

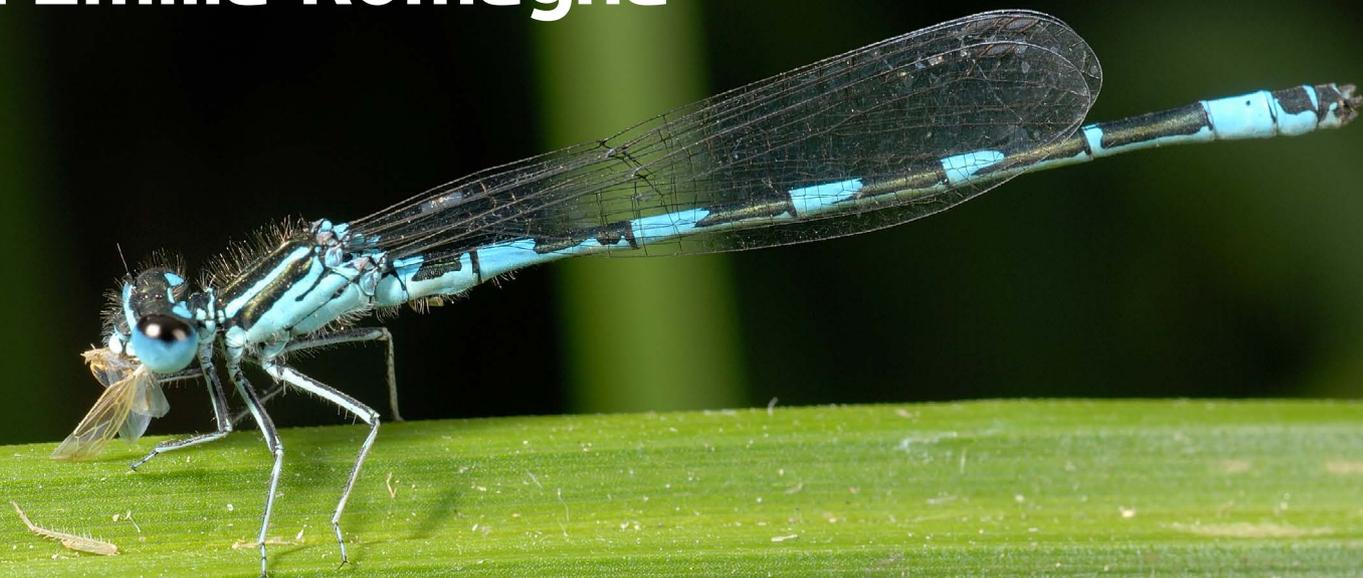


With the contribution of the LIFE
financial instrument of the European
Union LIFE 14 NAT/IT/000209 EREMITA

Layman's Report

LIFE 14 NAT/IT/000209 EREMITA Project

Coordinated actions to preserve residual and isolated populations of forest and water insects in Emilia-Romagna





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Introduction

The activities envisaged by the Life Eremita project have ended after six and a half years. A long and exciting adventure undertaken to meet the conservation needs of four rare insects, three beetles and a dragonfly known exclusively to experts and unknown to most, which succeeded in broadening our view from the protected areas of Emilia-Romagna to the most relevant Italian and European experiences. And not only that: now *Osmoderma eremita*, *Rosalia alpina*, *Coenagrion castellani* and *Graphoderus bilineatus* are species known to a much wider audience, adults and children alike, thanks to communication and educational initiatives, but above all thanks to the implemented conservation actions, in the protection and expansion of their distribution area - even after the closing of the Life project - and through the consolidation of management methods making production activities compatible with the maintenance of living habitats.

A small, concrete contribution to the adoption of ordinary behaviours conducive to a respect for the environment, ecosystems, and biodiversity, according to the ethical values that now more than ever must be shared on an even wider scale.



TOMMASO VALENTE

The project

The Life Eremita project (LIFE 14 NAT / IT / 000209), launched on 1 January 2016, takes its inspiration from one of the four species of insects which are the focus of the project activities, *Osmoderma eremita* (Hermit beetle), which by its name symbolizes the condition of isolation and rarity also shared by the other three target species, *Rosalia alpina* (Rosalia longicorn), *Graphoderus bilineatus* (Dytiscid water beetle) and *Coenagrion castellani* (Southern Damselfly). All four species are considered of Community interest pursuant to the Habitats Directive and protected by Regional Law no. 15/2006 “Measure for the protection of minor fauna in Emilia-Romagna”, established to guarantee adequate forms of protection and conservation for small animal species. The survival of these insect species is in fact threatened by the constant reduction or alteration of their habitat - forests for the Hermit and Rosalia, aquatic for the Dytiscid and Damselfly - mainly due to human activity. The Life Eremita project contributed to the improvement of the conservation status of residual populations, carrying out a series of concrete actions, such as: **monitoring**, necessary to increase knowledge on the occurrence/absence and distribution of target species, and plan targeted interventions; **habitat improvement**; **controlled breeding** of the hermit beetle; **release into the wild** of specimens taken from source populations or from designated breeding centre; **awareness-raising** of citizens on the ecological value of these species, with particular attention paid to schools, and **volunteers’ involvement**.

The implementation of the Life Eremita project was a unique opportunity to convey a positive message and focus all the necessary attention on a component of the regional biodiversity that had not yet been the subject of such in-depth research, reaching a large number of citizens, students and sector operators.

Approval by the European Commission
May 2015

Total budget of the project
2.126.987 euros
European contribution
1.268.863 euros
equal to 59.66% of total budget

Regional contribution
774.862,00 euros

Duration:
1 January 2016 — 30 June 2022

Coordinating Beneficiary
Emilia-Romagna Region

Associated Beneficiaries

National Park of Tuscan-Emilian Apennines, National Park of Casentinesi Forests, Mount Falterona and Campigna, Management Authority for Parks and Biodiversity of Western Emilia, Management Authority for Parks and Biodiversity of Central Emilia, Management Authority for Parks and Biodiversity of Eastern Emilia, Management Authority for Parks and Biodiversity of Romagna.

Participating sites of the Natura 2000 Network
78 in total



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Target species

Osmoderma eremita

(Scopoli, 1763)



The **Hermit scarab beetle** is characterized by the smell of ripe peach that the adult male emits to attract females. It lives and develops inside hollow trunks both in deciduous forests and in agricultural environments and city parks.

Order: Coleoptera

Family: Scarabaeidae

Description: black-bronze colour with metallic sheen

Size: length between 24 and 37 mm

Conservation: species protected by the Habitats Directive as a priority species (Annex II and IV)

Graphoderus bilineatus

(De Geer, 1774)

A **Dytiscid water beetle** is characterized by two dark lines interspersed with a large yellow band on the thorax. It lives in lakes, large ponds and peat bogs, preferably with clear, deep waters and rich in aquatic vegetation.

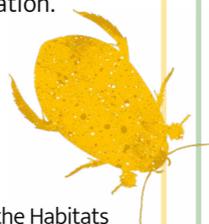
Order: Coleoptera

Family: Dytiscidae

Description: yellowish in colour with black marmoration on the elytra

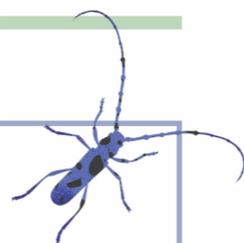
Size: length between 14 and 16 mm

Conservation: species protected by the Habitats Directive (Annex II and IV)



Rosalia alpina

(Linnaeus, 1758)



Cerambycid beetle, with an unmistakable appearance due to its elegant light blue livery with black spots and long striated antennae. It lives in the mountains, in more mature and sun-exposed beech woods, where there is abundant dead wood.

Order: Coleoptera

Family: Cerambycidae

Description: light blue with black spots

Size: length between 20 and 38 mm

Conservation: species protected by the Habitats Directive as a priority species (Annex II and IV)

Coenagrion castellani

Roberts, 1948



Small dragonfly, also known as **Southern Damselfly**. It is recognized by the presence of a U-shaped design on the second abdominal segment. It lives along small streams, sunny and rich in aquatic vegetation.

Order: Odonata

Family: Coenagrionidae

Description: blue and black (male); black, green and light blue (female)

Size: body length between 27 and 31 mm

Conservation: species protected by the Habitats Directive (Annex II)

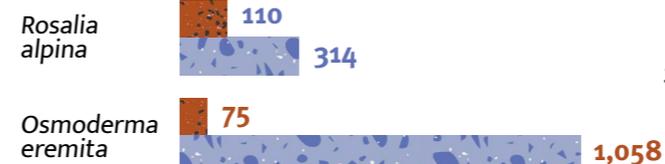
Actions and results

Osmoderma eremita and *Rosalia alpina*

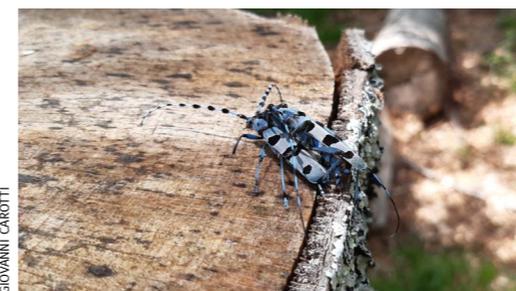
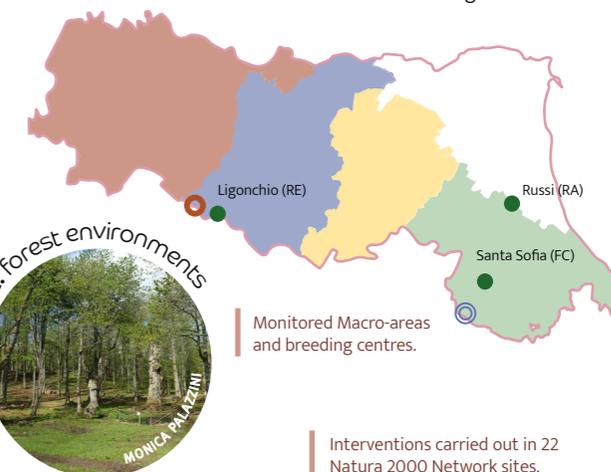
Distribution and monitoring

The project envisaged two monitoring campaigns: i) *ex ante* (2016-2017) aimed at knowing the distribution of *Osmoderma eremita* and *Rosalia alpina*, the areas and trees suitable for hosting the species, and ii) *ex post* (2020-2021) to assess the effectiveness of the conservation interventions carried out and evaluate the trend of the populations over time.

Number of detected specimens of *O. eremita* and *R. alpina*. For *O. eremita*, also the specimens in the WMBs were surveyed in the *ex-post* monitoring.



- Western Emilia Macro-area
- Central Emilia Macro-area
- Eastern Emilia Macro-area
- Romagna Macro-area
- National Park of Tuscan-Emilian Apennines
- National Park of Casentinesi Forests, Mount Falterona and Campigna
- Breeding centres



GIOVANNI CAROTTI

Conservation of the species: breeding and WMB

The conservation strategies of *O. eremita* envisaged a specific *ex-situ* breeding programme and the release of individuals obtained from specimens of local origin inside the Wooden Mould Boxes (WMB).

Interventions on habitats: chestnut and beech forests

In order to increase the availability of habitats for *R. alpina* in 8 Natura 2000 sites, interventions of ring-barking and controlled felling were carried out in suitable beech woods, for the creation of two types of deadwood: standing dead trees, dead trees lying on the ground or leaning, stacks and tripods.

In the chestnut forests, the interventions for the conservation of *O. eremita* consisted in the thinning of the plants around the habitat trees, in their pruning to foster insolation, and creating new hollows.

Interventions carried out in 22 Natura 2000 Network sites.

2,884 larvae bred and released in WMBs and in natural tree hollows

678 adults bred and released in WMBs and in natural tree hollows

1,001 carried out interventions

941 carried out interventions

150 installed WMBs



Coenagrion castellani

Distribution and monitoring

In order to assess the interventions for habitat restoration interventions and the possible translocation of *Coenagrion castellani*, a preliminary monitoring campaign was carried out, which highlighted an extremely reduced distribution of the species in Emilia-Romagna compared to the past, limited to 2 Natura 2000 sites. At the same time, a survey was also carried out to identify the watercourses potentially suitable for hosting *C. castellani*, which was followed by the definition of a conservation programme for the expansion and reinforcement of extant populations.



In 2021:

2,028
recorded adults

9
water courses

Habitat: aquatic environments



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- Romagna Macro-area
- Site of Natura 2000 Network IT4070011 "Vena del Gesso Romagnola"
- Site of Natura 2000 Network IT4090002 "Torriana, Montebello, Fiume Marecchia"



Sites identified in the Romagna Macro-area for habitat restoration actions, translocation of *C. castellani* and final monitoring.

Conservation of the species: translocation

For the protection of *C. castellani*, the undertaken actions were the recovery of small streams considered suitable for the development of the species, mainly through the control of riparian vegetation casting excessive shade on the water, and the subsequent translocation of the species by taking individuals from a source population with abundant occurrence. The translocation of the dragonfly in the chosen watercourses of the Romagna Macro-area took place only after the conservation interventions were completed.

550
translocated specimens

5
water courses

Graphoderus bilineatus

Distribution and monitoring

Before the Life Eremita, the reports on the distribution of *Graphoderus bilineatus* were somewhat old and incomplete. For this reason, an intense monitoring campaign was carried out in the early stages of the project in order to find out the real occurrence of the species in the region and define subsequent actions. The survey outlined a rather worrisome picture.



GIOVANNI CAROTTI



124
monitored basins

only 1
basin with the species' occurrence in the Modenese Apennines area



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Conservation of the species: restocking, what an exciting story!

The small number of individuals sampled in the regional site made it impossible to carry out the collection of the founders for the ex-situ breeding initially contemplated by the project, and forced the team to identify an alternative strategy, which envisaged the possibility of taking specimens from non-Italian populations compatible with those of the Modena site, at ecological and genetic level.

In order to find the source populations abroad, **networking** resulted in a collaboration with colleagues in Latvia, unfortunately hampered by the COVID-19 health emergency, which again forced the Life Eremita team to review plans and insist on investigations in the Italian territory. Fortunately, in 2020 the presence of *G. bilineatus* was detected in a Lombardy site, which provided a sufficient number of specimens for the restocking of a site in the north-eastern Apennines of Emilia-Romagna. The same year, the Latvian research group captured and sent a stock of specimens to Italy, which were subsequently released in two other small lakes in the north-western Apennines.

+ 15
research groups in Europe

132
released specimens

78 ♂
males

54 ♀
females

Networking

During the six and a half years of the project, the collaborations with other players in Life projects - similar in terms of themes, methodologies, objectives, and categories of stakeholders - were intense and went beyond national borders, reaching many European countries and confirming the value of the networking actions. The sharing and exchange of information, experiences and good practices provided ideas and support to the choices made, and in general contributed positively to the achievement of the objectives. In fact, **networking** developed through the participation of representatives of the various projects in discussion forums, thematic and training workshops, information and awareness-raising campaigns, and through the participation of technicians from the Life Eremita team in similar initiatives organized in other Italian and European contexts. The areas of cooperation included those concerning operational techniques and protocols; practices used to monitor the target species and their *in-situ* and *ex-situ* breeding; the methods used to reduce the negative effects of traditional forest management for the sole purpose of production, and the management of broadleaf woods compatible with the conservation of the target species. The networking action also made it possible to maximize the effectiveness of the dissemination of results. One of the experiences worth mentioning for its highlighting the importance of the network is the restocking of *Graphoderus bilineatus* which saw the participation of technicians and entomologists from other Life projects and foreign research institutions.



EMILIA-ROMAGNA REGIONAL ARCHIVE



Life Eremita established relationships with the projects **RigKilde Life** and **Life Raised bogs** (Denmark), **SemiAquaticLife** (Denmark, Germany and Scotland), **Life MIPP**, **Life GoProFor**, **Life WetFlyAmphibia**, **Life 360 ESC**, **Life Carabus** (Italy), **Life Osmoderma** (Lithuania), **BEETLES Life** (Portugal), **Life Rosalia** (Romania), **EcoCo Life** (Scotland), **Life Slovenija** and **Life LiveDrava** (Slovenia), **Life Bridging the GAP** (Sweden), **Life4Oak Forests** (Hungary and Italy).



Communication, dissemination and environmental education

An essential feature of Life projects is the attention paid to the elements of communication and dissemination and, in particular, the priority assigned to actions for the dissemination of pursued objectives, applied methodologies and attained results.

The main cultural challenge of the Life Eremita project was to transform the negative prejudice about insects into a new awareness. With this in mind, communication actions were developed targeting both an audience with technical-scientific interests and a wider audience of people simply curious and passionate about nature. The priority targets were in fact: schools, local authorities with specific competences in the area of “conservation of the natural heritage”, businesses and trade associations in the agricultural sector, environmental associations, and the general population.

Once the features of the main communication tools (logo, website, FB page etc.) had been defined, numerous educational, training and awareness-raising courses were designed from 2016 to date; workshops, technical-information meetings and events were organized, also making use of the Pala-Eremita. In order to support dissemination and educational activities, specific materials were designed, including editorial products, educational kits, brochures, posters, gadgets, information panels and videos.

Pala-Eremita and schools

Pala-Eremita is an inflatable structure shaped like an igloo, with a large dome, equipped with multiple entrances and capable of accommodating up to 100 people, dedicated to hosting project dissemination events. It was set up in many city squares and urban parks in Emilia-Romagna Region, in a long tour entailing **almost fifty events** from 2017 to 2021. With its colourful and fun-looking structure, it attracted the attention of many onlookers, inviting them to enter under the canopy of an imaginary forest to meet the target species of the project. The Life Eremita project was also brought to the schools, with visits involving **over 300 school groups** across the region, and offering children and teenagers an unprecedented path of environmental education.

The Life Eremita educational project was included in the curriculum of each individual class, promoting meetings, laboratory activities and field trips, with the aim of raising students' awareness of the importance of biodiversity.



EMILIA-ROMAGNA REGIONAL ARCHIVE



ARCHIVE OF THE NATIONAL PARK OF TUSCAN-EMILIAN APENNINES

Volunteers

The Life Eremita project promoted the direct involvement of volunteers, who were adequately informed and trained, and actively participated in the implementation of the project actions and will be able, in the future, to contribute to the continuation of the conservation policies, and offer their support as opinion leaders in the local communities. In particular, the volunteers supported the technical team in the activities of monitoring, active conservation, breeding, dissemination, awareness-raising and updating of the database.

The project saw the participation of amateur entomologists, university students, Voluntary Ecological Guards (GEV in Italian), environmentalists, nature enthusiasts, photographers and ordinary citizens residing in the project areas. **More than 130 volunteers** were then able to come closer to a world that is usually little known, and live an interesting experience, with the merit and satisfaction of having contributed to the implementation of a European biodiversity conservation project. The experience of Life Eremita has, in fact, confirmed that volunteering is a precious resource for the implementation of large and complex projects, as well as a fundamental instrument to convey the value of nature conservation to local communities.



ANDREA BONAVITA

Citizen Science: i – Rosalia

The term *Citizen Science* refers to the area of scientific research activities in which citizens and amateurs voluntarily participate in data collection and analysis, in the development of technologies, the verification of natural phenomena and the dissemination of scientific knowledge, actively contributing to scientific development.

In order to facilitate the achievement of the project objectives, Life Eremita launched a *Citizen Science* campaign, called “i-Rosalia”: the project was established in 2021 through an agreement between Emilia-Romagna Region and the creators of the InNat project, with the active participation of the beneficiaries of the Life Eremita project. The campaign coordinators were the Delta Institute of Applied Ecology (on behalf of Emilia-Romagna Region) and the Management Authority for Parks and Biodiversity of Western Emilia.

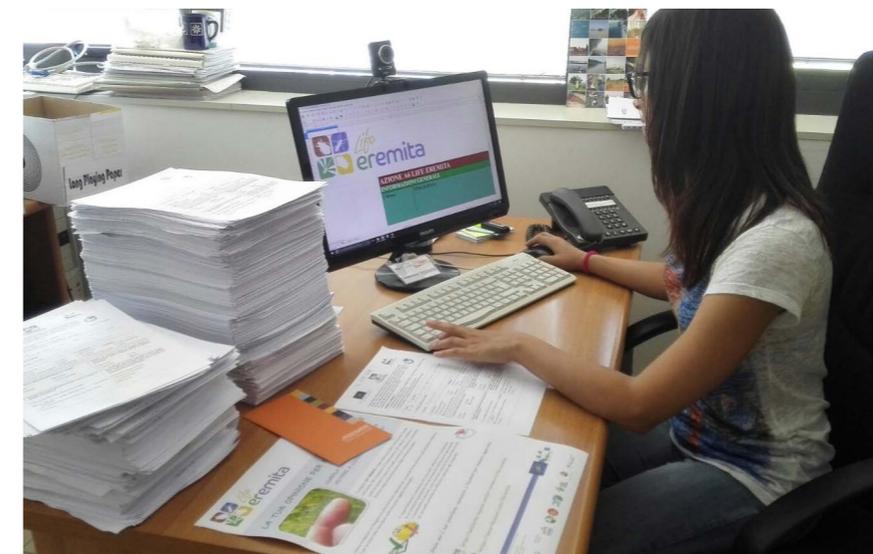
The initiative, which will not stop with the end of the Life project, aims to extend the monitoring of *Rosalia alpina* in the territory of Emilia-Romagna Region: using the InNat platform, citizens can provide reports to be added to the data already recorded by entomologists in the project database. The i-Rosalia campaign was disseminated through the web and social media channels of the project, and several online meetings, reaching **around 80 participants**.

Socio-economic impact

The threats to the 4 target species are mostly linked to traditional human activities regarding forest management, spring water abstraction, and “cleaning” of small watercourse, all factors impacting on the local socio-economic fabric, either directly or indirectly.

In order to acquire relevant data for the assessment of the socio-economic impact of the project activities, an *ex-ante* survey was carried out in the first year of the project (2016) gauging the basic level of understanding and awareness, while in the last year of the project (2021-2022) the same survey was performed in order to measure the impact of the project actions in the territory, its effects in economic terms and on public opinion.

The *ex-ante* paper questionnaire was distributed to 25 schools in Emilia-Romagna Region, while the *ex-post* questionnaire, distributed online due to COVID-19 restrictions, was administered not only to the 25 schools but also through the social media channels of the projects. The reached target was composed of local administrators, security personnel, environmental associations, students and farmers for the *ex-ante* questionnaire; these were joined by teachers, cultural operators, factory workers, clerks, professionals, researchers, retirees, homemakers, sales clerks, unemployed people, healthcare operators, and law enforcement personnel for the *ex-post* questionnaire.



EMILIA-ROMAGNA REGIONAL ARCHIVE

Results of the *ex-post* survey compared to *ex-ante* data

More than **350** completed questionnaires

- ↑ knowledge of Natura 2000 Network and the LIFE funding instrument
- ↑ awareness of the link between the reduction of saproxylic insects and timber removal
- ↑ willingness to invest for the conservation of Nature, not delegating it exclusively to public Authorities
- ↑ attention to environmental protection issues
- ↑ demand for environmental education activities tailored to adult targets

The understanding of the real cost of forest management or maintenance of watercourses has remained unchanged and is still quite low.

Future outlook and strategy

The conclusion of a Life Natura project never represents the ending of the implemented actions, but it is usually the time when the most substantial investment phase comes to an end, while their effects will then be measured in the medium and long term.

Thanks to the joint commitment of all partners, the protection action in favour of the four insects will continue after the formal closure of Life Eremita, according to the indications contained in the **After-Life Conservation Plan (After-Life)**, a plan that establishes how the actions started in the project will continue to be developed in the following years. The *After-Life* of Eremita has two main objectives: the maintenance and assessment of the effectiveness of the implemented actions for the restoration and increase of suitable habitats, and the on-going reinforcement of the populations

of the target species. In addition to the developed good practices, the specific conservation measures approved by the Region, which will become the reference standard for the protection of the target species in thirty-seven Natura 2000 sites in Emilia-Romagna, will contribute above all to strengthen the *After-Life* activities. The body of knowledge of the project, acquired during the monitoring actions focussing on detecting the distribution range of the target species in the Region, and in general, the results of the project have all helped to outline a clear picture of the conservation status of the four insects and the priority conservation measures to be included in the multi-annual strategic planning PAF (*Prioritized Action Framework*) document for the Natura 2000 Network in Emilia-Romagna Region which outlines the actions that can be financed with the structural funds in the programming period 2021-2027.



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Printing

Casma Tipolito – Bologna

On the cover: *Coenagrion castellani*, photo by Roberto Sindaco





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