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CONSERVATION OF ENDANGERED PLANTS AND HABITATS:
THE EXPERIENCE OF THE VALENCIAN COMMUNITY

SUMMARY

The Valencian Region, placed in eastern Spain, is home to approximately 3,050 vascular plant species, 64 of which are listed under critically endangered IUCN category. To afford protection to the endangered, rare and endemic flora, a network of small (2-20 ha) statutory reserves has been created by the Regional Wildlife Service. These are termed *microreserves* and encompass a large number of individual species and natural habitats. The objective is to monitor long term changes in the plant populations and to carry out active management of the protected plants.

RIASSUNTO

Conservazione di piante ed habitat minacciati: l'esperienza della Comunità Valenciana. La Regione di Valencia, nella Spagna orientale, ospita approssimativamente 3.050 specie di piante vascolari, 64 delle quali sono considerate "gravemente minacciate" secondo le categorie IUCN. Per garantire protezione alla flora minacciata, rara ed endemica, il Servizio Regionale per il patrimonio naturale ha creato una rete di piccole riserve (2-20 ha) legalmente riconosciute. Queste sono state denominate "microriserve" e contengono un vasto numero di specie ed habitat naturali. L'obiettivo è di monitorare i cambiamenti a lungo termine nelle popolazioni vegetali e di condurre una gestione attiva delle piante protette.

The Mediterranean basin, particularly the Valencian Region which occupies the central part of the Spanish Mediterranean coast, is considered an outstanding hotspot of plant diversity of Western Europe. Within an area of 23,260 km² it shelters ca. 3,050 vascular plant species, 64 of which can be considered strictly endemic and 68 shared with neighbouring territories

(AGUILELLA *et al.*, 2009), and also a high number of relict plant species which are representative of ancient climate conditions (LAGUNA *et al.*, 1998). However, the floristic heritage of the Valencian region is at risk. In addition to a long history of human intervention, the territory is currently subject to severe pressure from agriculture or neglected crops which causes erosive problems, overgrazing and trampling, forest fires, building construction and tourism (ROSSELLÓ, 1995). According to IUCN criteria (IUCN, 2001), 172 species are listed as endangered species (EN) and 64 as critically endangered (CR) at regional level. Most of these species are scattered across the territory and occupy micro-habitats. Despite the national and international laws addressed to protect flora, the outcome is that only 39% of the taxa listed under IUCN CR category are protected (LAGUNA *et al.*, 2004). Moreover, as in other regions of the Iberian Peninsula or other countries (CASTRO *et al.*, 1996; NANTTEL *et al.*, 1998), the existing regional network of Natural Protected Areas fails to secure the bulk of the provincially rare, endemic or endangered plants.

To answer the needs of protection of these species, the Regional Wildlife Service put forward a proposal to create a network of statutory protected areas which had encompassed the maximum number of individual species and natural habitats. These areas were termed Plant Microreserves.

Plant Microreserves are small land plots (up to 20 ha) of peak value in terms of plant species richness, endemism or rarity, given over to long term monitoring and conservation of plant species and vegetation types. This new protection feature was created by the Regional Wildlife Service by means of a Decree (ANONYMOUS, 1994). The legal frame confers Plant Microreserves a permanent status and provides strong protection to plants and substrates while allowing traditional activities compatible with plant conservation such as hunting, low intensity grazing or educational activities.

Plant Microreserves represent a network of plots mainly located in public land, although they can also be established on private grounds by means of contracts with landowners both physical or legal persons. These contracts cater for the need to provide incentives for those who wish to manage their properties to conserve plant species, so that they are not deterred for the cost of doing so (RUECKER & WITTMAN, 1995; WILCOVE & CHEN, 1998). Private microreserves permit a twofold objective: on the one hand, they allow the incorporation to the network of outstanding botanical sites and, on the other hand, they involve society in plant conservation.

Plant Microreserves are not considered Natural Protected Areas, but permanent plots for plant conservation in which protection of the substrate is a means to achieve this goal. In contrast with classical large protected areas, they not need to await for laborious management plans, so that a proclama-

tion decree can simultaneously approve the boundaries of the protected area and the management plan.

Once declared, active management of vegetation plots and protected plant populations is carried out such as census of endangered species, seed collection and storage in seed banks, population reinforcements and introductions, herbivore exclusion, scrub clearance, restoration of suitable environmental conditions, population monitoring, eradication of alien invasive species or educational activities. Thus, Plant Microreserves are designed to conserve vegetation and to develop or test active conservation methods that bring together *in situ* and *ex situ* actions.

The selection procedure for Plant Microreserves setting requires continuous field work to identify plant rich sites that must be preserved. Information of the taxonomic status, chorology, ecology, population censuses and threats to survival of rare, endangered and endemic taxa in the Valencian region is continuously gathered. Fieldwork is carried out to map those species whose distribution data is vague or which show the most restricted distributions. Additionally, their biotopes are characterized, the specific threats assessed and the assigned IUCN red data book categories to each taxon are revised and updated. The Plant Microreserves network is opened to new incorporations and new Microreserves are proclaimed almost every year. Distribution records of the rare, endangered and endemic species are digitized into geographic information systems. Thus the pattern of endemic species richness is examined and searched for hotspots. This pattern is collated with polygonal data themes (vegetation types, land ownership and Natural Protected Areas) which provide additional information for the design of the Plant Microreserves network. Whenever land is available around the targeted plant populations or vegetation types, Plant Microreserves are made as large as possible (20 ha) although the average size of them – 56% of the sites – is approximately 5 ha (AGUILELLA *et al.*, 2009). Ownership and the presence of human infrastructure often condition their size. Once the Microreserves are designed, a draft of the official document is sent to public enquiry procedures – Universities, NGOs, Public Administrations and owners. Then Plant Microreserves are declared by means of an Order in which a Management Plan with Use Limitations specific for each one is published.

Currently, the network comprises 273 Plant Microreserves – 52 of them are private, and the total protected surface is 1,981 ha. According to data available in 2007, the network includes representation of populations of 1,625 different species, 527 of them are active managed in terms of regular census, seed collection, reinforcement or scientific monitoring (AGUILELLA *et al.*, 2009). The network does not protect only plant species. The best examples of the 18 priority habitats (according to E.U. “Habitats” Directive) present in

Valencia region are protected within the network and 69% of habitats from the same Directive are represented.

Plant Microreserves must not be seen as an alternative to large protected areas, but as a complement. That is the reason why some of them are located within existing Natural Protected Areas. They allow closer monitoring of plant diversity and actions tailored to the needs of particular species or vegetation types. The network exemplifies how small landplots can encompass a large share of the plant richness of a territory of high diversity, where a small scale regional approaches to conservation is inescapable. Plant Microreserves have become an essential tool for the effective protection of the diverse flora of this mediterranean region.

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