

**First Austrian National Report  
on the  
Convention on Biological Diversity**

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## 1 EXECUTIVE SUMMARY

On the occasion of the conference of the United Nations on Environment and Development in June 1992 in Rio de Janeiro, Austria, along with 156 other states, signed the Convention on Biological Diversity. Austria ratified the Convention in 1994. The objectives of this Convention are the conservation of biological diversity (which includes the diversity both of and within species - such as in varieties of cultivated plants - as well as ecosystem diversity), the sustainable use of its components, and the fair and equitable sharing of the benefits resulting from the use of genetic resources.

With its ratification, Austria has committed itself to implementing the articles of the Convention. Beyond comprehensive regulations to protect the flora and fauna (including microorganisms), this Convention also calls for establishing protection areas, installing gene and sperm banks, improving education and public awareness in relevant issues, as well as for introducing environmental impact assessments. In addition, it seeks to ensure the participation of developing countries by supporting their efforts to protect biological diversity, for example through the transfer of technology. Furthermore, the participation of such states in exploiting the biological material they supply is planned.

In its most recent report "Global Environment Outlook - GEO", the United Nations Environment Programme stresses that biological diversity continues to drop despite the Convention's ratification. Biodiversity, however, beyond its intrinsic value, is indispensable for ecological stability, food security and for medical purposes.

A wide range of activity is taking place in Austria in the realm of conserving and sustainably using biological diversity. In Austria, a number of institutions are involved in implementing the Convention due to divided jurisdictions and competences between Federal and Provincial authorities. In addition, research institutions, industry, non-governmental organizations and private persons are very active in this sector. Nonetheless, the "Red Lists" of endangered species continue to grow. Continuing consideration should be given to the Convention's call for cooperation with developing countries. In principle, no major shortcomings in implementing the Convention can currently be identified in Austria, although a wealth of opportunities exist to considerably improve this implementation. The Convention also commits the member states to formulating a national implementation strategy, which is currently in the discussion phase in Austria. This strategy will no doubt further increase the implementation efficiency.

The National Commission on Biodiversity was called into life by the Federal Ministry for Environment, Youth and Family in order to coordinate the many activities and programs as well as to promote the flow of information. In addition to representatives from administrative authorities (Federal Ministries and Provincial agencies), scientists and NGOs are also members of this commission, which produced the present report based on a draft provided by the Federal Environmental Agency.

## 2 INTRODUCTION

Austria is a landlocked country with a surface area of approximately 84 000 km<sup>2</sup> and around 8 million inhabitants, whereby 1.7 million people (approx. 20% of the population) live in Vienna. Austria is a Federal State consisting of nine provinces (Burgenland, Carinthia, Lower Austria, Salzburg, Styria, Tyrol, Upper Austria, Vienna, Vorarlberg).

Austria is blessed with a very high diversity of landscapes, ranging from the Pannonian plains to high alpine areas. Among Austria's many landscapes, the Alps - which take up 60% of the surface area and whose highest peak is the Grossglockner (3798 m) - are the most wide-ranging. Beyond the Alps, Austria's borders extend into the lowlands (Kleine Ungarische Tiefebene), where they enclose lake Neusiedler See at an altitude of 116 m. The granite and gneiss highlands (Wald- and Mühlviertel) north of the Danube encompass approx. 10% of the country. The remainder consists of the northern and southern alpine foothills, the Pannonian region, and of basins (e.g., the Klagenfurter Basin with its many lakes).

Overall, Austria has a Central European climate (temperate, wet), although the eastern regions display features of a Pannonian climate (hot, dry). At higher elevations, the Central European climate is gradually replaced by the cooler and wetter alpine climate. Annual precipitation in the Alps reaches 2500 mm, while the inner alpine valleys and basins along with the eastern margin of the Alps are very dry (500-1200 mm). In the alpine foothills, precipitation decreases from 1400 mm to 530 mm from east to west, dropping further to 400 mm in the Pannonian region.

Austria and its biological diversity are characterized by age-old human intervention, especially through agriculture and forestry. These forms of use, along with hunting and fishing and, in recent decades, tourism, clearly underline the great economic importance of biological diversity.

This is accompanied by a wide range of direct and indirect forms of use, such as the exploitation of wild plants and animals, electrical power generation, landscape use in the framework of tourism and construction, the use of the protective function such as slope stabilization, soil protection and water retention.

The following examples serve to illustrate the manifold uses (product- and effect-related) of Austria's biodiversity: Cultivated species (domesticated animals, crop plants, ornamental plants), wild species (tree species, meadow and pasture plants, medicinal herbs, game species, fish, nuts, berries, mushrooms), biotopes (alpine grasslands, meadows, pastures for livestock, peat cutting in moors, logging in forests, hydroelectric use of rivers and streams, etc.), and landscapes (settlements, roads, waste disposal, tourism, surfaces for skiing and other sports, etc.); biodiversity's contribution to human well-being through biological regulation, purifying the air, moderating the climate, and other ecological functions, etc.; its recreational effects - "experiencing nature"; and finally as the object of scientific research, as a source of educational material for schools. Forests play a key role as far as indirect effects are concerned, e.g., they have a protective function and serve to improve our wellness.

This brief overview clearly illustrates that our lives and economy are highly dependent on natural resources that are components of biodiversity. Particularly since the turn of the 20th century, the type and intensity of the way we use nature has changed considerably in many branches of the economy, leading to deteriorated environmental conditions and to a reduced biodiversity. As a small country, Austria is keenly aware that many environmental problems can only be solved through bilateral, regional, and international cooperation. For this reason, Austria seeks international regulations in many areas of environmental protection. Austria signed the Convention on Biological Diversity during UNCED in 1992 and ratified it in 1994 (FLG.No. 213/1995). Austria actively participated in formulating the Convention on Biological Diversity and provided an expert to the United Nations Environmental Programme (UNEP) during the preparatory and drafting phase of the Convention. In addition, we note here that Austria contributed a sum far greater than its normal share to the Global Environment Facility (GEF), the designated financial instrument for many projects, including those dealing with biodiversity. This reflects the great importance that Austria attaches to the Convention on Biological Diversity.

In Article 6 of the Convention, governments are called upon to develop national strategies, plans, and programs to maintain and sustainably use biological diversity, or to adapt existing concepts. A broad spectrum of strategies, programs, and plans currently exists in the realm of environmental protection; these cover various aspects of the Convention. It is Austria's intention to build upon these existing programs and to draw up a comprehensive strategy in line with the Convention on Biological Diversity. Rather than presenting Austria's strategy or program, as called for by the Conference of Member States, the present report can be understood as a summary of the key measures already introduced to maintain biodiversity, as well as a description of the potential future course and the preliminary work already completed in fulfillment of Article 6 of the Convention. The measures listed in this report in no way represent a prejudication for the allocation of additional funds.

### **3 BACKGROUND**

#### **3.1 Legal framework**

The Austrian Federal Constitution is the framework for any and all legal regulations. In addition to delegating the competence (Federal/Provincial) for particular technical issues, it embodies comprehensive environmental protection as a fundamental principle. This also includes the political will to implement environmentally relevant measures and thus to take steps designed to protect biological diversity. In Austria, a broad range of laws governs the various facets of protecting and sustainably using biodiversity, a term which has not been generally incorporated into the Austrian legal system. Tables 1 and 2 below provide an overview of current laws and the responsible legislative bodies.

Beyond these domestic laws, certain European Union regulations are also relevant to the Convention on Biological Diversity (Table 3).

Table 1: Federal laws relevant to the Convention on Biological Diversity (selected examples)

<b>Federal law (most recent version)</b>	<b>Aim or content relevant to the Convention on Biological Diversity</b>
Bundesverfassungsgesetz	Comprehensive environmental protection anchored as a national goal
Landwirtschaftsgesetz, FLG.No. 375/92	Ensuring a competitive agricultural sector
Forstgesetz, FLG.No. 440/75	Conservation of forests and the sustainability of their functions
Forstliches Vermehrungsgutgesetz, FLG.No. 419/96	Conservation of a high genetic diversity in the propagation material of forests and in the resulting forest stands
Wasserrechtsgesetz, FLG.No. 252/90	Provisions governing the ecological integrity of aquatic ecosystems
Umweltverträglichkeitsprüfungsgesetz, FLG.No. 697/93	Evaluation of the potential impacts of major projects
Gentechnikgesetz, FLG.No. 510/94	Regulation of work with genetically engineered organisms, releases into the environment, and commercial applications
Umweltkontrollgesetz FLG.No. 127/85	Description of the state of the environment and documentation of environmental changes
Holzgütezeichengesetz, FLG.No. 228/93	Promotion of the sustainable use of forests worldwide by introducing a voluntary system of wood labeling and wood production stemming from sustainable management
Umweltförderungsgesetz, FLG.No. 185/93	Promotion of measures in the sectors water resources, environment, waste site cleanups, and environment protection abroad
Übereinkommen über die biologische Vielfalt, FLG.No. 213/95	Convention on Biological Diversity
Übereinkommen zum Schutz der Alpen, FLG.No. 477/95	Conservation and protection of the Alps through prudent and sustainable use of resources
Übereinkommen über Feuchtgebiete, insbesondere als Lebensraum für Wasser- und Watvögel, von internationaler Bedeutung, FLG.No. 225/83	Documentation, protection, and conservation of wetlands of international rank, especially as a habitat for water fowl and wading birds
Übereinkommen zum Schutz des Kultur- und Naturerbes der Welt, FLG.No. 60/1993	Documentation, protection and conservation of cultural and natural heritage as well as their transmission to future generations

Übereinkommen über die Erhaltung der europäischen wildlebenden Pflanzen und Tiere und ihrer natürlichen Lebensräume, FLG.No. 372/83	Conservation of wild plants and animals along with their natural habitat. Special focus on endangered and sensitive species
Übereinkommen über den internationalen Handel mit gefährdeten Arten freilebender Tiere und Pflanzen, FLG.No. 188/82	Control of international trade in endangered species
Durchführung des Übereinkommens über den internationalen Handel mit gefährdeten Arten freilebender Tiere und Pflanzen, FLG.No. 189/82	Implementation measures of CITES and regulations governing export, re-export, and import of specimens, parts thereof, or products from species listed in Appendices I-III of the Convention

Table 2: Provincial laws relevant to the Convention on Biological Diversity (selected example); see also Annex 12.3

<b>Provincial laws</b>	
Nature conservation laws	Species, biotope, and regional protection
Constitutional laws on arable land	Controlled development of rural areas
Game laws	Principles of sustainable hunting and game keeping
Fishery laws	Principles of sustainable fisheries via fish stocking
Animal breeding subsidy laws	Controlled development of the breeding of farm animals
Regional planning laws	Prudent land use (settlements, transportation, grassland, etc.)
Soil protection laws	Protection of soil against pollutants and other impacts
National Park laws	Protection of designated areas

Table 3: EU regulations relevant to the Convention on Biological Diversity (selected examples)

Reg. No. 2078/92	Implementation in Austria: Program for an environmentally compatible, extensive agriculture that protects the natural ecosystem („ÖPUL“)
Reg. No. 1467/94	Conservation, description, collection and use of genetic resources in the agricultural sector
Reg. No. 2092/91	Biological agriculture
Reg. No. 3626/82	Species protection
Dir. No. 79/409	Conservation of wild bird species (Bird Protection Directive); Implementation partly in the framework of nature conservation measures at the Provincial level
Dir. No. 92/43	Conservation of natural habitats as well as wild animals and plants (Fauna-Flora-Habitat Directive); implementation partly in the framework of nature conservation measures at the Provincial level
Dir. No. 90/220	Intentional release of genetically engineered organisms into the environment (Directive on release into the environment)

The following passages present key laws and agreements relevant to the Convention on Biological Diversity. Note that the term biological diversity, as defined in the Convention, remains to be incorporated into the listed Austrian laws. Each law therefore merely treats and regulates a particular aspect of biodiversity.

The goal of agricultural policy in Austria (Landwirtschaftsgesetz, FLG.No. 375/92), in accordance with the European Community's Common Agricultural Policy (CAP), is to maintain an agricultural and forestry sector that, among other tasks, guarantees the vital natural resources soil, water, and air and that is in a position to preserve and manage cultural and recreational landscapes.

The forestry sector is regulated in the Forstgesetz, FLG.No. 440/1975 of July 3, 1975 idgF. The Forstgesetz encompasses all measures dealing with the care, conservation and protection of forest land. The key regulations of the Forstgesetz that are relevant to maintaining biodiversity involve conserving forests and sustaining their role (a ban on forest destruction and clearing forests, obligatory reforestation) as well as the regional planning of forests (planning the forest cover on Federal lands in order to guarantee - at a sustainable level - its legally determined functions, including use potential along with protective, welfare, and recreational functions). The Bundesgesetz über das Forstliche Vermehrungsgut, FLG.No. 419/96 of August 20, 1996, makes special reference to genetic diversity. The propagation material category "increased genetic diversity" was introduced and, for the first time in a European country, a legally binding minimum number of trees was specified for seed harvest.

The centerpiece of water resources management in Austria is the Wasserrechtsgesetz of 1959, which has been amended a number of times since that time. A 1990 amendment (FLG.No. 252/90) was designed to promote integrated water management with adequate consideration of ecosystem approaches. The key principles of the Wasserrechtsgesetz are the precautionary principle, the emissions principle, the immissions principle, and the remedial principle.

As of July 1, 1994, the „Bundesgesetz über die Prüfung der Umweltverträglichkeit und die Bürgerbeteiligung“ (FLG.No. 697/1993) has been in force in Austria. It legally requires that certain types of projects submit an environmental impact assessment (EIA) prior to approval, including a determination and evaluation of the direct and indirect impacts on biotopes and ecosystems.

As of January 1, 1995, the Gentechnikgesetz (FLG.No. 510/1994) has been in effect in Austria. This law regulates work with genetically engineered organisms in closed systems, their release into the environment, as well as the marketing of products that contain or consist of genetically engineered organisms.

The nature protection laws of the Provinces contain general regulations governing the protection and maintenance of nature as the cornerstone for human, animal and plant life. Additional regulations govern special problems, for example the approval and obligatory notification for certain listed projects, the protection of plants and animals, regional protection, as well as - in some Provinces - the ex-lege protection of certain habitats (e.g., the protection of glaciers or wetlands).

Game laws regulate hunting activity and contain regulations to protect the diversity of game species.

EU Reg. No. 2078/92 provides for financial incentives to, among other things, promote biodiversity in agriculture. In Austria, this regulation is implemented in the framework of the "Program to promote an environmentally compatible, extensive agriculture that protects the natural environment" (ÖPUL). The goal is nationwide support for environmentally friendly production methods in agriculture coupled with ensuring an adequate income for farmers.

EU Reg. No. 1467/94 on the conservation, description, collection and use of genetic resources in the agricultural sector of 20 June 1994 serves to attain the goals of the Common Agricultural Policy and to preserve biological diversity. The term "agriculture" is understood in its broadest sense: it includes the genetic resources in the forestry sector. The aim of the regulation is above all to coordinate ongoing activities, but also to promote high priority activities (setting up a Europe-wide information net, concerted activities, supporting measures).

The objective of the EU's Bird Protection Directive, Nr. 79/409, is to maintain and restore an adequate diversity of and sufficiently large biotopes for all birds in the wild.

The goal of the EU's Fauna-Flora-Habitat Directive, Nr. 92/43, is to help secure part of Europe's biodiversity by conserving natural ecosystems along with their wildlife and plants.

In addition, by signing and ratifying a number of international regulatory measures that address biodiversity issues, Austria has committed itself to their implementation (see Table 1); Austria also actively participated in formulating the relevant international concepts.

Austria became party to CITES in 1982 and has therefore committed itself to protecting wildlife populations endangered by commercial interests, a commitment further strengthened by the EU Species Protection Regulation Nr. 3626/82. This obligation involves establishing a control system for international trade in endangered animal and plant species and the products thereof. In Austria, responsibility for implementing CITES lies with both the Federal and Provincial Governments, the latter being responsible for the scientific aspects. The Federal Ministry of Economic Affairs regulates the import and export of specimens according to the EU Regulation and CITES. In particular this involves monitoring endangered songbirds, parrots, large cats, amphibians, etc., whereby emphasis is placed on ensuring that certain quotas of particularly endangered species (especially those from the African and Asian continents) are not exceeded.

By ratifying the Alpine Convention, Austria has committed itself to take appropriate measures to secure in perpetuity the diversity of nature and landscapes within its alpine habitats. The most recent protocols to the Alpine Convention (not yet in force) formulate a wide range of specifications for such measures.

With its support of Resolution H-2 "General Guideline for the Conservation of the Biodiversity in European Forests" in the course of the Second Session of the Council of Ministers for the Protection of Forests in Europe (Helsinki, 1993), Austria committed itself to promote measures designed to protect forest biodiversity.

In the framework of the Council of Europe, Austria participated in drafting the Pan-European Biological and Landscape Diversity Strategy, which was adopted in Sofia in 1995 by the Europe's Ministers of the Environment.

The Convention on Biological Diversity, which serves as the basis for the current report, falls under the jurisdiction of the Federal Ministry of the Environment, Youth and Family. In order to coordinate questions dealing with the implementation of the Biodiversity Convention, the Federal Ministry of the Environment, Youth and Family established the Austrian National Commission on Biological Diversity which, among other duties, formulated this report based on a draft by the Federal Environmental Agency.

## 3.2 Current status

### 3.2.1 Species and landscape

Biodiversity in Austria is composed of an old, natural stock, spontaneous new arrivals, synanthropic<sup>1</sup> forms (weeds, agriophytes, etc.), domesticated forms (old and new domestic breeds), natural, rural and urban biotope types and landscapes. Austria is home to a highly diverse fauna and flora; to the extent that the autochthonous<sup>2</sup> animals and plant species have been recorded, Austria is among the most species-rich countries in Central Europe. Altogether, Austria is estimated to have approx. 45 000 animal species (of which 500 are vertebrates along with 36 850 insects, with other invertebrates being poorly documented), nearly 3000 species of ferns and angiosperms, as well as about 1000 mosses. The estimated number of lichens (ca. 2300), algae (ca. 5000) and fungi (ca. 10 000) is less precise. Austria also supports about 50 endemic<sup>3</sup> ferns and angiosperms and perhaps 1000 endemic invertebrates, although the latter number is only a rough estimate. The survey of the native fauna is far from complete and requires ongoing updates. For an overview see Table 4.

Table 4: Number of selected autochthonous animal species as well as fern and angiosperm species in Austria

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<sup>1</sup> All organisms more closely associated with humans or more or less dependent on human

<sup>2</sup> originally native to an area (e.g. Austria)

<sup>3</sup> Those species occurring in a more or less naturally delimited area (high mountains, islands)

	Mam- mals	Birds	Fishes and cyclostomes	Reptiles	Amphi- bians	Insects	Ferns and angiosperms
Species number	82	239	64	16	21	36,850	2 873 (of which ca. 50 are endemic)

Today, nearly 3000 animal species (of which 2300 are insects) are listed as being variously threatened in the Red List of endangered species. This number is on the increase. Ferns and angiosperms show a similar trend: approx. 40% have been classified as being threatened to one degree or another (see Table 5).

Table 5: Degree of threat to autochthonous vertebrates as well as fern and angiosperm species

Evaluated group	Category 0	Category 1	Category 2	Category 3	Category 4	not endangered	Sum of categories. 0 - 4
Mammals	5	4	3	18	13	39	52.4%
Birds (219 evaluated)	23	24	11	22	42	97	55.7%
Reptiles	1	1	4	8	1	1	93.8%
Amphibians	0	1	6	14	0	0	100.0%
Fishes and cyclostomes	5	5	7	13	9	21	65.0%
Ferns and angiosperms	53	156	300	401	171	1.792	37.6%

**Category:** 0: extinct; 1: threatened with extinction; 2: highly endangered; 3: endangered; 4: potentially endangered

The current factors responsible for the extinction and other threats to the flora and fauna are the destruction and modification of "natural" habitats that goes hand in hand with various forms of land use. It should also be noted here, however, that the presence of many species is tied to specific forms of cultivation.

In accordance with their legal competence, the Provinces have set a range of protective measures (for example placing certain animal and plant species under protection). Habitat protection is one of the most important approaches. Currently, ca. 25% of Austria's territory is classified as protected based on qualitatively distinct categories of habitat protection, with the most rigorous regulations having been established for nature reserves and the core zones of national parks. It should be noted that the following list (Table 6 and Table 7) of protected areas and natural regions is not additive, since the various protection or classification categories may overlap to some extent. Note also that one national park (Neusiedler See - Seewinkel) has been internationally recognized to have IUCN category II status.

Table 6: Number and surface area of protected areas

<b>Category</b>	<b>Number</b>	<b>Surface area km<sup>2</sup></b>	<b>% of Austrian territory</b>
National Park	5	2,329	2.7%
Nature Reserve	349	2,830	3.3%
Protected landscape	247	16,060	19.1%

Certain Provinces have additional categories beyond these three categories of habitat protection (i.e., protected landscape area, refuges, etc.). Contractual environmental protection (nature conservation measures anchored in legally binding agreements) is an equally important approach to conserving biodiversity. This is the framework behind most natural forest reserves and forest genetic reserves.

In addition, Austria also has a number of natural areas of international relevance (Table 7).

Table 7: Natural areas with international stature

<b>Category</b>	<b>Number</b>	<b>Surface area km<sup>2</sup></b>	<b>% of Austrian territory</b>
Ramsar areas	9	1,030	1.2%
Biosphere reserves	4	276	0.3%
Biogenetic reserves	56	2,105	2.5%
Europe diploma	2	no data available	

Approximately 100 areas (ca. 5% of Austria's territory) have been nominated for the network "Natura 2000" in order to implement the conservation-related guidelines of the European Union (Fauna-Flora-Habitat Directive, Bird Protection Directive). Most of these areas, however, involve already existing protection areas. The study "Important Bird Areas in Austria", commissioned by the Federal Environmental Agency and BirdLife Austria, lists 58 bird breeding and resting sites that are of supraregional significance in the framework of the international Important Bird Areas Program.

### 3.2.2 Agriculture

Of Austria's farmland, which comprises approx. 45% of the country's overall surface area, 39% is utilized as cropland, 29% as meadows, 25% as alpine grassland, 4.8% as pastures, 1.6% as vineyards, and 1.2% as garden land and orchards.

Agriculture's considerable role in species decline is indisputable because agricultural landscapes are or were the habitat of many endangered and extinct species. The main reasons for this decline are the increasing intensification, the removal of relict biotopes (loss of habitat diversity), altered usages (conversion of grassland into cropland, altered crop rotation), and herbicide use. New breeding

measures and biotechnological approaches will exacerbate this trend in farm animals.

On the other hand, many species have become indigenous due to farming activities and the resulting heterogeneity of the cultural landscape. In such cases, abandoning such activities (for example in moist or dry meadows) would lead to a decline in the number of species. Sustainable agriculture couples an ecological, site-specific adaptation of production methods to a highly structured and diverse cultural landscape. The agricultural sector's contribution to conserving and promoting biodiversity in Austria is therefore quite high.

### 3.2.3 Forests

Forests cover approx. 46% of Austria's total surface area and are largely privately owned. They have been managed for centuries in smaller plots and, compared with areas subject to other forms of land use, have remained relatively seminatural ecosystems.

A cooperative, interdisciplinary study between the University of Vienna and the Federal Ministry of Agriculture and Forestry (Hemeroby Study) revealed that Austria's forests can largely be classified as natural, near-natural, or only moderately altered despite centuries of use. Only 7% are classified as artificial.

The economic role of forests as producers of the raw material wood led the term "Nachhaltigkeit" (sustainability) to be coined in Austrian forestry 200 years ago. It was introduced in order to guarantee a supply of wood and the protection function of forests over the long run. On the other hand, commercial exploitation of forests led to an artificial spread of economically valuable and interesting tree species (i.e., spruce, pine). The result was a change in the composition of tree species in Austrian forests as well as a reduction in the surface area of natural forest communities. The loss of a sufficiently large network of naturally decomposing forest stands due to modern forestry has severely impacted organisms relying on dead and dying wood. The planting of spruce monocultures, even in areas outside their natural range, along with other silvicultural measures have reduced biodiversity in certain regions. Recently, the results of the Austrian Forest Survey have shown that this trend is being reversed (increase in multi-species stands). Hoofed game damage is another problem: dense game populations in many of Austria's forests hamper the natural regeneration of ecologically valuable tree species (fir, hardwood species) and depauperate natural forest ecosystems.

Last but not least, the introduction of acidifying substances and other pollutants (i.e., ozone, heavy metals, organic compounds) through anthropogenic air pollution damages the vegetation directly and, by impairing the soil over the long term, also impacts the forest vegetation indirectly.

Near-natural forest management is increasingly being practiced in the forestry sector. The development of uneven-aged, species-rich and site-related stands with largely natural regeneration leads to ecologically stable forests. Protection forests, which require special silvicultural management and are subject to only limited use,

safeguard ecologically sensitive sites (tree line, karstic sites, shallow soils). Closed forests play a key role in indirectly protecting non-forested land from avalanches, landslides, floods, etc. Forests are therefore a decisive element in conserving biodiversity on a large scale in Austria.

#### 3.2.4 Hunting

In Austria, the hunting sector is tightly tied to private ownership of land. Hunting rights therefore fall under property rights, which have a relatively high priority in the Austrian constitution. Any infringement of a property owner's rights is generally difficult, which has both positive and negative repercussions for biological diversity. A positive aspect is that populations of economically valuable animal species enjoy special protection. On the other hand, less commercially relevant species may be neglected or imbalances may arise in species composition or ecological interactions (for example through a one-sided preference for a particular species). At any rate, hunting has a significant impact on many species of game.

Some of the species subject to game laws are already extinct in Austria, while the populations of others are endangered and have therefore been placed on the Red List. Certain species of wildlife have been successfully reintroduced. Conflicts of use (hunting, forestry, agriculture, tourism, traffic and transportation) can pose a threat to the diversity of the wildlife falling under hunting laws.

#### 3.2.5 Aquatic ecosystems and water

Austria's special geographic location is responsible for the highly variable geomorphological and climatological conditions in the individual landscapes and explains our many rivers and lakes. The total length of Austria's aquatic systems includes 100 000 km of running waters; 9000 lakes are also present (62% of these are natural, with 26 lakes being larger than 1 km<sup>2</sup>). The total surface area covered by water is 1306 km<sup>2</sup>. Austria's main river is the Danube.

Approximately 3% of the water resources ( $85\,000 \times 10^6$  m<sup>3</sup>/a) are used as either as drinking water, for industrial purposes, or for irrigation. Virtually all drinking water stems from groundwater deposits.

The goal of Austria's water conservation policy in recent decades has been to improve highly polluted waters to class II status (moderately polluted) and to maintain the status of river sections with ratings above II by expanding the network of sewage treatment plants and by preventing pollutants from reaching aquatic ecosystems (Table 8).

Table 8: Biological quality of flowing waters (Gewässerschutzbericht 1996, comparison of biological quality 1966/71, 1988 and 1995)

Quality class	Relevant proportion in %		
	1966/71	1988	1996
I	15	9	6
I-II	18	18	22
II	31	39	44
II-III	19	21	24
III	6	11	4
III-IV	6	2	<1
IV	5	1	0

A rigorous lake restoration program led to permanent improvements and reestablished good to very good limnological conditions in Austria's lakes, which showed symptoms of eutrophication in the 1970s. From the hygienic standpoint, the status of most Austrian lakes is also highly satisfactory.

Austria is a mountainous country rich in water resources. This makes flood protection, especially in alpine regions, one of water management's prime responsibilities. At the same time, hydroelectric power plays a major role in the energy sector.

Although major efforts have been made to significantly reduce the burden on running waters by building sewage treatment plants (more than 72% of the population is hooked up to central sewage water treatment facilities), the events of the last few years have increasingly shown that the ecological integrity of aquatic systems is impacted. The main culprits are interventions into river structure and into hydrological regimes, specifically through the construction of hydroelectric power stations and flood protection measures.

In 1995, 74 fish species were reported in Austria's waters. Fifteen of these are not considered to be autochthonous, i.e., they were introduced or their populations can only be maintained by regular artificial stocking measures. Five species (beluga, sternhausen, waxdick, glatttick, and semling) are extinct in Austria.

Fishes are among the most highly endangered of all animals. More than half of the autochthonous species are on the endangered list, with many of these being classified as highly or even acutely endangered. Anthropogenic habitat changes are the greatest threat to the native fish fauna. Other key factors include water pollution (which has been reduced in recent years), river regulation, torrent control, hydroelectric power, damming, surge operation, bedload retention and bedload dredging, shipping and measures to keep shipping lanes open, as well as the various recreational uses of our waters.

### 3.2.6 Fishing

The history of fish-pond management extends back into the 11th century. Some of the 2500 ponds, especially those for carp, are valuable biotopes. Traditional

commercial fisheries along Austria's rivers are defunct. Professional fisheries still exist in a handful of large lakes, but only rarely do they represent the fisherman's chief occupation.

Recreational fishing is currently a very popular activity. In 1993, 120 000 fishing licenses and nearly 35 000 visitor's licences were sold. Intensive sport fishing and poorly adapted artificial stocking measures negatively impact the ecological integrity of lakes and rivers. The first symptoms include a reduced genetic heterogeneity of fish populations, faunal shifts through stocking, introduction of diseases, along with the additional problem of altered water chemistry and nutrient balance (eutrophication symptoms) through overstocking.

A good stocking policy can significantly contribute to maintaining fish populations and even guaranteeing the survival of individual fish species. In Austria, attempts are currently being made to bolster the populations of species that fall under fishery laws by breeding autochthonous fish species for stocking purposes.

### 3.3 Institutions included non-governmental organizations

#### 3.3.1 Public institutions at the Federal and Provincial level

The following Federal and Provincial agencies deal at the domestic level with issues related with the Convention on Biological Diversity (Table 9 and Table 10).

Table 9: Federal institutions

<b>Ministries</b>	<b>Competence in matters related to</b>
Chancellor's Office/Federal Ministry for Women's Affairs and Consumer Protection	Enforcement of the Gentechnikgesetz
Federal Ministry of the Environment, Youth and Family	Coordination of activities toward implementing the Convention on Biological Diversity, international issues such as high priority nature conservation projects (national parks, Ramsar areas) as well as support in implementing guidelines of the EU or other international conventions relevant to nature conservation, environmental mapping including publishing Red Lists of endangered species.
Federal Ministry of Agriculture and Forestry	Coordinate the sectors agriculture, forestry, and water resources management; departmental working groups for a national program to preserve genetic resources; commission research to preserve biodiversity in the agriculture, forestry and water resource management sectors; subsidies; international integration; coordinate activities to implement the Strassburg Resolution, the Helsinki Resolutions, as well as strategies in the framework of potential climate change and implementation of relevant EU guidelines
Federal Ministry of Economic Affairs	Control the import and export of certain protected animal and plant species, approve and monitor commercial and industrial facilities, road construction and road administration, energy, mining, technology and innovation

Federal Ministry of Science and Transport	Formulate and coordinate biodiversity-related scientific research and technological development on the national and international levels; railroad sector
Federal Ministry for Education and Cultural Affairs	The school system; research
Federal Ministry of Defense	Document biodiversity in military training areas; train members of the armed forces (environmental education)
<b>Other agencies</b>	
Bundesamt für Agrarbiologie	Gene bank (farm animals, seed, fruit); research; international cooperation and ICARDA security repository (legumes)
Höhere Bundeslehranstalt und Bundesamt für Wein- und Obstbau	Gene bank (fruit, wine); research; international cooperation
Höhere Bundeslehranstalt und -versuchs-anstalt für Gartenbau	Contribution to gene bank (vegetables); research
Bundesanstalt für alpenländische Landwirtschaft	Contribution to gene bank (grassland); research; international cooperation
Forstliche Bundesversuchsanstalt	Gene bank (forests); research; international cooperation, applied forest research
Bundesamt für Wasserwirtschaft	Research; international cooperation; training
Bundesamt und Forschungszentrum für Landwirtschaft	Gene bank (seed); research; international cooperation
Federal Environmental Agency	Environmental control; management of environmental cadastres; evaluation of release and product applications by genetically engineered organisms; "National Focal Point" for the Biodiversity Convention as well as for its "Clearing House Mechanism", for Infoterra as well as the EEA
Natural History Museum Vienna	Documentation of biological diversity

Table 10: Provincial Institutions

<b>Office of the respective Provincial Government</b> with departments responsible for the following issues	<b>Among others, competence for:</b>
Nature conservation	Enforce the nature conservation law; grant protection status; certifications, etc.
Agriculture	Agricultural law and agricultural subsidies; education and training; construction and economic sector; agricultural and forestry inspection
Water rights	Enforce Federal Wasserrechtsgesetz (Water Rights Act)
Hunting	Enforce game laws
Fisheries	Enforce fishing laws
Regional planning	Zoning matters
<b>Other authorities</b>	
Municipal agro-authorities	Land reform (joining of properties, land consolidation)
Environmental law agencies	The right to a hearing or deposition depending on the planned project
Landesversuchsanlage für Spezialkulturen in Wies/Steiermark	Vegetable cultures, ornamental plant cultures, medicinal plants and herbs, seed collection
Landesanstalt für Pflanzenzucht und Samenprüfung in Rinn/Tirol	Alpine cereal varieties
Landesversuchsanstalt Haidegg/Steiermark	Fruit gene bank
Natural history departments of the Provincial museums	Document biodiversity

### 3.3.2 Interest groups established by law

In Austria, a range of interest groups are established by law. This includes the Chambers of Agriculture and Forestry, whose work and advisory capacity significantly influence commercial activities in the agricultural and forestry sectors. The nine Laender Chambers have a combined representation in the Presidential Conference of the Chambers of Agriculture. This category also includes the Austrian Chamber of Commerce as the representative of trade and industry, as well as the Federal Chamber of Labor.

### 3.3.3 Private interest groups

Within the private interest groups (NGOs) one can distinguish between organizations devoted primarily to user groups (Hauptverband der Land- und Forstwirtschaftsbetriebe, Österreichischer Forstverein, forester associations, forest owner associations in the provinces, Zentralstelle der Österreichischen Landesjägersverbände, Österreichischer Fischereiverband, Provincial fishery associations, Österreichischer Wasser- und Abfallwirtschaftsverband, Österreichische Vereinigung für das Gas- und Wasserfach) and those devoted primarily to nature conservation and environmental protection (the umbrella organization for environmental groups ÖGNU, which includes 38 organizations such as BirdLife Austria, Friends of the Earth, Österr. Naturschutzbund, Alpenverein, Naturfreunde etc. along with the Ökobüro - the Coordination Center of Austrian Environmental Organizations which includes the WWF, Greenpeace, etc.). Since the latter group is increasing its efforts to incorporate users into their conservation activities, a strict distinction between the two is difficult. In addition, over the last few years numerous groups have been established that seek to promote conservation and sustainable use in concert with the users themselves (i.e., ARGE Bregenzerwald, BIOSA, Distelverein). The Österreichische Gesellschaft für Umwelt und Technik (ÖGUT) also deserves mention here.

The following NGOs figure prominently in dealing with genetic resources in the agricultural sector: Arche Noah collects seeds and preserves useful vegetables, cereals, grain crops, field crops, fruit, herbs, and medicinal plants. Conservation is also the focus of Ökokreis Waldviertel (Stift Zwettl) and Museumsdorf Niedersulz, numerous tree nurseries, as well as fruit-growing and garden clubs. The Verein zur Erhaltung gefährdeter Haustierrassen (Society for the Conservation of Domestic Animal Breeds, VEGH) is devoted to the in situ conservation of cattle, sheep, goats, pigs, horses, donkeys, and poultry. The organization ÖNGENE is also dedicated to conserving old domestic animals breeds.

Austria's NGOs are also actively involved in bilateral international cooperations and in the exchange of scientific information (i.e., Österreichische Forschungsförderung für Entwicklungshilfe). The society "Regenwald der Österreicher" (Austrian Rainforest) has erected a scientific research station in southern Costa Rica; here, rainforest research is conducted in cooperation with Costa Rican agencies.

### 3.3.4 Other organizations

Among their many tasks, zoos (e.g., Vienna-Schönbrunn, Salzburg-Hellbrunn, Innsbruck-Alpenzoo) participate in international breeding programs. The Schönbrunn Zoo, for example, maintains a breeding program for old domestic breeds.

Botanical gardens at many institutions (i.e., the Botanical Gardens of the University of Vienna, the Botanical Gardens of the University of Salzburg, the Alpengarten Belvedere, the Carinthian State Botanical Gardens, the Botanical Garden of the city of Linz) play an active role in species perpetuation (particularly ex-situ conservation) and participate in international sperm banks.

The National Park administrations implement measures to protect and develop national parks as well as to educate and inform visitors. They therefore play a key role in educating the public about biodiversity.

The collections of natural objects in our museums are also important documents of past times; they help to reconstruct nature's dynamic development process.

### 3.4 Research

Austria can look back on a long tradition of scientific research: its efforts in this sector always had and continue to have a strong international component. Thus, many areas of biodiversity are dealt with in cooperation with UNESCO (Man And Biosphere - MAB, World Heritage Sites) and other international organizations, along with foreign research institutions.

The universities, the Natural History Museum Vienna, the seven Austrian Provincial museums, the Federal Environmental Agency, the Forstliche Bundesversuchsanstalt (Forestry Research Centre), the Commission for Interdisciplinary Ecological Studies, the Konrad Lorenz Institute for Comparative Ethology, the Institute of Limnology, and the Institute of Nature Conservation and Landscape Ecology in Graz, research-oriented institutes in the Provinces such as the Biological Station Illmitz, the Kärntner Institute for Lake Research, the Joanneum Research Forschungsgesellschaft in Graz, as well as countless independent researchers are conducting scientific research in various fields related to biodiversity or are participating in biodiversity-related cooperative projects (from basic to applied research) with developing countries all around the world.

An "Exkursionsflora von Österreich", along with the compilation and description of Austrian plant associations, are now available. The University of Vienna was responsible for coordinating and completing this work. A first survey of Austria's "biodiversity hot-spots" has been carried out based on basic botanical data.

At the Austrian Academy of Sciences (ÖAW), the "Commission for Interdisciplinary Ecological Studies" (KIOS) has been entrusted with studying and documenting biodiversity in Austria. This task is being fulfilled by publishing catalogs of the fungi, lichens, algae, and mosses ("Catalogus Florae Austriae") and various animal groups ("Catalogus Faunae Austriae") that occur in Austria in the framework of the "Biosystematics and Ecology Series". Between 1952 and 1995, 49 volumes dealing with a wide range of animal groups were published. The number of species and distribution of vertebrates and certain insect families are rather well documented; less is known about functionally significant forms such as microorganisms, worms, and several other groups of invertebrates. A corresponding data bank network with international linkups is currently being developed.

The University of Vienna is currently also cooperating with the ÖAW on research behind the 3-volume tome "Kritische Flora von Österreich" for vascular plants. The international project "Cartography of the Flora of Central Europe" was also originally initiated by the University of Vienna. In the meantime, regional maps have been

published in this framework for western and eastern Germany as well as for northern Italy. The corresponding volume for the vascular plant flora of Austria is nearing completion.

A several-year-long UNESCO-MAB project is currently being conducted by agencies of the Federal Ministry of Agriculture and Forestry in cooperation with various universities: it deals with problems of grassland management in Austria's montane region. This task involves grassland relevés, which are being carried out by the Bundesanstalt für alpenländische Landwirtschaft (Federal Research Institute for Agriculture in Alpine Regions) in Gumpenstein, the University of Agricultural Sciences (BOKU), and the University of Vienna. The Federal Ministry of Agriculture and Forestry is planning to present an overview of these research efforts.

The Federal Research Institute for Agriculture in Alpine Regions was among the first institutions to recognize root ecology an important research sector. This facility has pursued this topic both independently and in the framework of international cooperations. This effort is also expressed in their supporting role in founding the International Society for Root Research. Two international symposia (1992 and 1992) dealing with this issue were held in Austria.

An additional focus of research is the nationwide survey of biotopes (e.g., moor protection catalog, dry meadows) and zoological survey programs, which provide precise data on, among others, mammals, breeding birds, amphibians and reptiles, and grasshoppers. In the field of ornithology, the survey of breeding birds is supplemented by several monitoring programs designed to evaluate bird populations (white stork, corncake, jackdaw) and to compile an ongoing, comprehensive documentation of the Austrian avifauna (Avifaunistic Archive of BirdLife Austria). Several of these survey and monitoring efforts are incorporated in internationally coordinated survey programs.

In Austria, more than 2 million zoogeographic data are currently compiled in electronic data banks. ZODAT (at the Biocenter of the Provincial Museum of Upper Austria) is the largest faunistic databank; it contains more than 1.7 million finding sites, predominantly for insects. This, for example, provided the basis for the distribution atlas of the moths of Austria.

The focus of research in the realm of the development and management of natural areas is concentrated in the various protected areas (National park Neusiedler See - Seewinkel, National park Hohe Tauern, National park Donau-Auen, National park Kalkalpen, Ramsar area Donau-March-Thaya-Auen).

"Red Lists of endangered species" help the decision-making process in the field of nature conservation. Such lists are published on the Federal and, to a lesser extent, even on the Provincial level. This is supplemented by habitat and cultural landscape mapping, which is generally initiated by the Provinces (more than half of Austria has been treated, albeit at different scales and using non-standardized methods).

The research institute of the WWF carries out nature conservation-oriented projects in the realm of species protection (e.g., brown bear, bearded vulture, fish otter).

wetlands management (e.g., Oberes Weinviertel, Danube backwaters), and forest management (natural forest reserves, restoration efforts, forest cropping).

The Federal Environmental Agency, using satellite images, has published land-use maps in the framework of an EU-wide project (CORINE-Landcover).

Research in the field of forests and forest use, along with relevant biodiversity issues, is largely being conducted by the University of Agricultural Sciences Vienna as well as a range of institutes from various other Austrian universities. Priority topics include the interdisciplinary research program "Research initiative against forest dieback (FIW)" and the special research program "Research in forest ecosystem restoration". These examine the complex causes for the decreasing vitality of forests and develop criteria and methods to restore the ecological balance of stressed and degraded forest ecosystems. A key restoration strategy involves increasing biodiversity.

The study "Hemeroby of Austrian Forest Ecosystems", carried out by the University of Vienna in the framework of a UNESCO-MAB research project, described the degree of naturalness of Austrian forests.

For many years, the Forestry Research Centre has contributed to research on biodiversity, with special emphasis on adaptations to alpine habitats. Vegetation and site relevés have been carried out. An atlas of tree species was published based on the data sets of the forest survey. Some of this research is being conducted in the framework of European cooperative projects. Exemplary studies include scientific research on natural forests as well as on the genetic makeup of native forests. This departmental research helps to quantify environmentally induced changes at various levels (ecosystem, species, gene). The results are translated into concepts and programs to preserve genetic resources. Conserving the adaptation potential and the genetic variability of tree species is considered to be an important element in the genetic diversity in forests. This research has been considerably expanded based on this postulate of genetic sustainability and on the desire to build in safety margins.

The University of Agricultural Sciences Vienna (BOKU) is involved in research dealing with river revitalization and lake restoration. In addition, a joint working group formed in 1985 by the University of Salzburg and the Federal Office of Agrobiology has focused on the development of cryoconservation methods for fish sperm. A further UNESCO MAB research project (supervised by the ÖAW) describes the ecosystems and socioeconomic repercussions of damming projects along the Danube ("Altenwörth"). A catalog designed to enable an autecological classification of aquatic organisms in Austria ("Fauna Aquatica Austriaca") was commissioned by the Federal Ministry of Agriculture and Forestry and published by the University of Agricultural Sciences.

One of the Federal Ministry of Agriculture and Forestry's major administrative and research tasks is to inspect, collect, and maintain valuable gene pools. In late 1995, a working group of experts including the research institutions of the Federal Ministry of Agriculture and Forestry as well as the universities and Provincial agencies was installed in order to coordinate this endeavor. The goal is to develop a national concept for the conservation of genetic resources. Efforts to enlarge the expert

group by incorporating private collectors and NGOs have already been successful in certain sectors and will be actively pursued. The expert working group is subdivided into the following fields: gene banks, fruit/wine, forest plants, farm animals including fishes and bees, medicinal plants including specialty crops (vegetables, herbs, and ornamental plants), and grassland.

In 1991, the Arbeitsgemeinschaft der Österreichischen Genbanken für Kulturpflanzen published the first "Index Seminum Austriae". It documents the collections that the respective Federal and Provincial agencies have compiled over the last few decades (Bundesamt und Forschungszentrum für Landwirtschaft, Federal Office of Agrobiology, Landesanstalt für Pflanzenzucht und Samenprüfung in Rinn, Tirol, and Landesversuchsanlage für Spezialkulturen in Wies, Styria). A supplementary volume to the "Index Seminum Austriae" was published in 1996. A comprehensive publication is planned for 1997. The Federal Office of Agrobiology is working within the International Plant Genetic Resources Institute (IPGRI) in the framework of the Grain Legumes Working Group. Ongoing Austrian research activities on Brassica beets in the private sector were successfully integrated into the framework of the ECP/GR Working Group Brassica.

In the framework of a research contract "Old fruit varieties and extensive orchard cultivation in Austria", the Federal Ministry of the Environment and the former Federal Ministry of Science, Transport and the Arts compiled and published exemplary maps of fruit tree areas and numerous initiatives aimed at conserving fruit varieties in Austria. As far as research is concerned, major players include agencies of the Federal Ministry of Agriculture and Forestry, the University of Agricultural Sciences, as well as Provincial schools and research centers.

Since its foundation in 1860, the Höhere Bundeslehranstalt und Bundesamt für Wein- und Obstbau has been involved in collecting grape cultivars. Biotechnological methods to identify grape cultivars are directly relevant to maintaining biological diversity and are being actively applied in viticulture. Austria is also participating in the research project "Grapevine Genetic Resources Network" (1997-2001) in the framework of EU Reg. No. 1467/94 dealing with the conservation, description, collection and use of genetic resources in agriculture.

The Höhere Bundeslehranstalt und Bundesamt für Wein- und Obstbau has long been involved in storing material from pome fruit, stone fruit, berry fruit and grapevines, and the capacities are being increased. The Federal Office of Agrobiology is cooperating with IPGRI in the framework of the Malus/Pirus project. For a number of years, the University of Agricultural Sciences has been conducting research projects devoted to breeding virus-free top varieties and to rid existing varieties of viruses. The Provincial agencies are partners in implementing these research results into the Provinces' existing activities to establish and maintain parent gardens. Special emphasis is being placed on conserving the European chestnut as a defining landscape element. Austria has been instrumental in combining a national research effort with an international cooperation in the form of a COST Action G4 "Multidisciplinary Chestnut Research" (at the Seibersdorf Research Center).

In animal sector, the Bundesanstalt für Fortpflanzung und künstliche Besamung von Haustieren, which was recently incorporated into the Federal Office of Agrobiology in Wels has been applying cryogenic methods for maintaining the cattle breeds "Tuxer Rind" and "Original Braunvieh" (Brown Mountain) since 1982. In 1982, the Association ÖNGENE surveyed old domestic breeds. From the beginning, ÖNGENE has provided scientific support and documentation in matters related to conserving living animal populations and even in the cryoconservation of sperm and embryos. These efforts are being conducted in close cooperation on the international level with the FAO, the IPGRI, and the EAAP/IFAO Working Group on Animal Genetic Resources.

Intensive fundamental research in the field of biotechnology and applied research is being conducted at the Universities of Innsbruck, Graz and Vienna, the Universities of Technology in Graz and Vienna, as well as the University of Agricultural Sciences Vienna. Additional biotechnological research programs are being carried out at the industrial firms Vitroplant, Sandoz/Novartis, Biochemie Kundl, Bender, the Institute of Molecular Pathology, as well as at the partially state-owned Austrian Research Center Seibersdorf. The Institute of Molecular Pathology and the University of Vienna jointly form the "Vienna International Research Cooperation Centre" (VIRCC). Biotechnological research of direct relevance to biodiversity is being conducted at the University of Agricultural Sciences' Institute of Applied Microbiology as well as at the Interuniversity Research Institute of Agrobiotechnology (IFA). In certain areas, Austrian institutions are closely cooperating with international organizations such as FAO or the IAEA.

Proponents of biotechnological research and the applied aspects of biotechnology in Austria have joined to form the Österreichische Gesellschaft für Biotechnologie and the Österreichische Gesellschaft für Genetik und Gentechnik.

The Österreichische Netzwerk Umweltforschung, which was established by the Federal Ministry of Science and Transport, was designed as an instrument to support the increasing internationalization of Austrian environmental research. It consists of nine specific thematic centers: process research plant - environment, biodiversity, cultural landscape research, ecosystem research - environmental monitoring, socioeconomic environmental research, climate and climate repercussion research, as well as atmospheric environmental research, sustainable water technology, and tropical rain forest research. Within their respective fields, each is meant to serve as an information center. These network nodes advise the Federal Ministry of science and Transport as well as other agencies on matters dealing with national and international research policies. They also actively promote international cooperation in the field of biodiversity.

Based on an initiative of the Federal Ministry of Science and Transport, an interdisciplinary working group has formulated a research proposal for the topic "cultural landscapes". This joint research project, which also encompasses the Federal Ministry of the Environment, Youth and Family, the Federal Ministry of Agriculture and Forestry, The Federal Chancellery, the Federal Ministry of Economic Affairs, the Provinces, and involves international financing plans, focuses on practical guidelines for the future development of Austria's cultural landscapes. Emphasis will be placed on optimizing the balance between biodiversity and quality

of life. Research into cultural landscapes encompasses the following scientific disciplines: indicators for sustainability, fundamentals of securing biodiversity and quality of life, the genesis, change, and perception of cultural landscapes, multifunctionality and conflicts of use, as well as regional and supraregional implementation strategies. The landscape research concept of the Federal Ministry of Science and Transport is designed for a 10-year period. The underlying data on biodiversity in Austria is currently being collected in the framework of this research initiative at the University of Vienna, the Seibersdorf Research Center, and the Joanneum in Graz. At the present time, work is progressing on a cartographic representation of biodiversity patterns and an analysis of the causal relationship between abiotic environment and commercial exploitation.

### 3.5 Funding

In Austria, funding for measures to preserve nature and landscapes comes primarily from general Federal and Provincial budgets. In addition, over the last few years special levies have been introduced for certain landscape uses. These so-called "Landschaftsfonds" provide a further source of funds. Other sectors such as those responsible for water resources, forestry or hunting also set nature conservation initiatives.

Financial incentives for nature conservation measures and to promote biodiversity are available in the framework of the ÖPUL program, which is cosponsored by the EU. The range of subsidized activities includes the cultivation of rare species and breeds of crop plants, the maintenance and conservation of extensive orchards (under the measure "protection of ecologically valuable land"), programs to let cropland lie fallow for 20-year periods, organic farming, adherence to cutting time restrictions, the mowing of steep slopes and montane cropland, as well as the keeping and breeding of endangered animal breeds. The response to these measures has been very uneven: improved information and technical advice should help to achieve broader acceptance of those measures known to preserve and promote biodiversity.

Another instrument that has proven to be successful in promoting biodiversity in the framework of EU Reg. No. 2078/92 has been funding through Lower Austria's program „Ökopunkte Niederösterreich“: here, strategies designed to promote extensive farming are coupled with landscape-structuring measures.

The "compensation payments for disadvantaged areas" has been a big help for hill farmers. It keeps them from abandoning agriculture and therefore decisively boosts biodiversity in these regions.

Finally, projects designed to preserve biodiversity are supported by NGOs and by private contributions.

Research into biodiversity-related topics is mostly either publicly funded or awarded in the form of contracts, for example in the form of priority research topics by various Federal Ministries, the Provinces, the Austrian Science Fund (FWF), the Industrial Research Promotion Fund (FFF), the Hochschuljubiläumsstiftung of the Austrian

National Bank, the Hochschuljubiläumsstiftung of the City of Vienna, as well as by the ÖAW, the Österreichische Forschungsförderungsgesetz, and by private sources.

Measures taken by businesses and municipalities in the sector of technological environmental protection (sewage treatment plants, exhaust air purification) can receive financial support based on the Umweltförderungsgesetz. The subsidy formalities are handled through the Austrian Kommunalkredit.

#### Box 1: Funding schemes: an example

BIOSA-Biosphere Austria, a society dedicated to dynamic environmental protection, is a voluntary initiative of farm and forestry enterprises. In this program, a total surface area of more than 1700 hectares has been made available by businesses which commit themselves - on a voluntary, commercial basis - to nature conservation management in the sense of biotope and species conservation. Twenty-year leases and scientific biotope management concepts were developed for these nature conservation contract areas. BIOSA obtains its funds from ecosponsoring projects in a partnership with industry and commerce. This is an active step toward a demand-oriented product management of nature conservation services (nature trails along rivers and lakes, moor projects, arid biotope conservation programs, etc.)

### 3.6 Ongoing programs

In Austria, virtually every sector that is addressed by the articles in the Convention on Biological Diversity has taken action that was already initiated long before the Convention became law. A number of activities are currently being undertaken that supplement the above-mentioned research programs (see 3.4).

The National Environmental Plan (NUP), published by the Austrian Federal Government in 1995, has a long-range view and serves as a binding framework that also encompasses strategies to preserve biodiversity in Austria. The NUP will be amended and updated approx. every 4 years and is currently being revised.

In Austria, nature conservation programs run both under the heading "species protection" (protection measures for brown bear, fish otter, bearded vulture, great bustard, corn crane, southern festoon butterfly and many others, reintroduction of the regionally extinct Large Emperor Moth etc.) and under the heading "biotope protection" (e.g., establishment of interlinked biotope systems, conservation of extensively farmed grassland). The nature conservation programs will also focus on guaranteeing the integrity and ensuring the competent management of existing and planned protection areas. Discussions on establishing further Ramsar areas (Lafnitztal) and new national parks (Thayatal, Gesäuse, Kalkhochalpen) are far advanced. Furthermore, efforts are being made to implement those EU guidelines pertaining to nature conservation; this work has been successfully completed in some regions. Measures have been taken to protect game and amphibians along Federal roads.

Austria's botanical gardens are participating in drafting common strategies (on the EU level and within the framework of Botanical Gardens Conservation International) to evaluate the role of botanical gardens in the Biodiversity Convention and their capacities, especially for ex-situ conservation.

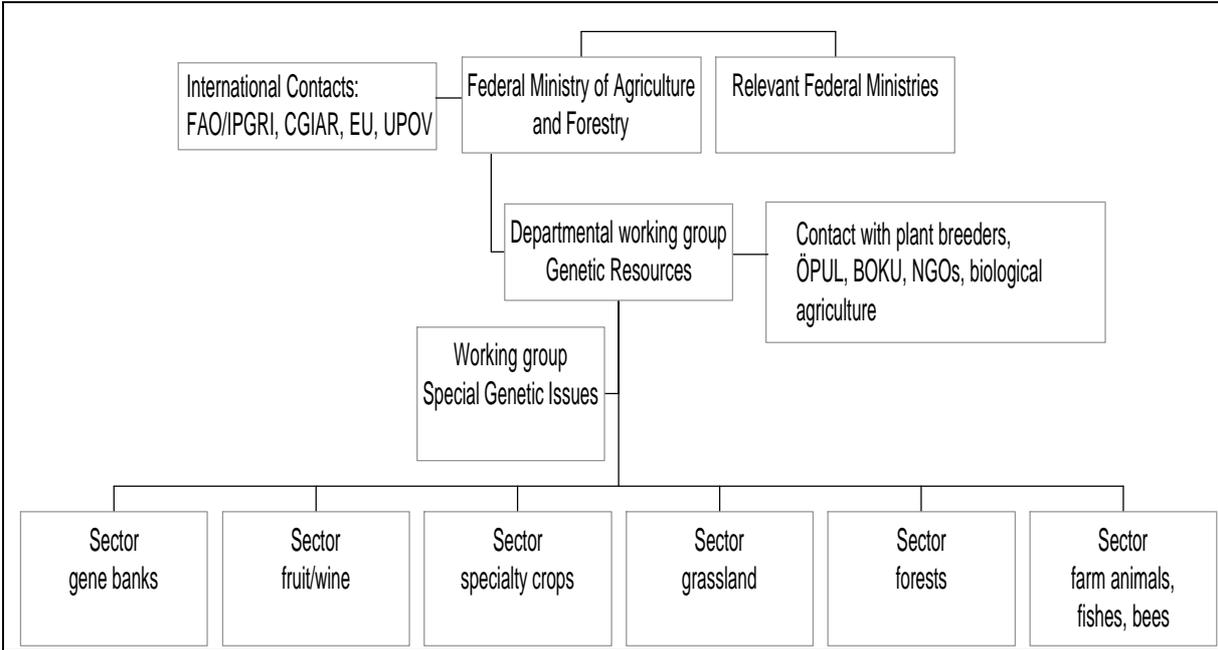
In Austria, activities to preserve genetic resources in the agricultural sector go back to the early 20th century. This effort involved working up and collecting autochthonal material, maintaining a stock of native and exotic varieties, and in running gene banks. Working and base collections are available at the two major state-owned gene banks (Bundesamt und Forschungszentrum für Landwirtschaft in Vienna and the Federal Office of Agrobiology in Linz) as well as in the two Provincial agencies (in Rinn and Wies).

The collections contain a total of 5500 samples of grain, vegetables, medicinal plants and herbs, as well as non-food plants. Beyond this, seeds are also stored in agricultural technical colleges, Federal educational and research institutes, Provincial laboratories, and universities.

The long-established repositories for old fruit varieties and grapevines at Federal and Provincial agencies will be maintained and, if possible, expanded. These inventories are currently being compiled and coordinated by a departmental working group at the Federal Ministry of Agriculture and Forestry.

In 1995, a departmental working group was established at the Federal Ministry of Agriculture and Forestry. Its task is to develop a "National Program to Preserve Genetic Resources" that encompasses both flora and fauna. This group is entrusted with coordinating the collection, processing, and conservation of genetic resources as well as making this material available for further use. It also hopes to compile/keep catalogs and data banks.

Figure 1: Diagrammatic representation of the national program to preserve genetic resources



The environmental program ÖPUL supports measures to preserve biodiversity in the agricultural sector. The Federal Ministry of Agriculture and Forestry collects and evaluates the data on the farms participating in the individual ÖPUL projects as well as on the surface areas involved and the number of subsidized animals. An ecological evaluation by ÖPUL, which considers biodiversity to be decisive item, is being carried out parallel to the program. This evaluation (Federal Ministry of Agriculture and Forestry, 1996) contains a number of measures for future development.

NGOs will continue to play an important role in in-situ conservation. In the case of crop plants, organizations such as Arche Noah concentrate on seed conservation and the conservation of vegetables, wheat, grain crops, field crops, fruit, herbs, and medicinal plants. The varieties offered by the individual members are published in an annual catalog and are therefore available for trading and continued reproduction. In the case of old fruit varieties, a number of initiatives are in progress to promote extensive orchard fruit growing.

An effort is currently being made to establish a gene bank for endangered farm animals in Austria. The Federal Office of Agrobiological (Institute of Biological Agriculture and Biodiversity in Wels) has the personnel and technical facilities for a gene bank that would fulfill current internationally accepted criteria. Efforts are also underway to establish an Austrian data bank.

The organizations ÖNGENE and VEGH are both involved in surveying and conserving animal populations in Austria. ÖNGENE, however, registers only those animals listed in herd books kept by breeders that are recognized by a breeding association.

The permanent Austrian forest inventory, carried out by the Forestry Research Centre, plays a major role in determining and monitoring the biodiversity of woody plants in Austria's forests. Beyond merely collecting basic data on Austria's forests, this program examines biodiversity-related indicators such as the distribution and composition of tree species. Forest condition is further documented by a forest damage surveillance system linked with a European network. Forest soil condition was documented in the course of a special, nationwide survey by the Forest Soil Condition Inventory; this included studies on vegetation ecology. A two-pronged effort is being made to implement Strassburg Resolution S-2 (Conservation of Forest Genetic Resources) of the First Conference of Ministers for the Protection of Forests in Europe. The first involves a national concept to preserve genetic diversity (implemented as of 1986) at the Forestry Research Centre in close cooperation with the Provinces and the Federal Forestry Agencies. The second involves Austria's formative participation in the European Forest Genetic Resources Programme. This program is undertaking a Europe-wide effort to coordinate the conservation of genetic resources for various tree species. In addition, the conservation of biological diversity is promoted in the framework of implementing Helsinki Resolutions H-2 (Protection of Biodiversity in European Forests) and H-4 (Adaptation of Forests to Climate Change).

Prompted by the forest dieback issue, the Forestry Research Centre in 1986 developed the project "Conservation of Genetic Diversity", which is a cooperative effort pooling a number of different disciplines. Since then, a series of coordinated in-situ and ex-situ conservation measures have been implemented in this framework. Nationwide, this has led to the establishment of 242 conservation units (gene conservation reserves > 30 ha and gene conservation cells < 30 ha) with a total surface area of more than 8200 ha.

As of 1995, the project "Natural Forest Reserves" has provided a vehicle to establish a representative network of such reserves for all types of tree communities known in Austria.

Since 1993, modern biochemical-genetic methods are being employed to investigate the range and geographic differentiation of the genetic diversity of key tree species in the framework of the project "Genetic Inventory of Austria". The results not only help optimize forestry measures to preserve genetic material, but also enable the quantification of potential long-term changes in the genetic diversity of forest tree populations.

In the framework of the Europe-wide UN-ECE-Program "Integrated Monitoring", the Federal Environmental Agency has established a long-term site in the Northern Limestone Alps to monitor forest ecosystems. This approach provides data that helps quantify and monitor the biodiversity of the fauna and flora. Further activities include the Austrian forest development plan and the forest eco-point system. Currently, efforts are also being made to establish a legal framework for criteria and indicators that would allow a quality seal to be awarded for wood and wood products that stem from sustainably managed forests.

The range and diversity of agricultural soils in Austria is being documented in the framework of Soil Status Inventories. These have been carried out since 1986

according to a standardized concept by the individual Provinces. The Österreichische Bodenkundliche Gesellschaft, in a research project funded by the Federal Ministry of Agriculture and Forestry along with the former Federal Ministry of Science, Traffic and the Arts, compiled the first standardized methodology for soil status inventories. An enlarged edition incorporating state-of-the-art investigation parameters was published in 1996. In the framework of this research, soil microbiological methods were developed to determine the status quo of Austrian soils and to evaluate protection measures. These approaches will be used in the observation of permanent soil plots.

In a cooperative effort, the Federal Ministry of Defense and the Federal Environmental Agency are conducting biotope mapping in military training areas.

Since 1991, water quality surveys in accordance with the Wassergüte-Erhebungsverordnung are being conducted in a cooperative effort between the Federal Ministry of Agriculture and Forestry, the Federal Environmental Agency, and the Provincial agencies. This program provides the foundation for aquatic ecosystem protection policy by surveying the water quality and saprobiological features of numerous rivers and streams. The Wasserrechtsgesetz stipulates that the Federal Minister of Agriculture and Forestry report to the National Assembly on the status of water resource protection in intervals of no greater than 3 years. The first water resource protection report was published in 1993, the second in 1996.

The quality of Austria's running waters and lakes is inspected at regular intervals. In the framework of the national monitoring program, the water quality of flowing waters is tested 6 or 12 times per year at a total of 244 stations.

Initial mapping surveys and ecomorphological evaluations of running waters have been commissioned in many regions of Austria by the Federal Ministry of the Environment, Youth and Family and the Federal Ministry of Agriculture and Forestry. This effort is designed to maintain and improve the ecological integrity of rivers and streams, which provide a habitat for a wide range of species. In the course of this work, typical reference stretches were established along many of the water bodies.

Fish stocking contributes to revitalizing running and standing waters. This measure relies heavily on the cryoconservation of fish sperm and embryos. Although cryobiological methodologies have been perfected in research laboratories, no well-stocked gamete repository has yet been established.

Biodiversity-related cooperative projects with developing countries all over the world are being carried out by Austrian university institutes and museums; many NGOs are also involved in this effort. Since 1993, the Republic of Austria has contributed a total of ATS 200 million to numerous projects in the framework of the Austrian "Nationalinitiative Wald - Dritte Welt".

Box 2: Case study Brazil

The Rio Armonia in the Brazilian State of Acre, near the Peruvian border, is home to the Ashaninka people. Although this region is extremely difficult to reach by land, Brazilian settlers and lumberjacks have made their way there. So-called civilization has brought the Indian tribes salt, sugar, oil, kerosene, soap and clothing. On the other hand, it has also introduced new diseases that require treatment with Western medicine. This has not only disrupted the sensitive ecological balance of the rainforest, but also disrupted and even destroyed the lifestyle of Indian communities.

These developments have prompted the Ashaninka, like many other indigenous people, to seek a sensible balance between traditional lifestyles and Western knowledge. They were supported in this endeavor by the Indian Research Centre in Sao Paulo, whose highly motivated and experienced staff provided valuable expertise. They work on site, directly with the Indian communities, and keep the Brazilian public informed. They also maintain contacts with foreign organizations that provide much-needed support. Austria supports this institute and several of its projects in the Amazon in the framework of the Rainforest Program.

### Box 3: Case study Panama

The Embera tribe lives in Panama's Darién Rainforest. In the framework of the Austrian Rainforest Program, a project was initiated in 1993 to survey the traditional territory and establish legally binding borders. At the same time, the Indian community came to the decision to reactivate their ancient knowledge about the great variety of trees that once grew in this region. This gave rise to a research program that is attempting reintroduce old tree species and to establish seed banks. This project is being sponsored by the Vienna Institute for Development and Cooperation.

## 4 STRATEGY

For ages, mankind was at the mercy of the natural elements. Natural selection processes applied to humans as well, putting us on the same level as all the other components that make up the biological diversity of our planet. Today, mankind has largely transcended this stage. The environment and, along with it, biodiversity worldwide has been and continues to be decisively influenced by human activity; based on current knowledge, this impact has been overwhelmingly negative.

In the biodiversity sector, this negative anthropogenic impact is reflected in accelerated species decline, loss of natural habitats, and in shrinking farmlands in which environmentally compatible, sustainable farming is practiced. In the abiotic realm, this impact is evident in increasing levels of those pollutants considered to be responsible for acid rain, projected climate change, or the ozone hole.

Based on our current knowledge of evolutionary and ecosystem processes, we know how crucial biodiversity is for human survival and well-being. Nature's own broad range of strategies can often open our eyes to solutions for human problems. The current, initial steps in combating declining biological diversity involve improving

technical operating procedures. A major contribution to conserving biodiversity would be to combine these individual measures into a more comprehensive concept designed to encompass all aspects of human activity.

The 1992 United Nations Conference on Environment and Development (UNCED), at which the Convention on Biological Diversity, the Climate Convention, and Agenda 21 were adopted, was a major international step toward integrated solutions, a step with support at the highest political levels.

Austria attaches great importance to these initiatives. The goal must be to ensure a harmonious relationship between nature, the utilization of biological resources, and mankind, both with respect to present needs and the needs of future generations. Such a harmonious economic system geared to long-term, sustainable use must be based on closed cycles and regenerable or renewable raw materials and energy sources; it will require a "wise use" of natural resources. A prerequisite for achieving this goal is the general acceptance of the underlying premises; the first step in this direction was the ratification of the Convention on Biological Diversity. The next step is to draft the corresponding implementation strategies; this will involve intensive cooperation with all administrative units and levels as well as with representatives of the various interest groups.

Some of the goals and activities designed to implement the Convention are already outlined in the Austrian National Environmental Plan (NUP). Evaluating and possibly expanding the NUP's relevance to fulfill Convention obligations may well set the Convention's goals in a broader framework. This would do justice to the designated task of integrating the conservation and sustainable use of biodiversity into relevant sectoral and integrated programs or plans (Article 6b). In this connection, greater emphasis will have to be placed on aspects of development cooperation.

One of the fundamental purposes of a national strategy to protect and sustainably use biodiversity must be to increase awareness and deepen our knowledge about the necessity for, and advantages/benefits of, biological diversity. This calls for global thinking. A primary goal must be an interdisciplinary effort to inventorize Austria's biodiversity at all levels. This includes genetic diversity (especially in the agricultural and forestry sectors), species diversity, and ecosystem diversity.

Balanced, economical measures based on objectively determined priorities can only be set if precise, representative information is available. However, the precautionary principle calls for actively protecting and sustainably using biodiversity before definitive, complete data sets are available.

One objective of this future strategy must be to better coordinate Austria's approach to nature conservation and species protection. This must be done in tune with neighboring countries both in- and outside the EU, i.e. it must involve a harmonized approach to nature conservation as well as to agricultural and forestry policies that conform with the three goals of the Convention on Biological Diversity. A coordinated, intelligent regional planning could contribute to this process.

A coordinated approach to the future action plan has already been initiated by the cooperation of the European Conference of Environmental Ministers; in 1995 they

called into life the "Pan-European Biological and Landscape Diversity Strategy", Action area 9 "Forest Ecosystems" and the process of the Conference of Ministers to protect forests in Europe.

The need to coordinate the approach to biodiversity with the results of the International Panel on Forests and the work of the United Nations Commission on Sustainable Development (UN CSD) is also necessary in light of future negotiations on a Forest Convention. The forest declaration adopted at the United Nations Conference on Environment and Development (UNCED) already strives to reach global consensus on the exploitation, conservation and sustainable development of all forest ecosystems; it attaches equal weight to all three aspects. The declaration clearly stresses the importance of forests for maintaining species diversity.

Ensuring the future of our natural resources and landscapes requires giving consideration to biological diversity and its conservation Austria-wide.

## **5 RECOMMENDED MEASURES**

The different types of land use in Austria are defined by a wide range of rights and interests. Therefore, a key prerequisite for establishing an Austrian strategy (or for incorporating the goals of the Convention on Biological Diversity into existing strategies and action plans) is to integrate all concerned interest groups from administrative, industrial, agricultural, forestry, scientific, and NGO circles. This is the only way to guarantee that the Convention's goals are integrated into daily life.

The first step in this direction is to establish a National Commission on Biodiversity open to representatives of all relevant interest groups and administrative authorities.

One prerequisite for formulating an independent strategy or for incorporating the Convention's goals into other strategies and plans is to determine the overlaps in the many current Austrian regulations and activities, strategies, and plans and to identify gaps and implementation deficits. The results of the study "Implementation of the Convention on Biological Diversity in Austria", commissioned by the Federal Ministry of the Environment, Youth and Family, was an important step forward.

Conserving biodiversity, sustainably using biological resources, as well as equitably sharing of benefits clearly calls for increased cooperation (Federal, Provincial, and Municipal levels, the private sector) between those who use nature and those who would protect it. This will require a level of interdisciplinary cooperation transcending traditional jurisdictions.

The principle of sustainability laid down in the National Environmental Plan includes the conservation of non-renewable environmental goods such as species diversity, landscape, natural ecosystems and biotopes. The following sectors will be critical in developing a strategy to implement the Convention on Biological Diversity: public education and awareness, training and research, law, subsidies. Discussions on initial measures within these sectors are currently underway. On the other hand, it should be noted that no funding has yet been secured for such measures.

### Recommended measures in the sector "public relations work and building public awareness"

- Develop information campaigns to reach the broader public
- Improve the level of information within the various Provincial and Federal agencies and information centers
- Improve the public relations departments at the nature conservation agencies of the Provincial Governments
- Promote the communication between the various land-use interest groups (agriculture and forestry, hunting, tourism, transportation, etc.)
- Establish an advisory agency to deal with nature and landscape conservation issues
- Promote biodiversity-related public relations work at botanical and zoological gardens, at museums, universities and other educational facilities.

### Recommended measures in the sector "education and research"

- Tailor the curricula of all school levels to incorporate the goals of the Convention on Biological Diversity
- Establish a university-level nature conservation program and strengthen university teaching in the fields related to conserving genetic material
- Convey the significant role of agriculture and forestry in conserving biodiversity in the curricula of agricultural colleges, forest ranger schools, hunting license courses, and universities
- Establish a nature conservation academy
- Fund and provide manpower for research on and documentation of biodiversity in both lower and higher organisms
- Fund and provide manpower for scientific institutions devoted to carrying out conservation measures and monitoring
- Improve the coordination between research in the various subdisciplines
- Bring together the results from relevant mapping efforts and document the available data sets on a nationwide basis.

### Recommended measures in the sector "law"

- Examine the constitutional clause about comprehensive environmental protection with regard to the protection of biodiversity
- Incorporate the goals of the Convention on Biological Diversity into Federal and Provincial substantive laws
- Conclude an agreement between the Federal Government and the Provinces to better coordinate national and international nature conservation responsibilities
- Amend, to the extent necessary, nature conservation laws to reflect the goals outlined in the Convention on Biological Diversity
- Amend game and fishery laws to reflect the goals outlined in the Convention on Biological Diversity
- Anchor the consideration of ecological measures in land-use laws
- Reconsider and possibly amend the European Community's seed regulations
- Secure and expand Austria's network of natural forest reserves
- Firmly anchor the national program to conserve and utilize genetic resources in the agricultural sector.

#### Recommended measures in the sector "subsidies"

- Review subsidies that negatively impact biodiversity
- Evaluate environmental programs in the agriculture and forestry sectors from the perspective of biodiversity
- Support and expand funding for various individual programs by the Federal, Provincial, and Municipal governments and better coordinate these efforts
- Introduce additional funding mechanisms and increase funding for existing mechanisms
- Increase subsidies for the keeping of all endangered breeds of farm animals
- Increase subsidies for ecologically oriented forestry management

#### Further recommendations:

- Intensify the combination of in-situ and ex-situ measures to conserve endangered genetic resources (also on the international level)

- Establish an Austrian nature conservation committee with representatives from the Federal Government, the Provinces, universities and other research facilities as well as delegates from nature conservation organizations
- Formulate ecological breeding objectives
- Increase efforts on the national and international level to set measures to combat air pollution
- Increase the effort to integrate aspects of the Convention on Biological Diversity Convention into bilateral and multilateral, government and non-government development projects, specifically by evaluating the ecological impacts of cooperative development projects
- Increased cooperation in drafting suitable criteria and parameters to evaluate sustainable development including the status of biodiversity
- Improve cooperation in drafting suitable criteria and parameters of sustainable use in order to fulfill the goals of the Convention on Biological Diversity
- Review and possibly change ownership rights and access rights to genetic resources
- Integrate the private sector (trade and industry) into the sustainable use of biodiversity, also on the international level
- Review options for boosting the transfer of technology dealing with conserving and sustainably using biodiversity
- Regularly review the effectiveness and efficiency of all measures implemented to protect and sustainably use biodiversity.
- Improve the function of state-owned institutions dealing with nature conservation, specifically with regard to implementing international commitments in the nature conservation sector and to better informing the public.

## **6 ACTION**

### 6.1. Art. 7: Identification of and monitoring biodiversity

The documentation and monitoring of natural, near-natural, or endangered ecosystems and habitats as well as of species and populations (i.e., Austrian Red

List of endangered animal and plant species, Red List of endangered biotope types, biotope mapping, status reports on protected areas) should be done on the Federal level using standard methodology, with a central coordination. These national surveys should be supplemented by regional mapping at the Provincial level (i.e., Regional Red Lists). Drafting the guidelines for this process and carrying out the surveys themselves will require consultation with scientific societies and other expert groups (i.e., the Österreichische Bodenkundliche Gesellschaft, Österreichische Entomologische Gesellschaft, Zoologische-Botanische Gesellschaft, to name a few), as well as the cooperation of the research facilities of the ÖAW, university institutes, other public and private research institutions, as well as volunteers (i.e., breeding bird surveys by members of BirdLife Austria, faunistic surveys by members of entomological societies). Based on and expanding upon the numerous existing data banks, the collected data should be managed in a form that is accessible to all interested parties (i.e., compatible data banks). These data are to be updated at regular intervals appropriate to the respective diagnostic and monitoring activities; these intervals are to be determined by experts in the field. This initial effort can only serve as a first step in the further monitoring process.

Steps must be taken to ensure the continuation of catalogs in the series "Flora and Fauna of Austria", the publication of the "Critical Flora of Austria", and the completion of the mapping of vascular plants in Austria.

The extensive orchard areas have only been mapped in a few regions. A coordination bureau should be charged with conducting a nationwide survey under the participation of Federal agencies, nature conservation organizations, and the private sector; it should also be responsible for an evaluation and prioritization. Emphasis should be placed on establishing a central, nationwide catalog of varieties. This would enable a quick overview of the available fruit varieties and would serve to better coordinate ongoing activities in this sector. The plan is to establish this data bank at the University of Agricultural Sciences' Institute of Fruit Growing and Horticulture.

A wide range of grassland surveys in Austria have been carried out by different bodies (universities, Federal and Provincial agencies). These mapping efforts should be consolidated. Any documentation of changes in the species composition of grassland communities calls for continuous updates of such data banks.

In the animal sector, a nationwide data bank for endangered domestic animal breeds would help pinpoint an increasing threat to a particular breed and to initiate countermeasures.

Emphasis should also be placed on an Austria-wide consolidation and evaluation in the realm of cultural landscape mapping.

An effort should be made to increase the number of biodiversity indicators in the Forestry Research Centre's nationwide forest inventory.

In the hunting sector, a national monitoring system - including transparent data management - should be initiated for all game animals. This would enable adequate documentation of population trends and allow appropriate action to be taken in the

framework of game laws or other hunting measures. This approach would also defuse recurring conflicts between hunters and nature conservation organizations (catchword: Red List of endangered species).

Documenting and monitoring biodiversity in aquatic ecosystems requires surveying and classifying the condition of the various water bodies. Suitable approaches include ecological integrity; geomorphological, hydrobiological, hydrological, biocoenotic and fish surveys.

International cooperation in harmonizing procedures to draft indicator systems for evaluating biodiversity is essential. Austria's experience and active participation could enrich the efforts in international fora and in the EU.

## 6.2 Art. 8: In-situ conservation

The competence to establish a system of protected areas or of areas calling for special measures to conserve biodiversity lies with the Provincial Governments, which may receive support from the Federal Ministry of the Environment, Youth and Family (e.g., national parks, Ramsar areas). Protected areas must be expanded as needed based on a systematic survey of Austria's biodiversity. This pertains both to existing protected areas (i.e., national parks, nature reserves, landscape conservation area) as well as to future nature reserves (i.e., Natura 2000 areas) established to implement the EU's Fauna-Flora-Habitat Directive. This process could be promoted by setting up special foundations designed to incorporate properties with high nature conservation value belonging to regional administrative bodies or private persons.

Guidelines for the selection, establishment, and management of protected areas or of areas calling for special measures to conserve biodiversity need to be based on a systematic survey of biodiversity in Austria. This will require a cooperative effort between the Provincial Governments, the Federal Ministry of the Environment, Youth and Family, Federal Ministry of Agriculture and Forestry, as well as scientists. Consideration should be given to the principles outlined in the current Fauna-Flora-Habitat Directive, and these should be amended as necessary.

Cooperation is also called for between Provincial Governments and environmental agencies in concert with affected owners and their lobbies. This is a prerequisite for regulating and managing biological resources that are important for conserving biodiversity both within and outside the protected areas, for promoting the protection of ecosystems and natural habitats, as well as for maintaining viable populations of species in their natural surroundings.

The first step toward promoting an environmentally compatible and sustainable development of areas bordering protected areas is to establish legal prerequisites for identifying buffer zones. Opportunities for cooperation with user groups should also be created.

The repair and restoration of impacted ecosystems as well as the regeneration or reintroduction of populations of endangered species must take place under the

auspices of nature conservation experts; cooperation with user groups would be advantageous here as well.

The introduction of alien species that present a potential threat to ecosystems, habitats, or species can be prevented by various substantive laws (e.g., fishery laws, game laws, nature conservation laws). Nature conservation agencies and user groups need to work together to control and eradicate alien species.

Provincial laws should be amended to cover at least those species protected under international conventions; game and fishing laws must be coordinated.

Conserving and promoting biodiversity on farmland requires both cultural landscape management as well as agricultural measures. On the Federal level, such measures are financially supported by ÖPUL; they should be subject to regular review for both their environmental protection and nature conservation relevance based on empirical criteria. Individual programs and projects designed to promote biodiversity in certain areas also exist on the Provincial and Municipal levels: these must be integrated into a common strategy in order to optimize their effectiveness. Private institutions can also play an important role here.

In order to reduce the direct input of fertilizers and pesticides (and associated impacts on biodiversity) around rivers and lakes and in refuges, the appropriate minimum buffer distances must be written into law (i.e., implementation of the nitrate guideline).

Organic farming, as a holistic method of cultivation, is a logical approach to increasing biodiversity. Nearly 20 000 organic farmers are registered in this country, making Austria a European leader in this field. Additional growth in this sector is desirable.

In the animal sector, steps must be taken to enable future cooperation with NGOs. The organization ÖNGENE has been very successful in the in-situ and ex-situ conservation of cattle breeds, while the VEGH has made valuable contributions in the in-situ conservation of horses, sheep, goats, pigs, donkeys, and poultry; these efforts deserve Federal funding. In the bee sector, the threat to one race in Austria has been classified as "critical"; a proposed plan to place these animals under the auspices of an expert working group in the Federal Ministry of Agriculture and Forestry should be implemented.

Improving the foundations for ecologically oriented forest management (i.e., promoting natural regeneration, afforestation with local tree species, conversion of site-atypical forest communities, environmentally friendlier harvesting methods, establishment of multi-storied forest stands oriented according to the potential natural forest community) also helps create the prerequisites for an optimal adaptation of native forest ecosystems to predicted climate change; biodiversity plays a key role in this adaptation process.

In a study designed to designate typical reference stretches of rivers and streams, ca. 2800 km of the largest Austrian running waters were investigated. Fifty-nine of the stretches, i.e. 25% of the investigated sections were documented and

designated as reference stretches exhibiting specific elements characterizing the original river type. The results of this study are fully applicable for modern water protection concepts designed to improve the ecological integrity of a water body. The corresponding measures at each water body are guided by the ecological "Leitbild" (model) developed in the framework of an interdisciplinary concept, the so-called "Gewässerbetreuungskonzept" (concept to monitor aquatic systems).

Last but not least, the private sector can contribute significantly to the in-situ conservation of biodiversity, for example by establishing and maintaining meadows, hedgerows, field margins, wetlands, and near-natural gardens; this activity should be supported.

Austria's experience in the realm of in-situ conservation should be made available to the international community.

### 6.3. Art. 9: Ex-situ conservation

Endangered species would benefit from increased efforts at ex-situ conservation in plant cultures, botanical gardens, zoos, as well as gene and sperm banks. In addition to gene banks, the keeping of autochthonous select cultivars in botanical gardens and ornamental gardens is a key element in ex-situ conservation and deserves more consideration. The renewal of gene bank material is a major problem. Especially in the case of endangered wild species, ex-situ conservation efforts must be accompanied by new data on germination behavior, storage conditions, and necessary replenishment cycles of gene bank material.

Neglected forms include vegetable varieties, where major gaps in our taxonomic knowledge exist, and potatoes, whose difficult storage prevents conservation. These fields will have to receive greater attention on a nationwide basis; in the case of potatoes, international cooperations may provide a way forward. One scientific task is to rid old varieties of viruses in order to guarantee their further reproduction. Conserving old varieties and strains in public facilities, schools, gardens, and on privately owned land must be accompanied by a nationwide effort to compile and document this information in a data bank on varieties; this would provide a much needed overview of valuable species diversity in Austria.

In the animal sector, support must be given to the cryoconservation of sperm and embryos of horses, sheep, goats, pigs, donkeys, poultry and fishes.

In the forest sector, the ex-situ conservation of rare tree species or of endangered tree varieties involves clone archives, maintenance plantations, maintenance stands, and long-term seed storage.

Austria's long-term efforts in the field of forest genetic resources, along with a harmonization of strategies (including the implementation of the Strassburg Resolution S-2, conservation of forest genetic resources), need to be strengthened.

The degree to which efforts are being made to preserve collections of microbial strains in Austria will have to be evaluated; this review should also determine

whether increased national and international cooperation is necessary to preserve and access such resources.

In summary, the present report underlines the necessity for establishing a central coordinating office for the ex-situ and in-situ conservation of genetic resources of crop plants and farm animals in Austria. This office should:

- seek contacts with all institutions involved in conservation measures
- keep an updated address list of all responsible facilities and persons
- guarantee the exchange of experience between all participating parties
- clarify rights of access and use
- recognize negative trends early on and raise alarm
- educate the public: create awareness, incentives for initiatives, etc.

#### 6.4 Art. 10: Sustainable use of components of biological diversity

Sustainable use in the agricultural sector implies the conservation and promotion of non-renewable environmental goods. This includes: the protection of natural ecosystems, the conservation of species diversity, as well as landscape and biotope conservation. Sustainable agriculture requires a workable and long-term dialogue between agricultural activity and general environmental policy. This can only be realized if farming is commercially viable, if other economic sectors also operate in an ecologically sustainable manner, and if the subsidiarity principle is emphasized in order to adapt to regional conditions.

The sustainable use of the components of biodiversity in agriculture means conserving a certain stock of "environmental capital" for future generations.

In the agricultural sector, organic farming methods can guarantee the sustainable use of the full range of components of biological diversity.

In order to reestablish, preserve and sustainably use the biodiversity of forest ecosystems, an attempt should be made to evaluate this diversity from an economic point of view. Determining the "full costs" involved in its use (hunting, tourism, protection function of forests, etc.) from the perspective of ecological capacity might be one approach to avoid or restrict the adverse impacts on biodiversity to a minimum.

#### 6.5 Art. 11: Incentive measures

A review of existing subsidy models and an expansion of contractual nature conservation should be opened for discussion, especially as it pertains to long-term funding.

In general, a critical examination of current subsidy programs in all sectors would provide an opportunity to modify or weed out those measures that negatively impact the conservation and sustainable use of biodiversity.

Financial subsidies from the EU to promote biodiversity in the agricultural sector can be sought in the framework of the "ÖPUL" program. Among others, this is designed to promote the cultivation of rare species and varieties. A blanket application of this measure on a nationwide level would be desirable. Combining this measure with others would decisively increase its acceptability. In addition, the spectrum of subsidized species and varieties should be expanded considerably. The bonuses for male breeding stock should be increased due to their significance in maintaining the population. Finally, the maximum number of subsidized animals should be increased from 200 to 300 individuals in the case of severely threatened breeds of cattle, horses, sheep, and goats.

In order to preserve biodiversity in disadvantaged areas in Austria (montane farming zones), it is essential that "compensation" payments from the EU be sought even beyond the new membership phase; these should be adapted to consider biodiversity.

It would be desirable to reorient the current forestry subsidy system, which is already ecologically oriented, toward compensation for near-natural forest management based on ecological criteria such as in the "forest eco-points" system.

## 6.6 Art. 12: Research and Training

A key step forward would be to formulate an overall scientific concept that is in keeping with the principle of free science; it should be based on an inventory of biodiversity in Austria and include the definition and development of sustainable forms of use.

The study and documentation of native Austrian microorganisms, fungi, plants, and animals, along with the degree to which they are endangered and need protection, is being conducted at several Austrian universities, the Museum of Natural History Vienna, the ÖAW, 7 Provincial museums, several research institutions, as well as by a large number of independent, qualified amateurs. A special effort should be made to teach the taxonomy of species-rich groups (e.g., insects, spiders, etc.) in university curricula in order to satisfy the demand for much-needed taxonomists.

The main agencies that fund biodiversity research in the agricultural sector are the Federal Ministry of Agriculture and Forestry, and the Federal Ministry of Science and Transport, as well as, in some subdisciplines, the Ministry of the Environment, Youth and Family. Research is being conducted at the University of Agricultural Sciences, agencies of the Federal Ministry of Agriculture and Forestry, Höhere Bundeslehr- und Versuchsanstalten, the University of Salzburg, the University of Vienna, agricultural schools and Provincial research centers.

The curricula at schools of agriculture and at universities should place greater emphasis on the role of biodiversity in farming and how to tap its potential. Farmers need to be made aware of the great contribution agriculture can make in protecting and conserving non-renewable resources.

In the forestry sector, research on biodiversity is mainly being conducted at the University of Agricultural Sciences, a number of institutes at the various universities,

and at the Forestry Research Centre. All facets of education and training in the forestry sector must place greater emphasis on the role of biodiversity for forest ecosystems and on methods to promote this role in management schemes. Existing institutions should assume this educational task and make an effort to target forest owners (farm forests): these programs need to stress the economic and ecological interrelationships in forest management. The same approach is valid for all licensed hunters.

Education and training in the fisheries sector is regulated Federally in the form of the agricultural and forestry vocation law. Advanced training courses for certified fishery technicians and fishery managers are held by the Institut für Gewässerökologie, Fischereibiologie und Seenkunde. In the sport fishing sector, it would be important to provide more comprehensive courses on managing standing and running waters, fish breeding, and similar topics. The advanced courses held by the „Österreichischer Wasser- und Abfallwirtschaftsverband" could help promote this approach.

Based on the restricted personnel and number of participating institutes, biotechnological research in Austria should set priorities. These priority topics should be supported financially and organizationally by the responsible institutions (Federal Ministry of Science, Austrian Science Fund). In light of the goal to preserve biodiversity, one such desirable priority topic would be laboratory and applied environmental biotechnology. Biotechnological research in the agricultural sector should give consideration to the high percentage of ecological farmers in Austria and the small-scale farming typical for the country. Using innovative biotechnology to capture market niches would do more to help preserve biodiversity and ensure profits than biotechnological applications in the framework of large-scale industrial agriculture.

One objective is to better coordinate the research (both basic and applied) conducted at Austrian university institutes, museums, and by independent researchers on conserving and sustainably using biodiversity in developing countries all over the world, especially tropical research. Short-, medium-, and long-term projects should be funded in order to guarantee the continuity of the work.

An effort should be made to expand the existing university curricula dealing with biodiversity.

#### 6.7 Art. 13: Public education and awareness

Promoting the communication process when conflicts of interest arise is especially important when the task is to preserve and sustainably use biodiversity.

All institutions dealing with the biodiversity issue bear a heavy responsibility in the public education sector. Their work, results and goals must be presented to the public in adequate form: after all, every private initiative is another step forward in conserving biological diversity. In the future, the initiatives and programs undertaken by the Federal Ministry of Agriculture and Forestry to promote biodiversity will have to be more effectively presented via television, radio, and newspapers in order to stress the role of agriculture in this field.

In addition to the above media, exhibitions provide an optimal public relations forum: here, the message can be taken up by all the senses (sight, taste, smell). Public interest can be awakened by attractively presenting the accumulated knowledge on old varieties in gardens, exhibitions, or zoos. Exemplary initiatives in Austria include the garden show of the Arche Noah at Schloss Schiltern (mostly old varieties of vegetables), the Lavantaler fruit tree museum along with its nature trail lined by fruit trees, and the "Tiroler Hof" at the Schönbrunn Zoo, with its traditional Austrian domestic animals. Beyond these efforts, more should be done to integrate private, biodiversity-related initiatives into the agricultural sector. Market gardens and nurseries run by private persons could do much to educate consumers by offering a balanced product range and providing information with every purchase.

In the future, research and documentation work will have to be accompanied by a greater public relations and marketing effort in order to build public awareness for the value of biodiversity.

In situ conservation measures require increased public relations and awareness-building measures both for the broader public and for the individual user groups. It would be very helpful if the Federal and Provincial authorities would set an good example in their management of public lands. One advantage would be to demonstrate the many possibilities for private persons to boost biodiversity by creating and maintaining meadows, hedgerows, field edges, wetlands, informal gardens and similar biotopes.

Schools and other, private, educational institutions could play an important role in building awareness and broadly disseminating information on the importance of biodiversity (environmental education). Providing information to user groups is a key facet.

Another approach would be to teach the value of biodiversity in the training program of all recruits in the Austrian Army.

## 6.8 Art. 14: Environmental impact assessment

The current efforts to amend the EIA law should attempt to integrate aspects of biological diversity. However, deregulation should be kept at a minimum. A major improvement in the biodiversity sector could be achieved by introducing strategic or concept EIAs; this would allow the impact on biodiversity to be estimated at an early stage and permit appropriate precautionary measures to be addressed and planned. More research on EIA methods would help improve prognoses.

In addition, there is a need to draft and implement criteria for quality control in environmental impact statements.

As far as international cooperation is concerned, the Espoo Convention should be operationalized, as currently put into practice by Germany and Poland. Discussions on the issue of liability should be initiated on the European level.

As of 1997, upon completion of preliminary work, the environmental impact of all proposals in bilateral development project proposals will be evaluated prior to approval. Here, an effort must be made to better incorporate issues raised in the Convention on Biological Diversity.

#### 6.9 Art. 15: Access to genetic resources

In Austria, this topic is relevant above all for those varieties used in farming or forestry. Access to wild species, with the exception of endangered or otherwise protected species, is not subject to any principle restrictions in Austria: the removal of limited amounts based on the customary rights of property owners is tolerated.

Restricted access becomes legally binding when rights of ownership are conferred (i.e., patent rights granted or plant varieties protected based on breeding or biotechnological efforts or on other methodological grounds).

This issue is one that can only be sensibly regulated on the European level; Austria should therefore make a major effort to provide expertise and make its views known to the EU. More emphasis should be placed on the scientific study of biodiversity.

The EU forbids marketing the seed of no longer registered native varieties or of obsolete cultivars of most crop plants. Appropriate supplementary provisions for seed types that preserve genetic resources would go a long way toward expanding the farmers' freedom of action and promoting subsidy measures.

A network of international gene banks has been established under the auspices of the FAO. Its task is to provide free access to genetic material. This network currently includes 12 international gene banks, with 31 additional countries having declared their intention to join. This arrangement would incorporate 46% of all the plant genetic resources of the planet.

The issue of access is currently being discussed in the framework of the FAO (International Undertaking on Plant Genetic Resources). All interested parties should have access to plant genetic material, and the provider of this material should have a stake in all profits made in the successful commercial application of the material.

For non-profit-oriented and scientific undertakings, such plant genetic material should be available without restriction and at no cost.

#### 6.10 Art. 16: Access to and transfer of technology

In joint projects, non-proprietary technologies are transferred at the level of scientific cooperation. Above all, applied aspects and technological know-how are developed and disseminated in this framework.

From the Austrian perspective, a greater effort should be made to transfer green technologies in the framework of aid and development programs. The private sector, however, plays an especially important role in this sector.

Austria's position is directed at working toward a European initiative on this issue.

#### 6.11 Art. 17: Exchange of information

The Federal Environmental Agency (UBA) is the contact address for the UNEP information exchange network Infoterra, whose main node in Central Europe is located at the University of Vienna. In 1995 the UBA, in the framework of Infoterra, responded to 283 inquiries from 50 countries on every continent. The UBA is also the national contact for the "clearing house mechanism", which is currently being established under the Convention on Biological Diversity.

Austria is also cooperating with other international organizations such as the Central European Initiative or the OECD.

The European Environment Agency (EEA) is the focal point for the collection and processing of European information on biological diversity: its topic centers deal with a range of biodiversity-related issues. One goal would be to adapt and supplement the available data sets to include more information on biodiversity. The FAO could play a role in this process.

In order to simplify the exchange of information in the German-speaking world, summaries in English and other languages are being published by a number of Federal agencies. This effort should be expanded to include English versions of publications with broad international interest.

Furthermore, museums and universities have long-standing agreements on the exchange of publications with partners abroad.

In the scientific field, Austria has cooperated for many years with international, regional, or local scientific organizations and foreign universities. A greater number of joint international projects and the concomitant dissemination of information would be desirable.

In the field of gene technology/biotechnology, the summaries of applications for releasing/licensing genetically engineered organisms are exchanged and discussed with the responsible agencies of other EU member states on an institutionalized basis. Austrian applications for releasing into the environment are reported to the OECD data bank Biotrack. In the future, this information exchange will be adapted to UNEP's global "Biosafety Register"; modern communication technologies (i.e., internet) will be employed to guarantee broader accessibility. The Austrian safety regulations covering the use of genetically engineered organisms (Gentechnikgesetz and the accompanying regulations) are available to the public in the German language via the internet server of the Federal Ministry of Science and Transport.

The following international agreements and programs designed to promote the exchange of information in the water conservation sector: Bucharest Danube Declaration (1985), Danube Protection Agreement, Danube Environmental Program, Environmental Program for the Danube River Basin. Beyond this, information is being exchanged via bilateral and multilateral water agreements with neighboring states, as well as in the form of bilateral and multilateral water commissions; international organizations have also established a number of programs in this sector.

Another aspect worth mentioning is the participation of the AWW (Austrian Working Group on Water: Federal Environmental Agency, Federal Ministry of Agriculture and Forestry) in programs of the European Environment Agency (EEA) in the framework of the European Topic Centres on Inland Waters. A future focus will be on standardized data collection in order to obtain comparable status quo reports.

Austria is also participating in the World Information Early Warning System on Plant Genetic Resources in the framework of the FAO. This program was called into life as the first step toward implementing the resolutions of the International Technical Conference on Plant Genetic Resources, held in Leipzig in 1996.

#### 6.12 Art. 18: Technological and scientific cooperation

An important future goal will be to improve contacts designed to promote scientific cooperation, for example on protected areas. This will involve forming partnerships such as those existing between the National park Hohe Tauern, the National Park Les Ecrins (France), and the National Park Triglav (Slovenia); another approach is transboundary species protection programs such as that currently in effect for bearded vultures. Austria should also increase its efforts to implement international agreements in the realm of species protection and nature conservation. Our scientific contacts with developing countries also need to be improved. One important area of cooperation would be migratory birds.

Austria's participation in international programs to collect and document biodiversity should be intensified and expanded (i.e., in the International Biodiversity Information Network, Systematics Agenda 2000, Diversitas, European Working Group on Research and Biodiversity, and activities in the European Environmental Agency). Austria is actively participating in the Plants Committee of CITES.

In the agricultural sector, the founding document of the FAO specifically mentions the task of promoting national and international activities to preserve natural resources. The "Commission for Plant Genetic Resources", established in 1983, serves as a permanent, supranational forum for drafting strategies and guidelines to guarantee that plant genetic resources are collected, evaluated, and used in nutrition and agriculture, and that these resources are made available for plant breeding and science (International Undertaking on Plant Genetic Resources).

The Federal Office of Agrobiological Sciences in Linz is integrated in the international grain legume working group in the framework of the European Cooperative Programme/Genetic Resources, which is run under the auspices of the IPGRI; it is

charged with compiling the Phaseolus data bank. The Federal Office of Agrobiology maintains the repository for large-seeded legumes (*Vicia faba*) and forage legumes (alfalfa) in its seed bank for the International Institute for Agricultural Research for the Dry Area, a research institute of CGIAR.

The Forestry Research Centre (FBA) is a member of EUFORGEN. Austria is a key player in the three working groups "Norway Spruce, Black Poplar, Noble Hardwoods". The FBA is also participating in the two EU research projects "Genetic Diversity in Alpine Forest Ecosystems: Protection, Restoration and Adaptation to Environmental Change" and "Genetic Resources in Common Beech: Protection, Afforestation and Adaptation". The genetic diversity of forest tree species plays a central role in both EU projects.

International cooperation in the realm of forest biodiversity, the expansion of sustainable forestry, and the use of biogenic resources has already been initiated in several projects and should be continued and expanded. Bilateral projects are planned in the fields of resource protection, agriculture, integrated rural development, sustainable forest use, forestry data banks, national parks, as well as cooperation at the university level.

Two institutes of the Bundesamt für Wasserwirtschaft (Federal Agency of Water Management) are members of the European Directory of Research Centres in the Fishery Sector.

As far as biological security is concerned, Austria's work in the framework of the EU and OECD is accompanied by an intensive exchange of experience at the scientific and administrative levels, above all with Central and Eastern European states.

The Federal Environmental Agency has observer status in the working group "Regulatory Oversight on Biotechnology in Central and Eastern Europe", which was established by UNIDO. Austria is also actively involved in organizing Central and Eastern European conferences on international and regional cooperation in the field of security in biotechnology (i.e., Hungary, 1995, Slovak Republic, 1996). This cooperation should be continued and expanded in the future.

The Vienna University of Technology and the Pharmaceutical Faculty of the Mahidol University in Bangkok (Thailand) are cooperating on a joint research project titled "Production of a fermented, nourishing drink from soy beans". An ongoing exchange of information about the results of the individual subprojects has been very positively evaluated by the Thai partners.

#### 6.13 Art. 19: Handling of biotechnology and distribution of its benefits

Austria is working intensively to improve the risk assessment criteria for living modified organisms; the goal is a comprehensive evaluation of environmental impacts based on the precautionary principle. New methods of ecobalancing and life-cycle analyses are being developed and introduced into the EU-wide and international discussions.

The implementation of the legally non-binding UNEP Technical Guidelines on Biosafety to protect biodiversity on an interim basis has received strong support, especially from the Eastern European countries.

Austria supports a legally binding instrument to regulate the transboundary transfer of living modified organisms. Austria is therefore actively participating in the negotiations on the so-called "Biosafety Protocol". These efforts should be actively pursued.

## 7 PARTNERS

Within the Austrian public administration, the competence for implementing the Convention is distributed among virtually all territorial authorities. Certain sections of the Convention fall under the jurisdiction of various ministries, Provincial governments, as well as cities and municipalities. This constellation reflects Austria's long tradition in the realm of nature conservation, species protection, and landscape conservation, which are all components of biological diversity. Many other sectors such as agriculture and forestry, aquatic ecosystems, and the sustainable use of biodiversity have also been subject to legal regulation for many years.

Domestically, implementation of the Convention lies in the hands of the Federal Ministry of the Environment, Youth and Family. Due to the multiple jurisdictions for the various sections of the Convention within Austria's borders, the Ministry of the Environment, Youth and Family established the "National Commission on Biodiversity", in which representatives of the respective Federal and Provincial authorities can coordinate their activities and fine-tune future activities. The agencies and organizations participating in the Austrian National Commission on Biodiversity are listed in Table 11.

Table 11: Members of the Austrian National Commission on Biodiversity

Austrian Academy of Sciences - Commission for Interdisciplinary Ecological Studies
BirdLife Austria
Conference of Presidents of the Chambers of Agriculture, Austria
Federal Chancellery
Federal Environmental Agency
Federal Ministry of Agriculture and Forestry
Federal Ministry of Defense
Federal Ministry of Economic Affairs
Federal Ministry of Education and Cultural Affairs
Federal Ministry of the Environment, Youth and Family
Federal Ministry of Finance
Federal Ministry of Foreign Affairs
Federal Ministry of Science and Transport

Greenpeace Austria
International Institute for Applied Systems Analysis - IIASA
Natural History Museum Vienna
Offices of the Provincial Governments
ÖGNU, umbrella organization for environmental groups
Ökobüro, coordination center for environmental groups
Synergy
University of Agricultural Sciences Vienna - Institute of Forest Entomology
University of Vienna - Dept. for Vegetation Ecology and Nature Conservation
University of Vienna - Institute of Botany and Botanical Garden
Vienna Institute for Development and Cooperation
World Wide Fund for Nature (WWF Austria)

In preparation for developing a strategy to implement the Convention on Biological Diversity, four workshops on the topics "in-situ conservation", "ex-situ conservation", "sustainable use", and "development and aid" were jointly organized in 1996 by the Federal Environmental Agency in cooperation with WWF Austria. In addition to representatives from the various Federal and Provincial authorities, participants from science, research, industry and commerce, nature conservation and species protection, the hunting and fisheries sector, agriculture as well as development and aid actively contributed to these workshops. The workshop results have been published.

## **8 SCHEDULE**

The future strategy is currently still under discussion. The present report can therefore only indicate the priorities in formulating the strategy and the potential for integrating this work in other plans and strategies. This means giving consideration to other relevant strategies such as that of the EU Commission or the "Pan European Strategy for Biological and Landscape Diversity", both of which are scheduled for completion in 1997. Austria will make every effort to complete its strategy as soon as possible.

## **9 FINANCIAL RESOURCES, ARTICLE 20**

No detailed presentation of costs is possible at this time. Based on the lack of an allocation parameter for biological diversity, and the fact that financial appropriations are made by a wide range of Federal and Provincial authorities, Austrian budgetary measures are virtually impossible to compile. Furthermore, the ongoing discussion about the type of strategy and the respective implementation measures precludes providing details on any potential funding requirements.

With regard to the funding of international projects, it is very difficult to breakdown the allocated project funds according to projects relevant for biodiversity. Austria's financial contribution to the pilot phase of GEF was relatively substantial (AS 400 million). A considerable proportion of this budget was used for biodiversity-related projects. Austria committed itself to providing a sum of AS 231.51 million for the first replenishment, of which 172.6 million has already been deposited.

In addition, a bilateral "Austrian Global Environment Cooperation Trust Fund" was established. This is administered in trust by the World Bank and to date has been endowed with special drawing rights totalling ATS 1.5 million.

Austria's annual contribution to the international nature conservation sector (Convention on Biological Diversity, International Convention for the Regulation of Whaling, IUCN, CITES, International Waterfowl and Wetlands Research Bureau, Ramsar Convention, Federation of Nature and National Parks in Europe) amounts to ca. ATS 800 000.

In order to accelerate the implementation of the provisions of Strassburg Resolution S-2 of the Conference of Ministers with regard to the protection of European forests, Austria has contributed US\$ 10 000 to EUFORGEN, a program coordinated by IPGRI in close cooperation with the FAO.

Austria contributes ATS 110 000 annually to IPGRI.

In 1985, Austria joined CGIAR, the World Bank consulting group for International Agricultural Research. As of 1993, the annual contribution amounts to US\$ 1.5 million.

## **10 MONITORING AND EVALUATION**

The Umweltkontrollgesetz delegates the Federal Environmental Agency with competence for evaluating and monitoring the state of the environment. This control of the environment might also be interpreted as including the implementation of the above-mentioned strategy or plan. Plans are already underway to incorporate the biodiversity issue in the National Umweltkontrollbericht (state of the environment report).

In Europe, collecting and evaluating environmentally relevant data is the task of the European Environment Agency. Austria is working in close cooperation with this agency. As far as the collection and evaluation of environmental data is concerned, the Austrian Central Statistical Office along with the European Office of Statistics are potential partners.

The OECD, EEA, along with EUSTAT and the United Nations commission on sustainable development are currently working on compatible indicator systems to evaluate the status of biodiversity. After completion and testing, these indicator systems should be adopted by Austria in order to ensure international compatibility.

## **11 SHARING OF NATIONAL EXPERIENCE**

Austria is actively participating in the relevant working groups of the EU, EEA, and OECD as well as in the relevant bodies of the UN family. These committees serve as a forum to discuss experience in implementing the Convention. Since Austria has not yet completed formulating its national strategy, it is too early to report on its content or to exchange experience.

In assessing and evaluating biodiversity, Austria is not only contributing data, but is also providing its experience to Europe's state of the environmental report, which is currently being prepared by the EEA.

National experience in the biosafety sector is also being shared through participation in the EU committee of responsible authorities for EU-Directive No. 90/220 (Directive on release into the environment), the Working Group on Risk-Assessment, as well as in the OECD ("Expert Group on Harmonisation of Regulatory Oversight in Biotechnology"). This experience is also being shared in the framework of regional Central and East European workshops on biosafety. This example demonstrates how international experience might be exchanged in other sections of the Biodiversity Convention as well.

The study on the "Implementation of the Convention on Biological Diversity" and the proceedings volume on the discussion points and results of the four workshops to implement the Convention have already been published.

The Annex contains a list of selected publications dealing with the biological diversity issue.

## 12 ANNEX

### 12.1 List of Publications

Adler W., Oswald K. und R. Fischer: Exkursionsflora von Österreich. Bestimmungsbuch für alle in Österreich wildwachsenden sowie die wichtigsten kultivierten Gefäßpflanzen mit Angaben über ihre Ökologie und Verbreitung. Ulmer-Verlag, Stuttgart, Wien 1994.

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BM für Landesverteidigung (Hrsg.): Biotoperhebung Allentsteig. Wien 1995.

BM für Umwelt, Jugend und Familie (Hrsg.): Feuchtgebiete. Schutz und Erhaltung im Rahmen der Ramsar-Konvention. Wien 1993.

BM für Umwelt, Jugend und Familie: Naturschutz [Inter]national. Übersicht internationaler Naturschutzprojekte in Österreich. Wien 1997.

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## 12.3 Provincial Laws

### **Nature protection laws of the Provinces**

- Law of November 1990 on the protection and management of nature and landscapes in Burgenland - Burgenländisches Naturschutzgesetz (LGBl.Nr. 27/1991 idgF)
- Law of 3 June 1986 on nature conservation and management - Kärntner Naturschutzgesetz (LGBl.Nr. 54/1986 idgF)
- Law of 11 November 1976 on nature conservation and management - Niederösterreichisches Naturschutzgesetz (LGBl.Nr. 5500-0 idgF)
- Law of 19 May and 1 October 1982 on nature conservation and management - Oberösterreichisches Natur- und Landschaftsschutzgesetz (LGBl.Nr. 80/1982 idgF)
- Law of 6 July 1977 on nature conservation and management in the Province of Salzburg - Salzburger Naturschutzgesetz (LGBl.Nr. 86/1977 idgF)
- Law of 30 June 1976 on landscape protection and management - Steiermärkisches Naturschutzgesetz (LGBl.Nr. 65/1976 idgF)
- Law of 18 March 1991 on nature conservation and management - Tiroler Naturschutzgesetz (LGBl.Nr. 29/1991 idgF)
- Law of 4 March 1997 on nature conservation and landscape development - Vorarlberg (LGBl.Nr. 22/1997)
- Law of 19 October 1984 on nature conservation and management - Wiener Naturschutzgesetz (LGBl.Nr. 6/1985)

### **National Park laws of the Provinces**

- Law of the establishment and management of the National park Oberösterreichische Kalkalpen - OÖ Nationalparkgesetz (LGBl.Nr. 20/1997)
- Law on the National park Donau-Auen - Wiener Nationalparkgesetz (LGBl.Nr. 37/1996)
- Niederösterreichisches Nationalparkgesetz (LGBl.Nr. 5505-0/1996)
- Law on the National park Neusiedler See - Seewinkel (LGBl.Nr. 28/1993)
- Law on the establishment of the National park Hohe Tauern in Tirol (LGBl.Nr. 103/1991)
- Law on the establishment of national parks - Kärntner Nationalparkgesetz (LGBl.Nr. 5/1983 idgF)
- Law on the establishment of the National park Hohe Tauern in the Province of Salzburg (LGBl.Nr. 106/1983 idgF)

### **Fishery laws of the Provinces**

- Burgenländisches Fischereigesetz (LGBl.Nr. 1/1949 idgF)
- Kärntner Fischereigesetz (LGBl.Nr. 43/1951 idgF)
- Niederösterreichisches Fischereigesetz (LGBl.Nr. 6555-0)
- Oberösterreichisches Fischereigesetz (LGBl.Nr. 60/1983)
- Salzburger Fischereigesetz (LGBl.Nr. 50/1970 idgF)
- Steiermärkisches Fischereigesetz (LGBl.Nr. 33/1983)
- Tiroler Fischereigesetz (LGBl.Nr. 16/1983F)
- Vorarlberger Fischereigesetz (LGBl.Nr. 27/1891 idgF)
- Wiener Fischereigesetz (LGBl.Nr. 21/1984)

### **Game laws of the Provinces**

- Law of 28 November 1988 on the regulation of hunting in Burgenland - Burgenländisches Jagdgesetz (LGBl.Nr. 11/1989 idgF)
- Law of 23 May 1978 on the regulation of hunting - Kärntner Jagdgesetz (LGBl.Nr. 76/1978 idgF)
- Niederösterreichisches Jagdgesetz (LGBl.Nr. 6500-0 idgF)
- Law of 3 April 1964 on the regulation of hunting - Oberösterreichisches Jagdgesetz (LGB.Nr. 32/1964 idgF)
- Law on hunting in the Province of Salzburg (LGBl.Nr. 100/1993 idgF)
- Steiermärkisches Jagdgesetz (LGBl.Nr. 23/1986 idgF)
- Tiroler Jagdgesetz (LGBl.Nr. 60/1983 idgF)
- Law on hunting - Vorarlberger Jagdgesetz (LGBl.Nr. 32/1988 idgF)
- Law on the regulation of hunting - Wiener Jagdgesetz (LGBl.Nr. 6/1948 idgF)

### **Regional planning laws of the provinces**

- Burgenländisches Raumplanungsgesetz (LGBl.Nr. 18/1969 idgF)
- Kärntner Raumordnungsgesetz (LGBl.Nr. 76/1969 idgF)
- Niederösterreichisches Raumordnungsgesetz (LGBl.Nr. 8000-9)
- Oberösterreichisches Raumordnungsgesetz (LGBl.Nr. 114/1993 idgF)
- Salzburger Raumordnungsgesetz (LGBl.Nr. 98/1992 idgF)
- Steiermärkisches Raumordnungsgesetz (LGBl.Nr. 127/1974 idgF)
- Tiroler Raumordnungsgesetz (LGBl.Nr. 81/1993 idgF)
- Vorarlberger Raumplanungsgesetz (LGBl.Nr. 15/1973 idgF)
- Wiener Bauordnung



## 12.4 List of Abbreviations

AAW: Austrian Working Group on Water  
BGBl: Federal Law Gazette  
BM: Federal Ministry  
BOKU: University of Agricultural Sciences Vienna  
CAP: Common Agricultural Policy  
CGIAR: Consulting Group for International Agriculture Research  
CIPRA: International Commission for the Protection of the Alps  
CITES: Convention on International Trade in Endangered Species  
CORINE: Coordination of Information on the Environment  
Dir.: Directive  
EAAP: European Association for Animal Protection  
ECP/GR: European Cooperative Programme/Genetic Resources  
EEA: European Environment Agency  
EIA: Environmental Impact Assessment  
EU: European Union  
EUFORGEN: European Forest Genetic Programme  
EUROSTAT: European Statistical Office  
FAO: Food and Agriculture Organization  
FFH-RL: Fauna-Flora-Habitat Directive  
FLG: Federal Law Gazette  
GEF: Global Environment Facility  
GEO: Genetically engineered organism  
IAEA: International Atomic Energy Agency  
IBA: Important Bird Area  
ICARDA: International Institute for Agricultural Research for the Dry Area  
idgF: in its current version  
IFA: Research Institute for Agro-biotechnology  
IPGRI: International Plant Genetic Resources Institute  
IUCN: International Union for the Conservation of Nature  
MAB: Man and Biosphere  
NGO: Non-governmental Organization  
NUP: National Environmental Plan  
ÖAW: Austrian Academy of Sciences  
OECD: Organisation for Economic Cooperation and Development  
ÖGNU: Austrian Society for Nature and Environmental Protection  
ÖGUT: Austrian Society for Environment and Technology  
ÖNGENE: Austrian National Association for Genetic Reserves  
ÖPUL: Program to promote an environmentally compatible, extensive agriculture  
Reg: Regulation  
RL: Directive  
UBA: Federal Environmental Agency  
UNCED: United Nations Conference on Environment and Development  
UN-ECE: United Nations-Economic Commission for Europe  
UNEP: United Nations Environment Programme  
UNESCO: United Nations Educational, Scientific and Cultural Organisation  
UNIDO: United Nations Industrial Development Organisation  
UPOV: International Union for the Protection of Plant Varieties  
VEGH: Society for the Conservation of Endangered Domestic Animals  
VIRCC: Vienna International Research Cooperation Centre  
VO: Regulation  
WWF: World Wide Fund for Nature