

## SUMMARY Action C2

To select the watercourses on which to intervene, a wide census of the environments potentially suitable for hosting the species was carried out on a regional scale. The suitability of the watercourses to the species was determined using the following criteria:

- Previous presence data;
- Water present all year;
- Chemical-physical data of the water (pH, conductivity, temperature, depth, clarity);
- Riverbed not excessively shaded;
- Distance (not more than 3 km) from the sites of ascertained presence of the species during the *ex ante* monitoring;
- Properties with preference for the public, as a guarantee of the sustainability of the interventions in the medium and long term and of a greater ease and speed of operation.

Based on these criteria, a suitability value for each watercourse surveyed has been assigned in the field, expressing it in the following scale of values: high, medium, low, and none, according to the expert judgment of the detector.

In SCI IT4070001 "Vena del Gesso Romagnola" six watercourses were found to be suitable for hosting the species. In two of these streams the species is present, but with numerically very small populations and with a limited extension of the suitable habitat; in four other streams the species has not been found, but the environments show characteristics suitable to host it, following the implementation of habitat improvement interventions.

In SCI IT4090002 "Torriana, Montebello, Fiume Marecchia", the three streams where the highest number of individuals has been counted are the ones involved in the interventions. In the other Romagna and Emilia areas of the project where the species has been researched, the watercourses have turned out to not be sufficiently suitable to be subjected to concrete actions to improve the habitat. In fact, there are numerous factors of threat to the species in Emilia - Romagna: water abstraction and excessive water withdrawals from the sources for various purposes, reorganisation of the small watercourses, decrease in rainfall (to be ascribed to climate change; Hassall & Thompson, 2008), evolution of the vegetation succession that causes the closing and shading of the water courses, presence of exotic animals that profoundly alter hydrophyte vegetation (e.g. coypu), disturbance of the riverbed by domestic animals (ducks, geese, poultry, etc.) and, last but not least, the general isolation of the present subpopulations, often characterised by a low number of individuals.

Within each Natura 2000 site, the action plan is aimed at promoting the creation of ecological corridors between the various sites of presence in order to allow greater diffusion of the species in its distribution area.

Natura 2000 site	Transect ID of the stream-watercourse	Municipality	Length	Suitability for actions
IT4090002 "Torriana, Montebello, Fiume Marecchia"	IT4090002_MAR_Coe_L1	San Leo	578 m	high
	IT4090002_MAR_Coe_L2	San Leo	588 m	high
	IT4090002_MAR_Coe_L3	San Leo	508 m	high
IT4070001	IT4070011_MAR_Coe_L4	Brisighella	206 m	<u>medium-high</u>
	IT4070011_MAR_Coe_L5-2*	Borgo Tossignano	340 m	medium
	IT4070011_MAR_Coe_L5-	Casola Valsenio	772 m	high

“Vena del Gesso Romagnola”	3*			
	IT4070011_MAR_Coe_L6-2	Brisighella	255 m	high
	IT4070011_MAR_Coe_L7	Riolo Terme	199 m	medium
	IT4070011_MAR_Coe_L8	Casola Valsenio	348 m	high
	IT4070011_MAR_Coe_L9	Casola Valsenio	206 m	medium

Table 1. List of transects subject to concrete actions for *Coenagrion mercuriale*. The interventions involve 9 watercourses corresponding to 10 transects. \* Two transects, IT4070011\_MAR\_Coe\_L5-2 and IT4070011\_MAR\_Coe\_L5-3, belong to a single watercourse.

The main limiting factor for the species found in the watercourses identified for the interventions concerns the excessive development of riparian vegetation and the consequent shadowing that prevents the growth of submerged and semi-submerged aquatic plants (e.g. *Mentha*, *Veronica*, *Carex*, *Juncus*, *Equisetum*, *Rorippa*, etc.), whose presence is necessary for spawning.

The control of the vegetation along the banks in the past was carried out naturally and continuously by the flocks and by the cattle that went watering in the rivers, and in the distant past by the herds of wild grazing animals. Now the practice of sheep farming and cattle grazing in the majority of the foothills area of the Emilia-Romagna region is either lost or has been greatly reduced.

Therefore, to allow a greater insolation on the riverbed, and thus allow a conspicuous development of the aquatic plants necessary for the biological cycle of the species, interventions have been planned and implemented, such as trimming along the banks with elimination of shrubs, bushes and brambles, delimiting and pruning of large trees, felling of trees placed within the streams and on the banks.

These types of interventions were carried out alternately on short sections of about 80 m with intervals of 30-50 m, so as to maintain a certain degree of naturalness of the watercourse and not adversely affect the flora and fauna present (e.g. amphibians and birds). The wood material and the obtained waste have been moved away from the watercourses so as not to release vegetable debris inside the riverbed. These interventions will be repeated in the following years to control the regrowth of trees and shrubs.

As part of the Life Eremita project, after a preliminary monitoring campaign aimed at verifying the distribution of *Coenagrion mercuriale castellanii* in Emilia-Romagna and a parallel investigation to identify the areas potentially suitable for hosting the species, a conservation program has been defined with the goal of expanding the species distribution area in Emilia-Romagna and reinforcing the populations present. The results of the *ex-ante* monitoring confirm the regression trend of the species in Emilia-Romagna, due to the progressive disappearance of its habitat of choice. The species already presents an inadequate conservation status in northern Italy with the worsening of all the reference parameters: range, population, habitat and future prospects (Riservato et al., 2014a, 2014b, 2014c).

To counter this process, the Life Eremita project has identified actions toward the restoration of the ecological conditions of the aquatic lotic habitats where the species lives to favour the expansion of its distribution area, and the subsequent translocation of specimens coming from a source population, for the purpose of numerically reinforcing reduced populations.