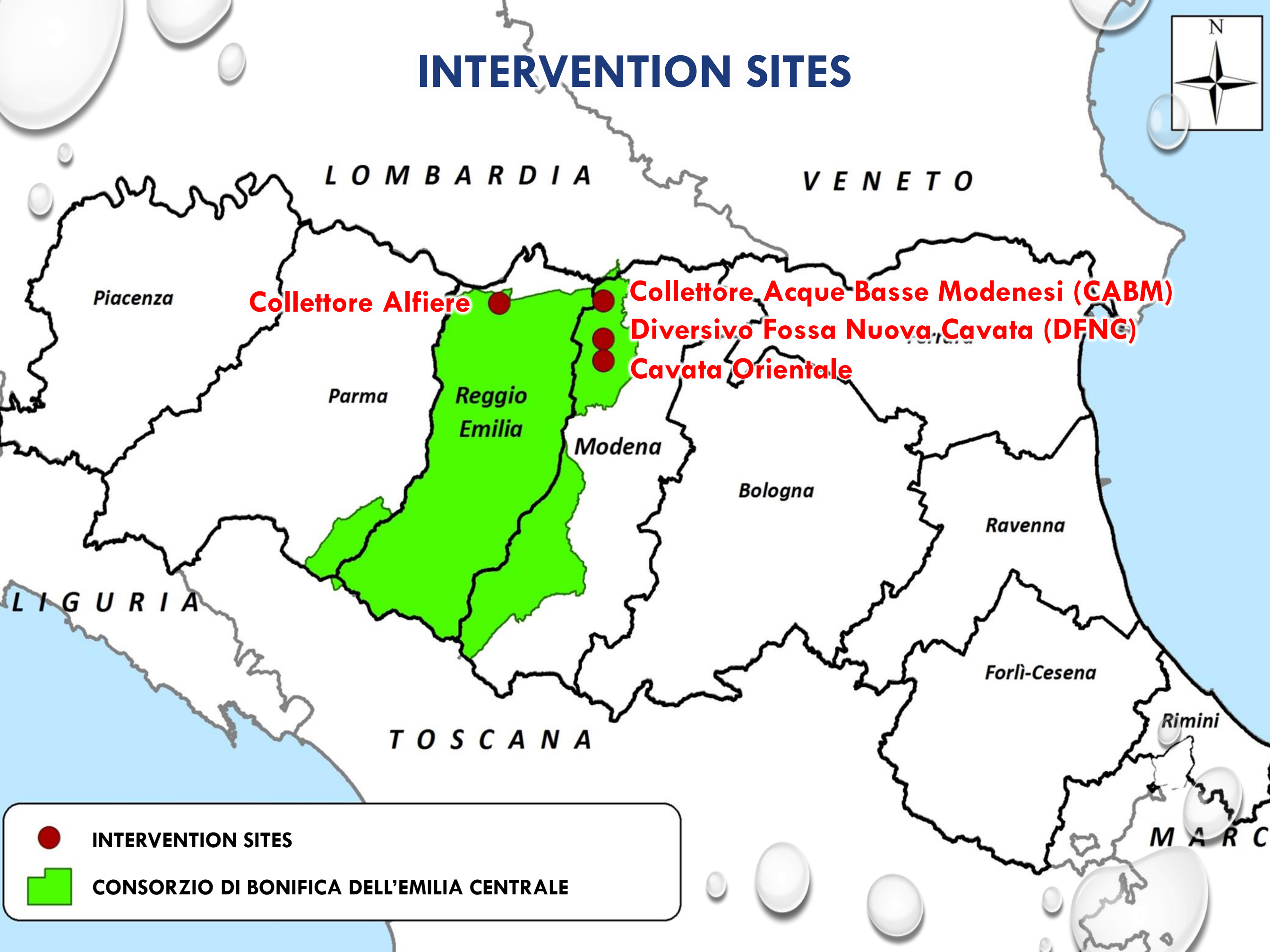


Multi-objectives expansion areas



Restored riverbeds

INTERVENTION SITES



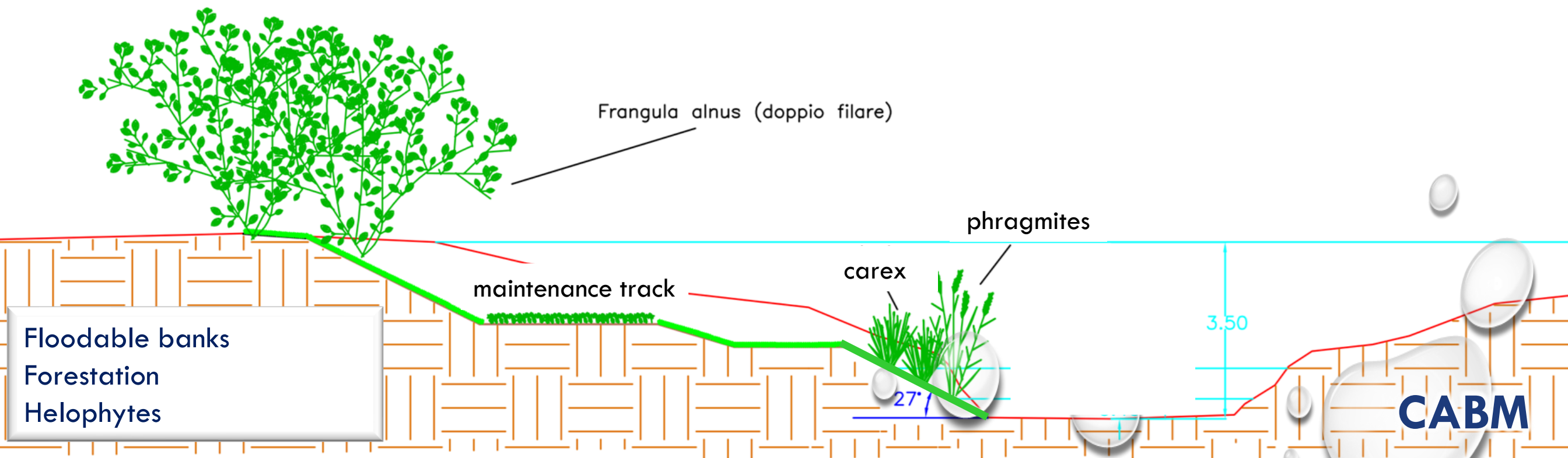
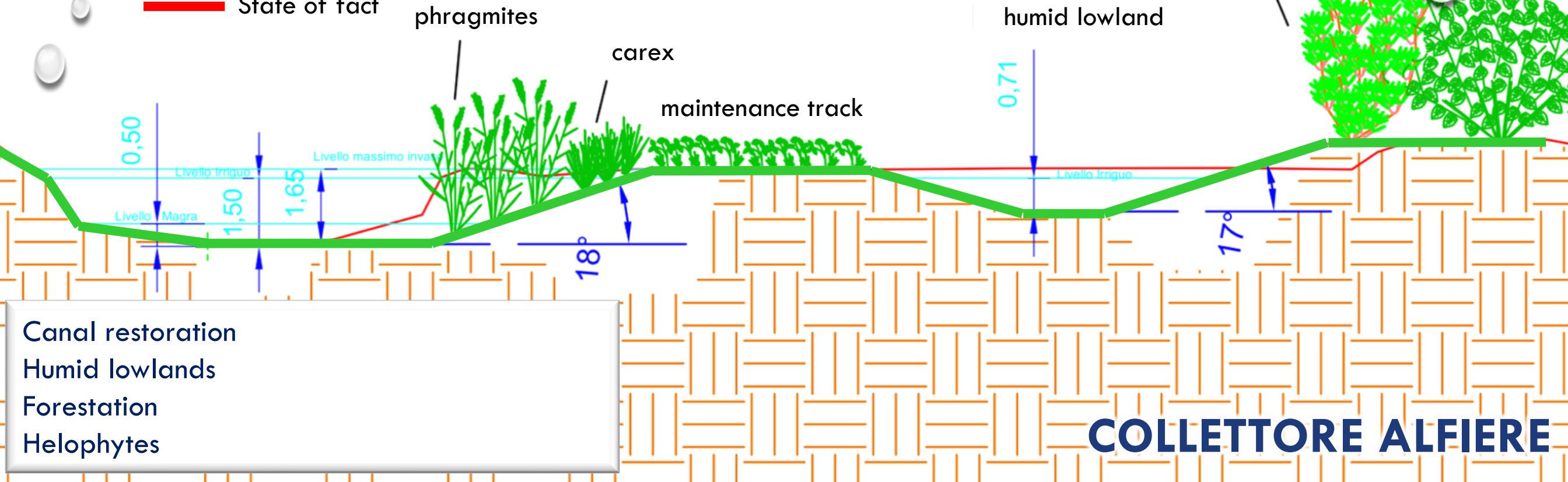
INTERVENTION SITES

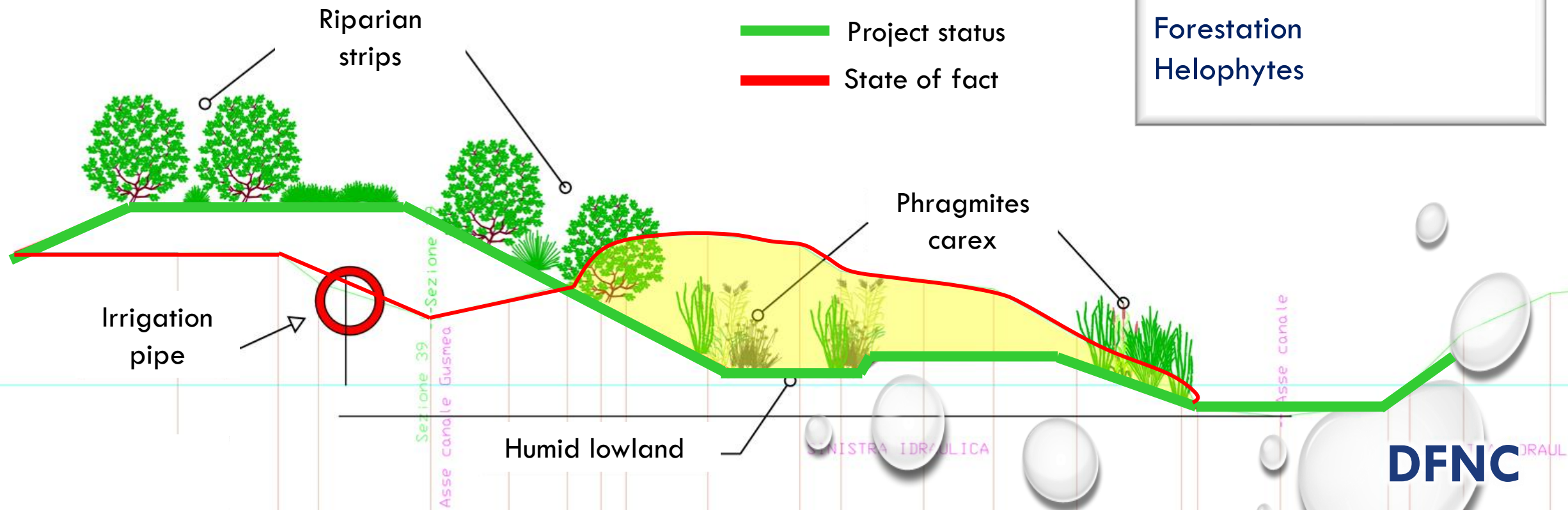
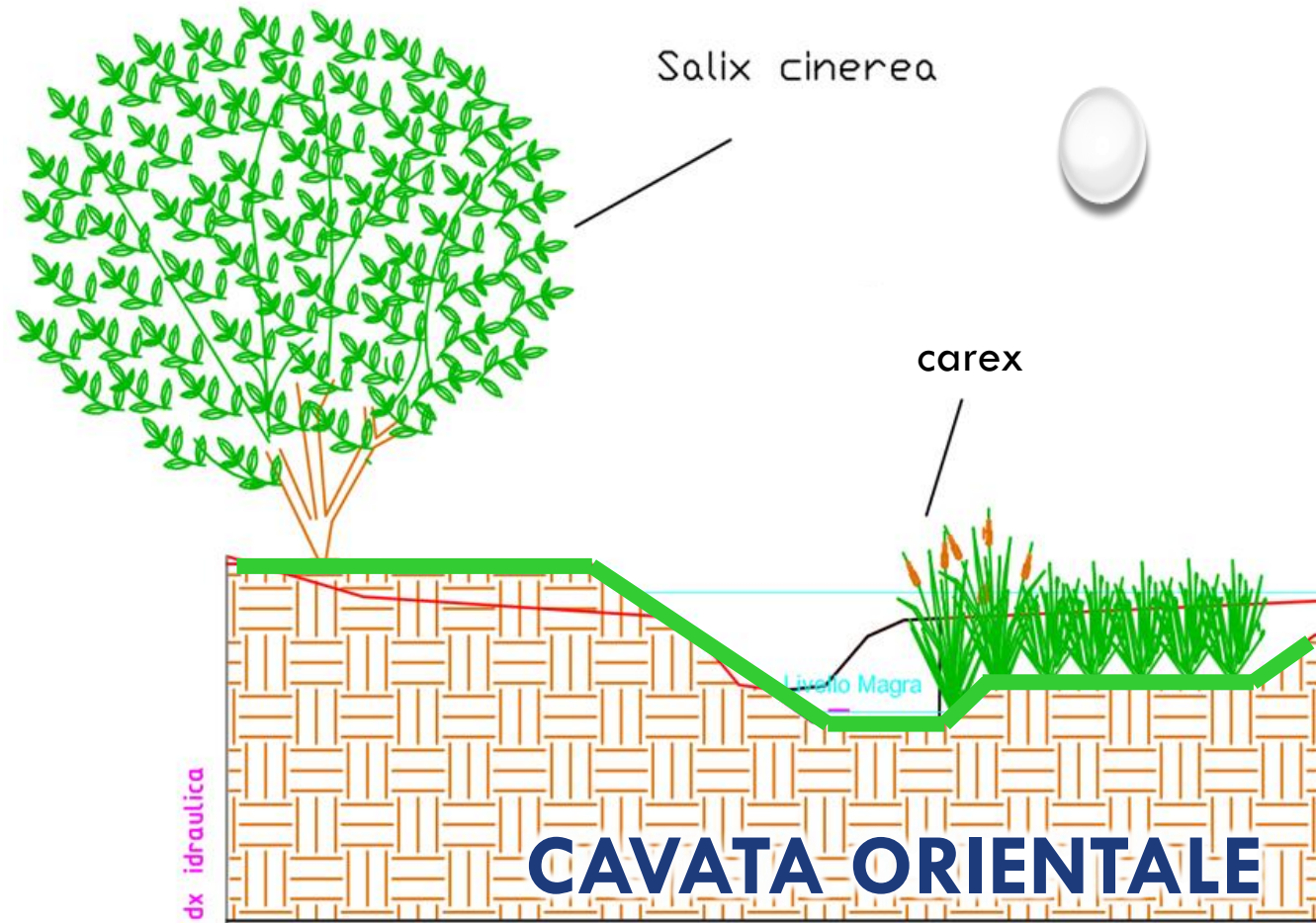
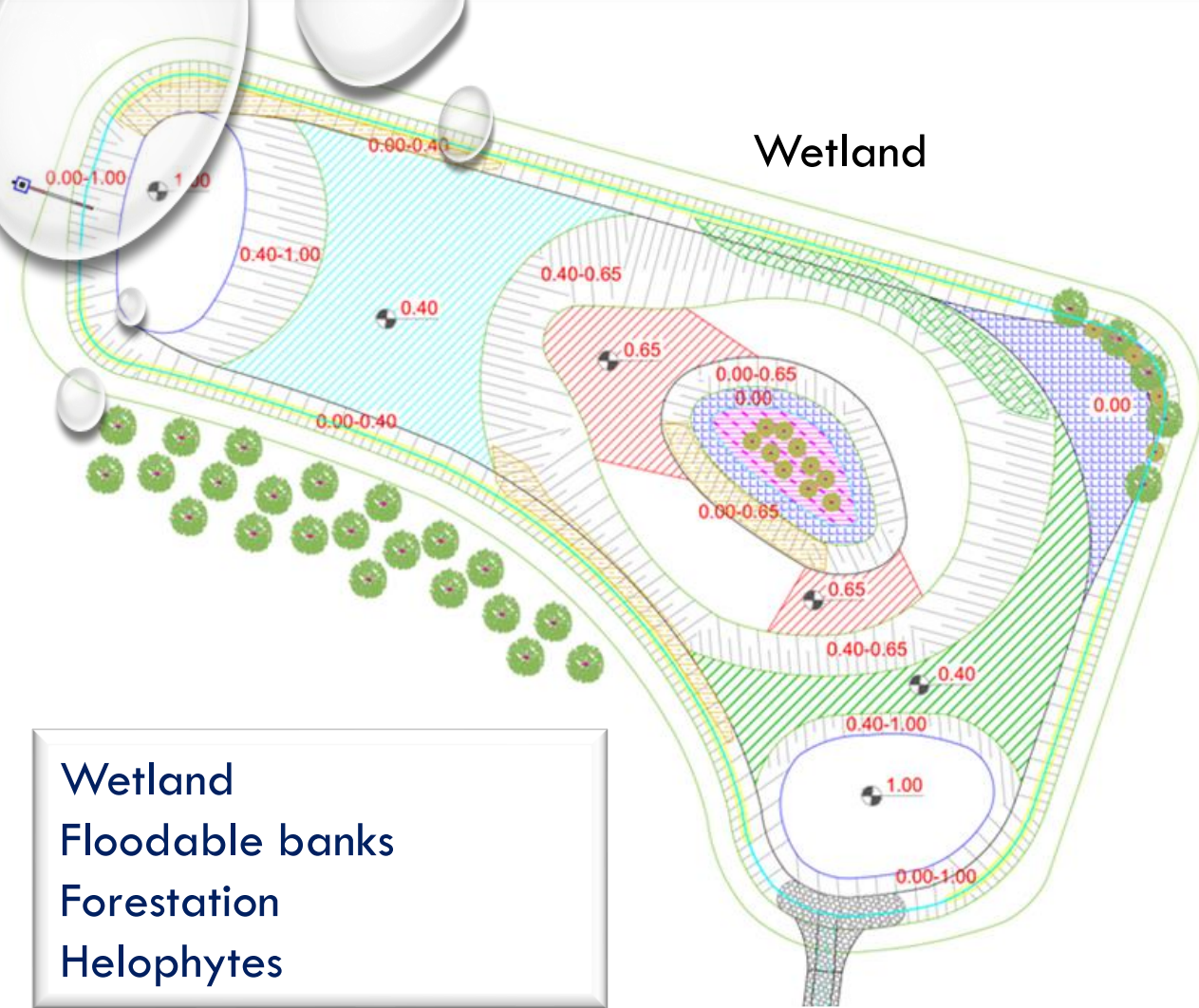


CONSORZIO DI BONIFICA DELL'EMILIA CENTRALE

ACTIONS

- Project status
- State of fact





ACTIONS

COLLETTORE ALFIERE

Comune di Gualtieri (RE)

- Canal restoration: **2 km**
- Humid lowlands: **5.000 mq**
- Helophytes: **8.000 mq**
- Riparian strips: **2 km**
- Cost: **65.000 €**

COLLETTORE ACQUE BASSE MODENESI (CABM)

Comuni di Carpi e Novi di Modena (MO)

- Canal restoration: **4 km**
- Floodable banks: **12.000 mq** (1,2 km)
- Helophytes: **4.400 mq**
- Riparian strips: **4 km**
- Cost: **92.000 €**

ACTIONS

CAVATA ORIENTALE

Comune di Carpi (MO)

- Canal restoration: **700 m**
- Floodable banks: **1.000 mq**
- Riparian strips: **2 km**
- Multi-objectives expansion areas: **3 ha**
of which wetland: **1 ha**
- Cost: **445.000 €** (expropriations excluded)

DIVERSIVO FOSSA NUOVA CAVATA (DFNC)

Comune di Carpi (MO)

- Canal restoration: **900 m**
- Floodable banks: **8.000 mq**
- Helophytes: **3.200 mq**
- Riparian strips: **2,7 km** (trifilar)
- Cost: **210.000 €**

BEFORE



Multi-objectives expansion areas - Cavata Orientale



Floodable banks - CABM



Humid lowlands - Collettore Alfieri



Floodable banks - DFNC

DURING



Multi-objectives expansion areas - Cavata Orientale



Floodable banks - CABM



Humid lowlands - Collettore Alfieri



Floodable banks - DFNC

AFTER



Multi-objectives expansion areas - Cavata Orientale



Floodable banks - CABM



Humid lowlands - Collettore Alfieri



Floodable banks - DFNC



Vegetation management



Alternate vegetation cut

“GENTLE” MAINTENANCE

The maintenance of the canals generally involves the almost complete removal of aquatic vegetation, to facilitate the flow of water. The awareness of the ecological importance of vegetation in the riverbed has led to the development of maintenance practices that are more attentive to the conservation of the aquatic ecosystem, based on more conservative cutting methods of vegetation, tested by the LIFE RINASCE project.

NATURE AFTER THE ACTIONS



MANUALE TECNICO

Progetto
LIFE RINASCE
LIFE13 ENV/IT/000169

INTERVENTI
DI RIQUALIFICAZIONE INTEGRATA
IDRAULICO-AMBIENTALE DEI CANALI
REALIZZATI CON
IL PROGETTO LIFE RINASCE

TECHNICAL MANUAL

LIFE RINASCE has produced a "Technical Manual" which summarizes the design, implementation and monitoring experience of canal restoration interventions developed with the LIFE project, with the aim of providing methodological and technical support for conceiving, adapting, designing, carry out and monitor hydraulic-environmental restoration of canals in other similar contexts in Italy.

([Download](#)¹)

¹ <https://progeu.regione.emilia-romagna.it/it/life-rinasce/notizie/2020/disponibile-online-il-manuale-tecnico-di-life-rinasce>



PUBLICATION BY

- **Marco Monaci** - Freelance
LIFE RINASCE Consultant
mm.monaci@gmail.com
- **Aronne Ruffini** - Consorzio di bonifica dell'Emilia Centrale
LIFE RINASCE Project manager
aruffini@emiliacentrale.it
- **Alfredo Caggianelli** - Regione Emilia-Romagna
LIFE RINASCE Regional contact person
alfredo.caggianelli@regione.emilia-romagna.it

CONTACTS

- **Email:** LifeRinascce@emiliacentrale.it
- **Sito:** <https://progeu.regione.emilia-romagna.it/it/life-rinascce>