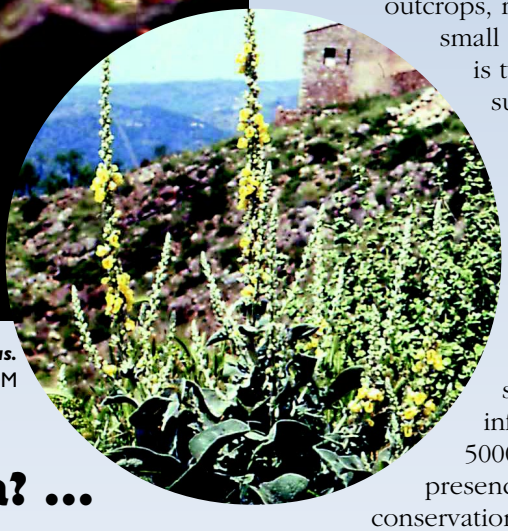

Volutaria lippi. INSET *Verbascum thapsus.*
Photos from the Flora of Valencia CD ROM

Plant conservation: the dawning of a new era? ...

'Pansies, lilies, kingcups, daisies, let them live upon their praises…. (William Wordsworth). **Flowers and plants have inspired artists, poets and musicians throughout the centuries. But when it comes to conservation, it seems the only role they can play without impunity is that of Cinderella. Neglected and almost forgotten, plants have been out of the limelight for too long now. But, if the handful of floristic projects funded under LIFE-Nature is anything to go by, things may finally be changing.**

With almost half of the threatened plant species listed in annex II of the Habitats Directive restricted to the Mediterranean region, it won't come as any surprise to learn that most of these projects are located in the Southern part of Europe. And that they have many features in common (see box). But one in particular – involving the establishment of a network of floristic micro-reserves in Valencia, Spain – stands out as a possible model for the future.

Arguably one of the richest botanical regions in Europe, Valencia harbours over 3000 flowering plants and ferns, of which 60 are endemic to the area. But, as elsewhere, their survival is heavily threatened by a combination of factors. These range from a booming tourist industry, which not only 'eats up' land but also consumes precious water supplies, to dramatic and sudden shifts in agricultural practices – causing an abandonment of extensive agro-pastoral practices in favour of more intensive cultures, such as citrus and rice. Swift action was therefore needed to rescue several plants from the brink of extinction, including 13 species listed on Annex II of the Habitats Directive.

Good preparation is the key ...

An inventory, undertaken prior to the start of the LIFE-Nature project, identified over 150 sites harbouring threatened and endemic plants in need of urgent attention. It also revealed that most were less than 2ha in size and confined to rocky outcrops, ravines, cliff tops, small pools etc…. This is typical of many such species in Europe, which are found, not in climax situations, but rather in marginal unstable biotopes strongly influenced by over 5000 years of human presence. The conservation objective of the project was thus to protect "marginal flora" under prevailing conditions of relative instability.

Legislation provides the necessary framework

This was to be done first and foremost through a system of micro reserves, and complemented by actions, such as land purchase, in core areas of prime botanical interest. Thus, in 1994, just after the start of the LIFE-Nature project, a law was passed establishing the micro-reserve as a new legal identity under Valencian law. This concept was considered much more pragmatic and adaptable to the particular needs of plants than the classic solution of nature

COMMON CHARACTERISTICS OF LIFE-NATURE PLANT PROJECTS

- *Target several plant species at once;*
- *Focus on restricted populations (point endemism), often consisting of a few individuals;*
- *Take place in small project areas – often consisting of clusters of protected sites;*
- *Combine ex situ and in situ conservation measures to enhance populations;*
- *Gather additional scientific data needed to prepare recovery plans;*
- *Put heavy emphasis on public awareness to boost the low profile of plant species.*

reserves or individual recovery plans (see box).

Thereafter, additional decrees were adopted to allocate funds for compensation and on-site actions within these reserves. Also, to help speed up the process of designation each site had to have a management plan, which was agreed upon by the stakeholders and the scientists. Given the wide array of species, land use prescriptions varied considerably: preventing further expansion of arable land inside micro-reserves, forbidding the use of fertilisers, re-routing paths to prevent trampling, reducing grazing pressure, etc..

Winning around local landowners

Because so many endangered plant species grow on privately owned land, the Valencian authorities focussed particular attention on persuading private landowners to join this new scheme. This meant not only negotiating for a part of their land to be dedicated on a voluntary basis to 'nature' but also encouraging them to undertake some of the on-site conservation actions themselves, with funding from LIFE. The intention was to make the land-owners feel they were an integral part of the programme – a sort of "protagonist for nature conservation".

This strategy appears to have worked well, for although the regional government provided financial compensation to the owners, it seems that the pride associated with "owning" a micro-reserve and contributing to the conservation of endangered species was viewed as a greater reward. The project has therefore clearly succeeded in creating much goodwill for conservation measures amongst local land–owners. This will hopefully help the process of acceptance of the Natura 2000 Network in the rural areas.

Complementing the micro-reserves with other essential measures

In view of the rarity of some species and the low population numbers, the project also promoted a well-balanced mix of *in situ* (field) and *ex situ* (laboratory) measures. As a typical *in situ* measure, seed would be collected in a micro-reserve and sown in small plots to test the most appropriate germination procedure and to enhance the populations in their natural environment. However, some plants are such poor seed producers that they need a little *ex situ* help. With the support of the Instituto Valenciano de Investigationes Agrarias (IVIA), a research institute specialised in citrus culture, several threatened species were multiplied *in vitro* before being re-introduced to the wild.

This procedure led to the outstanding recovery of *Cistus heterophyllus* subsp *carthaginensis*. In 1990, only one specimen was left in the wild but by 1998 the plants had produced enough seed *in vitro* to be re-introduced to the areas where it originally occurred. Now the population is strong enough to produce its own seed in its natural environment.

Giving plants 'a hard sell'

The final cornerstone of the project was a well-focused information campaign to raise the otherwise low profile of plant conservation and to encourage a continuous transfer of plant information from the conservation scientist to the site managers or the public at large. To this end a whole panoply of well designed brochures, posters, videos and CD Roms were produced and every opportunity was used to promote the objectives of the project, both regionally and internationally.

Other innovative measures included the construction of a rock garden in the Botanical Garden of Valencia, which has since become a showcase for the region's flora, attracting over 100,000 visitors a year. Half of these are school children who are brought here to learn how the geography of the western Mediterranean Basin contributed to the floristic diversity of the region.

WHAT IS A MICRO-RESERVE?

- *Generally 1–2 ha in size (always smaller than 20 ha) with a concentration of rare, threatened or endemic species.*
- *The designation of a micro-reserve is entirely voluntary but irreversible; the land owner may keep the land title, but must accept a management plan to protect the target species.*
- *Its designation does not include all the other restrictions which are automatically imposed by a statute of "nature reserve" this makes it easier to establish.*
- *The goal is over 250 micro-reserves.*
- *Until now, the micro-reserves network concerned flowering plants, but in the future it will be extended to include marine areas as well as micro-reserves for mosses, lichens and mushrooms.*

Photo: G. Raeymaekers, Ecosystems LTD

ON SITE continued

Where to go from here

By the end of this LIFE project 156 micro-reserves had been surveyed and designated and a further 80 were pre-selected for inclusion in the micro-reserve network. Consequently, about 60% of the endemic flora of Valencia is now protected, via some 750 ha of micro-reserves. In terms of SCI designation, 50% were proposed by the end of the project; and the Government has committed itself to proposing the remainder by the Autumn. Interestingly, over 80% of the Annex I habitat types present in Valencia also occur in these reserves, prompting a further LIFE-Nature project to protect 17 priority habitat types in 38 proposed pSCIs in Valencia.

Other more substantial Community funds are also being successfully tapped into. The micro-reserves around Sinarcas are being integrated in a rural tourism development plan co-financed by the EU structural funds and a FEOGA project has recently been set up to further protect Valencia's botanical diversity in agricultural areas.

But perhaps, at the end of the day, it will be the demonstration role of this project that will stand out most, not only for having used imaginative means to raise the profile of plant conservation but also for proposing pragmatic solutions. At a recent Planta Europa Conference, for instance, it was decided to explore the possibility, of creating a pan-European network of micro-reserves for plants, on the basis of the experiences of the LIFE-Nature project in Valencia.

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School children in the Valencia Botanical Gardens. Photo: E. Laguna

website:
http://www.gva.es/coma/
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esp_prin.htm

OTHER LIFE-NATURE PROJECTS TO PROTECT THREATENED PLANT SPECIES*

1994 Conservation of natural habitats and plant species in Corsica (France)
Restoration, conservation and management of threatened flora in Andalucia (Spain)

1996 Protection of *Jurinea cyanoides* in steppic grasslands near Volkach (Germany)
Conservation of 13 endangered plant species in Aragón (Spain)

1997 Conservation of threatened flora of the Canary Islands (Spain)

1998 *Asphodelus bento-rainhae*: conservation and management measures (Portugal)
Conservation of rare fern and salamander species in Valongo (Portugal)
Recovery of areas with threatened flora in the Sierra Nevada (Spain)

1999 Protection of priority plant species on the Aeolian islands (Italy)
Conservation of Madeira's priority and rare plant species (Portugal)
The protection of *Narcissus angustifolius* in the Dumbrava Vadului reserve (Romania)

* More information on these projects can be found of DG Env's website – the address is given on the last page