



An International Secretariat for the Rescue of Plants — a proposal

Author(s): Jean Yves Lesouëf

Source: *Botanic Gardens Conservation News*, Vol. 3, No. 7 (December 2001), pp. 46-50

Published by: Botanic Garden Conservation International (BGCI)

Stable URL: <https://www.jstor.org/stable/10.2307/24821224>

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at <https://about.jstor.org/terms>



Botanic Garden Conservation International (BGCI) is collaborating with JSTOR to digitize, preserve and extend access to *Botanic Gardens Conservation News*

JSTOR

An International Secretariat for the Rescue of Plants – a proposal

Jean Yves Lesouëf

Curator

Conservatoire Botanique National de Brest

52, allée du Bot, 29200 Brest, France

Tel: +33 (0) 2 98 41 88 95

Fax: +33 (0) 2 98 41 57 21

E-mail: cbn.brest@cbnbrest.com

Abstract

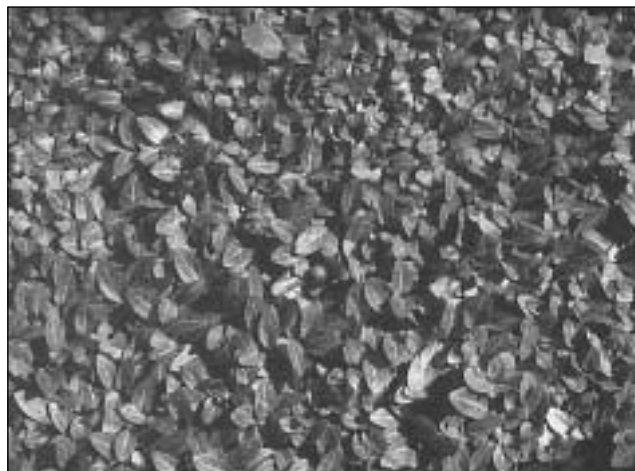
The extinction of a species erases irreversibly thousands or millions of years of evolution. It deprives humanity of all possible future use of this species. Approximately 25% of the known species of flowering plants are threatened and 6% are endangered or extinct. An international effort integrating in situ and ex situ measures could rescue a high proportion of these species. The creation of an International Secretariat for the Rescue of Plants is proposed.

Introduction

The extinction of a species is not reversible. Extinction is forever. The extinction rate of plants seems to have increased, in spite of increasing in situ conservation measures. Extinctions will probably still increase due to large scale destruction of most tropical habitats which are totally destroyed or reduced to isolated remnants. The species in these remnants are less able to exchange genes and are prone to extinction by hazardous events or by inbreeding depression. In the event of global climatic change they will have great difficulties in migrating. Some species which are extinct in the wild may still survive in



Ramosmania heterophylla from Rodrigues, Indian Ocean – the only wild specimen. The species has been rescued by the Royal Botanic Gardens, Kew, U.K. (Photo : J.Y.Lesouëf)



Seedlings of *Lysimachia minoricensis*, a balearic endemic extinct in the wild (Spain) (Photo : F. Le Hir)

cultivation, but their status remains precarious and some of them have also been lost in cultivation. Most species are of immediate use and every species is potentially useful.

The rescue of each species is a matter of urgency.

Long-term conservation of a species requires the conservation of its habitat. Conversely, the extinction of a species can seriously affect its habitat for biological and political reasons. The more endangered a species is, the greater the importance of ex situ conservation efforts. Already a number of species depend on cultivation for their survival.

International coordination is necessary because:

- of the benefits of shared experience;
- endangered or extinct plants are not limited to one country, but shared by several;
- extinct or almost extinct plants are sometimes maintained in cultivation outside their home range;
- most plants present specific problems for their in situ or ex situ management. Technical assistance and transfer of technology may be necessary as plants have specific requirements e.g. parasites, saprophytes, rheophytes, filmy ferns or specific habitats e.g. paramos, waterfalls;



Vicia dennesiana from the Azores. Extinct in the wild and lost in cultivation.

- the problems of reintroduction are not fully mastered;
- the experience obtained in a country can be transferable to another country. The publication of success stories is an encouragement for individuals and organisations in charge of threatened plants;
- a global overview is necessary to appreciate the urgency for each country, region or taxonomic group.

To reduce the number of future extinctions, it is proposed to create an International Secretariat at the Conservatoire Botanique National de Brest (see Box 1) to rescue plants working in close cooperation with organisations such as Botanic Gardens Conservation International (BGCI), the IUCN Species Survival Commission and the UNEP World Conservation Monitoring Centre.

Programme

Selection of the species

The Secretariat will work on vascular plants classified as extinct (EX), extinct in the wild, but surviving in cultivation (EW), critically rare (CR), endangered (EN) and data deficient (DD) by the IUCN. IUCN. (2001). *IUCN Red List Categories and Criteria: Version 3.1*. IUCN Species Survival Commission. The 1997 *IUCN Red List of threatened plants* (Walter & Gillett (eds) 1998) listed 796 extinct and 6,951 endangered plants. Intensive rescue work should be carried out on the three most threatened categories (EX, EW, CR).

Creation of a data base to promote action plans

The data base should integrate the situation in the wild and in cultivation.

- In the wild, all pertinent information should be collected concerning the number, the size and the structure of the populations, biological form, their future, the eventual recovery plans, etc.

- In cultivation, the following information should be stored:
 - Identity of the sites of cultivation and for each site:
 - participation or not to a recovery plan;
 - dependency or not on energy (greenhouse or open air);
 - permanency of the site (prospects);
 - origin of the cultivated material;
 - type of propagation (cloned specimens or genetically viable groups);
 - strategy for propagation of the species (dioecious, monoecious, self sterile, self fertile, apomictic, etc.);
 - number of specimens;
 - seeds, spores, pollen in freezers or lyophilised;
 - tissue bank.

A sample database of the Solanaceae is shown in Box 2.

Many species need only be briefly documented. For example, *Ginkgo biloba* or *Franklinia alatamaha*, which are extremely rare or extinct in the wild do not need an extensive search to verify that they are common in cultivation. It is useful to note the work undertaken for these plants, but it is necessary to concentrate upon the true emergencies.

Precise data concerning details of the distribution in the wild will not be released to the public for security reasons. However, the occurrence of plants in a protected area and their legal protection can be released.

Criteria for selection of species

In the last two years, the Conservatoire at Brest has established for each species a hierarchy of priorities based upon two criteria: IUCN category of threat and frequency in cultivation (see Table 1).



Normania triphylla from Madeira has been rescued in cultivation (Photo: L. Ruellan)



Solanum fernandezianum – relative of the potato from the Juan Fernandez Island – it is known from one locality (Photo: J.L. Autret)

Recovery Plans

A Recovery Plan will include all necessary means in an integrated way (in situ, ex situ, legislation, education etc.). An example using *Zanthoxylum paniculatum* is shown in Box 3.

For ex situ conservation, the Secretariat will propose propagation in one or a few sites and distribution to a number of other gardens for reasonable security. The sites should be diverse in terms of geography, politics, climate and sanitary conditions to insure maximum security.

A Recovery Plan should be suggested to the authorities (e.g. Ministry of Environment) in charge of the species. Contacts should be established between botanic gardens if necessary for the exchange of technology for in situ and ex situ conservation. Guidelines for Recovery Plans have been published by BGCI (Akeroyd & Wyse Jackson, 1995 *A Handbook for Botanic Gardens on Reintroductions of Plants to the Wild*). The publication of success stories in the Database and in *BGCNews* and other media should be a powerful encouragement for people in charge of threatened plants.



Normania nava from the Canary Islands, Spain – possibly extinct (Photo: J. Y. Lesouëf)

Box 1 Conservatoire Botanique National de Brest

In 1975, the Conservatoire was created by the French Ministry of the Environment. It was the first establishment in the world entirely devoted to the conservation of threatened plants. It is sited in a picturesque glen of 23 ha near the sea in an oceanic mild climate. The facilities include greenhouses, a documentation centre, herbarium, laboratory for the treatment of the seeds and an information centre. It is associated with in vitro laboratories. The Conservatoire cultivates about 3,000 taxa of which 1,500 are threatened including 350 extremely threatened from numerous countries. The Conservatoire is responsible for the conservation of the threatened flora in the massif armoricain (north-west France). The partners are the authorities, the land users, the scientists as well as the public.

Box 2 Availability of genetic resources: the example of the Solanaceae Data Base

It is important to maintain all species alive and in condition to continue their evolution. Availability is also important. The BGCI project to prepare a *Worldwide checklist of plants in Cultivation* is creating a very important tool for the users.

The International Secretariat will store information on the minority of species which are endangered or extinct. The database should help to define priorities.

The Solanaceae is a family very rich in medicinal and food plants and includes about 2,800 species. The figures given in the 1997 *IUCN Red List of threatened plants* have to be doubled. So that, about a hundred species are seriously threatened (categories EX, EW, CR, EN), 350 are less threatened, 2,350 not threatened. The Secretariat should work upon the hundred very threatened species. The three most endangered genera (4 spp) are shown in this box (see next page).

These plants are extremely important, both scientifically and practically and the absolute impossibility of creating them makes these plants the most urgent conservation priority for this family. Two genera are extinct (*Mellissia*, *Normania*) in the wild but they have been rescued in cultivation.

The most threatened genera of Solanaceae

1	2	3	4	5	6	7	8
<i>Melissia begoniifolia</i> (Roxb.) Hook. f.	EW	1	A	*BG St Helena 2001 *BG Kew 2001 BG Brest 2001 3 gardens	South Atlantic: St Helena	Monotypic genus considered as extinct since the end of 19th century. It has been rediscovered by S. Stroud in 1998 as 7 shrubs of which 6 dead and 1 in poor state, now dead. Seeds collected have been sown successfully in St Helena and in Kew. The deforestation of the lower slopes has almost eliminated the natural vegetation in the last centuries.	Cronk, 1997
<i>Normania nava</i> (Webb & Berth) Franc.-Ort. & R.N. Lester	EX	0	A	no gardens	Spain: Gran Canaria (EX) Tenerife (EX)	<i>Normania</i> includes 2 species living in the laurel forests. They are opportunistic annual plants. <i>Normania nava</i> seems to be extinct in Gran Canaria since about 1820 and in Tenerife since 1988. The plant could survive especially in Tenerife where seeds are possibly alive in the seed-bank of the soil.	Francisco Ortega <i>et al.</i> , 1993 Acebes Ginoves <i>et al.</i> , 1996
<i>Normania triphylla</i> (Lowe) Lowe	EW	1	A	*BG Brest 2001 *BG Funchal 2000 BG Kew 2001 BG Nijmegen 2000 BG Birmingham 1999 5 gardens	Portugal: Madeira	<i>Normania</i> includes 2 species living in the laurel forests. They are opportunistic annual plants. Rediscovered recently in Madeira after more than a century of apparent extinction. Seeds collected by P. Nobrega from the last known wild specimen have been sent to Brest. The species has been reintroduced in the National Park and distributed in Botanic Gardens. Protected by Bern Convention.	Francisco Ortega <i>et al.</i> , 1993 Nobrega, 1998 (pers. comm.)
<i>Heteranthia decipiens</i> Nees & Martius	EN A1cd B2ab cd	0	A	no gardens	Brazil : Bahia (EN) Rio do Janeiro (EX) Minas Gerais (EX)	This herb or subshrub, with insignificant flowers, is a monotypic genus of the humid oriental forest of Brazil (Mata atlantica). 12 collections are known, mostly from the 19th century. Only 2 collections belong to the 20th century : 1961 & 1967. A large scale deforestation for the cultivation of cacao & coffee was noted by the collectors.	Freire de Carvalho, 1999

(Headings for columns: **1-** Name of the plant, **2-** Category of threat of IUCN with Criteria, **3-** Frequency in cultivation (see Table 1), **4-** Rating of priorities for conservation, **5-** Name of the sites of cultivation if under 6. The establishments in charge of a Recovery Plan (partial or total) are noted * & Number of sites of cultivation, **6-** Distribution, **7-** Comment : Key words are included in the texts to facilitate thematic researches (for example : deforestation, Bern Convention, monotypic), **8-** References (This will refer to the bibliography. References: Acebes Ginoves *et al.* in Gomez Campo *et al.*, 1996 : *Libro Rojo de Especies vegetales amenazadas de las Islas Canarias*. Cronk, 1997 *The endemic flora of St Helena*. Francisco Ortega *et al.*, 1993 : - *Normania*, an endemic Macaronesian genus distinct from *Solanum* (Solanaceae) *Pl. Syst. Evol.* 185: 189-205. Freire de Carvalho, 1999 *Heteranthia decipiens* Nees & Martius (Solanaceae), uma especie rara, exclusiva da flora brasileira *Rodriguesia* 50: (76/77) & 77-83).

Box 3 A recovery plan for *Zanthoxylum paniculatum*

Data base	1	2	3	4	5	6
<i>Zanthoxylum paniculatum</i> Balf. f	CR	1	A	*BG Kew 2001 BG arboretum Saint-Paul 2001 2 gardens	Mauritius: Rodrigues	

(see Box 2 for headings to columns)

Zanthoxylum paniculatum Balfe. f. is critically endangered.

Large scale deforestation as reduced the species to two trees in the wild (Rodrigues Island). Another tree died in 1983. They were in the valley of Anse Quito. Two other localities were known. Legal protection. In cultivation one plant survives at the Royal Botanic Gardens, Kew (RBG, Kew) and another in Saint-Paul (La Réunion) both from seed (Strahm, 1989 **Plant Red Data Book for Rodrigues**).

Recovery plan

If the species is to survive, a coordinated programme is necessary using the four surviving specimens. The most simple would be to obtain seed from the two wild survivors. Artificial pollination is necessary because the plants do not produce fruit. If seedlings were obtained they could be reintroduced in two to three years. The plants maintained at RBG, Kew and Saint-Paul are genetically important because they come from seed and probably retain genes of a third, now dead tree (1983). Trials of cuttings have been made in Brest and Rodrigues without success as well as grafting and air layering in La Réunion.

The first step is to graft *Zanthoxylum paniculatum* onto *Zanthoxylum heterophyllum* to create in Rodrigues an orchard of about five specimens of the four survivors. Security copies of the four survivors should be cultivated in other sites preferably in tropical countries. The next step is to obtain seed and seedlings through a programme of cross pollination and then the young plants can be released. A delay of ten years is expected.

Information about this species supplied by Wendy Strahm (IUCN Plants Officer, Species Survival Commission).

Table 1 Method of evaluation

	EX	EW	CR	EN	VU	NT	LC	DD	NE
Not in cultivation 0	A		A	A	B	d	d	B	B
Cultivated in 1 to 5 sites 1		A	A	A	C	d	d	B	B
Cultivated in 6 to 20 sites 2		A	A	B	d	d	d	d	d
Cultivated in more than 20 sites 3		C	C	d	d	d	d	d	d
Data deficient 4		B	B	C	d	d	d	C	C
Not evaluated 9		B	B	C	d	d	d	C	C

Urgency for conservation: A (maximum) B (high) C (medium) d (low or nil)

Table 1 Method of evaluation - The combination of the two criteria determines the urgency of the action for each plant (When the situation has substantially changed, the past situation can be put in brackets.)