



LIFE III



LIFE and endangered plants

Conserving Europe's threatened flora



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LIFE ("The Financial Instrument for the Environment") is a programme launched by the European Commission and coordinated by the Environment Directorate-General (LIFE Unit - E.4).

The contents of the publication "LIFE and endangered plants: Conserving Europe's threatened flora" do not necessarily reflect the opinions of the institutions of the European Union.

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Luxembourg: Office for Official Publications of the European Communities, 2007

ISBN 978-92-79-08815-5

ISSN 1725-5619

doi: 10.2779/99297

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Printed in Belgium



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Plant micro-reserves: from concept to implementation

A plant micro-reserve (PMR) is a small plot of land (up to 20 ha – there is no minimum size) that is of peak value in terms of plant richness endemism or rarity. The PMR is a permanent, statutory reserve given over to long-term monitoring of plant species and vegetation types. As well as providing strong protection to plants and substrate, traditional activities compatible with plant conservation are allowed within the micro-reserve.

Europe's first plant micro-reserves were set up in 1994 by the Regional Wildlife Service of the Generalitat Valenciana, the autonomous government of the Valencia region, with the support of the LIFE programme.

Plant micro-reserves allow a close monitoring of target species by trained staff and the development of conservation actions tailored to their needs across a whole territory. Since a PMR can be proclaimed for a single target species, it can pinpoint isolated areas of high botanical value. The aim is to provide a small-scale and flexible approach to plant conservation and to act as a complement to large Natural Protected Areas.

The final aim of PMRs is not protection itself but inventory and monitoring of plant diversity.

The success of each PMR is measured by the rate of incorporation of three indicators: priority habitats, endemic taxa and threatened taxa.

Valencia pioneers the PMR

The Valencia region has a great diversity of plant species. Twelve of its 355 endemic plant species are included in Annexes II and IV of the Habitats Directive; and 150 species are considered rare or threatened. Much of this

flora appears in micro-populations fragmented throughout the whole region. These areas of high botanic value also include 33 habitats listed in Annexe I of the Habitats Directive, of which 15 are priority habitats.

Many of these plants and habitats are threatened by urban development and changes in land use, particularly on Valencia's coastal fringe and in its wetlands.

Valencia was therefore an ideal location for Europe's first network of PMRs, a project included in the UNESCO-MAB Programme in 1991 because of its scientific importance.

LIFE-Nature supported a two-phase project to create a network of flora micro-reserves in Valencia. The first phase (LIFE93 NAT/E/011100) ran

A PMR in Muntanya Cavall, Valencia

Photo: E. Laguna





Endangered plants in general

from 1994-96 and the second phase (LIFE95 NAT/E/00856) started in January 1997, ending in December 1999. The aim of the projects was to set up a network of some 100 small botanical reserves (with an average size of two hectares) that would be representative of the main endemic plant communities found in Valencia. In addition, a further 1,000 ha of land of prime botanical interest would be purchased for long-term research and monitoring in plant ecology.

Exceeding the objectives

The project surpassed expectation, succeeding in establishing a total of 158 micro-reserves, covering 286 ha. A total of 77 of these PMRs were granted a formal declaration of legal protection for both the plants and the physical habitat by Valencia's Regional Environment Minister.

The project was also able to draw up propagation protocols for 20 endangered native species and recovery plans were put in place for a number of species – *Limonium dufourii*,

Chaenorhinum tenellum, *Petrocoptis pardoii* and *Silene diclinis*. Conservation programmes were established for the genus *Biscutella*, terrestrial and aquatic cryptograms, the labiate genus *Teucrium* (germanders), *Satureja* (savo-ries), *Linaria* (toadflax), *Chaenorhinum* and *Sideritis* (ironwort).

Species conservation involved both *in situ* and *ex situ* measures. The former included land purchase agreements and habitat management plans, the latter included implementation of a seed bank, 'in vitro' propagation of species and cultivation of plants in greenhouses.

Expanding the network

The Valencia micro-reserve network has expanded significantly following the conclusion of the LIFE project in 1999. As of 2005, it consists of 247 plots, with a total surface area of 1,684 ha (the densest network of protected sites for plant conservation in the world). Some 80% of the micro-reserves are on public land, with the remainder owned by private individuals, NGOs or municipal authorities. For the Generalitat Valenciana, these private micro-reserves play an important dual role – on the one hand getting individuals directly involved in plant conservation, and on the other ena-

bling sites of high botanical interest to be incorporated into the network that would otherwise remain outside it. Private landowners are compensated for transferring management rights to the regional authority and are also eligible for grants and subsidies to maintain the PMR.

Two further LIFE-Nature projects in Valencia have complemented the network of flora micro-reserves established by the original project. "Conservation of priority habitats in the Valencian community" (LIFE99 NAT/E/006417) ran from July 1999 to the end of 2003 with the principal objective of conserving the vegetation in 17 priority habitats in the 38 sites proposed for inclusion in the Natura 2000 network; "Management and increasing appreciation of three high mountain priority habitats in Valencia" (LIFE03 NAT/E/0064) ran from 2004-2006 with the goal of improving the conservation status of three priority habitats: endemic black pine forests, endemic juniper forests and yew woods.

The mountain habitats project aimed to stop the widespread decline of yew and juniper woods through measures such as eradicating invasive species, preserving monumental trees

The PMR projects also involved ex-situ conservation actions – In-vitro reproduction of yew (left), *Silene hifacensis* seedlings in a nursery (centre) and *Helianthemum caput-felis* (right)

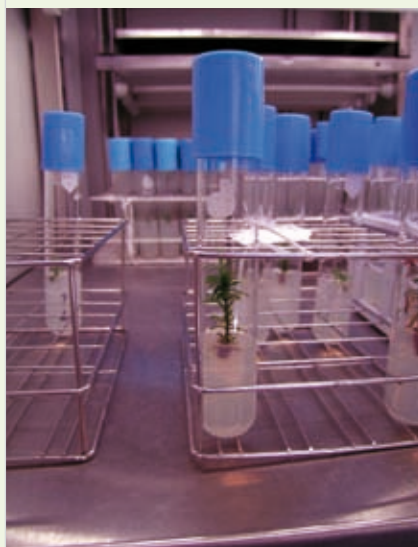




Photo: E.Laguna

Monitoring of plant species populations is vital for assessing their conservation status

and encouraging economic activities linked to the natural habitats and their conservation.

Some 21,000 seedlings of 23 species were planted to improve the conservation state of the habitats and encourage their natural regeneration. Demographic analysis of yew tree populations revealed that there are 6,451 specimens within the five sites where works were carried out during

the project – a sevenfold increase in the number of trees compared with previous data for the whole of Valencia.

The Botanical Garden of the University of Valencia collected 195 lots of seeds of the most characteristic plants of high mountain habitats for storage in a germplasm bank.

Invasive species such as *Robinia pseudoacacia* that threatened to colonise one



Photos: E.Laguna

of the best yew formations of the Alicante province were successfully eradicated. In the Pegunta ravine, specimens of the non-native poplar *Populus nigra x Canadensis* were felled and the trunks turned into drinking troughs. These troughs were one of the methods used to attract potential animal dispersers of seeds (along with the planting of fruit-bearing plant species and the installation of ecological beehives) with the aim of improving the low propagation rate of the targeted tree species.

Nurseries were established for the cultivation of endemic aromatic plants and 2,500 examples of each of six aromatic plant species native to the project habitats were given away free to visitors and local inhabitants.

Information panels describing the flora and habitats on view were added to eight mountain trails with the aim both of promoting knowledge of the natural environment and of attracting visitors to the area, one of a number of dissemination activities carried out during the project.

Exporting the concept

Planta Europa, the network of independent organisations, non-governmental and governmental, working together to conserve European wild plants and fungi, adopted the initial LIFE micro-reserves project in Valencia as a pilot scheme to evaluate the possible creation of a pan-European micro-reserves network. Steps have now been taken towards establishing such a network.

The LIFE project “Conservation of areas with threatened plant species in Minorca (Spain)” (LIFE00 NAT/E/007355) ran from 2001-4. In it, the government of Minorca (*Consell Insular*) developed a set of comprehensive actions to recover the plant species and priority habitats protected by the Habitats Directive, including the drafting of a network of 24 plant micro-



Photo: E.Laguna

Silene hifacensis: a priority Annex II plant species included in the Valencian PMR projects

reserves. The Minorcan government and regional government (*Govern Balear*) are now working on implementing this network of PMRs.

Slovenia was the first country outside Spain to go down the micro-reserve path. In the LIFE-Nature project “Conservation of endangered species/habitats in the future Karst Park (Slovenia)” (LIFE02 NAT/SLO/008587) that ran from 2002-5, the Science and Research Centre (ZRS) at the University of Primorska in the port city of Koper set up a network of 30 micro-reserves for rare and endangered wild plants, as well as for priority habitats protected by the Habitats Directive, mainly focused on small ponds, calcareous screes, rocky slopes and grasslands. All the sites are within the boundaries of the Karst Edge, to be included in the future Regional Park of the Slovenian Karst.

Since 2004, LIFE has been supporting the “CRETAPLANT” project (“A pilot network of plant micro-reserves in Western Crete (Greece)” – LIFE04 NAT/GR/000104). Developed by the (Mediterranean Agronomic Institute of Chania (MAICh) and the National and Kapodistrian University of Athens (NKUA), its aim is to adapt the PMR concept to the province of Chania in Western Crete. As the feature article on the following pages shows, results have been impressive.

