



MUSÉUM NATIONAL D'HISTOIRE NATURELLE

SAVING OUR PLANET'S FLORA

THE CONTRIBUTION OF
THE FRENCH NATIONAL NATURAL HISTORY MUSEUM





Department of Botanical and Zoological Gardens



The Department of Botanical and Zoological Gardens manages, in its five botanical gardens and four zoological parks, the living collections of the National Natural History Museum. These collections are used for diffusion of knowledge, for conservation of rare and endangered species, and in research programmes.

The current strategy to maintain and develop these collections is based on the global strategies for conservation of living species. Recent programmes and current projects demonstrate this commitment: conservation and display of rare and endangered floras (a planned New Caledonian glasshouse, development of the Malagasy collections, and of the flora of arid zones,...), ecosystemic presentations of various flora (forests of the *Ile de France region*) and of the global fauna/flora (planned Madagascar and Guyana ecosystems at the Paris Zoological Park). Museum researchers are involved in these projects, and the diffusion of scientific knowledge to all sectors of the public is ensured through the use of appropriate museographic presentations. This Department, through its rich diversity, manages this imposing heritage in a spirit of sustainability.



Department of Systematics and Evolution

The Department of Systematics and Evolution is concerned with our planet's flora in several respects.

Firstly, its members are in charge of the curation of the National Herbarium. This Herbarium, one of the largest in the world with more than 10 million specimens, represents a true historical record of plant diversity on the surface of our planet. It includes historical herbaria, such as those of Lamarck or Jussieu, which were among the first of such importance. It also includes herbaria resulting from the great explorations in the world starting in the XVIIIth century. Digitization of some historical herbaria and of type specimens is being carried out with the help of international foundations.

Secondly, the Department of Systematics and Evolution, in relation with the Herbarium, the *Conservatoire Botanique du Bassin Parisien* and the Department of Botanical and Zoological Gardens, conducts active research on biodiversity, and the systematics and evolution of plants, algae and fungi. These studies include fruitful explorations of areas where a large part of the diversity remains undescribed (Madagascar, New Caledonia, South-East Asia, China...), participation in large expeditions (Santo/Vanuatu), research in taxonomy and systematics on the organization that comprise this diversity, as well as an investigation of the evolutionary forces that have led to today's diversity, thus allowing an understanding of the present situation and the possible scenarios for the future...





Global Strategy for Plant Conservation (GSPC)



The Strategy's ultimate and long term objective is to halt the current and continuing decline in plant diversity. The Strategy also considers the issues of sustainable use and benefit-sharing, and aims to contribute to poverty alleviation and sustainable development.

This Strategy includes production oriented global targets set for 2010, and provides a framework to facilitate harmony between existing initiatives aimed at plant conservation, to identify gaps when new initiatives are required, and to promote mobilization of the necessary resources.

The Strategy was adopted by the Conference of the Parties of the Convention on Biological Diversity of April 2002.

Sixteen outcome oriented targets were established, with the following global aims:

- Understanding and documenting plant diversity,
- Conserving plant diversity (*in situ* and *ex situ*),
- Using plant diversity sustainability,
- Promoting education and awareness on plant diversity
- Building capacity for the conservation of plant diversity

The following text presents the contribution of the Museum to the 16 targets of this strategy.

Understanding and Documenting Plant Diversity

1 A widely accessible working list of known plant species, as a step towards a complete world flora

Participation in the compilation of various floras (New Caledonia, Madagascar, Gabon, Cambodia, Laos, etc.), including description of new species

Contribution to periodical publications on plant systematics (Adansonia)

Contribution to international databases of plant species: GBIF (more than 4 million data entries), BGCI, SONNERAT (<http://www.mnhn.fr/base/sonnerat.html>) and BRYOMYCO (more than 700,000 entries in these 2 databases)

Contribution to setting up national methodologies for inventories of French natural heritage

Inventory of the Paris Basin flora and monitoring of the list of protected plant species

Cooperation with the *Société française d'Orchidophilie* for the publication of a national atlas of orchids

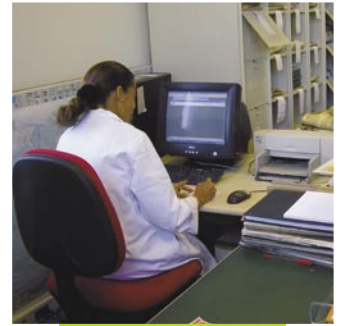
Creation of a website to access national inventories

French coordinator for the European network of excellence EDIT (<http://www.e-taxonomy.eu/>)

Participation in the African Plants Initiative Project and in the Millennium Seed Bank

General inventory and computerization of the collections of the Museum (National herbarium, seed banks, carpological collections, reference seed collections, living plants from the botanical gardens) and of 6 regional herbaria

Inventory and computerization of the reference documentation and archives of the Museum botanical gardens



The National Herbarium, founded in the 18th century, houses more than 10 million specimens, including more than 400,000 types specimens

2 A preliminary assessment of the conservation status of all known plant species, at national, regional and international levels

Establishment and facilitation of regional contact networks and of contracts with public (National Forestry Bureau) and private institutions for the surveillance of plant populations

Validation of regional plant inventories

Creation of local and regional plant watchdog groups in the Paris Basin

Vigilantes: A project of partnership between the *Fédération des Conservatoires botaniques nationaux* and the Museum with the aim of surveying common plants of the European territory of France

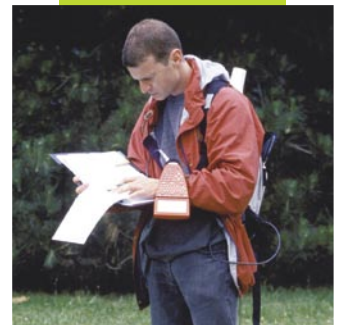
Bibliographic analysis of plant distribution in the Paris Basin

National coordination on an evaluation of the conservative status for plants species included in the appendices of the European directive 92/43

Contribution to the national and regional red data books on plants

Detailed analysis of endangered plant species and of the threats to their populations and habitats as well as development of reliable rarity indices for the Parisian Basin flora

Follow-up of a programme on the distribution of habitats and identification of priorities for the protection of habitats



The Museum is in charge of carrying out several flora inventories

3 Development of models with protocols for plant conservation and sustainable use, based on research and practical experience

Determination of harvesting and conservation protocols (*in situ* and *ex situ*) and follow-up operations for procedural reorientation for the Paris Basin

Theoretical research on the causes of the disappearance of plant species (Allee effect, inbreeding depression, etc.) and implementation of on-site experiments to test the theoretical approaches for the Paris Basin



The Museum leads numerous research programmes on protocols for plant conservation (here *Arenaria grandiflora*)

Conserving Plant Diversity

4 At least 10 % of each of the world's ecological regions effectively conserved

Establishment of plant conservation schemes in the Paris Basin

Public open-space habitat conservation programmes in the *Ile de France* region

Consulting on sensitive local natural areas of the Paris Basin

On site habitat protection policies



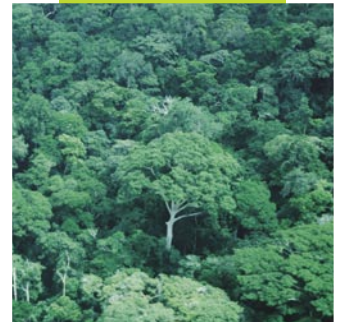
The Loire River, the last "wild river" of France, is bordered by rare habitats of European interest

5 Protection of 50% of the most important areas for plant diversity assured

Participation in the National Park of French Guyana pilot programme committee and in the scientific committees and boards of National Parks

Study of natural reserve and other protected areas projects

Development of tools to prioritize ecological zones of high interest



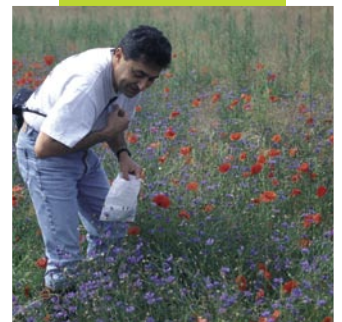
The Museum contributes to the creation and management of protected areas (in French Guyana) and in several other countries throughout the world

6 At least 30% of production lands managed consistent with the conservation of plant diversity

Recognition and management programmes for the heritage ecosystems in agricultural lands (Mouillères of Gatinais)

Harvest programmes of companion plants to crops

Cultivation programmes of heritage companion plants to crops



Harvest of companion plants to crops. These species are particularly threatened with extinction in the grain plains of the Paris Basin

7 60 % of the world's threatened species conserved *in situ*

- On-site implementation of threatened species protection programmes
- Development of partnerships with relevant public authorities as well as with the public and private land owners
- Participation in international plant species protection programmes (Africa, South America)



In situ population reinforcement using plants grown *in vitro*

8 60% of threatened plant species in accessible *ex situ* collections, preferably in the country of origin, and 10% of them included in recovery and restoration programmes

- Conservation and multiplication of rare and threatened plants in the four botanical gardens of the Museum: in particular Cycadales, orchids, aloes, cacti, Euphorbiaceae and other succulent plants
- Genetic resource conservation and preservation programmes of protected heritage plant species of the Paris Basin (seed bank, botanical collections)
- Maintenance in the botanical gardens of the Museum of a collection of 17,000 taxa of living plants (among which 4,300 are listed in red data books)
- Participation in the ENSCONET programme (European Native Seed Conservation Network, <http://www.ensconet.eu/>)



The seed bank of the *Conservatoire Botanique du Bassin Parisien* includes 7 million seeds of more than 450 species

9 70% of the genetic diversity of crops and other major socio-economically valuable plant species conserved, and associated indigenous and local knowledge maintained

- Research on the impact of slash and burn cultivation in southern French Guyana
- Comparative study of the biological and morphological diversity of manioc in Amazonia
- Conservation and promotion of useful tropical plants in the Museum's glasshouses
- Thematic collections of food plants (kitchen garden school, Ecole de botanique, ecological garden)
- Research on traditional varieties of cultivated plants and fruit trees in rural areas of France
- Establishment of conservation programmes of Ethiopian garden biodiversity through the valorisation of local products cultivated in these gardens (coffee, spices, seasoning...)



Basket weaving demonstration during the inauguration of the GADEPAM fair trade shop

10 Management plans in place for at least 100 major alien species that threaten plants, plant communities and associated habitats and ecosystems

- Establishment of lists of invasive alien plant species in France for regional environmental management committees
- Participation in programmes to fight against the invasive species of *Ludwigia*



The *CBNP* leads a recognition and eradication programme on invasive alien plants such as *Ludwigia*...

Using Plant Diversity Sustainably

11 No species of wild flora endangered by international trade

The Museum is the French Scientific authority for the Convention on International Trade in Endangered Species of wild flora and fauna (CITES, also known as the Washington Convention) and participates actively in the Convention's plant Committee

French customs assistance in plant identification and reception of confiscated plant specimens from customs authorities

Museum visitor information on the risks resulting from illegal plant trade, in particular in cacti, orchids and cycas



Customs often seize illegally traded plants. The Museum assists in the identification and conservation of confiscated specimens

12 30 % of plant-based products derived from sources that are sustainably managed

Expertise provided to companies on sustainable plant exploitation for the production of medications and cosmetics

Development of a database on useful plants

Participation in French Guyana forest certification procedures

Organisation of workshops on genetic resources exchange

Organisation of conferences in French Guyana on the sustainable utilisation of forest products

Participation in the evaluation of the social and environmental impacts of labelled and eco-certified products (organic agriculture, fair trade...) in six southern countries



The Museum offers its expertise to private companies for the sustainable utilization of plants used for cosmetics here: *Arnica montana*

13 The decline of plant resources, and associated indigenous and local knowledge, innovations and practices that support sustainable livelihoods, local food security and health care, halted

Setting up of an information centre on horticultural know-how: The House of Local Products used in Ethiopia

Implementation of the results of a research programme on non-timber forest products and associated knowledge and know-how in French Guyana

Creation of an association to promote and develop the utilisation of plants which are traditionally used in French Guyana (GADEPAM)

Creation of a cooperative for trade in natural and traditional goods taking into account economic, cultural and environmental aspects to promote sustainable and fair development in French Guyana



Mrs. Louison, owner of the *Bois de rose* Garden in Cayenne, points out the uses of *Quassia amara*, a medicinal plant traditionally used to treat malaria



Promoting Education and Awareness about Plant Diversity

14 The importance of plant diversity and the need for its conservation incorporated into communication, educational and public awareness programmes

Post-graduate training on plants, their taxonomy, ecology, conservation, management, and industrial, artisanal and traditional utilization (MSc and PhD programmes at the Museum), and in some other French and foreign universities

Pedagogical activities for pupils and training for primary and secondary school teacher

Professional training for civil servants (state and local) and for the private sector

Permanent and temporary exhibitions for the general public and for specific audiences

Publication of brochures, leaflets and books

Organisation of workshops and conferences for the general public and for targeted audiences

Guided tours of the botanical gardens and of the arboretum

Participation in the education working group of French and French-speaking countries botanical gardens



Each year the Museum welcomes 350,000 pupils and offers workshops in horticulture for the general public



Building Capacity for the Conservation of Plant Diversity

15 The number of trained people working with appropriate facilities in plant conservation increased, according to national needs, to achieve the targets of this Strategy

Training in botany, plant conservation and horticulture

Continuing education of botanical garden staff and teachers

Programme (in cooperation with three other French institutions) for the development of scientific expertise in plant biology in Western and Central Africa, Indian Ocean and South-East Asian countries



Each year the Museum trains more than 1,500 teachers

16 Networks for plant conservation activities established or strengthened at national, regional and international levels

Participation in national, European and global networks of botanical gardens, conservatories and herbaria

Contribution to the network of biodiversity observatories in the *Ile de France* Region



The International Agenda plaque acknowledges the commitment of the Museum's botanical gardens to plant conservation



Department of Mankind, Nature, Societies

The Department Mankind, Nature, Societies includes researchers in the human sciences (social and cultural anthropology, ethnobiology, human geography, ethnomusicology...) and the life sciences (biological anthropology, population genetics, primate ethology...). Research projects concern modern man and his relationship with his environment, in all ecosystems-tropical as well as temperate-including those in France.

Research involving plants follows two lines: the uses of wild or cultivated plants and classification systems and knowledge about plants in different societies.

Among the Department's research programs, several deserve mention: non timber forest products in French Guyana, palm trees in Amazonia, wild yams in Madagascar and West Africa, and therapeutic plants consumed by chimpanzees in Uganda, among others. Regarding cultivated plants, our approach associates inventories of local agro-diversity with its management and the valorization of local products through the use of labels (coffees in Ethiopia, roiboos in South Africa, fruit varieties in France...), in relation with the protection of ecosystems.



Department of Ecology and Biodiversity Management



The department of Ecology and Biodiversity Management combines both the study of nature and its management. It contributes to its inventory, analyses its history within different scales of space and time, studies its determinism, the mechanisms behind its functioning and its role in ecosystems. It puts forward scenarios of its evolution and implements management protocols.

Conservatoire Botanique National du Bassin Parisien (CBNBP)

The CBNBP, created in 1994 within the Museum, has the four following missions with the Paris Basin as territorial responsibility:

- To perform scientific studies and monitoring of the native flora and natural habitats of the Paris Basin
- To identify endangered native species and natural habitats in this geographical area and to ensure their conservation
- To provide expertise to the French government and local authorities
- To raise public awareness of the importance of plant biodiversity and its protection

Data on plant distribution in the Paris Basin (approximately 4 million entries) are computerized in the FLORA® database and are linked to the Global Biodiversity Information Facility (GBIF). The CBNBP is currently the sixth largest provider of data to GBIF

In the Paris Basin, the CBNBP evaluates the conservative status of all species, establishes regional Red Lists of threatened species, diffuses knowledge to the public, and serves as the scientific adviser of the French government and local authorities

The CBNBP also conducts specialised research projects on subjects such as urban biodiversity and the role of ecological corridors in maintaining plant diversity

Plant conservation activities involve both *in situ* actions (population reinforcement, reintroductions and transplantation) and *ex situ* activities in the laboratory (including a seed bank) as well as in cultivation

The CBNBP's activities have an international dimension through scientific partnerships developed with foreign institutions

Internet : www.mnhn.fr/cbnp

Service du Patrimoine Naturel “Natural Heritage Service”

The Natural Heritage Service (SPN) is a national structure and is supported by the Ministry of Ecology and Sustainable Development. It coordinates, within the Museum and for the French government, the scientific inventories of the natural heritage, by providing taxonomic referentials, methodology for the study of biodiversity. It cooperates with both the academic and the associative sectors (scientific partners as well as managers of natural habitats). Within the Information Facility on Nature and Landscape initiated by the Ministry, the SPN is responsible for the scientific administration of the coordination. This information system aims to provide the public with information on biodiversity which is scientifically validated using the best available criteria

In addition, the SPN provides its expertise to the different ministries and assists them in the implementation of the Natura 2000 European program as well as in the evaluation of the state of species and habitat conservation concerned by the European directive 92/43

Finally, in cooperation with the IUCN French National Committee, the SPN ensures the updating of the red data books



LE MUSÉUM NATIONAL D'HISTOIRE NATURELLE

Formerly “The King’s Garden”, the Muséum National d’Histoire Naturelle was founded in 1793. Its mission is “to discover, understand, highlight and help preserve the Earth’s natural and cultural diversity”, and its areas of activity are research, education and training, management and enrichment of its collections, expertise and diffusion of scientific knowledge.

The Museum plays a key role in the implementation of the GSPC through its botanical gardens, the *Conservatoire Botanique National du Bassin Parisien*, the Herbarium, and also by providing expertise on all areas of the Strategy (botany, conservation, ethnobotany, article 8j, sustainable use, etc.).

Professor Jacques Moret (MNHN and *Fédération des conservatoires botaniques nationaux*) is one of the two GSPC focal points for France.

Museum website: <http://www.mnhn.fr>

SOME KEY FIGURES

- **1800 staff members**
(including 500 researchers in a wide variety of disciplines)
- **400 students (MSc and PhD)**
- **2 million visitors per year**
- **Collections: 65 million specimens** (including 800,000 types)

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Photo credits :

Couverture : MNHN-DJBZ (1-8), M. Fleury-HNS (2,3,4,7), A. Descat© (5), O. Bardet-CBNBP (6), MNHN-DREP (9), MNHN et S. Bahuchet-HNS (11), Page 3 : M. Fleury-HNS (1), A. Descat© (2,4), MNHN-DREP (3), Page 4 : MNHN-DSE (1), S. Filoche-CBNBP (2), Page 5 : J. Cordier-CBNBP (1), J. Moret-CBNBP (2,4), M. Fleury-HNS (3), Page 6 : J. Moret-CBNBP (1,2), M. Fleury-HNS (3), L. Boudin-CBNBP (4), Page 7 : A. Descat© (1), R. Dupré-CBNBP (2), M. Fleury-HNS (3), Page 8 : MNHN-DJBZ (1), Page 9 : M. Fleury-HNS (1), MNHN-DREP (2), MNHN-DJBZ (3), Page 10 : M. Fleury-HNS (1), C. Duminiil-DJBZ (2), V. Priolet-DJBZ (3)

Impression/Printing :

Avril 2007, Escourbiac 81300 Graulhet, Imprimé sur papier recyclé 

