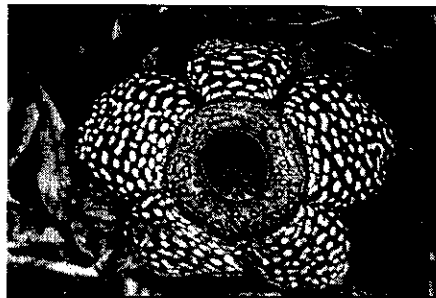


# **GLOBAL STRATEGY FOR PLANT CONSERVATION: ANNEX 1**

(Part of a submission by WWF for an Informal Consultation of SBSTTA, Convention on Biodiversity, Montreal, March 2001)

## **PLANT CONSERVATION AND WWF: CURRENT WORK AND RECOMMENDATIONS FOR THE FUTURE**



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**WWF Project 9Z1234  
(Capacity-building in plant conservation, internationally and in ecoregions)**

**July 2000**

## **Captions:**

From top left clockwise

- Maggie Vuadreu, a traditional healer and member of WAINIMATE, a women's medicinal plants group in Fiji.
- Bwindi Impenetrable Forest, Uganda, showing the sharp boundary between the National Park and surrounding communities.
- Amchi Tangyal Lama, a traditional healer from Dolpo, Nepal showing the root of *Aconitum spicatum* an important medicinal plant.
- Many orchid species are threatened by trade.
- *Rafflesia*, the largest flower in the world, is threatened by habitat conversion and logging.
- Collecting wild durians in community-owned forest, Mt. Kinabalu, Sabah.

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## **Acknowledgements**

The authors are grateful for all those who have contributed to the preparation of this report. Many are listed in Annex 1. We have benefited from greatly from discussions with Dr Yildiz Aumeeruudy-Thomas and Dr Tony Cunningham.

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## LIST OF ACROYNMS

CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DHKD	Society for the Protection of Nature (Turkey)
ERBC	Ecoregion-based conservation
EU	European Union
FSC	Forest Stewardship Council
ICDP	Integrated conservation and development project
IPGRI	International Plant Genetic Resources Institute
IUCN	The World Conservation Union
NO	National Organisation (of WWF)
NTFP	Non-timber forest product(s)
PO	Programme Office (of WWF)
SAC	Special Area of Conservation (related to the Habitats Directive, European Community)
SSSI	Site of Special Scientific Interest
WWF	Official designation of The World Wide Fund for Nature (World Wildlife Fund in Canada and USA)

# EXECUTIVE SUMMARY

## Contributions of WWF to plant conservation

This report contains the results of the first study undertaken to determine the contributions of WWF to plant conservation. The aim is to identify priority actions for the future, appropriate to the organisation. Plant conservation should be central to the work of WWF according to its Mission.

WWF has a complex structure, with National Organisations, Programme Offices and an International Secretariat. It has three priority biomes (forests, freshwater, oceans and coasts) and three priority themes (climate change, species, toxics). It has adopted an ecoregion-based approach to conservation, involving selection of a number of ecoregions for programmatic focus, an emphasis on integration of activities from field to policy, and often a concentration on cross-border issues. It is unlikely that plant conservation *per se* will be raised to the status of an equivalent priority, although work on plants is relevant to all those chosen and indeed will often be critical to practical achievement.

A survey to identify priorities for plant conservation (generally, not just in relation to WWF) was carried out in selected countries through interview and questionnaire. The objective was to provide a context for assessing the contributions of WWF. One hundred and twenty-one people interested in plant conservation contributed, about equally divided between WWF staff and outsiders. The survey was conducted opportunistically, sample countries being confined to Africa, Asia and Europe. The conclusions are that:

- *in situ* conservation is seen as normally the priority;
- conservation must be integrated with development;
- there is a need for greater public awareness of the importance of plant conservation;
- communities must normally be centrally involved in practical conservation initiatives;
- protected areas are often vital;
- reform of legal measures is a relatively low priority (but existing measures need to be enforced);
- more effective regulation of trade in wild plants is needed;
- there should be more exchanges of information and experiences in plant conservation between people and places.

The results draw attention to the inappropriateness of a paradigm which is common today among plant conservationists. This has a narrow focus on plant species conservation (only one aspect of plant conservation), gives insufficient attention to *in situ* conservation, fails to incorporate social systems adequately into its analyses and recommendations for action, and fails to recognise the central need to integrate conservation with development.

The low priority granted to legal measures reflects a widespread opinion that there are often more or less adequate laws and regulations (though reforms are needed) in comparison with the major task of putting laws and regulations into practice. This finding should not be misinterpreted to mean that respondents viewed policy instruments as unimportant – this was not the case.

A survey was carried out of WWF projects believed to contribute to plant conservation, undertaken under the WWF International Programme and by selected National Organisations. 282 such projects were identified (there are certainly more, implemented by other National Organisations). The principal categories are integrated conservation and development projects (66), protected area projects (49) and community-based conservation projects (30). There are very few projects concerned directly with conservation of particular plant species. The effectiveness of the projects was not determined, nor any systematic study made of the types of botanical work undertaken within the more general types of conservation project (e.g. integrated conservation and development projects). However, the personal experience of the authors suggests that botanical work in such projects, when carried out, sometimes lack the incisiveness and attention to botanical detail necessary for maximum effectiveness. While virtually everyone working for WWF acknowledges

that the involvement of communities is typically essential for conservation, there is insufficient recognition of the types of botanical work with communities that are most needed.

The survey revealed a much higher attention given to policy (in relation to field activities) in Europe compared to other regions. This probably reflects the generally greater political legitimacy of WWF in Europe (where there are many National Organisations) and a greater belief that new policy measures will be translated into conservation benefits on the ground. WWF India and WWF South Africa stand out as the members of WWF most committed to plant conservation.

WWF International ran a Plants Conservation Unit between 1989 and March 2000, after which it was absorbed into WWF-UK. The unit has supervised numerous projects, internationally and in many countries, focusing its attention since 1992 increasingly on a capacity-building project in applied ethnobotany (the *People and Plants* initiative). Both the desirability of focus, in general, and the particular focus chosen of *People and Plants*, in particular, have been generally commended, within and without WWF. On the other hand, the actual practical support received from different sections of WWF for *People and Plants* has been mixed. Broadly generalised, it has proved easier to integrate *People and Plants* into other WWF activities in Asia and the Pacific than Africa. Contributions to the demise of the Plants Conservation Unit and to some of the difficulties which it has experienced in running *People and Plants* are believed to include:

- inadequate mechanisms generally within WWF for linking 'policy units' (such as the Plants Conservation Unit) to field programmes;
- out-posting of the Plants Conservation Unit at WWF-UK, away from the organisation to which it is responsible (WWF International);
- the complexity of WWF, with numerous cross-cutting strategies, work programmes and centres of influence, making integration difficult for a small cross-cutting programme, active both internationally and within several countries (e.g. to attend planning meetings, especially given their number);
- a focus on 'wildlife' within certain sections of WWF (notably some sections of the African Programme);
- inadequate recognition within WWF of the general conservation importance of the subject of *People and Plants* (capacity-building in applied ethnobotany).

Current general challenges for plant conservationists within WWF include:

- several drawbacks of the ecoregion-based approach to conservation, adopted by WWF, especially the danger that its apparent emphases on large-scale planning and region-wide processes may detract from direct practical work at particular field sites and related training, as are much needed to conserve threatened plant species and plant resources;
- inadequate use of its wide geographical coverage and vertical scale of its operations (field projects, national, international) to the best advantage for plant conservation. It lacks an efficient mechanism to identify and share best practices, based on its own experiences, both within itself and with other concerned organisations and individuals (though efforts are being made to correct this deficiency).

### **Recommendations for future work on plant conservation by WWF**

There is need for much greater concerted international effort to conserve plants, within the WWF network and more widely. Based on its own experiences and fields of focus, WWF is well placed to:

- promote new emphases in plant conservation which (relative to the traditional plant conservation paradigm) contain a wider vision of the value of plants, see *in situ* conservation as normally of prime importance, incorporate social systems integrally into analyses and recommendations for action, and integrate conservation and development;
- contribute to developing and playing its part in an international network for plant conservation, based on acceptance of new emphases in plant conservation (as above) and bringing new partners into the network based on their acknowledged fields of expertise. Members of the network should be actively involved in practical work, especially at field level, and be able and

willing to extract lessons from these experiences to propose and promote related policies and best practices.

There should be a greater focus on plants if WWF is to achieve its objectives. To this end, the new International Plants Conservation Unit of WWF-UK (successor to the Plants Conservation Unit of WWF International) should:

- take a leading role in developing the above network, within WWF and more widely;
- select applied ethnobotany as one field for its own particular focus, through continuing its commitment to *People and Plants*. Within this theme, four topics should be selected for the development and promotion of recommendations for policies and best practices, as follows:
  - wood-carving and conservation;
  - conservation of high altitude Himalayan medicinal plants;
  - sustainable use of plant resources within protected areas;
  - curricula in applied ethnobotany.
- select additional fields for its own particular focus, in discussion with other members of WWF-UK and more widely. Likely candidates are aspects of the conservation of medicinal plants, a subject believed to be particularly appropriate to WWF as well as generally being of international conservation importance.

Practical implementation of the above recommendations by the International Plants Conservation Unit of WWF-UK requires that:

- funds and partners are secured for continuing work under *People and Plants*, and the work is then implemented;
- proposals are developed, funded and carried out, relating to development of an international plant conservation network and specific work on chosen issues (such as aspects of the conservation of medicinal plants).

# 1. OBJECTIVES

1. Determine WWFs' current contributions to plant conservation.
2. Propose how WWF can best contribute to plant conservation internationally in the future.

## 2. BACKGROUND AND GENERAL APPROACH

This is the first time that an attempt has been made to determine the contribution of WWF to plant conservation. It is clear from its Mission (Box 1) that plant conservation should be high on WWF's agenda, both as regards conservation of plant diversity and promotion of sustainable use of plant resources.

### Box 1. The Mission of WWF

WWF aims to conserve nature and ecological processes by:

- preserving genetic, species and ecosystem diversity;
- ensuring that the use of renewable material resources is sustainable both now and in the longer term;
- promoting actions to reduce pollution and the wasteful exploitation and consumption of resources and energy.

Limits to the scope of this analysis are necessary, considering that so many human activities influence the world of plants and that virtually any programmatic action of WWF will have some influence on plant conservation. The present study concentrates on existing or potential actions by WWF aimed specifically at conservation of plant diversity (including of habitats important for this purpose) or at promoting the more sustainable use of plant resources. It focuses on activities which are more direct and practical, especially those which are field-based. The root causes of much environmental malaise can be considered to include various global social, economic, cultural and political trends, in some of which WWF is engaged with analysis and advocacy of more environmentally friendly policies. While recognising the relevance of these trends and associated work by WWF to plant conservation, these matters are largely excluded from the present study, to contain it within practical bounds.

Interviews provided a fundamental tool to solicit information and views about priorities in plant conservation. It was recognised early in the study that the judgements of experienced people would contribute much to the analysis. It was also apparent that their co-operation would most likely be achieved in face-to-face discussion, rather than through soliciting their opinions at a distance. Interviewees were encouraged to expound on aspects of plant conservation with which they were particularly familiar. In general, the process seems to have been reasonably successful in bringing out people's genuine thoughts. The authors are grateful to all concerned for providing their time. Individual views have necessarily usually been subsumed into generalisations for the purpose of this report, hopefully without undue distortion. A total of 121 people contributed to the survey, 74 working for WWF and 47 others (Annex 1).

A questionnaire was used in most of these interviews, largely as an *aide memoire*, though an attempt was made to secure answers to all questions. The questionnaire included a question containing a list of potential areas of conservation action, which interviewees were requested to score in terms of priority. Fifty-seven people answered this question, 28 of whom worked for WWF and 29 others. When possible, the questionnaire was presented in advance, to allow interviewees time to consider their responses.



A small WWF Advisory Group was established to help guide the project, especially to check information relating to particular places and to assist with formulating recommendations. However, final responsibility for this report rests with the authors.

WWF is a large and complex organisation, with a range of campaigns, programmes and projects which directly or indirectly impinge on plant conservation. It has not been possible to look at all relevant activities of the organisation, given the time and other resources available. There is geographical concentration on particular regions and countries. Decisions on which regions and countries to include, and people to consult, were largely determined opportunistically, as we proceeded with our other duties for WWF.

The report consists of the following main parts:

- a short description of the nature of WWF (as a particular type of conservation organisation), necessary to appreciate its programme and to provide a realistic platform for assessing its future potential;
- an account of plant conservation priorities, in general, concentrating on particular regions and countries. This includes the results of the exercise to select priorities in plant conservation, part of the questionnaire. This section is included so that the relevance of the work of WWF and recommendations for its future actions are placed (as they should be) within the wider universe of actions necessary overall to conserve plants;
- a description of the present contributions of WWF to plant conservation. This includes an analysis of all plant conservation projects classified as belonging to the WWF International Programme, as well as those of selected National Organisations (NOs). It also includes information on WWF activities solicited by interview, mainly relating to the regions and countries of species focus (the same areas as in 2 above);
- recommendations for future work on plant conservation by WWF.

### 3. WWF AS AN ORGANISATION

WWF (formerly known as the World Wide Fund for Nature or, in Canada and the USA, the World Wildlife Fund) is the world's largest conservation charity. The work of its many components is united by agreement on a common Mission (Box 1). It consists of 27 National Organisations (NOs), 5 Associates and 24 Programme Offices (POs). It is co-ordinated by an International Secretariat, WWF International. It has activities in about 100 countries.

WWF NOs and Associates, having a better chance to be embedded in the civil societies of their countries, are well placed institutionally to influence national policies. POs lack this advantage, though this can sometimes be temporarily offset if their staff are personally known and respected in their regions or countries of operation. The distribution of NOs and Associates by region is very uneven. NOs and Associates are notably few in Africa, parts of Asia, and Central and South America.

WWF is a broad-based conservation organisation which uses a wide spectrum of approaches and methods in pursuit of its Mission. It supports field projects, is engaged in environmental education, lobbies for policies favourable to conservation (including at national and international levels, and by industry) and mounts campaigns aimed at raising public awareness and changing policies. It generally adopts a co-operative rather than a confrontational approach. It has a traditional strong involvement in field projects, but has become increasingly involved in policy work over the last decade recognising the limitations of working at (necessarily) only a few field sites. It has tended to move from an organisation welcoming external proposals for projects to relying more on its own strategic thinking (usually with the aid of external experts) in choosing how it can most effectively deploy its resources. A significant advantage of WWF among conservation organisations is its potential to work on issues at many levels, from the field to the national or regional, and internationally.

The overall strategy of WWF is agreed by an International Board and a Programme Committee. The majority of members of both bodies are members of the NOs. NOs pursue programmes within their

own countries, based on this strategy but otherwise largely independently. There are 4 Regional Sub-committees – for Africa, Asia/Pacific, Europe and the Middle East, and Latin America/Caribbean. These are responsible for programmes within their geographical areas, especially in countries lacking NOs or Associates, or where activities extend across national boundaries. Sub-regional and Country Teams establish the frameworks of programmes at lower geographical levels. Funding for the International Programme (a term used mainly for activities in countries lacking NOs) comes mainly from 6 richer NOs (Germany, the Netherlands, Sweden, Switzerland, the UK and the USA). This inevitably results in these NOs having considerable influence in shaping the International Programme, a tendency which has probably increased since the mid-1990s, when a policy of decentralisation was adopted by WWF. WWF-US tends to be particularly independent.

The International Programme is established in relation to priorities set by various components of WWF. Geographically, various countries were once selected for special focus by the organisation as a whole, and those WWF NOs with funds for the International Programme still maintain their national preferences. More recently, WWF has started to select specific ecoregions (see Section 5.3.2.) as geographical units of focus, either for WWF as a whole or on the part of funding NOs. Ecoregions often cross national boundaries. There is current debate on how best to integrate country-based and ecoregional activities. Apart from geographical priorities, WWF at the international level has selected 3 biomes (forests, freshwater, oceans and coasts) and 3 other themes (climatic change, species, toxics) for special attention. [The term 'species' in this context refers to a few charismatic vertebrates such as elephants, rhinos and tigers; no plants are included.] Apart from these international priorities, there are others relating to every programmatic component of WWF. For instance, two of the priorities of WWF-UK are 'levers for long-term change' (including capacity-building for conservation) and the 'engagement of industry in conservation' – these being selected on the basis of the perceived position of the UK in the context of global conservation. There are botanical aspects relevant to all places and themes selected as priorities by WWF; in many a focus on plants will be critical to success.

WWF benefits from a diversity of views held by its staff about how conservation can best be achieved. However, this diversity can limit the decisiveness of its actions. There are divergent opinions about the relative merits of field projects *versus* pursuit of policy change, the importance of tackling immediate or more underlying causes of conservation problems, the relative roles of protection *versus* community engagement in the management of protected areas, and the relative merit of supporting environmental education. The organisation will certainly continue to be a fertile ground for tussles about priorities. Plant conservation at the international level must be pursued within these complexities.

## 4. PLANT CONSERVATION PRIORITIES

### 4.1. Methods

The regions (and countries) of focus are Africa (Kenya, Madagascar, South Africa, Uganda, Zimbabwe), Asia (India, Malaysia, Nepal, Pakistan) and Europe (Greece, Italy, UK). These parts of the world contrast in their levels of plant diversity, dependency of people on wild plant resources, types of technology available and levels of economic prosperity.

All the people selected for interview have thought about plant conservation. Their backgrounds vary, most of them being referable to one or another of these categories: (1) professional plant conservationists; (2) conservationists (in a more general sense); and (3) interested academic botanists. Plant conservation is a very large topic and it was quickly found that the interviewees varied greatly in their breadth of experience, levels of theoretical understanding, and depth of geographical or thematic knowledge. These contexts have been taken into account in the summaries of opinions which follow.

Determination of plant conservation priorities is difficult. Take, for instance, potential responses to an apparently simple question: "Is there good knowledge of the conservation status of plant species in your country?" There may be a published list of threatened plants, but is it accurate? And even if

it is accurate, is the information available in an understandable form to people in positions to take necessary conservation actions? Is the information actually used on the ground for practical benefit?

A question in the questionnaire requested respondents to score potential actions to conserve plants in terms of priority. A few respondents objected in principle to the idea of prioritisation, pointing out that action is necessary on many fronts. They considered it invidious to set them up against one another, as though they really were alternatives. More frequently, respondents failed to understand why certain items had been included in the list, not realising their potential relevance. Despite the limitations, the answers to this question allow at least a semi-quantitative impression of perceived priorities.

## 4.2. Africa

The survey mainly covered five countries, Kenya and Uganda (treated together), Madagascar, South Africa and Zimbabwe.

### Kenya and Uganda

Two of the principal **threats** to conservation of plant diversity were regarded by interviewees as **habitat degradation** and **deforestation**, themselves related (according to the interviewees) to the underlying factors of increasing population, agricultural expansion, changes in agricultural practices and poverty. Changes in agricultural practices are resulting in loss of some local varieties of crops. Poverty contributes to much harvesting of wild plants, sometimes unsustainably. Poor governance was mentioned as a major problem, particularly in Kenya: aspects of concern included inadequate land-use planning and law enforcement, and land-grabbing by influential people.

Forest conservation was seen as a high priority, especially because neither country carries much forest. Forests near the Indian Ocean in Kenya were seen as needing special attention, given that they are particularly rich in endemic and rare plants, small in size and highly threatened. Afromontane forest was also regarded as a high priority. Remaining patches of Afromontane forest often stand on land favourable for agriculture, with many people living on their peripheries.

A number of other habitat types apart from forest were noted as priorities for conservation. Among them were swamps, many of which are now being reclaimed for agriculture. Landless people are often involved, because undrained swamps are typically regarded as open-access land, available for settlement. In the case of Kenya, other priority habitats noted were montane wooded grassland (on land of prime interest for commercial farming, including cattle-ranching), vegetation on limestone outcrops (mostly on privately owned land and highly threatened), and some areas of semi-arid to arid woodland and bushland (under great pressure for charcoal production).

The interviewees broadly agreed on four **priorities for conservation action**. These were:

- motivation of the public to conserve plants, based on the message that plants are valuable, including as resources for items of everyday use. The interest of many people in medicinal plants was noted. A number of mechanisms to raise public motivation were mentioned. These included formal and informal education, encouraging nature clubs, producing publications suitable for the public (such as field guides) and allowing the harvesting of plant resources in protected areas, in cases where this can be done sustainably;
- training. Two priority subjects at postgraduate level were noted – taxonomy and ethnobotany;
- support for community-based conservation;
- better management of protected areas, including through the engagement of communities in their systems of management.

Other fields in which conservation actions were considered desirable included promotion of cultivation to help take pressure off over-harvested wild plants (e.g. planting *Casuarina* to replace palms as sources of termite-resistant poles in Uganda) and surveys to identify priority sites and species for follow-up conservation actions. In the cases of Kenya in particular, there were calls for revision of systems of land tenure and for the gazettment of further protected areas.

The following were not seen as priorities (a statement which should not be interpreted to mean that they are of no significance): revision of laws (except to legalise the involvement of communities in the management systems of protected areas); *ex situ* conservation; control of invasive species; and habitat restoration.

### **Madagascar**

The most serious **threat** to plant diversity, according to the WWF-Madagascar PO, is loss of primary types of vegetation, due to: clearing for agriculture; removal of woody plants for fuelwood and charcoal; timber exploitation (especially in the western region); and fires, started to promote cattle pasture. The most threatened habitats were considered to be:

- moist eastern and littoral lowland forests. These are rich in endemics, small in size, highly threatened by cultivation, mining and fire, and inadequately represented in the network of protected areas;
- southern dry forests and xerophytic bush. These vegetation types are fragile because of the extremely slow rates of growth of their plants. Human pressure is very high – agricultural, cattle and charcoal extraction;
- wetlands, under pressure from the spread of paddy rice and erosion;
- heathland, endangered by cattle grazing.

**Priorities for conservation action** were identified:

- education, especially of young people, on the wise use of natural resources;
- selection and effective protection of a network of protected areas that adequately represent all vegetation types within phytochoria.

### **South Africa**

South Africa is special country in terms of global plant conservation in that it contains two types of vegetation, fynbos and succulent karoo, of outstanding floristic wealth. There are aspects of the floras of these vegetation types which are of economic interest, notably for horticulture or floriculture. However, the fynbos, in particular, has few species of current economic value (including for subsistence), in comparison to the size of the flora and compared with many other vegetation types. This has implications for the ways that conservation should be approached, notably because it can be relatively difficult to justify setting aside land for conservation of biodiversity in the face of competition from other forms of land-use.

The interviewees reported that the fynbos flora is under great **threat** from invasive species, as well as from habitat loss and fragmentation. Some of the worst invaders are Australian acacias, *Hakea*, and pines. The main causes of habitat loss and fragmentation are expansion of agriculture, mining and settlement. Lowland fynbos, in comparison with mountain fynbos, is especially **threatened**, mainly because the land is more suitable for agriculture and settlement. Fynbos along the coast is very poorly protected: there are hardly any protected areas. More than 90% of one fynbos type – lowland Renosterveld, found on fertile shale-derived soils – has already been transformed for agriculture; only fragments remain. A threat mentioned for some fynbos species, also relevant to the succulent karoo, is collection of wild plants for trade. A considerable number of plant species both in the fynbos and succulent karoo, offer attractive flowers or foliage, or are valued as house-plants (the succulent karoo has many beautiful succulents). An additional threat to the succulent karoo is over-grazing.

As for threats to other vegetation types, interviewees noted that forests (very restricted in extent in South Africa) are often threatened by incursions by fire, over-grazing by domestic stock, over-collection of plant resources (e.g. pole-cutting and removal of wood for the manufacture of carvings) and the incursions of invasive plants (e.g. *Pereskia aculeata* – Barbados Gooseberry, and *Acacia gregii* – Cat's Claw). Grasslands are sometimes threatened by schemes for afforestation with exotic species and also by plant invaders.

Interviewees considered that **priorities for conservation action** to protect the floras of the fynbos and succulent karoo include a greater number of protected areas and more active participation in conservation by private land-owners. Many actions are already being taken by governmental and voluntary agencies to combat invasive species in the fynbos, but the sum of these is inadequate and the battle against invasive species needs to be intensified. One scheme *Working for Water*, run by the Department of Water Affairs and Forestry, was mentioned as a good example of the potential for imaginative initiatives. It combines the removal of alien plants, mainly acacias, with the incentive to the workers involved to gain additional income through being allowed to sell privately the *Acacia* wood which they cut. The Department has an interest in removing acacias because they extract much water from catchments and should be removed anyway to maintain water supplies. Actions suggested by interviewees to combat the other threats noted tended not to be very specific, referring to the general need to reduce over-grazing and to control plant-collecting in the succulent karoo, and better protective measures for the forests and grasslands.

The politics of the 'new' South Africa has implications for plant conservation. For a long time, South Africans of mainly European descent have set the agenda for plant conservation and dominated the field professionally. Government funding for conservation has become reduced in the new political environment as other pressing issues compete for financial resources. A challenge facing conservationists is how to expand the conservation agenda to include a wider set of conservation (and related developmental) concerns, while, at the same time, not losing sight of the need to take actions to conserve the globally outstanding floras of the fynbos and succulent karoo. Institutions engaged in plant conservation need to find ways to recruit, retain and promote staff that combine recognition of professional competence with provision of opportunities for members of social groups that have been traditionally disadvantaged.

## **Zimbabwe**

The biggest **threats** to plant diversity were held to be expansion of human settlement and expansion of cultivation, particularly when this is into marginal, semi-arid, ecosystems. One aspect of agricultural change, causing loss of plant habitat, is the recent turning over of large tracts of land to cotton production. The declining macro-economic status of Zimbabwe, marked by falling real wages and opportunities for formal employment, was noted as having a serious deleterious impact on the environment, including on plants. Dependency on resources of wild plants has increased, for instance to supply fuelwood to urban areas. A further issue in some places is the destruction of vegetation caused by the over-stocking of large mammals, particularly elephants.

The most threatened types of habitat were considered to be dry forest (reduced to pockets) and montane grassland.

Land issues figured prominently in suggestions about **priorities for conservation action**. Reallocation of existing farmland, notably that held by white farmers, is a matter of topical political debate. A more general question is that of land-use planning and land rights in the country as a whole. Questions of land allocation and tenure are long-standing political issues. Better land-use planning is seen as a priority. Such planning could be advantageous for plant conservation if official recognition and protection is accorded to places of special botanical interest. Therefore, a priority for botanists is seen as making information about priority areas for plants available to planners in accessible forms. Other conservation actions seen as desirable include finding ways to enhance the values of wild plant resources to communities (i.e. presumably hoping that this will reduce the quantities collected in exchange for greater returns per volume harvested, or through raising the motivation of people to manage the plants better) and culling elephants.

### 4.3. Asia

The survey mainly covered four countries, Malaysia and three countries in South Asia – India, Nepal and Pakistan (discussed jointly).

#### Malaysia

Interviewees reported the biggest **threat** to plant diversity to be loss of habitat, especially of lowland forest and especially primary forest. Large tracts of forest still remain, though much of this has been logged, sometimes repeatedly at short intervals. Extensive areas of forest have been converted to plantations, notably of rubber and, in more recent years, oil palm. Borneo has recently experienced several incidents of severe burning, presumably presaging further disasters to come. Secondary forest and peat swamp forest are forest types particularly susceptible to burning. On the whole, montane forest has been better preserved than lowland forest, partly because it tends to be less accessible (including to loggers). However, logging in Malaysia has been extending from the lowlands into the hills. More local threats include the expansion of hill-resorts along the Main Range of Peninsular Malaysia and mining, an especially serious threat to the many locally endemic species of plants found on limestone outcrops. The collection of ornamental plants, notably orchids and pitcher plants, is a serious problem, yet to be seriously tackled.

The top **priority for conservation action** was considered to be protection of examples of forest, especially at critical sites and in pristine condition. Lowland forest is a high priority, given the large areas which have already been logged (sometimes repeatedly) and the great threats which they continue to face from logging and conversion to plantations or agriculture. Other forest types requiring protection include forests on limestone and ultramafic rocks, coastal forests (including peat swamp forest and mangrove – threatened by coastal development and unsustainable harvesting) and some areas of montane forest (especially at lower altitudes). The locations of sites particularly rich in plants are believed to be known in broad outline, but there is an urgent need for detailed inventories to assist local land-use planning.

All those interviewed considered that protected areas are essential to protect good examples of the forests. Inadequacies of some of the existing protected areas were noted, including poor demarcation on the ground, insecure legal status and a shortage of trained staff (required, *inter alia*, to guard against illegal incursions by loggers).

The involvement of communities in conservation is increasingly being seen as important, both in relation to protected areas and elsewhere. The need was noted for more applied ethnobotanists, able to work with communities on practical issues of conservation and sustainable development.

Although given a somewhat lower priority than protected areas, some interviewees considered that more attention should be given to Production Forests (set aside for timber production). They pointed out the desirability of more research to develop methods of harvesting timber and forest management favourable to plant conservation. Forest certification was seen as a useful tool for promoting better logging and forestry practices.

Interviewees gave *ex situ* conservation a low priority, emphasising that the urgency now is to concentrate on trying to protect important surviving habitats. They also regarded CITES as a weak conservation tool, at least in the way it is currently applied in Malaysia. Invasive organisms were not regarded as a serious threat.

## South Asia (India, Nepal, Pakistan)

Interviewees identified the main general **threats** to plant conservation as loss and degradation of habitat, especially forest. All three countries have experienced major loss and degradation of forest in recent years, including through the over-harvesting of plant resources, such as timber, fuelwood, fodder and medicinal plants. The regeneration of trees is often hampered by over-grazing. Governments have found it difficult to enforce laws and regulations.

There has been a major rethink of aspects of forest policy in India and Nepal over recent years. Nationalisation of the forest estate in Nepal in 1957 resulted in great forest loss and this, in turn, triggered a revolution in the approach of government to forests. The involvement of communities in forest management came to be perceived as fundamental to their conservation. Starting in the early 1980s, the country is now recognised as a world leader in community-based forest management through its Community Forestry Programme. India is well known for its experiments in Joint Forest Management, also initiated in the 1980s and involving agreements between Forestry Departments and communities. The position is different in Pakistan, where the government has been little engaged in involving communities in forest management. The tribal areas in the north of Pakistan are exceptional in that, according to the national Constitution, the forests there are largely outside governmental control. One of our interviewees reported that the rate of deforestation is particularly rapid in the tribal areas of Pakistan, but there are also reports of cases where communities have been quite successful in conserving their forests.

The interviewees mentioned several habitats and sites important for plants which are critically threatened and require urgent conservation attention. In the case of India, these habitats included: high altitude Himalayan forest and pasture; mangrove forest (particularly on the west coast); shola forest in southern India; and the vegetation of freshwater lakes. Priority sites included the Andaman and Nicobar Islands, Sikkim, Arunachal Pradesh, the north-eastern states, and the Western and Eastern Ghats. Critically threatened habitats mentioned for Nepal included: low altitude tropical forest (including sal *Shorea robusta* forest); mid-hill forest (including *Castanopsis* forest); and alpine habitats. Key habitats noted for Pakistan included: moist temperate forest (the highest priority); juniper forest (Baluchistan), chilgozha *Pinus gerardiana* forest (Baluchistan and North West Frontier Province); semi-desert (Baluchistan) – subject to over-grazing; scrub forest of *Olea ferruginea* and *Dodonaea viscosa* – often readily accessible and subject to over-cutting; mangrove forest; and mountain pasture. One interviewee commented that deforestation was such a serious problem in the Himalayas that any opportunities to save substantial tracts of forest anywhere should be given urgent attention.

There are many particular local threats to plants. For instance, a dam planned for the Palas valley, Koistan District, Pakistan will place under threat at least 3 species of restricted distribution, *Jasminum leptophyllum*, *Rhamnella gilgitica* and *Ulmus villosa*.

The top **priority for conservation action** in South Asia was widely held to be the better involvement of local people in conservation. Reasons given for this opinion included the (often) high local population density (the presence of local people cannot be ignored), the high level of dependency of rural people on wild plants (both for subsistence use and sale) and the great botanical knowledge of many local people (actually or potentially of benefit to better management). Within the umbrella call for greater involvement of local people, the particular need to integrate communities better into the management systems of protected areas was widely noted. It was pointed out that there would be many benefits if experiences from individual integrated conservation and development projects (ICDPs) could be shared, with best practices identified and promulgated. However, it was not only in connection with protected areas that greater involvement of local people in conservation was regarded as important. Many threatened plants grow outside protected areas and there are many instances of over-harvesting of plant resources which require addressing at village-level. More action is needed to conserve crop land races, many of which are threatened.

It was pointed out by some interviewees that plants growing in the local landscape provide resources central to the livelihoods of most people in South Asia. Villagers typically have a much more vital interest in wild plants than wild animals; there is no doubt that a good way to involve communities in conservation generally is through focusing on issues relating to sustaining supplies of plant resources, even when the initiative for a conservation project may stem from outside concern for

conservation of large animals. Some of the many NGOs working in India with rural communities have had some success in conservation taking this approach. Medicinal plants often figure prominently in their projects, a typical dual strategy being to use them to create public awareness about the need for plant conservation, starting from the basis of community concerns about supplies of medicinal plants, and to promote the cultivation of threatened species in demand.

In principle, the pressure on over-harvested wild plant resources could be lessened either through creating alternative sources of plant resources through cultivating the same or other species, or through the enhancement of income by other means, enabling people to purchase alternative supplies. However, many rural people in South Asia are very poor and have few realistic economic options. Therefore, it is important that cultivation succeeds. There can be many hazards. Schemes promoting cultivation may not succeed unless benefits accrue to those actually engaged in gathering the wild plants, rather than relatively rich land-owners. There is also a need to combine promotion of cultivation with measures to protect wild populations better, whether this be solely through community institutions or agreements between communities and agencies. Some interviewees noted that community-based conservation and development projects need to be undertaken with dedication. Unexpected problems can arise. For instance, a scheme in Nepal to take the pressure off wild populations of rosewood (*Dalbergia latifolia*) by promoting its cultivation was threatened with collapse when disease struck the cultivated trees. A disillusioned community threatened to abandon the project.

Some interviewees pointed to the potential of sacred forests, which are common in South Asia, as focal points for initiatives in community-based conservation. Although sacred forests are often very small and not particularly rich in species (in comparison with pristine examples of equivalent types of vegetation), they can represent virtually the only surviving remnants of more natural types of vegetation in the neighbourhood. Prominent examples in India include Mawphlong (Law Pyngdoh) in Meghalaya, Kavus/Devakavus in Kerala and Deorais in Maharashtra. Small sacred groves of *Acacia* thorn forest or *Olea* forest represent the only surviving fragments of these formerly widespread vegetation types in parts of Pakistan (in the Punjab and Himalayan foothills respectively). Many sacred forests are poorly managed today, a product of , social cultural and economic change. The opportunities for conservation presented by sacred forests are widely recognised by conservationists, but as yet apparently little exploited.

Many interviewees ranked education as a priority for plant conservation. This was partly because of the perceived importance of involving the general populace in conservation in South Asia. It was also because education was felt necessary to promote changes in attitude and knowledge, making it easier to adopt necessary new policy measures.

All the interviewees regarded protected areas as very important for plant conservation. Many also pointed out that the systems of protected areas were not established much with plant issues in mind. There is a need to take stock of plants covered in the existing networks of protected areas, identify gaps in the systems and establish new protected areas at priority plant sites. No great priority was accorded to revising legislation, except for Pakistan, in which case some interviewees held that policies regarding protected areas need to be rethought to find ways of including local people better in their systems of management. The Centre for Environmental Law (with which WWF-India is working) liaises with the government over proposals to amend environmental policies and laws, and has established a Diploma Programme in Environmental Law attended by students from the South Asian region.

The need to train professional plant conservationists was widely identified. Priority disciplines mentioned included taxonomy, ecology and ethnobotany, especially aspects of these subjects of an applied nature. Expertise in horticulture and in the marketing of plants in trade were mentioned as sometimes valuable skills for conservationists to possess in work with communities.

Some interviewees believed that conservationists should give more attention to placing trade in wild plants (including timber and medicinals) on a more conservation-friendly basis. One interviewee in India believed that the regulations relating to the movement of plants along trade networks need to be strengthened. Whatever the desirability of such revisions, many interviewees pointed out that laws in South Asia relating to plant trade are often not adequately enforced, making it



correspondingly more important to pursue other avenues of conservation, such as working with communities on systems to harvest wild plants sustainably.

There is considerable concern, especially in India, about the inadequacy of regulations relating to the exploitation of biodiversity for commercial purposes. Some prominent cases have drawn widespread attention to the need for new regulations and business practices to ensure a fair return of benefits to those countries and sites, from which materials for biodiversity prospecting have been obtained, and the desirability of reviewing policies and laws relating to rights over intellectual property.

Some interviewees mentioned that the flora of South Asia is reasonably well known, though more information is required on the distribution and ecology of species, and the levels of threat to which they are subject. It was noted that 3 volumes of plant Red Plant Data books have been prepared for India, there are many papers on the threatened plants of individual Indian states, a volume on the rare and endangered plants of Nepal has been published and a checklist of the threatened plants of Pakistan is being prepared by the Forest Research Institute of Pakistan.

There is debate about the degree to which invasive plants constitute a threat in South Asia. Problem species include *Chromolaena odorata*, *Eichhornia crassipes*, *Lantana camara*, *Mikania micrantha* and *Parthenium hysterophorus*. *Broussonetia papyrifera* is a nuisance around Islamabad, where many people have proved allergic to its pollen. *Ex situ* conservation was ranked as a low priority (compared to *in situ* conservation) by all those interviewed.

#### 4.4. Europe

The survey mainly covered three countries, Greece, Italy and the United Kingdom. The European Union (EU) is a super-regional political structure, uniquely important for plant conservation in the global context. Many interviewees referred to the great significance of the policies of the EU in deciding the fate of plant diversity within its member countries.

All interviewees regarded the biggest **threat** to plant diversity in Europe as loss of habitat through agricultural intensification. A related threat was reported to be the spread of monospecific plantations, often of conifers (e.g. in the UK) or *Eucalyptus* (e.g. in Portugal). There have been massive changes in the landscape over recent decades, especially in western Europe. For example, between 1957 and 1992, Britain lost 50% of its lowland fens and mires, 60% of its lowland heath, 80% of its chalk downs, 95% of its hay meadows and 200,000 kilometres of its hedgerows (Ponting, 1992). Many areas of broad-leaved forest have been replaced by conifers. These transformations are due partly to technical innovations in agriculture. In Britain for example, these have included an 8-fold increase in nitrogen-based fertilisers (1955-1976) and a 30-fold increase in pesticides (1945-1990s) (Clapp, 1994). Apart from technical innovations (some of which might have happened anyway), all the interviewees considered that the policies of some countries (e.g. the UK) as well as of the European Union have seriously contributed to loss of environmental quality, including in terms of plant diversity. These policies have encouraged the over-production of crops, the planting of some types of crop repeatedly in the same fields (especially cereals), the over-stocking of livestock, and excessive applications of pesticides and inorganic fertilisers.

There has been great loss in traditional knowledge about the local environment, including about plants. Major loss of traditional rural cultures occurred relatively early in more intensively-farmed parts of northern Europe. Decline in a widespread local woodland culture in Britain dates back many decades, related to the take-over of woodlands by the gentry during the Agricultural Revolution and widespread replacement of wood by fossil fuel. Parts of eastern and southern Europe have retained more of their traditional farming practices, including in mountainous regions unsuitable for industrial farming. But in southern Europe, too, relatively traditional ways of rural life are in decline. There is a major drift of people, especially young people, away from rural villages, attracted by the economic and cultural possibilities under offer elsewhere. Decline in traditional farming around the Mediterranean is regarded by Médail as a serious threat to plant conservation (Médail and Quézel, 1997). Vegetation is often growing taller in stature as grazing and other pressures are reduced. The loss of vegetation types of low stature, especially pasture, is a threat to conservation of plant diversity, since such vegetation types are among the most botanically-rich of Mediterranean

ecosystems, including in endemics. Ranker vegetation and decreased environmental care on the micro-scale have contributed to an increased frequency of destructive large-scale fires (Delanoë et al., 1996).

Protected areas were regarded by all those interviewed as a high priority for plant conservation. However, they were all sceptical of the adequacy of existing networks of protected areas in terms of the areas covered. Everyone agreed that the management of many protected areas is poor. Apart from a few areas owned outright by states, many protected areas are under private ownership (e.g. many Site of Special Scientific Interest [SSSIs] in Britain). Adequate levels of co-operation from landowners in conservation are frequently not forthcoming.

The active management of protected areas and other sites important for plant conservation in Europe is often required to maintain or create those vegetation types regarded as of particular botanical interest. This is especially the case in more intensively farmed areas, where areas of relatively natural vegetation have been reduced to scattered fragments and anyway differ considerably in structure and floristic composition from the vegetation types which would have been present had people never existed. The habitat base-line in conservation efforts is often that which prevailed before the introduction of modern industrial farming. Nature conservation agencies and charities can be successful only very locally in maintaining traditional practices (or applying measures which mimic these practices). A return to a more botanically diverse landscape on any scale awaits serious agricultural reform.

Interviewees expressed relatively little concern over deprivations caused by the harvesting of wild plants. In contrast, it was pointed out that decline in the harvesting of bark from cork oak (*Quercus subur*) in the Iberian peninsula could result in a significant reduction in biological diversity since cork oak forest is biologically richer than the likely future replacements. Wild fungi are widely harvested in Europe, where many species are becoming rarer. Some communities have regulations over the quantities of fungi that may be collected. These may help, but acid rain probably contributes importantly to fungal decline, beyond the reach of such local measures. Generally, the harvesting of wild plants occurs on a larger scale in eastern and southern Europe than in the north. There is some concern over the collection of medicinal and aromatic plants (including orchids for salep in Turkey), and bulbs. A survey of the trade in medicinal and aromatic plants in Europe reported 150 species as threatened in at least one European country as a result of over-collection (Lange, 1998), but trade networks have been little explored, the trade is largely unmonitored and the state of endangerment of most species on wider scales is difficult to assess.

Although there are reports of collectors targeting rare plants because they are rare (e.g. in Greece (Phitos et al., 1995)), the degree of threat to rare plants from fanatical collectors or specialist traders (e.g. in the case of decorative species) is probably relatively small, though, of course, serious when it occurs. This type of threat is regarded as less significant in Britain now than it was in Victorian times (Marren, 1999).

Acid rainfall is a major threat to plant conservation, especially in Northern Europe (Murlis, 1995). The habitats at greatest risk are those which are naturally poorly buffered in bases, for instance heathland. A survey has shown acidification to have adversely influenced 141 Sites of Special Scientific Interest (SSSIs) in Britain, these being mainly in upland areas (Farmer, 1995). Acid rainfall is responsible for major damage to trees in Europe – no fewer than 40% of trees in Austria were found in 1990 to have suffered some level of canopy defoliation (Shepherd et al., 1998). Acid rainfall has a fertilising effect, because it contains nitrogenous compounds. Recently, this fertilising effect has been found to be causing major habitat change in Europe, influencing many plant species. Even habitats well buffered against acidity are affected, for instance calcareous grassland, in which the growth of rank grass can smother shorter, more botanically interesting, types of vegetation (Bobbink et al., 1998).

Interviewees identified a number of habitats under particular threat. These included 'soft' coastal habitats (such as sand-dunes) threatened by coastal development. This is a major issue around the Mediterranean where such habitats can contain local plant endemics. Loss of wetlands is another major concern, including for the conservation of European bryophytes [Bryophytes, 1995 #234]. More eutrophic types of wetland are widely under threat from drainage for agricultural development. More acidic wetlands, though floristically poor, are nevertheless of considerable

conservation interest. The raised and blanket bogs of north-west Europe are unusual geo-biological features: they are widely threatened by peat-mining, acid rain and, in the case of blanket bogs, over-grazing by sheep. More natural types of grassland, including steppe, are also widely under threat; they are commonly reduced to isolated pockets. Our interviewees failed to rank forest as a habitat of conservation priority for plants. This should not be interpreted as meaning that forests are not important habitats for plants, including for some rare species. Indeed, one of the two critical habitats for conservation of bryophytes in Europe is forest (the other is wetlands) [Bryophytes, 1995 #234]. Perhaps the relative lack of concern about forests is because, unlike most parts of the world, the area of forest in Europe has actually increased over recent years.

The top **priorities for conservation action** mentioned by our interviewees (for EU countries) were reform of the Common Agricultural Policy (the major environmental criminal among the policies of the EU) and full implementation of the Habitats Directive. These are not the only policy instruments of the EU which have significant influence on plant conservation, others mentioned by interviewees included Structural Funds and Cohesion Funds, to which may be added EU regulations relating to trade in endangered species. The Habitats Directive requires countries to nominate species and areas of habitat for protection. The areas so nominated will be considered for inclusion in a network of sites for special protection (the Natura 2000 Network). Greece, Spain and Sweden are said to be nominating about 15% of their territories for inclusion in the Natura 2000 Network, compared with only 2.8% in the case of the UK. Both WWF-UK and the dedicated plant conservation charity Plantlife regard the latter figure as unacceptably low. However, it is not only percentages that count. Greece, for instance, has some serious practical problems which restrict its abilities to conserve plants effectively, whatever the good intentions of the state. There are many unresolved problems of land tenure, some dating back to Ottoman times, as well as questions about institutional responsibilities for conservation, at present being addressed by the Ministry of Environment and Public Works (which it must do if the sites nominated by Greece for the Natura 2000 network are to be accepted).

The conservation of plant diversity in Europe, considered as a whole, is critically dependent on events in southern Europe, since this is where species and genetic diversity (including genetic diversity within many species) are concentrated. Facetiously, it could be said that covering the whole of Europe north of the Alps with concrete would have less effect on the sum total of global plant genetic diversity than so covering a single critical mountain range in Spain, Greece, Italy or Turkey (though this is not recommended). There are many local plant endemics in southern Europe, often found in places which are naturally ecologically isolated, such as mountain tops, cliffs, sand-dunes and islands. Hundreds of plant species are said to be threatened in southern Europe (Médail and Quézel, 1997) (Delanoë et al., 1996), although 'only' 25 species are known to have become extinct during the last 400 years (WWF and IUCN, 1994).

Some European countries, such as Sweden and the UK, have sufficient financial and institutional resources, as well as sufficient degrees of national cultural interest in biological rarity, to mount quite comprehensive action plans to save threatened species. These can involve guarding particular populations of plants, taking actions to multiply their populations where necessary, and backing up *in situ* work with *ex situ* conservation. This type of approach seems unlikely to be adopted on any substantial scale in most southern European countries, though encouragingly there are moves towards such a comprehensive approach to plant species conservation in Spain. Akeroyd (Akeroyd, 1999) recommends the creation of more protected areas, not only large reserves (which are relatively feasible for botanical hotspots on mountains), but also micro-reserves in the more populated lowlands. He points out that many rare or endemic lowland species are confined to special habitats, such as areas of unstable soil, cliffs or saline soils. An adaptation of this approach is already being implemented by DHKD in Turkey, providing an example which it could usefully share with other Mediterranean countries. The methodology used by DHKD involves a listing of habitats, then the ranking of these habitats according to their vulnerability, then a listing of sites within habitats and then a ranking of these sites according to their priority for conservation. Actions desirable for conservation are then identified for the sites which emerge as priorities from this process, and these are followed up with practical steps. The types of actions required can range from trying to influence local or central government, industries, land-owners or communities, or mounting public campaigns championed by DHKD itself.

WWF and other organisations are involved in a campaign to encourage environmentally friendly forestry in Europe. The linked mechanisms used are promotion of certification of forests under the standards of the Forest Stewardship Council and labelling of timber emanating from these forests as 'good wood' at points of sale. There are signs that this approach is working reasonably well, though FSC must compete with other certification systems. Eventually, it might result in greater plant diversity over substantial tracts of forest. It is less certain that this campaign will have much effect on conservation of plant species and genetic diversity in Europe considered as a whole, given their geography on the European scale.

#### 4.5. Ranking of plant conservation priorities (results of a questionnaire survey)

This section gives a summary of the answers to a question in the questionnaire survey. Fifty-seven people interested in plant conservation provided scores to items on a list of possible priorities for conservation action (Table 1).

The highest perceived priority, for all regions considered together, was **strengthening of community-based conservation**. The second highest overall priority was **improving the management of protected areas** (seen as related, in part, to greater community involvement). There then followed, in turn, **education** (about the importance of plant conservation), **revising protected area networks** (regarded as significant because many do not adequately cater for conservation of plant diversity), revising **legal provisions** relating to the harvesting or collection or plants, and **training**. Low priorities were accorded to the control of invasive species (perceived as a priority only locally, as for South Africa), *ex situ* conservation, and revision of regulations relating to plant trade and protected areas (except as relating to community involvement in their systems of management).

**Africa and Asia.** Highest and lowest priorities were given broadly to the same potential actions as in the overall score. This is perhaps not surprising given, given the numerical bias in terms of numbers of respondents for these continents.

**Europe.** Exceptionally high priorities, compared with overall scores, were given to **revision of rules relating to plant collection or harvesting** and to **restoration** of vegetation. The latter is a reflection of the high degree of human modification of habitats in much of Europe.

**South America.** As with Europe, a high priority was accorded, in comparison to the overall scores, to **revision of rules relating to plant collection or harvesting**. Surprisingly, community conservation merited a relatively low score.

Generally, WWF and non-WWF staff gave similar responses. However, greater emphasis was given to **restoration of vegetation** by WWF staff (perhaps related to their frequently greater involvement with practical field operations) and a lower priority to identifying priority plant sites (possibly related to the problems of practical engagement at priority plant sites already known).

#### 4.6. Conclusions

1. **Plant conservation requires people of many skills.** Plant conservation requires actions on many fronts and by people with a variety of skills. We do not wish to decry the value of work in fields which emerge low in lists of priorities given in this report; indeed, such work may be essential to overall success. Rather, we are attempting here to identify those aspects of plant conservation which require special attention at the present time.

2. ***In situ* conservation is normally the priority.** The diversity of plants in the world as a whole is threatened by a decline in more natural types of habitats and a tendency towards biological homogenisation. Industrial varieties of crops are spreading at the expense of traditional landraces, areas of more primary vegetation (often richer in local endemics) are being lost to secondary vegetation types (many species of which are geographically widespread) and by the advance of alien plants. Virtually all our interviewees regarded *in situ* conservation as the priority at the present time.

Although not mentioned by our interviewees, we believe that there are exceptional cases where a significant allocation of resources for *ex situ* conservation (though linked to *in situ* conservation) is justified. These include conservation of the floras of some oceanic islands (in which populations of many plant species can be severely reduced in numbers) and conservation of crop landraces (in which case, *ex situ* systems should be designed in part to provide direct benefits to local farmers). *Ex situ* conservation is only practical on a large scale, as a tool for conservation of plant diversity more generally, in countries which are financially rich and in which there is a strong cultural interest in the conservation of botanical rarities.

POTENTIAL ACTIONS	AFR	ASI	EUR	LAC	GLO	ALL REGIONS		
						TOTAL	WWF	Non WWF
<b>Education, training and public awareness</b>								
Training (practical disciplines)	12	10	8	13	14	10	8	9
Education relating to plant conservation	11	11	15	15	15	13	13	13
Raising public awareness	13	14	9	6	14	8	10	10
<b>Laws, regulations and conventions</b>								
Revising protected area legislation	8	2	11	6	5	4	6	3
Revising rules relating to trade in plants	1	3	4	9	5	3	3	4
Revising rules relating to plant collection or harvesting	4	6	15	15	8	11	9	7
<b>Socio-economic factors</b>								
Strengthening the commitment of industry to plant conservation	6	7	5	9	9	6	4	11
<b><i>In situ</i> conservation</b>								
Revising the protected area network (size, number, etc.)	6	5	5	13	12	12	12	8
Improving protected area management	14	13	14	13	12	14	14	13
Strengthening community-based conservation	15	15	8	10	12	15	15	15
Controlling invasive species	5	1	2	4	5	1	1	2
Restoring vegetation	2	8	12	7	8	7	11	5
<b>Information and planning</b>								
Identifying priority plant sites	11	12	11	4	8	9	7	14
Identifying threatened species	9	9	3	4	5	5	5	6
<b>Other</b>								
Promoting <i>ex situ</i> conservation	3	4	1	4	1	2	2	1
<b>TOTAL NUMBER OF RESPONDENTS</b>	<b>22</b>	<b>20</b>	<b>6</b>	<b>3</b>	<b>6</b>	<b>57</b>	<b>28</b>	<b>29</b>

Table 1. Ranking of potential actions for plant conservation according to priority (15=highest priority; 1=lowest priority). Respondents were asked to give scores to a number of possible priority items (left-hand column) listed in a questionnaire. The scores given for items per region are rankings based on the sum of scores returned by all respondents per region. Some respondents failed to give scores to some (usually a few) items: these are regarded as being awarded zero scores for the purposes of calculations here. The scores given in the final three columns are rankings for all responses added together (all respondents, then split in the final 2 columns into WWF and non-WWF personnel); no correction has been made in these totals for differences in the numbers of responses per region. Codes: AFR=Africa; ASI=Asia; EUR=Europe; LAC=Latin America & Caribbean; GLO=plant conservation generally (not regionally restricted); ALL=all areas considered together.

**3. Conservation must be integrated with development.** The practical pursuit of *in situ* conservation requires recognition of the strong forces, operating at all social levels, calling for economic expansion or development. Additionally, the natural environment is under great pressure in poor countries for the provision of natural resources for immediate benefit, including human survival. There is therefore a need to integrate conservation with development at every level, from the village to the state, and for the world as a whole.

**4. There is a need for greater public awareness of the importance of plant conservation.**

Several of our interviewees drew attention to the need to create greater awareness about the importance of plant conservation at every social level. Such awareness should include the concept of conservation priorities – that certain places and certain species require special attention. Wider appreciation of the desirability of plant conservation needs to be built on aspects of the cultures of social groups already favouring conservation. For instance, several of our respondents noted that medicinal plants often provide a valuable starting point, since they are of interest to people in many social groups, there are many medicinal species (the number of medicinal plants constitutes the biggest category of use of the biological world in terms of numbers of species specifically targeted) and because the relationships between conservation and development can often be made obvious.

**5. The involvement of local communities is essential.** A very high priority expressed, particularly by interviewees concerned with developing countries, was the need for the strong involvement of local communities in plant conservation. The livelihoods of many rural people in most developing countries are strongly linked to the exploitation of wild plants. The need for greater involvement of private land-owners was also noted, especially in the case of richer countries.

**6. Protected areas are essential.** Protected areas were regarded by all interviewees as an essential element in conservation of plant diversity. However, there were many expressions of concern about their often inadequate siting. Management of protected areas was regarded as almost universally poor. There was widespread insistence that local communities should be much more involved in the management systems of protected areas, especially in cases where there is reliance on wild plant resources. The inadequacy of legislative provision for the involvement of local communities in the management systems of protected areas was widely noted.

**7. Reform of legal measures is a relatively low priority.** Interviewees generally regarded reform of legislative measures as a low priority. There were two exceptions. One was the need in many countries for legislative reform to allow communities more involvement in the management systems of protected areas. The other concerned the European Union, in which case reform of the Common Agricultural Policy and full implementation of the Habitats Directive were at the top of the agenda. The latter reflects a stronger faith in the effectiveness of legal provisions for conservation than is normal in most parts of the world.

**8. Regulation of trade in wild plants is needed, though difficult to effect.** There was much concern about deprivations caused by the unsustainable harvesting of wild plants, including for timber, fuelwood and other commodities. Forest certification, concentrating on provision of timber, may be beginning to be effective in Europe, but is little developed elsewhere. There is much need for development of more effective approaches and methodologies to deal with conservation of plants yielding non-timber forest products in trade.

**9. Much could be gained by more exchanges between places and countries.** Many species and many issues are common between different localities, yet there is often little exchange of information or of experiences in conservation between them

## 5. PRESENT CONTRIBUTIONS OF WWF TO PLANT CONSERVATION

### 5.1. Analysis of the WWF project list

A list of WWF plant conservation projects is given in Annex 2. This analysis is based on projects active in 1999, or shortly before. The list is based, in the first instance, on projects included in the International Project portfolio. An effort has been made to check whether these projects are actually active and some modifications have been made accordingly (additions and subtractions). The projects included are those believed to contribute significantly and rather directly to plant conservation, a judgement normally made on the basis of very incomplete information. Most projects dealing with protected areas and community-based conservation are included, unless they obviously relate rather narrowly to animal conservation.

NUMBERS OF PROJECTS	MAIN THEME OF PROJECT													Total	
	CA	CO	IC	IN	PA	PL	PO	PU	RE	SP	ST	SU	TR		UN
Multi-regional	1		1				2					2	2		8
Africa	1	9	18	5	23		1	4		2	7	3		2	75
Asia/Pacific	6	15	24		10	3	5		1	3	9	7	7		90
Europe	2	1	8		16	6	15	3	5	3	6	9	1	2	77
Latin America/Caribbean	1	5	15	1		1			1		4	4			32
<b>Total</b>	<b>11</b>	<b>30</b>	<b>66</b>	<b>6</b>	<b>49</b>	<b>10</b>	<b>23</b>	<b>7</b>	<b>7</b>	<b>8</b>	<b>26</b>	<b>25</b>	<b>10</b>	<b>4</b>	<b>282</b>
<b>PERCENTAGES OF PROJECTS</b>															
Multi-regional	13		13				25					25	25		
Africa	1	12	24	7	31		1	5		3	9	4		3	
Asia/Pacific	7	17	27		11	3	6		1	3	10	8	8		
Europe	3	1	10		21	8	19	4	6	4	8	12	1	3	
Latin America/Caribbean	3	16	47	3		3			3		13	13			
<b>All areas</b>	<b>4</b>	<b>11</b>	<b>23</b>	<b>2</b>	<b>17</b>	<b>4</b>	<b>8</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>9</b>	<b>9</b>	<b>4</b>	<b>1</b>	

Table 2. Themes of WWF plant projects by number and percentage. Note: this is not a full list of WWF projects (see text). Codes: CA Capacity building; CO Community-based conservation; IC Integrated conservation and development; IN Invasive species; PA Protected area; PL Planning; PO Policy (includes laws, conventions, national strategies); PU Public awareness; RE Restoration; SP Individual plant species; ST Studies, research; SU Sustainable use; TR Plant trade; UN Uncertain theme (but believed to concern plants).

The list is known to be very incomplete as a full inventory of WWF plant-related work, as projects run by most NOs and Affiliates within their own countries are excluded. However, a sample of projects run by NOs was examined, the countries concerned being Italy, Greece, Malaysia, Pakistan, South Africa and the UK. Several other NOs, including WWF-Australia, have substantial programmes in plant conservation, but limitations of time precluded their inclusion in the analysis.

A list of projects by itself is not very informative. For instance, it tells us nothing about the scale of the projects or whether they are successful. It was felt useful to take the analysis one stage further through assigning a primary conservation theme to each project, based on information available. These assignments may not be individually very accurate, but overall the sum of such assignments probably gives a reasonable indication of the main directions of work by WWF. The categories of themes chosen are shown in the caption to Table 2.

Ecoregion-based conservation projects have been excluded from the analysis. Project labelled "Ecoregion-based conservation in Ecoregion \_\_\_\_" (or similar titles) are starting to replace existing projects in some parts of the programme. To include these in this analysis would not have been very useful. This is partly because it is impossible to know from their titles alone what the projects actually do. It is also because ecoregion-based conservation is a new initiative of WWF and very few (if any) ecoregion-based projects have actually reached the stage of practical implementation. [The pace of (at least nominal) replacement of previous projects by ecoregion-based projects can be startling. For instance, all existing projects in the Latin America/Caribbean region included in the International Programme were replaced overnight by ecoregion-based projects during the course of a visit to WWF-US by one of the present authors to check a provisional list of projects for the region. The pre-existing, more comprehensible, list of projects is used in the present analysis.]

The major results of the survey are that:

- in general, WWF's most important contribution to plant conservation is promotion of *in situ* conservation, often in protected areas;
- communities are involved in many projects;
- the commonest category of plant conservation project run by WWF is the integrated conservation and development project (ICDP), involving communities and, usually, also protected areas;
- other major project themes are policy, research and sustainable use;
- there are very few projects directly concerned with conservation of particular plant species.

One of the most obvious contrasts between the regions is the much higher attention given to policy issues in Europe compared to the other regions. A reason for this is probably the greater political legitimacy of WWF in Europe (where there are many NOs) compared with some other regions. Additionally, governments in at least some parts of Europe have a relatively high ability to translate their policies into effective actions on the ground, accordingly making it more worthwhile for conservationists to place a stronger emphasis on the development and implementation of national (and EU) policies.

Two WWF NOs stand out for their special devotion to plant conservation:

- WWF-South Africa, which has many plant conservation projects, mostly very practical efforts aimed at conserving important examples of the botanically very important fynbos and succulent karoo;
- WWF-India, which also has many plant projects, but covering, overall, a greater diversity of themes than is the case with WWF-South Africa.

## **5.2. Review of contributions to plant conservation by geographical components of WWF, based mainly on interview (including views expressed about desirable directions of future work)**

### **5.2.1. Africa**

The survey covered four WWF organisations, WWF-South Africa (an NO), and the Programme Offices for Eastern Africa, Madagascar and Southern Africa.

#### **The WWF Eastern Africa Regional Programme Office (EARPO)**

EARPO is responsible for eastern Africa, including the eastern part of the Democratic Republic of Congo, but excluding Tanzania. Its programme consists largely of field projects, with little involvement in policy. We have found 8 projects on the project list apparently relating to plants, but only one of these is believed to be actually operational and dealing with an issue of central importance to conservation of global plant diversity. This project is concerned with gazettement and management of the very botanically significant and threatened coastal forests of coastal Kenya.



EARPO is also involved in the *People and Plants* programme, striving to build capacity in applied ethnobotany (usually classified as a multi-regional project in the WWF system).

### **WWF-Madagascar**

The WWF-Madagascar PO has traditionally been involved in a major educational programme, direct support for the protection of protected areas and several large-scale integrated conservation and development projects. It once also ran a small but innovative project in applied ethnobotany, linking conservation to the development of a system of integrated health-care, drawing on local and western practices. The PO has now embarked on an ecoregion-based approach to conservation. This includes much gathering of information and planning (including attempts to document all plant diversity with the chosen ecoregions, identification of threats and assessments as to how these can be combated). A training programme in botany is planned for the spiny forest ecoregion in the south-west.

### **WWF-South Africa**

WWF-South Africa, with WWF-India, is more involved in activities directly aimed at plant conservation than any other component of WWF included in the survey. The involvement of WWF-South Africa in plant conservation is perhaps not surprising, given the location of its office in Stellenbosch, at the doorstep of the Cape Floral Kingdom. WWF-South Africa is said to be the most powerful private conservation body in South Africa. Over the last thirty years it has helped establish or enlarge 32 Protected Areas (16 in the floristically rich Western Cape) and supported 16 Environmental Education Centres. One of its main roles is that of a conduit between funders and projects. Most of its projects result from proposals submitted by outside individuals and organisations. Such proposals are peer-reviewed, with reference to their degrees of innovation, sustainability, catalytic qualities and stakeholder involvement. Most funds are received from its more than 570 corporate members.

Under its present plan of work (1998-2002), WWF-South Africa is giving more attention to community-based conservation, environmental education and capacity-building in environmental conservation (the latter concerning especially the recently opened Southern African Wildlife College).

We have recorded 32 plant conservation projects, but this underestimates the total effort since several of these projects have multiple activities. For instance, WWF-South Africa runs four affiliated trust funds (National Park Trust, The Green Trust, Leslie Hill Succulent Karoo Trust and Table Mountain Fund) – not all botanical aspects of which are included in the project list. There are 30 components associated with the Green Trust and 20 with the Table Mountain Fund, most of them concerned with plant conservation. The Table Mountain Fund is a major conservation initiative which has received significant funding from the Global Environment Facility (GEF). The original remit of this Fund was to conserve the fauna and flora of the Table Mountain Chain, but this has since been broadened to include the whole Cape Floristic Region. GEF funding has been used to strengthen management of the new (1998) Cape Peninsula National Park, declared by Nelson Mandela as a 'Gift to the Earth'.

### **The WWF Southern Africa Regional Programme Office (SARPO)**

This office was created recently, effectively transforming the WWF-Zimbabwe PO into a regional organisation covering the whole of southern Africa except for South Africa. Its conservation programme has an unusually high emphasis on wildlife. Its list of projects indicates little involvement in plant conservation. We have only recorded 3 plant conservation projects, 2 of which are aimed at general conservation of wetlands and another in Zimbabwe with a component on utilisation of plant resources. However, additionally, SARPO has been involved in the *People and Plants* programme, concerned with capacity-building in applied ethnobotany (usually classified as a multi-regional project by WWF).

### **Africa: views on desirable directions of for future work by WWF in plant conservation**

All 3 WWF organisations surveyed in mainland Africa (EARPO, WWF-South Africa, SARPO) intend to become more involved in local or regional policy issues in the future. They report that outstanding policy issues which they should tackle include revision of protected area regulations (relating to community involvement), the training of professional staff in fields related to plant conservation and policy reform relating to trade in wild-harvested plants.

WWF staff in EARPO and SARPO consider that training and capacity-building are good areas for future work.

WWF-South Africa intends to maintain its present high level of involvement in plant conservation, though more proactively. It will become more engaged in developing its own projects based on an analysis of priorities, with less reliance on *ad hoc* proposals received from external sources. It is keen to use funds for the purchase of more protected areas, these to remain under the ownership of WWF-South Africa but managed by the conservation agencies of the state. WWF-South Africa regards this as a good time to purchase areas of endangered species-rich fynbos, since such areas are unusually now coming onto the market.

Some suggestions about the future role of the International Plants Conservation Unit of WWF were contributed by WWF staff working in Africa. A greater involvement in programmatic planning was considered useful.

## **5.2.2. Asia**

Our survey covered 3 NOs (India, Malaysia, Pakistan) and the PO for Nepal.

### **WWF-India**

WWF-India is probably the largest WWF NO and the largest conservation charity in India. It has a Secretariat in New Delhi, 4 Regional Offices, 28 State Offices and several field offices. It has several programmes and projects in which plant conservation is a central theme. We have listed 24 plant conservation projects. Unusually for a WWF NO, it has several expert botanists on its permanent staff. The relatively high profile accorded both to plant conservation and the engagement of botanists on the staff reflect a general national recognition of the importance of plant resources to the livelihoods of people in India. WWF-India is strongly involved in community-based approaches to conservation, incorporating plant elements. Its Forestry and Wildlife Programme is promoting joint forest management.

WWF-India has a long-running Biodiversity Hotspots Conservation Project focusing on 3 areas, the Eastern Himalayas (Sikkim and Arunachal Pradesh), the Western Ghats, and the Andaman and Nicobar Islands. The objective is general strengthening of conservation. Much work is undertaken on plant issues, including promotion of cultivation of medicinal plants and orchids.

Since 1996, WWF-India has mounted a project, the Biodiversity Conservation Prioritisation Project, involving preparation of Community Biodiversity Registers and assessments of the conservation status of plants through a Conservation Assessment and Management Plan (CAMP) process. The former involves communities in assessing their own floras, with the potential for follow-up grassroots action. The latter is a prioritisation exercise involving botanical specialists to establish priority species requiring conservation attention. It has been applied to medicinal plants, endangered plants, species of mangrove forest and wild relatives of crops.

TRAFFIC-India is based in the WWF-India office and has undertaken considerable work on plant trade, notably studies of the volumes and impacts of trade in species used for timber and as medicinals, including *Aquilaria malaccensis* (agar), *Picrorhiza kurrooa* (kutki), *Nardostachys grandiflora* (jatamansi) and *Pterocarapus santalinus* (sandalwood).

## **WWF-Malaysia**

WWF-Malaysia has its headquarters in Petaling Jaya (Peninsular Malaysia) and a state office in Kota Kinabalu (Sabah). It is unrepresented in Sarawak. Its staff includes several active botanists, unusual for a WWF NO. WWF-Malaysia is centrally concerned with plant conservation and has 10 plant conservation projects, including surveys of botanical diversity (including orchids) on the Main Range of Peninsular Malaysia, studies of plants on limestone outcrops, a vegetation survey at Kinabatang (Sabah), and training and community conservation projects associated with the *People and Plants* initiative. The main conservation thrust of conservation work by WWF-Malaysia has been to promote the conservation of key habitats, especially through establishment of new protected areas at major biodiversity sites. It has tended to operate mostly at the federal level, which has limited its effectiveness since powers over natural resources are largely the prerogative of the states. It has, however, worked closely with the authorities of several states in the production of State Conservation Strategies, a purpose of which is to point out priority areas requiring protection. It has also prepared a National Conservation Strategy (1993), not yet adopted by the government. A more recent approach to promoting prime sites for conservation in Peninsula Malaysia has been to produce more popular materials, rather than bulky technical reports, pointing out very clearly the actions needed in favour of conservation (the 'Critical Ecosystems for Conservation Project'). The existence of an office in Sabah has greatly assisted the work of WWF in this state, in which WWF has worked closely with the government to identify critical areas for conservation. This has since been followed up with development of WWF-Malaysia's first substantial ICDP at Ulu Padas. WWF-Malaysia is promoting environmentally friendly forest management, including through certification and a model forest management project at Deramakot Forest Reserve, Sabah.

## **The WWF Programme Office for Nepal**

The PO for Nepal is dedicated mostly to practical field-based conservation. We have recorded 6 plant conservation projects. All are ICDPs, except for a *People and Plants* project aimed at capacity building in applied ethnobotany. The latter project works closely with one of the ICDPs, at Shey Phoksundo National Park, and is particularly concerned with building community capacity for medicinal plant conservation and related health-care development. WWF has supported the preparation of a book on the rare and endangered plants of Nepal and a number of botanical inventories, including for Royal Bardia National Park and the Kanchenjunga Conservation Area.

## **WWF-Pakistan**

WWF-Pakistan has its headquarters in Lahore, regional offices in several major cities and field projects mainly in the northern and north-western parts of the country. WWF-Pakistan has been developing its field programme since the early 1990s and now has 7 projects significantly concerning plant conservation according to our records. Most of these relate to strengthening protected areas or promoting community-based conservation. WWF-Pakistan has taken a strategic approach to the development of its conservation programme, which began with an inter-disciplinary scoping survey in the early 1990s to gain an overview of conservation possibilities in the whole country. This survey was subsequently followed up by field projects at several of the sites identified. Field projects are generally started on a small scale, expanding if this seems worthwhile. There is an emphasis on training.

## **Asia: views on desirable directions for future work in plant conservation (South Asia only)**

Several people interviewed emphasised the importance of ICDPs. Work with communities in relation to conservation of protected areas is generally becoming easier due to recognition on the part of governments that communities must be involved in such efforts. The major roles that plants play in the lives of people in South Asia was stressed by all, as was the great importance of promoting botanical work within the context of ICDPs. A focus on plant issues is seen as a useful way of bringing together the various stakeholders (including communities, agencies and industries)

to devise systems for the management and sustainable use of plants. Medicinal plants were seen as a very useful theme for WWF engagement in the region.

There are several people within WWF-India keen to develop plant conservation work further. Several ideas relating to different geographical scales were floated. One was to create an independent platform for plant conservation within WWF-India, i.e. possibly a new Plants Conservation Division with a network of officers based in its regional offices. Another was to use the Indira Gandhi Conservation Monitoring Centre as a home for developing and managing a botanical database for South Asia, particularly of species shared between countries. Finally, there was a proposal to create an Asia-wide WWF Plant Conservation Centre, for which WWF-India could provide the institutional home. These possibilities have the potential to raise WWF-India's profile as a centre of excellence in plant conservation.

Some advice was also received on how WWF, in general, could contribute more to plant conservation. It was pointed out that there were efforts to set up a plant conservation network within WWF in the early 1980s, but this came to nought. It is still believed that a plant conservation network would be useful within WWF, but this needs to be institutionalised and co-ordinated. It was suggested that the Plants Conservation Unit of WWF International could serve as a co-ordinating body, including acting as a clearing-house for information on plant-related projects (possibly distributed through a website).

Staff of WWF-India expressed views about the types of activities in plant conservation most suitable for WWF-India. Those mentioned were: (1) fostering community involvement for the sustainable use of plant resources; (2) undertaking projects to promote the conservation and cultivation of medicinal plants; (3) raising public awareness; (4) lobbying and campaigning for policy changes at governmental level; (5) creating awareness of field projects to catalyse other initiatives; and (6) mitigating obstacles to flows of information relevant to plant conservation between various sectors of society, including government departments, commercial companies and NGOs.

Staff of the WWF PO for Nepal recognised that WWF should become more active at the policy level in Nepal. This could be very beneficial for plant conservation, for instance in attempts to place trade in medicinal and other plants on a more sustainable basis, as is much needed. However, scepticism was also expressed about the value of policy work given the instability of Nepalese governments, it being suggested that a better use of resources would be to achieve solid results at the district level and specific field sites. Other suggestions about directions of future work in plant conservation in Nepal included: (1) more emphasis on training and capacity-building; (2) create greater public awareness about the importance of plant conservation; and (3) an expansion of the type of practical ethnobotanical work, combined with training, being attempted under *People and Plants* in Shey Phoksundo National Park. Some plant conservationists interviewed outside WWF expressed the view that more small grants from WWF would be desirable to enable botanists to carry out inventories and other practical projects.

Apart from advocating more work with communities and ICDPs, people in Pakistan mentioned the need for greater awareness-raising about the importance of plants, and the desirability of support being given to tertiary-level training.

### 5.2.3. Europe

The Europe/Middle East Programme of WWF covers Europe, the Middle East, North Africa, the former Soviet Union and Mongolia. There are many WWF NOs, all in western Europe and 1 WWF Associate (DHKD, Turkey). Our survey mainly covered 3 NOs (Greece, Italy, UK).

Although individual WWF NOs have existed longer, the WWF Europe/Middle East Programme was established only in 1989/1990. Its objectives are to integrate the work of the various WWF NOs, transfer WWF resources from western and northern Europe to the east and to the Mediterranean, and influence the development of the European Union in favour of the environment. There are many sub-programmes: European (EU) Policy\*; Arctic; Baltic; North-east Atlantic; Mediterranean\*; Danube-Carpathian\*; Russia\*; Hungary\*; Latvia; Georgia; and Mongolia (\* = with associated offices). There are pan-European teams working on "Forests", "Agriculture and Rural Development",

and "Ecological Networks and Species". The Agricultural and Rural Development team includes representatives from the WWF-EU Policy Office and about 9 WWF NOs; the aim is to align policy work within different EU countries for greater effectiveness. The aim of the Ecological Networks and Species team is promote implementation of the Habitats Directive. The Danube-Carpathian Programme promotes conservation, restoration and sustainable use of natural resources over an extensive area (9 countries) based on a landscape approach. The WWF Mediterranean Programme was initiated in 1992, acquiring an office in Rome in 1996. Work is focused on promoting conservation in the 3 WWF priority biomes (forests, freshwater, marine), environmental education and capacity-building.

Habitat protection and restoration are major themes of WWF's work in Europe, with emphasis on forests and wetlands and often with a focus on National Parks and other protected areas. Promotion of the Natura 2000 network is a major objective in EU countries. Some examples of WWF's work on habitat protection and restoration are: Czech Republic – support for Sumava National Park; Estonia – establishment of 3 new National Parks; Georgia – promotion of a network of National Parks; Finland – Hotspots Campaign for forests; Greece – integrated conservation and development at Prespa, reforestation of Ymitos, support for Dadia Forest Reserve, the campaign Forests for Ever (promoting fire protection plans in valuable conservation areas and habitat restoration in two model sites near Athens); support for protection of 32 Important Forest Areas (IFAs); Hungary – establishment of a National Park in the Gemeric-Béda-Karapancsa area, preparation of a management plan for Duna-Drava National Park; Italy – support for Abruzzo National Park; Lithuania – establishment of Nemunas Delta Regional Park, biodiversity conservation in military areas; Mongolia – support for Altai Tavan Bogd and Khar ud Nuur Protected Areas, establishment of new protected areas at Hyargas, Onan Valley, and Ulaan Taiga and Darkhad Depression; Poland – support for Bialowieza National Park; Russia – establishment of Bolonsky Nature Reserve; Slovakia – support for Slovak Paradise National Park; Turkey – Important Plant Areas project (to identify and lobby for conservation of key plant sites), the Greenspace project (campaign for protection of 10 natural areas in Istanbul).

Work on forests within the WWF-Europe/Middle East Programme includes a campaign (the "European Forest Hot Spot Campaign" - launched 1997) to lobby for more and larger protected forest areas in Europe. A target of 10% protection for each forest type is being advocated (fitting in with WWF's global target). 100 Forest Hot Spots have been selected for special attention and a subgroup of 20 of these for even more active campaigning. FSC certification of forests (for 'green labelling' of timber) is being actively promoted. Forest certification is becoming increasingly adopted (e.g. 600,000 ha of forests in Sweden are now certified), except in eastern Europe where certification is viewed largely as a 'western' concept. There is less emphasis on forest certification in the Mediterranean Region, because (it is held) timber production is less significant; instead the WWF-Mediterranean Programme is pursuing the sustainable use of non-timber forest products.

The various WWF NOs and POs of WWF in Europe are involved in much work of relevance to plant conservation. Indeed, compared with the size of Europe and its relative importance for plant conservation in global terms, WWF is much more active per unit area or 'unit threatened plant species' than anywhere else. We have identified 77 projects relevant to plant conservation, but many others will have been missed because we did not survey most of the national organisations, conspicuously numerous in Europe. The principal themes of the projects are: protected areas; policy; sustainable use (mainly timber certification); and integrated conservation and development.

### **WWF-Italy**

WWF-Italy is probably unique among WWFs in that it directly manages and sometimes owns a network of protected areas (the OASIS System). It embarked on this endeavour fuelled by a sense of urgency and a desire to see some concrete practical results. The OASIS System consists of 77 areas, some administered directly by WWF (27,000 ha) and some run in association with local NGOs or conservation agencies. Many of the reserves contain examples of natural habitats (e.g. wetlands, coastal), which elsewhere have been widely destroyed or reduced to fragments. Many contain rare and endangered plants. Some have environmental education centres. In addition to the OASIS system, WWF-Italy runs a few projects aimed at conservation of specific habitats important for

plants, including forest of *Abies alba*, *Fagus sylvatica* and *Pinus nigra* (Campania region), Mediterranean evergreen forest (south Sardinia and Gennargentu), steppe (northern Sardinia) and dune systems (Gargano). WWF-Italy contributes to two WWF-European teams ("Forests, Agriculture and Rural Development"; "Ecological Networks and Species") dealing with EU issues.

#### **WWF-Greece**

This is a relatively new and small organisation. It has contributed to plant conservation in several ways, including publication of a Red Data Book for Greek plants and a long-term integrated conservation and development project to conserve Dadia Forest. There has been some support for the conservation of individual threatened plant species, including a population of *Juniperus drupacea* in the Eastern Peloponnese (this is an isolated population of a mainly Asian species). WWF-Greece has successfully promoted the inclusion of this area in the Natura 2000 network. A Forest Campaign was started in 1998 to promote new protective legislation and the practical establishment of sites proposed for the Natura 2000 Network.

#### **WWF-UK**

WWF-UK is a large organisation with a broad-based programme. It has an International Projects Unit, whose work falls outside the UK and Europe – its projects are covered, where relevant, elsewhere in this report. Work by WWF-UK on the terrestrial environment of the UK and Europe falls to its Future Landscapes Team. There are 3 priorities: (1) raising awareness of the deleterious impacts of the Common Agricultural Policy on wildlife; (2) striving to make the Habitats and Species Directive more effective; and (3) promotion of sustainable rural development. We have identified 23 projects which contribute to plant conservation. About half of these are concerned with national conservation policy, especially in connection with EU directives. Subjects include definition of Special Areas for Conservation, revision of the Wildlife and Countryside Act, the meaning of Favourable Conservation Status, implementation of the Habitats and Species Directive, promotion of the Natura 2000 Network and promotion of environmentally friendly agriculture. A few projects support research or back-up tools useful for conservation, including promotion of a UK Vegetation Database. A few projects support habitat restoration at particular sites (the habitats are wetland, fenland and hay meadow). Only one project in the UK deals directly with conservation of a particular plant species, the Lundy Cabbage (*Coinceya wrightii*). There are projects in the UK-Dependent Territories of Falkland Islands and St Helena concerned with conservation of their endemic floras.

### **5.2.4. Summary**

- 1. WWF has over 282 projects of relevance to plant conservation.** The three principal themes are integrated conservation and development, protected areas and community involvement. Very few projects deal with the conservation of individual threatened plant species.
- 2. WWF has an uneven geographical coverage in its work of relevance to plant conservation.** The countries with the highest number of plant projects are South Africa and India, understandable perhaps given the exceptional botanical diversity of parts of South Africa and the great significance of local plant resources to everyday lives in India. There are also many plant conservation projects in Europe. Tropical Africa and the USA have relatively few projects relevant to plant conservation.
- 3. Most WWF country or regional programmes are concerned mainly with practical plant conservation at field sites.** The main exception is Europe, in which national (and EU) policy receives higher priority.

### 5.3. Review of some thematic activities of WWF relevant to plant conservation

#### 5.3.1. Plants Conservation Unit of WWF International

A Plants Conservation Unit was established by WWF International in 1989, out-posted at WWF-UK. It was initially engaged in implementing the largely uncompleted work programme of the Joint IUCN/WWF Plants Conservation Campaign, initiated in 1984. It has supervised, advised on and sometimes initiated many plants conservation projects around the world over the years. The Joint IUCN/WWF Plants Conservation Programme ceased to exist in 1991. Lists of projects and publications associated with the unit are given in Annexes 3 and 4.

A decision was made in 1992 to focus the work of the Unit increasingly on a single theme, on the basis that this was probably the only way in which it was likely to achieve much progress in plant conservation within WWF, given its complex nature. The theme selected was a capacity-building programme in ethnobotany concentrating mainly on areas with tropical forests (because of their relative richness in plant diversity). The type of ethnobotany chosen was applied ethnobotany – meaning ethnobotany applied in practical ways to conservation and the sustainable use of plant resources. The theme of applied ethnobotany was selected because: (1) field projects were seen as the heart of WWF's activities; (2) it was apparent from an analysis of threats at 234 priority plant conservation sites worldwide (Centres of Plant Diversity datasheet sites) that there was a huge need to involve local communities more effectively in conservation (Hamilton, 1997); (3) plant resources (as compared with animal resources) are usually of particular concern to communities in forested environments; (4) concentrating on plant issues seemed an excellent way of focusing the efforts of integrated conservation and development projects (ICDPs); and (5) capacity-building seemed a good role for WWF in many of the regions of its operations. Accordingly, the *People and Plants* initiative was founded. WWF was joined by two partners in this endeavour, UNESCO (Division of Ecological Sciences) and the Royal Botanic Gardens, Kew. Capacity-building was taken to embrace: (1) the training of applied ethnobotanists; (2) the development of related NGOs and training programmes; and (3) the identification and promulgation of best practice approaches and methodologies.

The out-posting of the Unit created some institutional problems. At first, it was treated as an integral part of WWF International, then later it became a 'project', and then it became an 'endangered project' with insecure funding from year-to-year. The unit has recently consisted of 3 people, the authors of this report and Ros Coles (Programme Support Officer). The Unit has attempted to integrate itself with other parts of the WWF, but this has not always been easy. It has continued to be involved in field projects, as well as policy issues, because of a perception that field projects should remain of central importance to WWF (as its particular type of conservation organisation) and of the desirability of developing policies from real field experience. Involvement in field programmes has sometimes been difficult, since there have been few institutional mechanisms within WWF linking policy to field. It has not been officially represented on any of the numerous WWF planning and strategy groups responsible for devising work programmes for particular geographical areas (this would not, anyway, have been practically possible in view of the time needed to contribute effectively to them).

The unit initiated the present project because of a perceived need to assess the contribution of WWF to international plant conservation, so as to increase the overall effectiveness of the organisation in this regard.

The International Plants Conservation Unit was transferred to WWF-UK in April 2000, in part as a result of financial exigency. New management is streamlining the conservation programme of WWF-UK; it was unprepared to accept the anomaly of funding a unit of WWF International without control over its programme.

The future programme of the unit is currently under debate. The unit will be required to undertake some activities in direct support of projects carried out by WWF-UK. Additionally, it has a mandate to continue to promote plant conservation internationally. It is accepted that it will continue to run the *People and Plants* initiative until December 2004, though subject to certain geographical restrictions in its operations related to the overall conservation strategy of WWF-UK and finance

available (effectively competing with other projects). The results of the present survey are seen as providing a valuable basis for planning its future activities.

There is a new concept within WWF of establishing "Centres of Excellence" as nodal points for the organisation on particular issues. There is a possibility that the unit will be requested to assume this role in respect of plant conservation for the WWF network as a whole.

### 5.3.2. Ecoregion-based conservation (ERBC)

WWF International has accepted an Ecoregion-based approach to conservation, which is now being adopted in some geographical areas. ERBC within WWF is a developing field, with several elements:

- general recognition of ecological (and, to some extent, other) inter-connections, for instance that sites important for biodiversity conservation (e.g. some protected areas) influence, and are influenced by, ecosystems and human activities outside their boundaries;
- division of the entire surface of the world into ecoregions. 895 terrestrial ecoregions were recognised by WWF at last count. For this purpose, an ecoregion is defined solely in relation to its natural (not human) environment. It is "a large unit of land or water containing a geographically distinct assemblage of species, natural communities, and environmental conditions" (Anonymous, 1999);
- selection of certain ecoregions (or possibly combinations of adjacent ecoregions) as sites of special global significance for biodiversity conservation. This is the Global 200 set of sites, which WWF is recommending to its own constituents and outside organisations as priorities for conservation action;
- choice of certain ecoregions (or possibly combinations of adjacent ecoregions) for conservation programmes by WWF itself. Programmes or projects with the label of "Ecoregion-based conservation in ecoregion \_\_\_" (or similar) are then developed within these ecoregions. WWF-US is a leader in this field, for instance having reclassified all the projects which it previously supported in Latin America and the Caribbean with ERBC labels. New offices are being established and new officers hired to oversee ERBC for some ecoregions.

ERBC in WWF is at an initial stage of implementation and it is not clear how it will develop. Three phases of implementation within an ecoregion are envisaged, namely: (1) biological and ecological analysis; (2) socio-economic analysis; and finally (3) implementation. Only a handful of ecoregions have moved beyond the first phase. The analytical phases had proved expensive in terms of time, money and human resources, and ERBC has yet to be fully implemented in any ecoregion.

ERBC has some potential advantages for plant conservation:

- It recognises the special importance of certain places for conservation, based on their biological properties. Centres of Plant Diversity (a project of the Plants Conservation Unit of WWF International) has apparently been widely consulted during the process of identifying priority ecoregions for conservation.
- It provides a conceptual framework for linking actions at field sites with work on higher level policies.
- It can use language familiar to government planners, aiding collaboration.
- It can be a useful tool for bringing together sectoral interests (forests, water, agriculture, etc.) at both technical and political levels.
- It can reveal opportunities for cross-border co-operation in the case of those many ecoregions which cross international frontiers or significant internal boundaries within countries.

ERBC also presents these challenges as regards plant conservation:

- ERBC places too much stress on one (biologically-defined) way of dividing up the surface of the Earth for the organisation of conservation programmes. Systems which need to be considered for conservation have many different shapes and sizes, depending on the issues being addressed. In particular, ERBC is challenged with giving adequate recognition to the



geography of those socio-political systems through which conservation will actually be implemented. The great importance of the national level in conservation is currently inadequately recognised.

- There is a danger of WWF over-reaching its mandate as an NGO through 'forcing' its agenda on agencies responsible for conservation (especially in the case of poorer countries, seduced by financial support).
- The ERBC approach will tend to draw attention to cross-border issues (many ecoregions extending across national frontiers); this may result in over-commitment of resources to dealing with (often intractable and politically sensitive) cross-border issues.
- Too many resources will be devoted to planning, rather than implementation.
- Insufficient attention may be devoted to attaining specific results, e.g. in terms of the safeguarding of important sites or capacity-building in priority themes. There is a danger of losing practical focus, as is so necessary given the strength of the forces effectively opposing conservation today. There are many agencies and NGOs trying to influence conservation and development policy. The influence of WWF is likely to become reduced (and difficult to recognise) if it strays too far away from its acknowledged fields of competence.

### 5.3.3. Other thematic activities

WWF has selected 3 biomes as priorities (forests, freshwater, oceans and coasts). All are relevant to plant conservation, especially the first two, given that most of the world's plant diversity is forest-related (though there are other significant biomes) and that there is a common need to make utilisation of plants in wetland systems more sustainable. WWF has programmes and campaigns in each biomic field.

Two of the main objectives under the **forests** theme are to: (1) establish an ecologically representative network of legally protected and effectively managed areas (with a target of 10% of the world's forests by 2000); and (2) promote sustainable forest management outside protected areas (with a target of certification of 25 million ha of sustainably managed forest by June 2001). Attainment of these objectives will be beneficial for plant conservation. The Plants Conservation Unit has recently become involved with the Forest Unit of WWF International in trying to see how Forest Stewardship Council (FSC) certification can be extended to cover small-holders growing trees on their farms and to non-timber forest products (particularly in relation to the potential certification of wood-carvings in Kenya).

The target of 10% of ecologically representative forest types in protected areas has limitations for plant conservation, since it fails to recognise that not all forest types are of equivalent value for the conservation of plant diversity.

**People and Conservation** is a unit of WWF International which has concentrated mainly on the issue of conservation *versus* the rights of local communities (especially indigenous communities). There has been collaboration with the Plants Conservation Unit in the training of WWF staff and others to work with communities in integrated conservation and development projects.

WWF also undertakes work on several other themes relevant to plant conservation, including the promotion and development of some global environmental conventions (e.g. the Convention on Biological Diversity, RAMSAR and CITES), climatic change and toxics. The Plants Conservation Unit has provided case-studies (particularly on sustainable use of plant resources and multiple-use zones in protected areas) for use in an advocacy campaign related to the Convention on Biological Diversity.

There is a growing emphasis on **capacity-building within** WWF. While valuable, in the final analysis this must be seen as of only secondary importance since WWF does not own or manage land or biological resources (with rare exceptions). Capacity-building should be directed mainly at raising the capacities of those directly involved in conservation or resource-use through their roles as owners, managers or users of land or biotic resources. Capacity-building directed specifically at WWF should be designed to produce benefits at this primary level fairly immediately.

#### 5.3.4. Summary and analysis: thematic contributions of WWF to plant conservation

- The Plants Conservation Unit of WWF International no longer exists. Its staff have been absorbed into WWF-UK. WWF-UK has expressed a willingness for the unit to continue to promote plant conservation internationally, though there must be some bias towards the specific interests of the WWF-UK International Programme.
- The strategy of the Plants Conservation Unit to concentrate on one particular theme (*People and Plants* – capacity building in applied ethnobotany) was correct. Concentration of effort is still seen as essential for the unit to have much chance within WWF of making a significant contribution to international plant conservation, given the complexity of the organisation. The particular theme chosen is still regarded as suitable for WWF, given its emphasis on field projects (especially protected areas and the involvement of local communities) and its potential institutional capacity to link experiences in field projects with wider international advocacy.
- Weaknesses of this concentrated approach have included a failure to gain adequate support from powerful sections of WWF, especially those holding funds. The emphasis in *People and Plants* has been collaboration with selected NOs and POs in developing countries, which carry relatively little influence over patterns of spending in the International Programme. (But, a failure to be represented on the committees within WWF responsible for developing its geographical programmes has been largely inevitable, given their large number.)
- It is unlikely that WWF will embrace plant conservation as a major theme equivalent to Forests or Ecoregions. WWF already has a plethora of cross-cutting priorities and programmes. However, a focus on plants will often be critical to WWF for the achievement of its targets.
- Nevertheless, plant conservation is central to WWF's Mission. There are numerous WWF projects and thematic programmes relevant to plant conservation. At present, these lack synergy. Experiences from them, and analyses of these experiences, are generally unavailable either to members of WWF working outside the particular projects or themes, or indeed to the wider international conservation community. WWF should play a role to stimulate plant conservation internationally. One way of achieving this would be to work in partnership with other concerned organisations.

### 6. RECOMMENDATIONS FOR FUTURE WORK ON PLANT CONSERVATION BY WWF

There is need for much greater concerted international effort to conserve plants, within the WWF network and more widely. Based on its own experiences and fields of focus, WWF is well placed to:

- promote new emphases in plant conservation which (relative to the traditional plant conservation paradigm) contain a wider vision of the value of plants, see *in situ* conservation as normally of prime importance, incorporate social systems integrally into analyses and recommendations for action, and integrate conservation and development;
- contribute to developing and playing its part in an international network for plant conservation, based on acceptance of new emphases in plant conservation (as above) and bringing new partners into the network based on their acknowledged fields of expertise. Members of the network should be actively involved in practical work, especially at field level, and be able and willing to extract lessons from these experiences to propose and promote related policies and best practices.

The new International Plants Conservation Unit of WWF-UK (successor to the Plants Conservation Unit of WWF International) should:

- take a leading role in developing the above network, within WWF and more widely;
- select applied ethnobotany as one field for its own particular focus, through continuing its commitment to *People and Plants*. Within this theme, four topics should be selected for the development of recommendations for policies and best practices, as follows:
  - wood-carving and conservation;
  - conservation of high altitude Himalayan medicinal plants;
  - sustainable use of plant resources within protected areas;
  - curricula in applied ethnobotany.
- select additional fields for its own particular focus, in discussion with other members of WWF-UK and more widely. Likely candidates are aspects of the conservation of medicinal plants, a subject believed to be particularly appropriate to WWF, as well as generally of international conservation importance.

Practical implementation of the above recommendations by the International Plants Conservation Unit of WWF-UK requires that:

- funds and partners are secured for continuing work under *People and Plants*, and the work is then implemented;
- proposals are developed, funded and carried out, relating to the development of an international plant conservation network and specific work on chosen issues (such as aspects of the conservation of medicinal plants).

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## **ANNEX 1. PEOPLE INTERVIEWED FOR A SURVEY OF PLANT CONSERVATION PRIORITIES**

\* Contributed data used in the construction of Table 1.

### **PLANT CONSERVATION GLOBALLY**

Dr Janice Alcorn, Biodiversity Support Program, WWF-US  
Judy Braus, Director of Education, WWF-US  
Gina DeFerrari, Living Planet Campaign Coordinator, WWF-US  
Dr Geoffrey Hawtin, Director General, IPGRI  
Toby Hodgkin, Principal Scientist, Genetic Resources, Science and Technology Group, IPGRI, Rome  
Dr P. Kapoor-Vijai, Botany Department, Natural History Museum, London  
Peter Kramer, Director of Network Development, WWF International  
Miguel Jorge, Regional Marine and Freshwater Coordinator, Latin America and Madagascar, WWF-US  
Johanna Mang, Macroeconomics for Sustainable Development Program, WWF International (based at WWF-US)  
Adam Markham, Climate Change Unit, WWF-US  
Sally Nicholson, Head International Policy Division, WWF-UK\*  
Sheila O'Connor, Eco-regions Co-ordinator, WWF-US  
Dr Sara Oldfield, Head of Global Programmes, Fauna & Flora International  
Dr David Olsen, Senior Scientist, Conservation Science Program, WWF-US  
Leonardo Petri, Associate Scientist, Forest Genetic Resources, IPGRI, Rome  
Jane Toll, CGIAR System-wide Genetic Resources Programme, IPGRI, Rome  
Dr Paul Toyne, International Policy Division, WWF-UK\*  
Joseph Turok, Director and EUFORGEN Co-ordinator, Regional Office for Europe, IPGRI, Rome  
Alex Wood, Macroeconomics for Sustainable Development Program, WWF International (based at WWF-US)  
Dr Peter Wyse-Jackson, Director, Botanical Gardens Conservation International

### **AFRICA**

#### **Africa in general**

John Barker, Africa Programme, WWF-UK\*  
Tony Mokombo, Head of Program, West and Central Africa and Madagascar, WWF-US  
Kate Newman, East and Southern Africa, WWF-US  
Henri Nsanjama, Vice President Africa/Madagascar, WWF-US  
Debbie Snelson, WWF Representative, East African Regional PO

#### **Cameroon**

Yaap Schooli, Director of Field Program, WWF PO, Cameroon\*

#### **Eastern Africa**

Robert Höft, Regional Co-ordinator for East Africa, People and Plants Programme, UNESCO\*  
Debbie Snelson, WWF Representative, East African Regional PO

#### **Kenya**

Simon Kangethe, Plant Conservation Programme, National Museums of Kenya\*  
Quentin Luke, Project Executant, Coastal Forest Conservation Unit, National Museums of Kenya\*  
George Mugambi, Plant Conservation Programme, National Museums of Kenya\*  
Winfred Musila, Plant Conservation Programme, National Museums of Kenya\*  
Grace Ngugi, KENRIK, National Museums of Kenya\*  
Anne Robertson, formerly Project Officer for WWF, Kenya Coastal Forest Survey\*  
Stella Simiyu, The East African Herbarium, Museums of Kenya, Kenya\*

### **Madagascar**

Jean-Paul Paddock, Programme Director, WWF-Madagascar Programme Office\*

### **South Africa**

Charlotte Hejnis, GIS Specialist, Institute for Plant Conservation, University of Cape Town

Greg Lawes, Manager Green Trust, WWF-South Africa

Dr Peter Linder, Lecturer, Department of Botany, University of Cape Town\*

Dr Rob Little, Conservation Director, WWF-South Africa\*

Dr Ian MacDonald, Chief Executive, WWF-South Africa

Dr Bruce MacKenzie, Director, Botanical Society of South Africa\*

Dr Dave McDonald, Principal Scientist, National Botanical Institute of South Africa\*

Dr Jeremy Mitchley, Lecturer Department of Botany, University of Cape Town\*

Lisa Padfield, Conservation Manager, WWF-South Africa

Dr Razeena Wagiet, Community-based Conservation Co-ordinator, WWF-South Africa

Amanda Younge, Cape Action Plan for the Environment Co-Ordinator, WWF-South Africa

### **Uganda**

Professor RZ Bukonya, Department of Botany, Makerere University\*

Xavier Mugumya, MSc Student, Department of Botany, Makerere University\*

Onesimus Muhwezi, Project Officer, National Wetlands Conservation and Management Programme, Ministry of Water, Lands and Environment, Uganda\*

Jakson Mutebi, Director, Development Through Conservation Project, CARE, Kabale

Patrick Omeja, MSc Student, Department of Botany, Makerere University\*

### **Zimbabwe**

Ivan Bond, Resource Economist, Support to CAMPFIRE Programme, WWF-Southern Africa Regional PO\*

Dave Cumming, Senior Conservation Advisor, WWF-Southern Africa Regional PO

Dr Bob Drummond, National Herbarium, Harare

Dick Pitman, Director, Zambesi Society, Harare

Russell Taylor, Project Executant, Support to CAMPFIRE Programme, WWF-Southern Africa Regional PO

Ed Wilson, Acting Regional Representative, WWF-Southern Africa Regional PO

## **ASIA**

### **Asia in general**

Migma Norbu Sherpa, Director of Conservation, Asia/Pacific Programme, WWF-US

Jenny Springer, Senior Program Officer Asia/Pacific, WWF-US

Sejal Worah, ICDP Co-ordinator for Asia/Pacific, WWF

Peter Ramshaw, Head of Asia Programme, WWF-UK\*

### **China**

Jim Harkness, WWF Representative, WWF-China Programme Office

Prof Pei Shen-ji, Head, Department of Ethnobotany, Institute of Botany, Chinese Academy of Sciences, Kunming\*

### **India**

Dr S. M. Dr M. Ahmedullah, Vice Chair Indian Subcontinent Plant Specialist Group, IUCN (seconded to WWF to work with IGCMC)

Rashmi Bajaj, Law Officer, TRAFFIC India

Sudipto Chatterjee, Senior Programme Officer, Eastern Himalayas, Biodiveristy Hotspots Conservation Project, WWF-India

Sharad Gaur, Director, Indira Ghandi Conservation Monitoring Centre (IGCMC)

Krishna Kumar, Senior Programme Officer, Andaman & Nicobar Islands, Biodiveristy Hotspots Conservation Project, WWF-India

M. K. Misra, Director, Traffic India\*

Dr S. M. Nair, Head, Division of Environment Education, WWF-India\*

A.R.K. Sastry, Director, Biodiversity Hotspots Conservation Project, WWF-India  
Raghuvansh Saxena, Manager Community Biodiversity Conservation Movement\*  
Shekhar Singh, Advisor to WWF-India and Chairman of Steering Committee of Biodiversity  
Conservation Prioritisation Project, Indian Institute of Public Administration\*

#### **Indonesia**

Dr Jim Jarvie, Botanist, Independent Consultant\*

#### **Malaysia**

Rez Azmi, Botanist, WWF-Malaysia\*

Dr Geoffrey Davison, Sabah DIRECTOR?, WWF-Malaysia

Dato Dr Michael Kavanagh, Chief Executive Officer, WWF-Malaysia

Shahril Kamarulzaman, Botanist, WWF-Malaysia\*

Ramadasan Krishnar, Forests for Water and Water for Life Project, WWF-Malaysia\*

Sanath Kumar, Forest Conservation Officer, WWF-Malaysia\*

Dr Isabelle Louis, formerly CEO, WWF-Malaysia

Daris Mathew, Critical Ecosystems for Conservation Project, WWF-Malaysia\*

Chitramala Nadarajah, Scientific Officer, Critical Ecosystems for Conservation Project, WWF-Malaysia\*

Dr John Payne, formerly Director of Sabah Office, Sabah, WWF-Malaysia

Balu Perumal, Forest Officer, WWF-Malaysia\*

Wendy Yap, Senior Scientific Officer, WWF-Malaysia\*

#### **Nepal**

Dr K. Basnet, WWF Eco-regions Co-ordinator Asia/Pacific\*

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Anil Manindar, WWF Programme Officer Asia/Pacific\*

Professor Prasad, Plant Physiologist, Central Department of Botany, Tribhuvan University\*

Dr T. Shresta, IUCN

Migma Norbu Sherpa, Acting Representative of WWF-Nepal \*

#### **Pakistan**

Ashiq Ahmad Khan, Senior Conservation Officer, WWF-Pakistan

Dr Mir Ajab Khan, Department of Biological Sciences, University of Quaid-i-Azam, Islamabad, Pakistan\*

Dr Mirza Hakim Khan, Director Biological Sciences, Research Division, Pakistan Forest Institute, Peshawar\*

Dr Rubina Rafiq, National Herbarium, Islamabad, Pakistan\*

Dr Zabta K Shinwari, National Herbarium, Islamabad, Pakistan\*

Dr Shakeel Haider Zaidi, Medicinal Plant Botanist, Pakistan Forest Institute, Peshawar

#### **South-east Asia**

Dr Francis Putz, CIFOR & University of Florida\*

### **EUROPE**

#### **Europe in general**

Per Rosenberg, European Forest Co-ordinator, WWF International\*

Dr Jane Smart, Director, Plantlife\*

Chris Tydeman, Chief Scientist, WWF-UK

#### **Mediterranean in general**

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Pedro Regato, Forest Officer, WWF-Mediterranean Programme Office

#### **Belgium**

Jean-Pierre d'Huart\*

**Italy**

Manuela Osmi, Consultant for Natura 2000 and Life Project, WWF-Italy  
Paulo Lombardi, Conservation Director, WWF-Italy

**Greece**

Dr Aristotelis Papageorgiou, Forest Officer, WWF-Greece\*  
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**United Kingdom**

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Rebecca May, Future Landscapes Team, WWF-UK\*  
Gail Murray, Future Landscapes Team, WWF-UK  
Sean Pullan, Marine Programme, WWF-UK  
Dr Jane Smart, Director, Plantlife\*

**LATIN AMERICA AND CARIBBEAN**

John Butler, Senior Program Officer for Peru, Bolivia and Chile, WWF-US  
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Gabriella Grau, Latin America Program, WWF-US\*  
Donald P Masterson, Senior Forest Program Officer, Latin America and Caribbean, WWF-US  
Lauren B Spurrier Senior Program Officer, Latin America Program, WWF-US  
Meg Symington, Director, Latin America and Caribbean Program, WWF-US\*

**NORTH AMERICA**

Ronald Tipton, Director, US Ecoregion Conservation, WWF-US\*



## ANNEX 2. WWF PROJECTS WHICH HAVE A BEARING ON PLANT CONSERVATION

There are bound to be many inaccuracies in this list, which is based only on information which was fairly easy to obtain. The list is certainly incomplete, because it excludes the national plant conservation projects of most WWF NOs. Further caveats about the list are mentioned in the main body of this report.

\* Indicates a project, as recognised for the present study. Ecoregion-based conservation projects have been excluded, partly because they are new and partly because it is impossible to know from their titles what they actually do.

The first code is the WWF project code (not available for all projects; some projects with 2 codes).

The second code (in bold) indicates the estimated main thrust or theme of the project. Only one such assignment is permitted per project. Assignment is often difficult, mainly because of incomplete information available on the projects. The codes used are: **CA** Capacity building; **CO** Community-based conservation; **IC** Integrated conservation and development project; **IN** Invasive species; **PA** Protected area; **PL** Planning; **PO** Policy (includes laws, conventions, national strategies); **PU** Public awareness; **RE** Restoration; **SP** Plant species; **ST** Studies, research; **SU** Sustainable use; **TR** Plant trade.

The official title of the project is given (if known).

There usually follows a brief description, indicating the main activities.

### MULTI-REGIONAL

\* 9Z0420. **TR**. Support to TRAFFIC International. Institutional support to TRAFFIC, including in relation to trade in timber and medicinal plants.

\* 9Z0556. **CA**. Ethnobotany and the sustainable use of wild plants. A partnership programme with UNESCO and the Royal Botanic Gardens, Kew. Information provision, capacity-building and field projects. A major effort to build capacity in ethnobotany applied to conservation and sustainable development. Field projects in Africa (Kenya, Tanzania, Uganda, Zimbabwe) and Asia (Nepal, Pakistan, South-east Asia).

\* 9Z0692. **PO**. Promoting the implementation of the Convention on Biodiversity. With Project Officers in WWF offices in 7 target countries.

\* 9Z0698. **SU**. Promoting peoples' participation in forest conservation. Gathers case-studies for 9Z0699.

\* 9Z0699. **SU**. Promoting certification of forests. Develops models relating to peoples' participation in forest certification.

\* 9Z0711. **PO**. Forest policy and conservation capacity-building in the southern cone of South America. Forest policy development and public awareness in Chile.

\* 9Z0718. **TR**. Securing the future of medicinal plant resources. Regional programmes in East Asia, Indian Subcontinent, South America. Mainly programme planning, studies of harvest and trade controls.

\* 9Z0917. **IC**. WWF tropical rainforest portfolio: inter-regional support. Co-ordinates a major conservation initiative, with 7 ICDPs in Honduras, Ecuador, Gabon (2), Ethiopia, Pakistan and the Philippines.

### AFRICA

#### Cameroon

\*CM0008. **IC**. Korup ICDP. Conservation of Atlantic Coastal Forest, protected area management, community forest management.

- \* CM0016. **SU.** Promotion of sustainable timber production. Part of a wider WWF programme. Drafting and testing forest certification standards, pilot concession area.
- \* CM0019. **IC.** South-east forest projects.
- \* CM0019.04/19.05. **IC.** Lobéké Forest Project
- \* CM0026. **IC.** Mount Kupe Forest Project. ICDP, Atlantic and montane forests.
- \* CM0036. **ST.** Survey of montane forest areas.

- \* CM0037. **IC.** Waza-Logone Project. Working with IUCN, includes sustainable harvesting of gum arabic in Waza National Park.
- \* CM0041. **PO.** Policy project focusing on international conventions (CBD & CITES) and national legislation.
- \* CM0047. **IC.** Jengi Project. Congolian forest, protected area management, collaboration with logging concessionaires.

#### **Central African Republic**

- \* CF0005. **IC.** Conservation and development in the tropical forest of south-west CAR – Dzanga-Sangha Special Reserve and the Dzanga-Ndoki National Park ICDP. Plant studies, WWF logging concession.
- \* CF0851. **ST.** Bangassou Dense Forest. Initial biodiversity surveys, project may become an ICDP.

#### **Democratic Republic of Congo**

- \* ZR0008. **CO.** Virunga Reforestation and Environmental Education Project. Reforestation for fuelwood, buffer zone establishment.

#### **Ethiopia**

- \* ET0021. **PA.** Bale Mountain National Park Project.

#### **Gabon**

- \* GA0003. **PA.** Minkebe Forest.
- \* GA0007. **PA.** Conservation support to the Gamba protected area complex.

#### **Ivory Coast**

- \* CI0004. **IC.** ICDP at Tai National Park.
- \* CI0009. **IC.** ICDP planning for Banco National Park.
- \* CI0012. **PA.** Conservation of Como National Park.
- \* CI0013. **PA.** Conservation of Mt Nimba Natural Reserve.

#### **Kenya**

- \* KE0066.02. **CO.** Community Wetlands Project, Saiwa National Park and Lake Begoria.
- \* KE0069. **IC.** Lake Nakuru Conservation and Development Project.
- \* KE0074/86. **CO.** Coastal Forest Conservation Unit. Gazettment and management of kaya forests (sacred groves); a follow-up to KE0056 (floristic survey of coastal forests).
- \* ?. **Kiunga Project.** Conservation of mangroves.
- \* **ST.** Survey of sea-grass beds.

#### **Madagascar**

- \* MG0048. ?. Madagascar: Nature Conservation in Zombitse and Vohibasia.
- \* MG0055. **CA.** Beza Mahafaly Special Reserve – training and research centre.
- \* MG0061. **IC.** Montagne d'Ambre protected area. ICDP project.
- \* MG0062. **IC.** Forestry support and Nature Protection Agents (similar to MG0073, qv).
- \* MG0073. **IC.** With MG0062, ICDPs at 4 sites – Andravory, Antisiraka, Tolongoina and Tsitongambarika. Participatory forest management, forest classification, monitoring, forest use.
- \* MG0079. **ST.** Andringitra and Pic d'Ivohibe ICDP. Research for management plan, including impact of mountain forest fires on plant regeneration, resource use by local communities.
- \* MG0080. **PA.** Marojejy and Anjanaharibe-Sud Reserves.
- \* MG0084. **CO.** Fort-Dauphin regional forest resources management project. Management plan implementation, community resource management, education.
- \* MG0093. **PA.** Forest Guardian Initiative, Betaolana. Promoting protected area between Marojejy National Park and Anjanaharibe-Sud Special Reserve.

### **Mauritania**

- \* MT0002. **PA.** Banc d'Anguin National Park.

### **Nigeria**

- \* NG0003. **IC.** Development of the northern sector (Okwangwo) of the Cross River National Park.
- \* NG0007. **IC.** Gashaka Gumpti National Park.
- \* NG0009. **PA.** Protection of Okumu Nature Sanctuary, Edo State.

### **South Africa**

- \* ZA137. **IN.** Alien Vegetation Control. Country-wide assistance to volunteer hacker groups.
- \* ZA152. **PA.** Agulhas National Park – Southern Tip (Malan). Help with park establishment (lowland fynbos).
- \* ZA193. **PA.** Anysberg Nature Reserve. Reserve purchase; important example of karoo vegetation.
- \* ZA206. **SP.** Endangered Wildflower Project. To ensure the survival of threatened plant species and habitats within the fynbos. Has run for over 10 years. Implemented by the Botanical Society of South Africa.
- \* ZA221. **PA.** Skilpad Wildflower Reserve. A reserve in the centre of Namaqualand specifically managed for its spectacular spring flower display. About 1000 ha, will form the core area of the proposed Namaqua National Park. Run by South Africa National Parks in conjunction with the local community.
- \* ZA230. **PA.** Maputaland Coastal Forest Reserve. Assist the KwaZulu Natal Nature Conservation Service to consolidate the reserve, between the Mozambique border and Sodwana Bay.
- \* ZA307. **SP.** Protea Atlas Development. Public involvement in data collection. Includes information on distributions and conservation status; purpose – a management tool.
- \* ZA390. **IN.** Biological control of alien plant invaders: *Chromolaena odorata*. Research into controlling one of South Africa's most pernicious invasive plants.
- \* ZA419. **ST.** Forests of the Eastern Cape: the effects of grazing. Research on impacts of grazing by cattle and sheep on indigenous forest structure, and impacts on faunal and floral diversity.
- \* ZA420. **PA.** Table Mountain Fund. A trust fund supporting management of Table Mountain and Cape Peninsula National Park. Supports 20 projects most directly on plant conservation.
- \* ZA441. **PA.** Land acquisition: Matjiesriver Farm in the Cedarberg. 13,000 ha of fynbos, major tourist area.
- \* ZA495. **PA.** Sandy Bay. Land purchase, will be part of the Cape Peninsula National Park.
- \* ZA526. **IN.** Alien vegetation control: Natal Drakensberg Park.
- \* ZA554. **PA.** Land acquisition: Knysna forest properties. 2 areas to be incorporated into the local protected area network managed by the Department of Water Affairs and Forestry.
- \* ZA558. **PA.** Land Acquisition: Skilpad Wildflower Reserve – De Beers properties. Purchase of 2 farms; long-term aim to develop proposed Namaqualand National Park (floristically rich arid area).
- \* ZA564. **PA.** Conservation of Franschoek Wetlands (Farm 1027). Farm purchase partly for flora.
- \* ZA567. **PA.** Land Acquisition: Kogelberg Biosphere Reserve – Solva Farm. Will extend the reserve to the Palmiet River and protect the Elgin Shale flora.
- \* ZA572. **PU.** Kirstenbosch Interpretive Fynbos Garden. Outdoor classroom, links garden practices to fynbos ecology.
- \* ZA579. **PA.** Anysberg Nature Reserve – acquisition of De Vlakte. Will help secure the complete Anysberg complex for conservation of succulent karoo. 6 vegetation types represented.
- \* ZA581. **PU.** Namaqualand: a succulent desert. Book by Richard Cowling to raise awareness of succulent karoo.
- \* ZA590. **PA.** Land acquisition: Kogelberg Nature Reserve – Koppie Allen. Related to ZA567.
- \* ZA593. **CO.** Incentives for land owners to conserve biodiversity of the Cape Lowlands. Important because most of the conservation worthy land is in private hands. A Table Mountain Fund project implemented by the Botanical Society of South Africa.
- \* ZA597. **IN.** Alien Vegetation Control: Silvermine Nature Reserve. Alien clearing by volunteers.
- \* ZA1015. **SU.** Hluhluwe-Umfolozi Park Indigenous Plant Nursery Project. 5 medicinal plant gardens with local community, indigenous plant nursery. Project won the Peace Gardens Award for excellence in 1996 and 1997.
- \* ZA1054. **PU.** The Montagu Nature Garden: establishing a nursery. For use of tourists and the people of Montagu.
- \* ZA1055. **PU.** The Garden Route: Botanical Garden. First botanical garden on the Garden Route, centre for environmental education.

- \* ZA1057. **CO.** Kwa Dapha Camp at Kosi Bay. Conservation awareness raising and ecotourism development as an alternative to shifting agriculture in a fragile dune and swamp forest environment adjacent to the Banga Nek turtle nesting beach.
- \* GT46. **CO.** LEAP Blouberg Conservation Project (Green Trust). Multi-faceted, community-based conservation project at Blouberg Mountain Range, Northern Province (baobabs, *Podocarpus* forest, remnant fynbos).
- \* GT55.4. **IN.** Co-ordinator for the National Water Conservation Campaign. Advisor in the Ministry of Mines, Water and Environment seconded to the Department of Water Affairs and Forestry. Includes clearing large tracks of fynbos of alien species. Policy guidelines on water utilisation.
- \* GT60. **IC.** A partnership project between Kruger National Park and traditional healers living in neighbouring communities. To conserve medicinal plants.
- \* GT63. **PA.** Agulhas Plain Biodiversity Conservation Project. Lowland fynbos, proclamation of part of the area as a new national park. Implementation phases of research project ZA261.
- \* GT74. **ST.** Francolins and Grasslands Project. Study of biologically friendly farming.

#### **Tanzania**

- \* TZ0044. **IC.** Support to Udzungwa Mountains National Park.
- \* TZ0056. **IC.** Conservation of lowland coastal forest.

#### **Uganda**

- \* UG0019. **ST.** Support to Institute of Tropical Forest Conservation at Bwindi Impenetrable Forest.
- \* UG0023. **IC.** Rwenzori Mountains Conservation Project. ICDP. Temporarily suspended project due to insecurity.

#### **Zambia**

- \* ZM0020.02. **CO.** Bangweulu Wetlands Project, Samfya.
- \* ZM0037. **CO.** Kafue Flats Wetlands Partnership.

#### **Zimbabwe**

- \* ZW0025. **SU.** Natural Resources Management Project. Components on utilisation of plant resources, e.g. *Kigelia africana* and *Trichilia emetica* fruits.

### **ASIA/PACIFIC**

#### **More than one country (Asia)**

- \* 9S0051. **PL.** Himalaya - sustainable development and conservation in the Eastern Himalaya. Development of a comprehensive conservation programme, especially for Sikkim and Arunachal Pradesh.
- \* 9S0085. **PL.** Tri-national protected area complex, Cambodia, Laos, Vietnam. Ecoregional planning for forests of the Lower Mekong. Information for a workshop to prioritise areas.
- \* 9S008. **CA.** Conservation and development support programmes. Training and capacity-building in ICDP methodologies.

#### **More than one country (Pacific)**

- \* 9P0019. **TR.** Support to TRAFFIC Oceania.
- \* 9P0024. **SU.** Pacific general: provincial sustainable development planning. Collaborating with one local authority in each of Papua New Guinea and Solomon Island to incorporate ecological sustainability in planning.
- \* 9P0026. **SU.** Forest information campaign in Melanesia Region. Promoting sustainable forest management related to green timber purchasing.
- \* 9P0027. **CO.** Pacific general: Pacific partnerships for conservation. Community involvement in natural resource management and conservation.
- \* 9P0028. **CO.** Pacific general: natural economics – useful plants in the Pacific Island. Recording ethnobotanical knowledge; promoting related conservation and development.
- \* 97035. **TR.** Medicinal plant trade in South Pacific (Micronesia). Survey of the trade, including of bio-prospecting by pharmaceutical companies.

#### **Bhutan**

- \* BT0007. **SU.** Cultivation of medicinal plants.

- \* BT0010. **PA.** Royal Manas National Park. Development of management strategy, including biological inventories; monitoring forest resources.
- \* BT0013. **PA.** Survey and identification of conservation areas and critical habitats. Assistance to Forestry Service Division, including management of priority areas.

#### **China**

- \* CN0022. **PA.** Management plan for the giant panda and its habitat. Includes management plan for Wolong Biosphere Reserve.
- \* CN0039. **PL.** National Wetlands Action Plan.
- \* CN0062. **IC.** Coastal management in southern China. Includes conservation and sustainable use of mangroves.
- \* CN0088. **RE.** Central Yangtze programme. Includes restoration of wetlands.

#### **India**

- \* IN0061. **IC.** Eco-development in the fringe areas of Ranthambhore National Park. ICDP; promoting alternatives to fuelwood and fodder.
- \* IN0068. [Thrusts/themes given for individual sub-projects below] Biodiversity hotspots conservation programme. A major programme with work in the Western Ghats, Eastern Himalayas, and Andaman & Nicobar islands. Strengthening protected areas networks; conservation outside protected areas; includes 12 recent projects with a plant conservation focus – subjects include medicinal plant use, cultivation and conservation, orchid conservation and cultivation, NTFPs for income generation. Specific projects involving plants are:
  - \* **ST.** Baseline Survey of Eagle's Nest Wildlife Sanctuary, Chessa Orchid Sanctuary and foothill areas, Arunachal Pradesh/India.
  - \* **SP.** Preparation of seed catalogue for wild plants of Maharashtra, Western Ghats. Seed collection to enrich the *ex situ* conservation of the National Bureau of Plant Genetic Resources.
  - \* **ST.** Conservation of coastal biodiversity on the west coast between Mumbai and Goa. Studies of the coastal flora and fauna, societies, economies, local resource use and practices for a plan.
  - \* **ST.** Identification of keystone species and associates in selected areas of Western Ghats of Kerala. Includes floristic studies in Silent Valley National Park, Eravikulam National Park and Agastyar Hills.
  - \* **ST.** Identification of bio-rich patches and corridors between protected areas in the northern sectors of the Western Ghats for the promotion of conservation action. Vegetation mapping; planning with NGOs and State Forest Department; 2 new protected areas.
  - \* **SP.** Conservation of orchids in the hotspots area of Tadiandamol, Kodagu District, Karnataka. Establishment of orchidarium, identification of orchid hotspots.
  - \* **RE.** Regeneration of mangrove ecosystems in Kumarakom area in Kerala. Restoration of degraded mangrove with community participation; nurseries.
  - \* **CO.** Biodiversity conservation of endangered medicinal plant in Anaikatty Hills, Western Ghats. Encouraging local cultivation of medicinal plants; primary health-care kit and resource materials.
  - \* **CO.** Medico-ethnobotanical survey of Sikkim with special reference to Dzongu area, Northern Sikkim: Lepchas people perception and conservation in Sikkim. Community based; use of wild and cultivated plants for medicine and other purposes; awareness raising.
  - \* **ST.** Evaluating plant diversity in different forest types of Kerala by laying out permanent plots. Biodiversity monitoring.
  - \* **CO.** Assessment of medicinal plants in Karjat Taluka, Maharashtra and establishment of a genetic garden. *Ex situ* medicinal plant conservation; strengthening local healthcare traditions.
  - \* **CO.** Micro-propagation farming in jhumlands and development of a market base for commercially grown orchids, Arunachal Pradesh. Community cultivation of orchids for sale, linked to environmental conservation.
  - \* **CO.** Cultivation of high yielding species of bamboo and broom grass on degraded farm and jhumlands in Arunachal Pradesh. Similar aims to above project on orchids.

- \* **PO.** Work with the Centre of Environmental Law; report on 'unclassified forests' in Arunachal Pradesh; report on 'Medicinal Plants and Law'.
- \* 212027. **TR.** Facilitating the effective implementation of the CITES Appendix II listing of kutki *Picrorhiza kurrooa* and jatamansi *Nardostachys grandiflora*. TRAFFIC India project.
- \* 212030. **TR.** Assessing the Implementation of the CITES Appendix II listing of *Aquilaria malaccensis*. TRAFFIC India project.
- \* 9Z0718. **TR.** Securing the Future of Medicinal Plant Resources – motivating actions to sustain the medicinal plant resources of the Indian subcontinent. A study of locally used and exported species. TRAFFIC India project.
- \* **CO.** Biodiversity conservation prioritisation project. Community documentation of priority areas, species and strategies for biodiversity conservation.
- \* **ST.** Biodiversity assessment and mapping. Indira Gandhi Conservation Monitoring Centre; databases on vegetation and threatened plants of India and South Asia; maps.
- \* **CO.** Community Biodiversity Conservation Programme. Conservation of sacred groves; working with religious groups, restoration, inventories, community involvement.
- \* **TR.** Medicinal plant trade in North East India. Project with the Ministry of Environment and Forests to assess the medicinal plants' trade through field studies and interviews. TRAFFIC India project.
- \* **TR.** Trade in Sandalwood in India. Study of the trade and its impacts. TRAFFIC India project.

### **Indonesia**

- \* ID0091.08. **IC.** Ujung Kulon Project. ICDP; ecotourism, selling carvings; inventory of forest products.
- \* ID0094. **IC.** Management of Kerinci Seblat National Park, Sumatra. ICDP; includes zonation and development of management plans.
- \* ID0097. **CA.** Conservation resource centre. Capacity building programme.
- \* ID0101. **IC.** Kayan Mentarang National Park. Documenting forests, community values and plant uses.
- \* ID0103. **PA.** Lorentz Strict Nature Reserve. ICDP project concentrating at present on development of management plan.
- \* ID0105. **PA.** Wasur National Park, Irian Jaya. ICDP focusing on technical support to park authority and monitoring biodiversity; survey and control of invasive plants.
- \* ID0110. **IC.** Nusa Tenggara integrated conservation and development. Includes surveys of forest areas vulnerable to fire; floristic surveys of Flores and Mt Mutis; mapping forested areas.
- \* ID0117. **IC.** Bukit Tigapuluh rain forest and resource management. ICDP; land-use zonation; buffer zone.
- \* ID0126.0.1. **PA.** Strict Nature Reserve of Arfak Mountains, Manokwari. Biodiversity research; community involvement in reserve management.
- \* ID0134. **IC.** Kalimantan, Bintuang Karimum Transfrontier Park. ICDP; ground-truthing remote sensing data to identify major ecosystems; floristic surveys.
- \* ID0144.01. **SU.** Certification of community forests in Indonesia. Recording case-studies of community involvement; evolving criteria for community forest management.
- \* ID0146.01. **SU.** Bintuni Bay, Irian Jaya. Traditional and commercial resource utilisation; emphasis on sustainable use of mangroves.
- \* ID0161. **PO.** Traditional knowledge and biodiversity conservation. Working with government to develop benefit-sharing tools for indigenous peoples regarding access to genetic resources.

### **Cambodia**

- \* KH0004. **CA.** Virachay National Park and Rattanakiri Province watershed protection. Training for government officials in biological surveys and in documenting community resource use.

### **Malaysia**

- \* MY0067. **PA.** Technical support to Perlis State Park establishment. Studies to provide justification for proposed park; studies of limestone flora, lobbying for the park.
- \* MY0077. **PL.** Integrated conservation and development of the Main Range, Peninsular Malaysia. Land-use and forest planning.
- \* MY0080. **IC.** Enhancing community skills and awareness Kenong Forest Park. Sustainable utilisation of the park by communities.

- \* MYS336 (MY0092). **PO.** Identification of potential protected areas in Sabah. Plant diversity is a major criterion. Being followed up at Ulu Padas, with WWF-Malaysia's first substantial ICDP.
- \* MYS339/96 (MY0075). **ST.** Study of biodiversity and biogeography of the Peninsular montane flora. Research plots in montane forest; surveys of orchids and orchid trade.
- \* MYS359/96. **IC.** Kinabatang, Sabah, land-use management plan. Baseline (including vegetation) studies of the Kinabatangan flood plain, proposed protected area.
- \* MYS374/97 (MY0079). **PO.** Critical ecosystems for conservation. State by state protected area development for Peninsula Malaysia (3 states so far).
- \* 9Z0556. **CA.** People and Plants in Southeast Asia. Training in ethnobotany; field projects with community conservation.
- \* 9Z0692. **PO.** Promoting the implementation of the Convention on Biological Diversity. Focus on protected areas and lobbying at state level to promote them.
- \* **SP.** Preliminary survey of limestone floras in Sabah.

### **Nepal**

- \* NP0016. **IC.** Annapurna Conservation Area. ICDP; development of human resources; regeneration and wildlife enhancement.
- \* NP0022. **IC.** Northern Mountain Conservation Project. Areas: Shey Phoksundo National Park and Dhorpatan Hunting Reserve. ICDPs. Botanical inventory of Shey Phoksundo National Park completed 1996.
- \* NP0024. **IC.** Royal Bardia National Park Conservation Programme. ICDP; organisation of user-groups for community forestry and nursery establishment; plant inventory.
- \* NP00859. **IC.** Kanchenjunga Conservation Area Project. Protection of the area (a proposed Biosphere Reserve), preparation for conservation plan, development assistance; botanical inventory.
- \* NY0869. **IC.** Agroforestry, Sagamatha National Park. Promotion of community and private forestry; work with forest user-groups (principally women) for forest restoration and vegetable growing.
- \* 9Z0556. **CA.** People and Plants Project in Shey Phoksundo National Park, Dolpo. Sustainable management of medicinal plants; development of health-care systems; training.

### **Papua New Guinea**

- \* PG0013. **IC.** Kikori Basin Conservation Project. ICDP.
- \* PG0023. **CO.** Community Land Care Project. Community-based conservation at various sites of high biodiversity.
- \* PG0025. **CO.** Community Land Care Lukautim Graun Project. ICDP; 2 areas: Sepik Hills and another to be confirmed.

### **Pakistan**

- \* PK0029. **IC.** Conservation of Chalghoza forest ecosystems, Suleiman Range. ICDP. Baluchistan and NWFP. Community conservation agreements involving tribal owners; economic incentives.
- \* PK0040. **IC.** Support strategy for protected area network in Pakistan. Conservation of 4 representative protected areas in Pakistan with involvement of communities.
- \* PK0047. **IC.** Surveys, management planning and proposal for Azad Jammu and Kashmir. Management plan for Machyara National Park, including incorporation of plant use by local people.
- \* PK0048. **IC.** Conservation of mangrove forest at coastal areas in Sindh and Baluchistan. Research, education and awareness.
- \* 500163. **CO.** Wildlife protection and juniper forest conservation, Torshor Zarghoon Valley, Baluchistan. Medicinal plant conservation through community management.
- \* 500165. **CO.** Biodiversity conservation in Federally Administered Tribal Areas in North West Frontier Province.
- \* 800023. **IC.** Protection of biodiversity in the Jhangar Valley, Chakwal District, Punjab. Community conservation with 5 villages. Involves both Reserved and Community Forests.
- \* 9Z0556. **CA.** People and Plants. Conservation and training in applied ethnobotany. Ayubia National Park.

### **Solomon Islands**

- \* SB0002. **CO.** Solomon islands: community resource conservation. Community involvement in conservation and sustainable resource use.
- \* SB0006. **CA.** Advocacy support for forest resource centres. Community forest management.

## **Thailand**

- \* TH0031. **CO.** Environmental action and mobilisation at Thap Lan/Pong Sida/Pha Khum. Community based conservation.
- \* TH0039. **IC.** Western Isan forest ecosystem. ICDPs; management improvement for 4 protected areas.
- \* TH0049. **CO.** Biodiversity monitoring in community forest.

## **Vietnam**

- \* VN0005. **ST.** Biodiversity surveys.
- \* VN0007. **ST.** Remote sensing support - mapping and monitoring.
- \* VN0021. **IC.** Conservation of Vu Quang Nature Reserve. ICDP, includes improved agriculture.
- \* VN0022. **IC.** Cat Tien National Park conservation project. ICDP; collaboration with CARE International.
- \* VN0024. **IC.** Linking Phong Nha-Ke Bang (Vietnam) and Hin Namno (Laos) through parallel, cross-border, ICDP initiatives.
- \* VN0030. **SU.** Supporting forest certification. Development of national standards and a model logging project.
- \* VN0025. **PA.** Strengthening protected area management. Promoting community involvement; reviewing laws and regulations; looking at protected area siting.

## **EUROPE**

There are many WWF NOs in Europe. The plant conservation programmes of only 3 of them (Greece, Italy, UK) have been determined for inclusion in this list, which therefore certainly underestimates the total contribution of WWF to plant conservation in Europe.

More than one country

- \* 9E0047. **PO.** Agriculture Europe. Policy development in agriculture.
- \* 9E0057. **PA.** Establishment of protected area system in the Oder Valley. Includes cross-border national park between Poland and Germany.
- \* 9E0060. **PL.** Conserving biodiversity, Green Danube. Conservation co-ordination between countries, including for forests, meadows and conservation of threatened plant species.
- \* 9E0077. **PO.** Conservation and development in the Arctic Region. Policy lobbying and field activities.
- \* 9E0081. **PO.** Habitats Directive and biodiversity conservation awareness campaign. Co-ordination of WWF-EU policy programme on Ecological Network and Species.
- \* 9E0125. **PO.** Central Asian Republics: conservation of biodiversity. Promoting national conservation strategies.
- \* 9E0129. **PL.** Gap analysis of Mediterranean old-growth forest. Establishing priority areas for forest protection.
- \* 9E0144. **PL.** Gap analysis of protected forests. For temperate forests.
- \* 9E0147. **CA.** SILVA Mediterranean forest course. 2 week 'forest and conservation' course.
- \* 9E0151. **SU.** Sustainable use of NTFPs in the Mediterranean Region.
- \* 9E0157. **PL.** Mediterranean forest programme development. Project development, including for old-growth forest conservation in Turkey.
- \* 97007 (WWF-UK project). **TR.** Medicinal plants: conservation, use and trade in Europe. Publication; based on field surveys in several countries.

## **Bulgaria**

- \* BG003. **RE.** Green Danube programme – Bulgarian flood plain forest. Flood plain restoration.

## **Czech Republic**

- \* CS0004. **PA.** Development of management plan for Sumava Biosphere Reserve. German/Czech border.

## **Estonia**

- \* EE0002. **ST.** Alvar vegetation in Estonia – survey and management. Species-rich limestone grassland.



### **Georgia**

- \* GG0001. **PO.** Conservation programme for the Caucasus. Establishing protected areas, sustainable development.
- \* GG0004. **SU.** Promotion of medicinal plant cultivation and use around Pas. Working with the NGO Kuna.
- \* GG0005. **IC.** Development of a management plan for protection and sustainable resource use. Includes documentation of the flora.
- \* GG0008. **PA.** Implementation of the Borjomi-Kharagauli National Park. Support to the park.

### **Greece**

- \* GR0044. **PA.** Promotion of a 10% target for forest protected areas.
- \* **IC.** Dadia Forest Reserve. ICDP. Includes monitoring of *Pinus nigra* and *P. brutei*. Assisting local communities to develop sustainable ways of life.
- \* **PO.** Natura 2000. Evaluation of the national list and making suggestions for changes, including inclusion of additional areas.
- \* **PO.** Promotion of the 10% forest protected area target for Greece. Implementation of a pledge by the government to protect 10% of the country's forest cover.
- \* **PU.** 'Forests for Ever' campaign. To protect forests from fire. Includes restoration of 2 sites near Athens - the first time that WWF-Greece members have been involved in practical field activities.

### **Hungary**

- \* HU0012. **RE.** Tisza River basin. Restoration of floodplain habitats.
- \* HU0014. **RE.** Green Danube programme. Hungarian floodplain forest conservation and restoration.
- \* HU0016. **PO.** Forest monitoring programme. Implementation of forest laws in Hungary.
- \* HU0017. **SU.** Wooded pastures grazing forest conservation. Promoting of conservation of long established wooded pastures.
- \* HU0018.01. **PA.** Management of the Somly grassland. Management plan, involvement of volunteers, project associated with Danube Ipoly National Park and possible purchase for conservation.
- \* HU0023. ?. Hungarian steppe oak forest programme. Conservation of a rare forest type.

### **Italy**

- \* **PA.** Protection of *Abies alba* forest. 5 sites on the Apennines, including Selva Grande. Arboretum and nurseries. Monitoring succession and regeneration.
- \* **PA.** Protection of *Fagus sylvatica*/*Pinus nigra* forest. At Monte Polveracchio, Campania Region. Arboretum and nurseries.
- \* **PA.** Protection of Mediterranean evergreen forest, Monte Arcosu, southern Sardinia. WWF-Italy has purchased 4000 ha. Problems of grazing and fires.
- \* **PA.** Protection of steppe areas at Osieri, northern Sardinia. WWF-Italy has purchased 80 ha (total habitat area 3000 ha). Establishment of best grazing regime in co-operation with local people.
- \* **PA.** Protection of Mediterranean evergreen forest at Gennagentu. A new national park. Grazing and fire issues; awareness-raising in 10 communities.

### **Latvia**

- \* LV0005. **SU.** Privatisation and sustainable forestry: demonstration project in Mozole. Promoting better forest management by small-scale private owners.

### **Lebanon**

- \* LB001. **PU.** Chouf Forest resource centre. Promoting forest management and reforestation.

### **Mongolia**

- \* MN0002. **PA.** Development of protected area system in Mongolia.

### **Poland**

- \* PL0003. **PA.** Establishment of a national park in Biebrza Valley. Network of river valleys and freshwater wetlands; aimed to control succession.
- \* PL0005. **PA.** Olsztyn Landscape Park.

### **Portugal**

- \* PT0011. **PA.** Elaboration of the Guardiana Valley Natural Park (Alentejo). Development of management plan and restoration of forest maquis.
- \* PT0012. **IC.** Guardiano Vivo. Promotion of community participation in management of protected areas and education.

#### **Romania**

- \* RO0003. **IC.** Green Danube Programme: Danube Delta, Romania. Ecological restoration, sustainable development and protection of wetlands.
- \* RO0004. **IC.** Planning and establishment of Craiului Biosphere Reserve.

#### **Russia**

- \* RU0007. **IC.** Pechora Ilych – forest conservation. ICDP, protected area, ecologically sound forestry.
- \* RU0019. **IC.** Establishment of Kunovatsky Zapovednik. Conservation and sustainable use.
- \* RU0028. **PA.** Establishing of two new reserves – Yamal and Gydan.
- \* RU0034. **PA.** Establishment of new federal protected area – Kaninsky Reserve.
- \* RU0041. **PA.** Establishment of new nature reserves in Amur Region: Upper Amur Zapovednik.
- \* RU0054. **?** Promotion of conservation in Yakutia.
- \* RU0058. **PA.** Establishment of WWF Sakha Reserve. Taiga.
- \* RU0060. **PA.** Lenskie Stolby National Park.
- \* RU0063. **PA.** Establishment of two Nature Parks on Kamchatka. Proposals for park creation.
- \* RU0064. **PL.** South Karelian wetlands and grasslands: inventory & conservation strategy development. Information gathering and developing a conservation strategy.
- \* RU0067. **SU.** Model project on sustainable forestry in N and Central European Russia. ICDP, sustainable forest management.

#### **Spain**

- \* ES0034. **PL.** Gap analysis of forest distribution and protection in Spain. Research towards promoting protection.
- \* ES0035. **PA.** Donaña National Park development. Implementation of Habitats Directive.

#### **Tunisia**

- \* TN0010. **IC.** Conservation and development of El Feidja National Park and surrounding forest region. Education programme, promotion of sustainable development, NTFP promotion, honey production.

#### **Turkey**

- \* TU0011. **CO.** The promotion of indigenous propagation of threatened bulbs.
- \* TU0018. **SU.** Development of forestry programme for Turkey. Focus on the north-east.

#### **Ukraine**

- \* UA0001. **IC.** Green Danube Programme – Danube Delta Ukraine.

#### **United Kingdom**

- \* 94140. **ST.** Habitat quality and value. Major scientific study reviewing habitat quality.
- \* 95161. **PO.** 'By Hook or by Crook' – Guidelines for Magistrates on Wildlife Crime.
- \* 97004. **PO.** SAC Shadow list. Proposes Special Areas for Conservation for particular species (marsh saxifrage, slender green feather moss, Killarney fern) and revision of SAC methodology.
- \* 97126. **PO.** EU policy instruments and Natura 2000.
- \* 97130. **PU.** 'Eyes and Ears' (and 'Buyer Beware'). Public awareness about trade in endangered species. Includes mentions of orchids and cycads.
- \* 98023. **PO.** Favourable Conservation Status. To help define the meaning of Favourable Conservation Status, using case-studies of species and habitats in Cornwall.
- \* 98024.1. **PO.** Wildlife and Countryside Act. Pushing for review of the act.
- \* 98024.2. **PO.** Wildlife legislation. Collaborative project with Wildlife and Countryside Link advocating review of the Wildlife and Countryside Act. Uses plant decline data to advocate stronger legislation.
- \* 98025. **PU.** Understanding the Habitats and Species Directive. Workshops to explain the directive.
- \* 98044. **ST.** Review of rural development projects. WWF-UK's contribution to producing a WWF-Europe inventory of projects on sustainable rural development. May include projects on plants.

- \* **ST.** Habitat loss and habitat quality. Details losses in plant species and habitats, mainly due to agriculture.
- (The two projects above are associated with the WWF-Europe Agriculture & Rural Development Team.)
- \* 91047. **CA.** UK Vegetation Database. To increase its understanding by County Trusts.
- \* 91047. **ST.** Habitat Red Data Book. Subjective review of main threats to UK vegetation communities.
- \* 95043. **PO.** Nature conservation and pastoralism. Policy focus, nature value of extensive grazing.
- \* 98004. **SU.** Basic Environmental Standards for Agriculture. For implementation of greener practices.
- \* 96052. **PO.** Review of agri-environment regulation. Policy mechanisms to encourage wildlife friendly farming systems.
- \* 97097. **SU.** Delivering biodiversity in the UK. Development of a framework of environmental advice for farmers
- \* 97100. **SU.** Networks of knowledge. Review of advice, education and research to farmers.
- \* 95048. **RE.** Wealden Meadows. Hay meadows and grassland restoration, harvesting seed.
- \* 96139. **RE.** Denmark Farm. Habitat restoration on a degraded farm, now an education centre.
- \* 98005. **PO.** GIS, semi-natural woodlands and SACs. Sites for restoration and management in the Chilterns, promotion of shadow SACs, e.g. Aston Rowant SSSI, Bucks/Oxon.
- \* 97090. **ST.** Bumblebee Working Group. Identification of reasons for bumblebee decline, strategies for restoration.
- \* 96008. **SP.** Lundy cabbage conservation. Securing populations of the species.

#### **UK Dependent Territories**

- \* 96050. **SP.** St Helena – recovery of endemic plants. Surveys, propagation, training.
- \* 97125. **SP.** Falkland Islands – native plants survey. Involves trained botanists and volunteers, first publication on distribution of native plants – useful for land-use planning, legislation, etc.

#### **LATIN AMERICA/CARIBBEAN**

##### **More than one country**

- \* 9L0701. **ST.** Misiones Region Tri-National Atlantic Forest conservation Project. Brazil-Argentina-Paraguay Atlantic forest; developing methodologies.
- \* 9L0716. **CO.** Conservation of Awa Territory. Community conservation.
- \* 9L0725. **PL.** Conservation of Llanos and Orinoco Regions of Colombia and Venezuela. Strategic conservation plan; includes analysis of biological importance.
- \* 9L0771. **CA.** Building conservation infrastructure: training programs in Latin America/Caribbean. Subjects include protected areas, biodiversity management, community involvement.
- \* 9L0785. **ST.** Identification of botanical gaps.
- \* 9L0801. **SU.** Region-wide forest campaign and co-ordination

##### **Bolivia**

- \* BO0856. **SU.** Forest management. Promoting forest certification.

##### **Colombia**

- \* CO0856. **CO.** Developing strategies for community-based conservation.
- \* CO0860. **CO.** Strengthening civil society and conservation. NGO support; development of network of private nature reserves.
- \* CO0862. **CO.** Conservation and management of paramo ecosystem. Community involvement, resource management.
- \* CO0863. **ST.** Biogeographic priority setting and monitoring (Northern Andean Ecosystems). GIS survey.
- \* CO0867. **SU.** Improving forest management. Promoting voluntary forest certification.
- \* CO0014. **CO.** Territorial management plans and regional development dialogue of indigenous communities, Utria Sound National Park. Community conservation.
- \* CO0855. **ST.** Conservation priorities and direction in the Colombian Amazon. Analysis of conservation opportunity and threats. Identification of site for ICDP in foothills of eastern Andes or Varzea.

- \* CO0854. **IC.** Conservation, environmental education and sustainable development in Central Andes of Colombia. Los Nevados National Park, eco-development, education.
- \* **IC.** Management of Tatabro River Watershed: Bajo Anchica, Choco. ICDP project; agroforestry, mixed cropping, forest management systems.

#### **Costa Rica**

- \* CR058. **IC.** Conservation and sustainable use in Arenal.
- \* CR0858. **RE.** Conservation in northern Costa Rica and conservation capacity countrywide. Includes restoration of forest fragments.

#### **Cuba**

- \* CU0851. **IC.** Conservation and sustainable development in Cuba. Support to about 6 parks.

#### **Ecuador**

- \* ECO853. **IC.** Conservation of biodiversity and sustainable development in Sangay National Park.
- \* EC0859. **IN.** Protected area management in the Galapagos. Control of invasive species.

#### **Guatemala**

- \* GT0012. **IC.** Eco-development in the Sierra de las Minas Biosphere Reserve. ICDP-type project.

#### **Honduras**

- \* HN0851. **IC.** People-centred conservation in north-eastern Honduras, Rio Platano Biosphere Reserve; ICDP.

#### **Mexico**

- \* MX0852. **IC.** People-centred conservation and development in Selva Zoque (Chimalapas-Uxpanapa-Ocote) Region. ICDP, strengthens local institutional capacity, policy development for land and resource use.
- \* MX0853. **IC.** Yucatan Moist Forest. ICDP.
- \* MX0854. **IC.** People-centred conservation and development in the El Triunfo Biosphere Reserve. ICDP; includes organic agriculture.
- \* MX0855. **IC.** People-centred conservation and development in Oaxaca. ICDP; includes identification of conservation priorities and community forestry.

#### **Nicaragua**

- \* NI0851. **SU.** Conservation and development of northern Nicaragua. Sustainable forest management in Kukalaya and Layasiksa watersheds. Community forest management, certification of pine timber.

#### **Peru**

- \* PE0033. **IC.** Sustainable development in the Mario River Sub-basin and conservation of Ampay Forest Sanctuary. ICDP project, land zonation, tree planting.
- \* PE0601. **IC.** Conservation and ecological sustainable development in the Manu Biosphere Reserve. ICDP; re-afforestation with native fruit trees and marketing of fruits; agroforestry.
- \* PE0851. **IC.** Protection and management of Rio Abiseo Park. ICDP; nursery, organic gardens.
- \* PE0852. **IC.** Pacaya-Samiria integrated programme for development and conservation. Sustainable utilisation of natural resources.

#### **NORTH AMERICA**

(No information collected, but there are few if any WWF plant projects in the USA.)

### Annex 3. Projects of the Plants Conservation Unit, WWF International, 1989-2000

(Brief titles only)

1. Cameroon – ethnobotanical survey of Kilum Mountain forests.
2. Turkey – propagation of indigenous bulbs.
3. Spain (Canary Islands) – conservation of endemic flora.
4. China – conservation of *Camellia japonica*.
5. Asia – book on conservation of wild mangoes.
6. Conservation of medicinal plants– ethical guidelines.
7. Chile (Easter Island) – list of threatened plant species.
8. China – *in situ* and *ex situ* conservation of Hainan plummyew.
9. International botanic gardens strategy.
10. France (La Réunion) – conservation of plant diversity.
11. Conservation of *Prunus africana*.
12. Portugal (Madeira) – conservation of rare and endangered bryophytes.
13. Yemen – status of threatened species on Socotra.
14. Europe – Red Data Book on European Bryophytes.
15. Fiji - Conservation plants on islands
16. Sri Lanka – conservation of medicinal plants.
17. Madagascar – conservation and integrated health-care.
18. Mauritius – conservation of threatened plants.
19. India – documentation of threatened plants of the Andaman Islands.
20. Conservation of African medicinal plants.
21. Portugal (Madeira) – advice on control of invasive plants.
22. Portugal (Madeira) – support for the development of the Natural Park.
23. Conservation des resource vegetales (book).
24. Booklet on conservation of the wild relatives of crops.
25. Booklet – “The vital wealth of plants”.
26. China – conservation of limestone forest.
27. Centres of Plant Diversity (3 volume series).
28. Guidelines to conservation of medicinal plants (book).
29. Greece – Plant Red Data Book.
30. Europe – wild plants in trade (report).
31. Principles and practices of plant conservation (textbook).
32. Asia – palms for human needs (book).
33. Wild plant conservation and the law (book).
34. Zaire – identification of critical plant sites in eastern Zaire.
35. Distribution of literature on plant conservation.
36. Support for education programmes in botanic gardens.
37. Tanzania – survey of coastal forests.
38. India – conservation of plants on the Palni Hills.
39. International strategy for plant conservation (preparation, translation).
40. Philippines – directory of ethnobotanical literature.
41. Pakistan – Handbook on Silviculture of trees.
42. China - conservation of *Mangifera*.
43. Malaysia – conservation of palms on Mt Kinabalu.
44. Madeira – creation of a garden of indigenous plants.
45. Vietnam – conservation of rare and endangered species.
46. Africa – clinical evaluation of medicinal plants.
47. Nepal – rare and endangered plants (Red Data Book).
48. Seychelles – conservation of non-flowering plants.
49. Conserving wild relatives of plants of Gran Canaria (book).
50. Indonesia: evaluation of medicinal plants. in Kerinci Seblat.
51. Pakistan – ethnobotany of Machyara Proposed National Park.
52. The *People and Plants* initiative, including numerous sub-projects, including:  
*Field projects in:*  
Bolivia – Beni Biosphere Reserve.  
Kenya – wood-carving and conservation.

Malaysia – Crocker Range, Mt Kinabalu, Ulu Padas.

Mexico – Oaxaca.

Nepal – Shey Phoksundo National Park.

Pakistan – Ayubia National Park.

South Pacific – Fiji, Papua New Guinea, Solomon Islands, Vanuatu.

Tanzania – Udzungwa National Park.

Uganda – Bwindi Impenetrable National Park, Rwenzori Mountains National Park.

Zimbabwe (on bark-use issues).

*Other activities:*

Central America - curriculum development in ethnobotany.

International ethnobotanical workshops in the Caribbean, Kenya, Mexico and the South Pacific.

Publications (see Annex 4).

## ANNEX 4. MATERIALS PRODUCED BY THE PLANTS CONSERVATION UNIT, WWF INTERNATIONAL, 1989-2000

### (1) Materials associated with the People and Plants Initiative

#### WEBSITE

<http://www.rbgekew.org.uk/peopleplants>

#### PEOPLE AND PLANTS CONSERVATION MANUALS

- \* Martin, G.J. (1994). *Ethnobotany: a methods manual*. Stanley Thornes Publishers Ltd., Cheltenham. 268 pp. (also available in Bahasa Malaysia and Chinese)
- \* Cronk, Q.C.B. and J.L. Fuller (1995). *Plant invaders: the threat to natural ecosystems*. Stanley Thornes Publishers Ltd., Cheltenham. 261 pp.
- \* Tuxill, J. and Nabhan, G.P. (1998). *Plants and protected areas - a guide to in situ management*. Stanley Thornes Publishers Ltd., Cheltenham. 248 pp.
- \* Berjak, M. & Grimsdell, J. *Botanical databases for conservation and development*. WWF, Godalming. 87 pp.

*In preparation:*

- \* Cunningham, A.B. *Applied ethnobotany: wild plant use and conservation*. Earthscan, London.
- \* Laird, S. *Biological diversity and traditional knowledge: equitable partnerships in practice*. Earthscan, London.
- \* Luckert, Campbell & Mandondo. *Valuing trees, woodlands and forests*. Earthscan, London.

#### PEOPLE AND PLANTS WORKING PAPERS

1. Cunningham, A.B. (1993). *African medicinal plants: setting priorities at the interface between conservation and primary healthcare*. UNESCO, Paris. 50 pp. (also available in Spanish)
2. Cunningham, A.B. and F.T. Mbenkum (1993). *Sustainability of harvesting Prunus africana bark in Cameroon: a medicinal plant in international trade*. UNESCO, Paris. 28 pp.
3. Aumeeruddy, Y. (1994). *Local representations and management of agroforests on the periphery of Kerinci Seblat National Park, Sumatra, Indonesia*. UNESCO, Paris. 46 pp. (also available in French and Spanish)
4. Cunningham, A.B. (1996). *People, park and plant use: research and recommendations for multiple-use zones and development alternatives around Bwindi Impenetrable National Park, Uganda*. UNESCO, Paris. 56 pp. (also available in French)
5. Wild, R.G. and Mutebi, J. (1996). *Conservation through community use of plant resources: establishing collaborative management in Bwindi Impenetrable and Mgahinga Gorilla National Parks, Uganda*. UNESCO, Paris. 45 pp. (also available in French)
6. Höft, M., Barik, S.K. and Lykke, A.M. (1999). *Quantitative ethnobotany: applications of multivariate and statistical analyses in ethnobotany*. 46 pp.
7. Aumeeruddy, Y. *et al.* *Joint management: an annotated bibliography*.

*Others in preparation.*

## **THE PEOPLE AND PLANTS HANDBOOK: SOURCES FOR APPLYING ETHNOBOTANY TO CONSERVATION AND COMMUNITY DEVELOPMENT**

1. Martin, G.J. and A.L. Hoare (eds) (1996). *Keeping in touch: journals, networks, newsletters, organisations and professional societies*. WWF, UNESCO and the Royal Botanic Gardens. 24 pp. (also available in Spanish)
2. Martin, G.J., Hoare, A.L. and D.A. Posey (eds) (1996). *Protecting rights: legal and ethical implications of ethnobiology*. WWF, UNESCO and the Royal Botanic Gardens, Kew. 32 pp. (also available in Spanish)
3. Martin, G.J. and Hoare, A.L. (eds) (1996). *Returning results: community and environmental education*. WWF, UNESCO and the Royal Botanic Gardens, Kew. 40 pp. (also available in Spanish)
4. Martin, G.J., Hoare, A.L. and Agama, A.L. (eds) (1998). *Measuring diversity: methods of assessing biological resources and local knowledge*. WWF, UNESCO and the Royal Botanic Gardens, Kew. 40 pp.

*Other issues In preparation.*

### **PEOPLE AND PLANTS DISCUSSION PAPERS**

- \* Cunningham, A.B. (1993). *Ethics, ethnobiological research, and biodiversity*. WWF International, Gland, 44 pp.
- \* Laird, S.A. (1995). *Fair deals in the search for new natural products*. WWF International, Gland, 20 pp.

### **SOME OTHER PEOPLE AND PLANTS PUBLICATIONS**

- \* Banik, R.L., Alam, M.K., Pei, S.J. and Rastogi, A. (eds). *Applied ethnobotany*. Proceedings of the subregional training workshop of applied ethnobotany at Bangladesh Forest Research Institute, Chittagong (17-22 December 1997). Bangladesh Forest Research Institute, Chittagong, Bangladesh 1998. 132 pp.
- \* Cunningham, A.B. and Höft, R. (eds) (1997). *The African Ethnobotany Network*. Bulletin No. 1, November 1997. AETFAT, UNESCO, WWF and the University of Zimbabwe, Harare. 103 pp.
- \* Giampaoli, P. (s.d.). *Common plants of the Rwenzori Central Trail circuit*. Uganda Wildlife Authority. Kampala. 41 pp.
- \* Pei Shengji and Long Chun-lin (1998). *Applied ethnobotany*. Proceedings of the National Training Workshop on Applied Ethnobotany in China 24-30 April 1997. Yunnan University Press, Yunnan. 210 pp.
- \* Rastogi, A., Godbole, A. and Shengji, P. (eds). (1998). *Applied ethnobotany in natural resource management: traditional home gardens*. Highlights of a training workshop held at Kohima, Nagaland, India, 18-23 June 1997. International Centre for Integrated Mountain Development, Kathmandu, Nepal. 97 pp.
- \* Shrestha, K.K., Jha, P.K., Pei, S.J., P., Rastogi, A., Rajbhandary, S. and Joshi, M. (1998). *Ethnobotany for conservation and community development*. Proceedings of the National Training Workshop in Nepal (6-13 January 1997). Ethnobotanical Society of Nepal, Kathmandu. 144 pp.

### **VIDEOS**

- \* *People, gorillas and forests: ethnobotanical methods and multiple-use management in Uganda*. Produced and filmed by A.B. Cunningham. 1997.
- \* *Saving the wooden rhino: ethnobotanical methods and Kenya's woodcarving industry*. Produced and filmed by A.B. Cunningham. 1998.
- \* *Carvers, conservation and consumers*. Produced and filmed by A.B. Cunningham. 1998.

*Others in preparation.*



## (2) OTHER MATERIALS PRODUCED OR SUPPORTED BY THE PLANTS CONSERVATION UNIT

- \* Akerele, O., Heywood, V.H. and Synge, S. (1991). *Conservation of medicinal plants*. Cambridge University Press. 362 pp.
- \* Davis, S.D., Heywood, V.H. and Hamilton, A.C. (1994). *Centres of Plant Diversity. Volume 1: Europe, Africa, South West Asia and the Middle East*. IUCN Publications Unit, Cambridge, UK and Gland, Switzerland. 354 pp.
- \* Davis, S.D., Heywood, V.H. and Hamilton, A.C. (1995). *Centres of Plant Diversity. Volume 2: Asia, Australasia and the Pacific*. IUCN Publications Unit, Cambridge, UK and Gland, Switzerland. 578 pp.
- \* Davis, S.D., Heywood, V.H., Herrera-MacBryde, O., Villa-Lobos and Hamilton, A.C. (1997). *Centres of Plant Diversity. Volume 3: The Americas*. IUCN Publications Unit, Cambridge, UK and Gland, Switzerland. 562 pp.
- \* de Klemm, C. (1990). *Wild plant conservation and the law*. IUCN Environmental Law Centre, Bonn. 215 pp.
- \* Hoyt, E. (1992). *Conserving the wild relatives of crops*. IBPGR, IUCN, WWF. 52 pp.
- \* Given, D.R. (1994). *Principles and practices of plant conservation*. Timber Press Inc., Portland, Oregon. 292 pp.
- \* Johnson, D. (ed.) (1991). *Palms for human needs in Asia*. A.A. Balkema, Rotterdam. 258 pp.
- \* Kostermans A.J.G.H. and Bompard, J.M. (1993). *The mangoes*. Academic Press, London. 233 pp.
- \* Lewington, A. (1993). *Medicinal plants and plant extracts*. TRAFFIC International, Cambridge. 37 pp.
- \* Phitos, D. A. Strid, S., Snogerup and Greuter, W. (1995). *The Red Data Book of rare and threatened plants of Greece*. K. Michalas S.A., Athens. 527 pp.
- \* Shrestha, T.B. and Joshi, R.M. (1996). *Rare, endemic and endangered plants of Nepal*. WWF-Nepal Program, Kathmandu. 244 pp.
- \* Stewart, N. (1995). *Red Data Book of European bryophytes*. European Committee for the Conservation of Bryophytes, Department of Botany, University of Trondheim. 291 pp.
- \* Strahm, W. (1989). *Plant Red Data Book for Rodrigues*. Koeltz Scientific Books, Königstein. 241 pp.
- \* Walters, M. and Hamilton, A.C. (1993). *The vital wealth of plants*. WWF International, Gland. 49 pp.
- \* WHO, IUCN and WWF (1993). *Guidelines on the conservation of medicinal plants*. IUCN, Gland. 50 pp.

Submission to an Informal Consultation (March 2001) of the Subsidiary Body on Scientific, Technical and Technological Advice, Convention on Biodiversity (CBD) towards the possible establishment of a:

## Global Strategy for Plant Conservation

Submitted on behalf of WWF by Dr Alan Hamilton, Head, International Plant Conservation Unit, WWF-UK.

This submission is in support and, in part, development of the Objectives of the IUCN/SSC Plant Conservation Programme (2000-2005), to which cross-reference is made. It is also supportive of the position of Planta Europa, backed by Plantlife and others, in its development of a Plant Conservation Strategy for Europe. The submission concentrates on aspects of plant conservation with which WWF has greatest experience and therefore does not cover all matters which should be included in a Global Strategy. It draws on a supporting document (Annex 1), which contains a recent analysis of the contributions of WWF to plant conservation, includes the results of a survey of perceived priorities in plant conservation and contains a list of various documents (including books, reports and videos) produced by WWF to promote plant conservation internationally.

### Contents

1. Recommendations
2. Basis of the submission

Annex 1: Supporting document: *Plant conservation and WWF: current work and recommendations for the future.*

## 1. RECOMMENDATIONS

WWF recommends that:

### **1. General measures**

Ref. CBD Article 6 and Article 10(a).

**1.1. Incorporate botanical components into national conservation strategies.** Conservation of plant diversity and promotion of sustainable use of plant resources should be major components of national strategies and plans for biodiversity conservation and sustainable use of bioresources, for instance regarding selecting sites for protected areas.

### **2. Identify and monitor components of biological diversity important for its conservation and sustainable use**

Ref. CBD Article 7; IUCN/SSC Objective 1, Output 1.1.

**2.1. Important Plant Areas (IPAs).** Identify key sites for conservation of plant diversity (Priority Plant Areas) in order to target resources available for conservation efficiently. Selection of IPAs should be based on: (1) analysis of patterns of distribution of plant species and, where possible, genetic variation within species, taking due note, *inter alia*, of species richness and endemism; (2) analysis of threats to this diversity and assessments of the vulnerability of different sites; (3) knowledge of the causes of these patterns and assessments of the influence on them of predicted environmental change; and (4) determination of types and areas of vegetation providing wider ecosystem services, such as water supply and soil stabilisation. Subordinate administrative units of the state should be required to undertake more refined analyses to identify IPAs within their territories. States should cooperate with

others sharing the same major plant geographical units (e.g. Ecoregions in WWF terminology) to ensure that IPAs within their territories are well chosen considering the wider, as well as the national, perspectives.

2.2. Plant products in trade. Determine the types and quantities of traded plant products (timber and non-timber forest products) harvested from wild plants, and assess the sustainability of this trade in relation to populations of the targeted species and the effects of harvest on the wider conservation values of the ecosystems from which the products are derived.

2.3. Local botanical knowledge. Identify the knowledge, values (including uses) and methods of management of plants held by different social groups, especially rural communities. Special attention should be given to more indigenous peoples, recognizing the wealth of traditional knowledge which they typically hold.

2.4. Monitor the status of IPAs. Indicators should be established and monitored at landscape and local levels. The former should include monitoring by remote sensing. There should be central compilation and analysis of monitoring data from protected areas (see under Management of protected areas, below).

2.5. Monitor plant trade. Establish indicators of the trade in products derived from wild plants and the impacts on populations of the targeted species and on their source ecosystems. Botanical, ecological, social and economic indicators should be included.

2.6. Monitor local botanical knowledge. Monitor changes in knowledge of plants held by local people.

### **3. Establish protected areas and institute measures at other sites at which special provisions are needed for the conservation of biological diversity**

Ref. CBD Article 8a.

3.1. Establish protected areas at IPAs. As appropriate, protected areas may be under the control of central or more local administrations, or managed by communities or private land-owners. In general, the more important sites should be under the control of higher administrative units.

3.2. Promote biocultural diversity. Promote linkages between conservation of plant diversity and conservation of cultural diversity, as through the promotion of cultural landscapes (with their botanical and cultural diversity) or through support to indigenous groups seeking to protect their biological and cultural diversity from forceful external incursions (e.g. industrial logging or agriculture).

### **4. Management of protected areas**

Ref. CBD Article 8 (most clauses), Article 9(c) and Article 10. The development of effective management may require reform to legislation and regulations (Article 8(k) – see below) or control of invasive organisms (not specifically covered in this submission).

*The following recommendations are particularly concerned with management of protected areas in places where local communities have livelihood dependency on the plants of these areas. This is especially the case in the tropics and sub-tropics. Such communities often have cultures or economies closely bound to plants growing in protected areas. They may regard all or parts of the protected areas as falling within their territories.*

*Definitions of core, multiple-use and support zones. A core zone comprises that part of the protected area in which conservation of special biological features is given the highest priority; often no extractive activities will be allowed. A multiple-use zone is one in which biodiversity conservation remains a high priority, but some extractive use or other relatively low-impact uses are permitted. A support zone comprises an area adjacent to (or sometimes within) a protected area, with which it is closely bound ecologically, culturally and/or economically; it provides services supportive to conservation in core and multiple-use zones. For example, a support zone may consist of land adjacent to a protected area used to cultivate plant resources to replace those which cannot be collected sustainably from wild populations within the protected area.*

- 4.1. No large-scale exploitation. Prohibit large-scale commercial exploitation of plant resources (e.g. industrial logging) in protected areas.
- 4.2. Management systems must involve local people. Develop management systems for protected areas in consultation and agreement with major stakeholders, especially local people that have strong livelihood or cultural ties to the protected areas. (Note: it is often useful to develop management systems for protected areas through a strong focus on the use of plant resources within them. This is often the case even when a prime external interest in conservation may be non-botanical, e.g. animal conservation. This is because plant resources are often of such central importance to local communities.)
- 4.3. Identify special local features of plant diversity. Identify botanical components (species, varieties, vegetation types) within protected areas of particular importance for biodiversity conservation in wider perspectives (e.g. nationally or globally threatened species; special areas for water conservation). Determine their geography.
- 4.4. Identify features of local plant use. Through partnerships between scientists and local communities (particularly knowledgeable resource-users), identify: (1) the values of plants to local communities (including for provision of products for local use or sale); (2) the characteristics of collection of plant products by local people (harvesting techniques, amounts used, quantities, etc.); (3) methods used by local people for managing plant populations; (4) the collectors, including their social, cultural and economic status; and (5) community institutions, regulations and customs relevant to plant use and management (existing or potentially capable of development for this purpose).
- 4.5. Assess the sustainability of plant use. Through partnerships between scientists and local people (particularly knowledgeable resource-users), assess the sustainability of wild plant harvest in protected areas in terms of its impacts on both populations of the targeted species and wider biodiversity values.
- 4.6. Balancing conservation and sustainable use. Require agencies responsible for protected areas, in collaboration with local people, to engage in assessments (separately and together) to determine how balances between conservation and sustainable use best can be met. Identify institutions within the communities able to bargain and agree with the agencies on community rights and responsibilities in respect of protected areas, and capable of enforcing regulations. Where appropriate, develop schemes of land zonation within protected areas (sometimes extending to support zones), so as best to provide a balance between: (1) protection of botanical features of special conservation value (in core zones); (2) provision of wild plant resources for the use of local communities (in multiple-use zones); and (3) provision of alternatives to those plant resources which cannot be collected sustainably from wild populations or those whose wild harvest is incompatible with other aspects of biodiversity conservation (in support zones).
- 4.7. Promotion of plant diversity. Promote the conservation of vulnerable plant species or vegetation types within protected areas (and, where appropriate, landraces of crops in support zones). Measures might include steps to increase the populations of vulnerable species (sometimes linked to *ex situ* conservation) or manipulation of ecosystems, including the removal of invasive species.
- 4.8. Enhance plant populations or provide alternatives to over-harvested species. Through partnerships between communities and scientists, and for species vulnerable to over-harvest, identify and promote techniques to create more viable populations of vulnerable species or provide alternatives to wild-collected resources (e.g. through cultivation of the same or substitute species in support zones).
- 4.9. Adaptive management. Given the inherent uncertainties in conservation and development, generally adopt an adaptive approach to management. This will involve phases of: (1) stipulation of regulations; (2) monitoring the effects of these regulations; and (3) review.
- 4.10. Indicators. Select indicators of conservation status and sustainable use for regular monitoring. The majority should be suitable for regular monitoring by the permanent local staff of the agencies responsible for protected areas or by local people. There should also be other indicators suitable for periodic monitoring by scientists and other specialists. Indicators should relate to: (1) species and vegetation types of special biodiversity importance; (2) species vulnerable to over-harvest; and (3)

alternative resources. Botanical, ecological, social and economic indicators should often all be used for categories (2) and (3).

## **5. Legislation and regulations regarding threatened species and populations.**

Ref. CBD Article 8k.

5.1. Legislation and protected areas. Review legislation relating to protected areas to ensure that their management systems can include community involvement.

5.2. Legislation relating to the use of plant resources. Establish regulations over harvesting (including related to stumpage fees and royalties), trade or sale of particular species or plant products to promote conservation and sustainable use. Regularly review these measures, in the light of information on vulnerability.

## **6. Ex situ conservation**

Ref. CBD Article 9.

*Ex situ is taken here to include circa situ, referring to off-site conservation near in situ localities. Circa situ conservation may include the retention of certain wild species or varieties when land is cleared, the cultivation of normally wild species, and the storage and replanting at local level of seeds and other propagules collected from wild or cultivated plants.*

6.1. Circa situ conservation. Promote the cultivation or seed storage of vulnerable plant species and varieties at local level by communities and other relevant parties. Such plant species and varieties may include generally endangered species, as well as species and varieties of local value, whether this be for cultural, subsistence or financial reasons.

6.2. Promote the cultivation of plants vulnerable to over-harvest from the wild. Cultivation in the support zones of protected areas should be particularly promoted.

6.3. Field gene banks. Promote field gene banks to store, propagate and distribute vulnerable plant species and varieties, including those of value for livelihood security.

6.4. National ex situ collections. Support national-level *ex situ* facilities for vulnerable plant species and varieties, including those used by local people. A major feature should be to coordinate, promote and strengthen field gene banks, themselves supporting *circa situ* and *in situ* conservation of plant diversity and plant resources.

## **7. Sustainable use of components of biological diversity**

Ref. CBD Article 10; IUCN/SSC Objective 3.

See also recommendations under (4) Management of protected areas and (6) *Ex situ* conservation.

7.1. Promote local botanical knowledge. Promote the continuity and development of local knowledge of plant types, uses and management, especially by local communities (but also by botanical and natural history societies). Special attention should be given to the involvement of more indigenous peoples.

7.2. Materials. Promote the production and effective distribution of materials (e.g. field guides, videos) in appropriate formats (including regarding language) for the practical use of those who can contribute towards plant conservation and the sustainable use of plant resources. Key target audiences should include those working in agencies or NGOs concerned with forests, rangelands, agriculture, healthcare, and community development.

## **8. Training**

Ref. CBD Article 12a. IUCN/SSC Objective 5, Output 1.1.

**8.1. Training in applied ethnobotany.** Train botanists and the staff of agencies responsible for the management of plant resources (e.g. forestry, agricultural and pasture management agencies) to work effectively with the owners, users and managers of plants (including local communities, private owners and those working for commercial enterprises dependent on resources of wild plants), for the benefits of conservation and sustainable use. Components of training in applied ethnobotany could include (this is an indicative, not an all-inclusive list): (1) knowledge of the values, and conservation and development issues relating to plants and vegetation types in wider contexts; (2) approaches and methodologies for collaborative work with the owners, users or managers of plants to determine their conservation and development concerns relating to plants; (3) knowledge of social structures and processes relating to plant use and management; (4) systems of tenure and ownership relating to plants and the land on which they grow; (5) the abilities to document and analyze systems of plant trade; and (6) knowledge of relevant laws, regulations and local customs.

**8.2. Training in fundamental disciplines.** Develop training programmes in fundamental botanical and related disciplines relevant to conservation and sustainable use of plant resources. These include taxonomy, plant geography, ecology, population biology and more academic aspects of ethnobotany.

## **9. Research**

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**10.1. Local exchanges.** Promote exchanges of information for the benefits of conservation of plant diversity and sustainable use of plant resources. Exchanges can involve communities, NGOs, agencies, scientists and others.

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This submission is based on those areas of experience and competence listed below. *Caveat:* the recommendations made do not constitute a complete list of those required for a comprehensive Global Strategy for Plant Conservation.

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- *in situ* conservation is seen as normally the priority;
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The results draw attention to the inappropriateness of a paradigm which is common today among plant conservationists. This has a narrow focus on plant species conservation (only one aspect of plant conservation), gives insufficient attention to *in situ* conservation, fails to incorporate social systems adequately into its analyses and recommendations for action, and fails to recognise the central need to integrate conservation with development.

The low priority granted to legal measures reflects a widespread opinion that there are often more or less adequate laws and regulations (though reforms are needed) in comparison with the major task of putting laws and regulations into practice. This finding should not be misinterpreted to mean that respondents viewed policy instruments as unimportant – this was not the case.

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5. Commitment to the development of applied ethnobotany. Local people that have strong livelihood dependency on local wild plants must be involved in conservation efforts if they are to be successful. Applied ethnobotany is a discipline of particular relevance (ethnobotany is the discipline concerned with the relationships between people and plants; applied ethnobotany is the discipline in which ethnobotany is applied to conservation and promotion of sustainable use of plant resources). Recognition of this led to the founding in 1992 of the People and Plants programme, a joint initiative of

WWF, UNESCO and the Royal Botanic Gardens, Kew. The aim is capacity-building, in terms of professionals, institutions and recommended approaches and methodologies. Programmes have been mounted in several countries, with training provided in the context of pressing real-life conservation issues, including those connected with the interface between protected areas and people, and others relating to trade in products derived from wild plants. People and Plants has also been active at promoting applied ethnobotany internationally, producing and distributing freely in developing countries several series of publications, as well as training videos, and mounting a website (see Annex 1).

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Submission to an Informal Consultation (March 2001) of the Subsidiary Body on Scientific, Technical and Technological Advice, Convention on Biodiversity (CBD) towards the possible establishment of a:

## Global Strategy for Plant Conservation

Submitted on behalf of WWF by Dr Alan Hamilton, Head, International Plant Conservation Unit, WWF-UK.

This submission is in support and, in part, development of the Objectives of the IUCN/SSC Plant Conservation Programme (2000-2005), to which cross-reference is made. It is also supportive of the position of Planta Europa, backed by Plantlife and others, in its development of a Plant Conservation Strategy for Europe. The submission concentrates on aspects of plant conservation with which WWF has greatest experience and therefore does not cover all matters which should be included in a Global Strategy. It draws on a supporting document (Annex 1), which contains a recent analysis of the contributions of WWF to plant conservation, includes the results of a survey of perceived priorities in plant conservation and contains a list of various documents (including books, reports and videos) produced by WWF to promote plant conservation internationally.

### Contents

1. Recommendations
2. Basis of the submission

Annex 1: Supporting document: *Plant conservation and WWF: current work and recommendations for the future.*

## 1. RECOMMENDATIONS

WWF recommends that:

### **1. General measures**

Ref. CBD Article 6 and Article 10(a).

**1.1. Incorporate botanical components into national conservation strategies.** Conservation of plant diversity and promotion of sustainable use of plant resources should be major components of national strategies and plans for biodiversity conservation and sustainable use of bioresources, for instance regarding selecting sites for protected areas.

### **2. Identify and monitor components of biological diversity important for its conservation and sustainable use**

Ref. CBD Article 7; IUCN/SSC Objective 1, Output 1.1.

**2.1. Important Plant Areas (IPAs).** Identify key sites for conservation of plant diversity (Priority Plant Areas) in order to target resources available for conservation efficiently. Selection of IPAs should be based on: (1) analysis of patterns of distribution of plant species and, where possible, genetic variation within species, taking due note, *inter alia*, of species richness and endemism; (2) analysis of threats to this diversity and assessments of the vulnerability of different sites; (3) knowledge of the causes of these patterns and assessments of the influence on them of predicted environmental change; and (4) determination of types and areas of vegetation providing wider ecosystem services, such as water supply and soil stabilisation. Subordinate administrative units of the state should be required to undertake more refined analyses to identify IPAs within their territories. States should cooperate with

others sharing the same major plant geographical units (e.g. Ecoregions in WWF terminology) to ensure that IPAs within their territories are well chosen considering the wider, as well as the national, perspectives.

2.2. Plant products in trade. Determine the types and quantities of traded plant products (timber and non-timber forest products) harvested from wild plants, and assess the sustainability of this trade in relation to populations of the targeted species and the effects of harvest on the wider conservation values of the ecosystems from which the products are derived.

2.3. Local botanical knowledge. Identify the knowledge, values (including uses) and methods of management of plants held by different social groups, especially rural communities. Special attention should be given to more indigenous peoples, recognizing the wealth of traditional knowledge which they typically hold.

2.4. Monitor the status of IPAs. Indicators should be established and monitored at landscape and local levels. The former should include monitoring by remote sensing. There should be central compilation and analysis of monitoring data from protected areas (see under Management of protected areas, below).

2.5. Monitor plant trade. Establish indicators of the trade in products derived from wild plants and the impacts on populations of the targeted species and on their source ecosystems. Botanical, ecological, social and economic indicators should be included.

2.6. Monitor local botanical knowledge. Monitor changes in knowledge of plants held by local people.

### **3. Establish protected areas and institute measures at other sites at which special provisions are needed for the conservation of biological diversity**

Ref. CBD Article 8a.

3.1. Establish protected areas at IPAs. As appropriate, protected areas may be under the control of central or more local administrations, or managed by communities or private land-owners. In general, the more important sites should be under the control of higher administrative units.

3.2. Promote biocultural diversity. Promote linkages between conservation of plant diversity and conservation of cultural diversity, as through the promotion of cultural landscapes (with their botanical and cultural diversity) or through support to indigenous groups seeking to protect their biological and cultural diversity from forceful external incursions (e.g. industrial logging or agriculture).

### **4. Management of protected areas**

Ref. CBD Article 8 (most clauses), Article 9(c) and Article 10. The development of effective management may require reform to legislation and regulations (Article 8(k) – see below) or control of invasive organisms (not specifically covered in this submission).

*The following recommendations are particularly concerned with management of protected areas in places where local communities have livelihood dependency on the plants of these areas. This is especially the case in the tropics and sub-tropics. Such communities often have cultures or economies closely bound to plants growing in protected areas. They may regard all or parts of the protected areas as falling within their territories.*

*Definitions of core, multiple-use and support zones. A core zone comprises that part of the protected area in which conservation of special biological features is given the highest priority; often no extractive activities will be allowed. A multiple-use zone is one in which biodiversity conservation remains a high priority, but some extractive use or other relatively low-impact uses are permitted. A support zone comprises an area adjacent to (or sometimes within) a protected area, with which it is closely bound ecologically, culturally and/or economically; it provides services supportive to conservation in core and multiple-use zones. For example, a support zone may consist of land adjacent to a protected area used to cultivate plant resources to replace those which cannot be collected sustainably from wild populations within the protected area.*

4.1. No large-scale exploitation. Prohibit large-scale commercial exploitation of plant resources (e.g. industrial logging) in protected areas.

4.2. Management systems must involve local people. Develop management systems for protected areas in consultation and agreement with major stakeholders, especially local people that have strong livelihood or cultural ties to the protected areas. (Note: it is often useful to develop management systems for protected areas through a strong focus on the use of plant resources within them. This is often the case even when a prime external interest in conservation may be non-botanical, e.g. animal conservation. This is because plant resources are often of such central importance to local communities.)

4.3. Identify special local features of plant diversity. Identify botanical components (species, varieties, vegetation types) within protected areas of particular importance for biodiversity conservation in wider perspectives (e.g. nationally or globally threatened species; special areas for water conservation). Determine their geography.

4.4. Identify features of local plant use. Through partnerships between scientists and local communities (particularly knowledgeable resource-users), identify: (1) the values of plants to local communities (including for provision of products for local use or sale); (2) the characteristics of collection of plant products by local people (harvesting techniques, amounts used, quantities, etc.); (3) methods used by local people for managing plant populations; (4) the collectors, including their social, cultural and economic status; and (5) community institutions, regulations and customs relevant to plant use and management (existing or potentially capable of development for this purpose).

4.5. Assess the sustainability of plant use. Through partnerships between scientists and local people (particularly knowledgeable resource-users), assess the sustainability of wild plant harvest in protected areas in terms of its impacts on both populations of the targeted species and wider biodiversity values.

4.6. Balancing conservation and sustainable use. Require agencies responsible for protected areas, in collaboration with local people, to engage in assessments (separately and together) to determine how balances between conservation and sustainable use best can be met. Identify institutions within the communities able to bargain and agree with the agencies on community rights and responsibilities in respect of protected areas, and capable of enforcing regulations. Where appropriate, develop schemes of land zonation within protected areas (sometimes extending to support zones), so as best to provide a balance between: (1) protection of botanical features of special conservation value (in core zones); (2) provision of wild plant resources for the use of local communities (in multiple-use zones); and (3) provision of alternatives to those plant resources which cannot be collected sustainably from wild populations or those whose wild harvest is incompatible with other aspects of biodiversity conservation (in support zones).

4.7. Promotion of plant diversity. Promote the conservation of vulnerable plant species or vegetation types within protected areas (and, where appropriate, landraces of crops in support zones). Measures might include steps to increase the populations of vulnerable species (sometimes linked to *ex situ* conservation) or manipulation of ecosystems, including the removal of invasive species.

4.8. Enhance plant populations or provide alternatives to over-harvested species. Through partnerships between communities and scientists, and for species vulnerable to over-harvest, identify and promote techniques to create more viable populations of vulnerable species or provide alternatives to wild-collected resources (e.g. through cultivation of the same or substitute species in support zones).

4.9. Adaptive management. Given the inherent uncertainties in conservation and development, generally adopt an adaptive approach to management. This will involve phases of: (1) stipulation of regulations; (2) monitoring the effects of these regulations; and (3) review.

4.10. Indicators. Select indicators of conservation status and sustainable use for regular monitoring. The majority should be suitable for regular monitoring by the permanent local staff of the agencies responsible for protected areas or by local people. There should also be other indicators suitable for periodic monitoring by scientists and other specialists. Indicators should relate to: (1) species and vegetation types of special biodiversity importance; (2) species vulnerable to over-harvest; and (3)

alternative resources. Botanical, ecological, social and economic indicators should often all be used for categories (2) and (3).

## **5. Legislation and regulations regarding threatened species and populations.**

Ref. CBD Article 8k.

5.1. Legislation and protected areas. Review legislation relating to protected areas to ensure that their management systems can include community involvement.

5.2. Legislation relating to the use of plant resources. Establish regulations over harvesting (including related to stumpage fees and royalties), trade or sale of particular species or plant products to promote conservation and sustainable use. Regularly review these measures, in the light of information on vulnerability.

## **6. Ex situ conservation**

Ref. CBD Article 9.

*Ex situ is taken here to include circa situ, referring to off-site conservation near in situ localities. Circa situ conservation may include the retention of certain wild species or varieties when land is cleared, the cultivation of normally wild species, and the storage and replanting at local level of seeds and other propagules collected from wild or cultivated plants.*

6.1. Circa situ conservation. Promote the cultivation or seed storage of vulnerable plant species and varieties at local level by communities and other relevant parties. Such plant species and varieties may include generally endangered species, as well as species and varieties of local value, whether this be for cultural, subsistence or financial reasons.

6.2. Promote the cultivation of plants vulnerable to over-harvest from the wild. Cultivation in the support zones of protected areas should be particularly promoted.

6.3. Field gene banks. Promote field gene banks to store, propagate and distribute vulnerable plant species and varieties, including those of value for livelihood security.

6.4. National ex situ collections. Support national-level *ex situ* facilities for vulnerable plant species and varieties, including those used by local people. A major feature should be to coordinate, promote and strengthen field gene banks, themselves supporting *circa situ* and *in situ* conservation of plant diversity and plant resources.

## **7. Sustainable use of components of biological diversity**

Ref. CBD Article 10; IUCN/SSC Objective 3.

See also recommendations under (4) Management of protected areas and (6) *Ex situ* conservation.

7.1. Promote local botanical knowledge. Promote the continuity and development of local knowledge of plant types, uses and management, especially by local communities (but also by botanical and natural history societies). Special attention should be given to the involvement of more indigenous peoples.

7.2. Materials. Promote the production and effective distribution of materials (e.g. field guides, videos) in appropriate formats (including regarding language) for the practical use of those who can contribute towards plant conservation and the sustainable use of plant resources. Key target audiences should include those working in agencies or NGOs concerned with forests, rangelands, agriculture, healthcare, and community development.

## **8. Training**

Ref. CBD Article 12a. IUCN/SSC Objective 5, Output 1.1.

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