

REPORTE DE AVANCE SOBRE EL DESARROLLO DE LA ESTRATEGIA NACIONAL SOBRE DIVERSIDAD BIOLÓGICA Y SU PLAN DE ACCION EN LA REPUBLICA ORIENTAL DEL URUGUAY

I) INTRODUCCION

El presente informe que se envía a la Secretaría del Convenio sobre la Diversidad Biológica, pretende ilustrar sobre el grado de avance de la implementación del Artículo 6 de la Convención sobre la Diversidad Biológica (CDB) en Uruguay.

Actualmente el proceso de elaboración de la Estrategia Nacional y el Plan de Acción para la conservación y la utilización sostenible de la diversidad biológica en Uruguay está en plena marcha y se estima que para setiembre de 1998 el documento estará pronto y será puesto a consideración de las autoridades políticas.

El Convenio sobre la Diversidad Biológica fue firmado por el Uruguay en la Conferencia de las Naciones Unidas sobre el Medio Ambiente y Desarrollo (CNUMAD) celebrada en junio de 1992 en Rio de Janeiro. El Parlamento Nacional lo aprobó por Ley No 16.408 del 27/8/93 y luego fue ratificado ante Naciones Unidas el 5/11/93, siendo el Estado No.32 en hacerlo.

Por Decreto del Poder Ejecutivo No 487/993 del 4/11/93, el Ministerio de Vivienda, Ordenamiento Territorial y Medio Ambiente (MVOTMA) y dentro del mismo la Dirección Nacional de Medio Ambiente (DINAMA), fue designado como "autoridad competente y punto de contacto para la instrumentación y aplicación del CDB" en Uruguay.

El MVOTMA ha considerado al CDB a los efectos de su implementación dentro del marco de los documentos emanados de la CNUMAD, es decir en la filosofía del Desarrollo Sostenible (Agenda 21) y por lo tanto se le ha dado un enfoque multisectorial, multidisciplinario y participativo, única manera de poder lograr la implementación de los artículos que lo componen y que abarcan variadas temáticas tales como conservación in-situ y ex-situ, utilización sostenible de los recursos, evaluaciones de impacto ambiental, educación, investigación, biotecnología, incentivos económicos, cooperación internacional, etc.

En el ámbito internacional y a partir de la CNUMAD el Uruguay participó en las negociaciones de la 1era y 2da Reunión del Comité Intergubernamental del CDB; posteriormente ha participado activamente las Conferencias de las Partes, Reuniones a nivel de Latinoamérica y del Caribe organizadas por

el CDB, Reuniones del Organismo Subsidiario de Asesoramiento Científico, Técnico y Tecnológico y de Grupo de Trabajo sobre el Protocolo de Bioseguridad.

II) PRIMEROS PASOS PARA LA IDENTIFICACION DE LAS PRIORIDADES NACIONALES

El CDB aconseja a los Estados Partes en su Art.6 la "elaboración de estrategias, planes o programas nacionales para la conservación y utilización sostenible de la diversidad biológica"...

A los efectos de iniciar este proceso el MVOTMA invitó en 1994 a diversas instituciones públicas y del sector civil (incluidas ONGs) a integrar una Comisión a los efectos de comenzar a discutir los principales lineamientos e ideas de implementación del CDB y cuestiones anexas.

Dentro de las tareas de la Comisión se organizó en 7/94 un Seminario-Taller sobre Estrategias Nacionales para implementar el CDB. El mismo contó con el apoyo técnico del World Resources Institute y el Biodiversity Support Program bajo la coordinación del Dr. Kenton Miller. Concurrieron al Seminario 45 participantes provenientes de 18 instituciones públicas y privadas involucradas en el tema (Ministerios, Universidad, Intendencias, Entes del Estado, ONGs, etc).

Como conclusión del Seminario mencionado fueron identificadas cinco líneas temáticas de importancia :

- Aumentar el conocimiento de la diversidad biológica, sistematizar su información y divulgarla.
- Establecer pautas de manejo de la diversidad biológica con amplia participación y coordinación de todos los sectores.
- Promover la educación ambiental a todos los niveles.
- Perfeccionar el marco legal sobre diversidad biológica.
- Coordinar y cooperar regionalmente en el manejo de los recursos biológicos compartidos.

Si bien estas no pueden ser identificadas todavía como las prioridades nacionales, pues el proceso de consulta está aún en marcha, se pueden señalar las mencionadas, como áreas de reflexión en esta temática.

Posteriormente en 1995 el MVOTMA elaboró un Proyecto y lo presentó ante el GEF, a los efectos de obtener apoyo financiero para el proceso de elaboración de la Estrategia Nacional y el Plan de Acción.

A fines de 1996 el GEF aprobó el Proyecto **URU/96/G31** por U\$S 121.500: Formulation of the National Biodiversity Strategy, Action Plan and Report to the Conference of the Parties, el que será admisistrado por el PNUD.

El citado Proyecto ha comenzado a ser operativo en octubre de 1997 y esta siendo implementado a través del MVOTMA. Más adelante en este informe se explicitan las características del Proyecto.

A juicio del MVOTMA la coordinación inter-institucional es fundamental para la implementación del CDB. Las competencias sobre diversos tópicos relacionados con la biodiversidad se encuentran aún dispersas entre distintos Ministerios (siendo estas anteriores a la aparición del CDB y a la propia creación del MVOTMA), en virtud de lo cual la referida coordinación llevará un período de adaptación y negociaciones previo.

III) INVENTARIOS Y BASES DE DATOS

En este sentido se pueden destacar diversos esfuerzos que se realizaron o realizan en el país relacionados con la diversidad biológica a través de diversas instituciones:

a) Estudio Ambiental Nacional (EAN); realizado por la Oficina de Planeamiento y Presupuesto (OPP) con el apoyo de la Organización de Estados Americanos (OEA) y el Banco Interamericano de Desarrollo (BID) y publicado en 1992.

Este trabajo incluyó un diagnóstico de la situación ambiental general del país y en diversos capítulos incluye información sobre diferentes parámetros de la diversidad biológica nacional tales como biogeografía, ecosistemas, fauna, flora, recursos forestales, áreas silvestres, turismo ecológico, reservas genéticas, etc.

También incluyó una serie de propuestas, entre ellas la creación de un Sistema Nacional de Areas Protegidas, con el cual el Uruguay no cuenta todavía.

El EAN fue la base del Informe de Uruguay para la CNUMAD de Río en 1992, incluyendo aspectos generales referidos a la diversidad biológica en Uruguay, los cuales se adjuntan en este informe (en idioma inglés).

b) Programa de Biodiversidad y Desarrollo Sostenible de los Bañados del Este (PROBIDES); actualmente en su segunda fase de ejecución tiene por finalidad la investigación de las extensas áreas de humedales situadas en la región sureste del Uruguay con el objetivo de su conservación y manejo sostenible. Este programa cuenta con financiación del GEF y la participación de gran número de técnicos nacionales.

Entre las actividades que se están desarrollando, se encuentra la redelimitación y formulación del Plan Director de la Reserva de Biósfera (UNESCO/MAB) Bañados del Este, cuya propuesta inicial e informe de avance ha sido ya presentado publicamente.

c) Proyecto de Inventario de Habitats para la aplicación del CDB en Uruguay ; actualmente en la fase final de su ejecución, tiene por objetivo la realización de un inventario de áreas naturales a escala nacional a los efectos de jerarquizar aquellas a priorizar para su conservación y utilización sostenible (Art. 7 del CDB). El Proyecto ha sido financiado por la Agencia Española de Cooperación Internacional (AECI) y ejecutado por técnicos del MVOTMA, otros técnicos nacionales y de la Junta de Andalucía.

d) Ministerio de Ganadería, Agricultura y Pesca (MGAP), a través de la Dirección de Recursos Naturales Renovables (RENARE), realiza las actividades de protección y conservación del bosque indígena del país. En este sentido ha elaborado un Proyecto de creación de un Centro de producción y promoción de especies arbóreas y arborescentes nativas.

También realiza actividades en relación con la administración de la mayoría de las áreas protegidas que por distintas normativas existen en el Uruguay. Existen otras áreas protegidas administradas por Gobiernos Municipales y otros Ministerios del Poder Ejecutivo.

La RENARE realiza actividades de protección, control y conservación de la fauna autóctona.

El Instituto Nacional de Pesca (INAPE), dependiente del MGAP, tiene jurisdicción sobre los recursos biológicos acuáticos ya sean marinos o continentales e implementa las políticas de conservación y uso sostenible de los mismos.

f) En materia de **Biotecnología**, funciona un Comité de Biotecnología en la órbita de la Dirección de Ciencia y

Tecnología del Ministerio de Educación y Cultura (MEC).

El Instituto Nacional de Investigación Agropecuaria (INIA) cuenta con una Unidad de Biotecnología , cuyos representantes han participado en eventos de la Convención de Diversidad Biológica, a su vez el MGAP también cuenta con unidades apropiadas en la materia y la Universidad de la República tiene una Comisión de Biotecnología.

La Universidad de la República a través de las Facultades de Ciencias, Agronomía y Veterinaria tienen en sus tareas habituales de docencia e investigación actividades que tienen relación con la diversidad biológica. Entre las últimas actividades desarrolladas en referencia con este informe, es importante señalar la realización del 1er. Seminario de Diversidad Biológica Vegetal y el 2do. Seminario de Recursos Fitogenéticos, organizado por Facultad de Agronomía y con una amplia participación de sectores académicos, profesionales, institucionales y del sector de ONG's, cuyas conclusiones se incorporarán al proceso de elaboración de la Estrategia Nacional y el Plan de Acción del Uruguay.

g) En referencia al tema de los Recursos Fitogenéticos, el Ministerio de Ganadería, Agricultura y Pesca creó una Comisión multi-institucional a los efectos de preparar la participación del Uruguay ante la Conferencia de FAO sobre Recursos Fitogenéticos en Leipzig de 1996.

h) La DINAMA ha brindado apoyo económico a diversas ONGs ambientalistas que han presentado proyectos concretos de investigación en diversas temáticas del CDB. Además existen numerosas ONGs ambientalistas en el Uruguay que trabajan intensamente y hacen publicaciones en temas relacionados con la diversidad biológica.

IV) MARCO INSTITUCIONAL

a) Ministerio de Vivienda, Ordenamiento Territorial y Medio Ambiente (MVOTMA)

A los efectos de centralizar las actividades del Estado en el tema de medio ambiente y coordinar las correspondientes acciones, el MVOTMA fue creado por Ley 16.112, de mayo de 1990, la citada Ley define entre sus competencias...

Artículo 3

Sección 7 - La formulación, ejecución, evaluación y supervisión de los planes nacionales de protección al medio ambiente y la

instrumentación de la política nacional en la materia.

Sección 8 - La coordinación con los demás organismos públicos nacionales o departamentales en la ejecución de sus cometidos.

Sección 10- La relación con los Organismos Internacionales de su especialidad.

Dentro del MVOTMA estas tareas están a cargo de la Dirección Nacional de Medio Ambiente (DINAMA)

b) Ley 16.466 de Protección del Medio Ambiente

La misma obliga a someter a Estudios de Impacto Ambiental (EIA) a una importante cantidad de actividades y obras públicas y privadas, las cuales deberán ser aprobadas por el MVOTMA en forma previa a su comienzo.

El Decreto de Reglamentación de la Ley incorpora entre las actividades pasibles de EIA, a varias directamente relacionadas con la protección de la diversidad biológica, tales como forestación, grandes extensiones de agricultura, planes de manejo, obras o construcciones en áreas naturales o protegidas, etc. Todo esto sin perjuicio de que en todas las otras obras comprendidas para la realización de EIA, el MVOTMA tiene especial consideración en los parámetros relativos a la diversidad biológica.

Es opinión del MVOTMA que los EIA son una herramienta operativa y eficaz para hacer real la protección de la diversidad biológica dentro del contexto del Artículo 14 del Convenio.

c) Comisión Técnica Asesora para la Protección del Medio Ambiente (COTAMA)

El Decreto No 261/993 reglamentó el Artículo 10 de la Ley de creación del MVOTMA, e integró la COTAMA, esta se integra por representantes de todos los Ministerios, Oficina de Planeamiento y Presupuesto, Poder Legislativo, Gobiernos Locales, Universidad, Organizaciones de los Sectores Rural, Industrial, Comercial, Trabajadores y las ONGs ambientalistas.

Corresponde a la COTAMA "colaborar con el Poder Ejecutivo a través del MVOTMA, en la definición de la política nacional en medio ambiente"...; también debe "promover la inserción de la dimensión ambiental en las decisiones de los organismos públicos e instituciones privadas"...

El MVOTMA adjudica una gran importancia a la COTAMA como instrumento de coordinación a los efectos de implementar el CDB

en el Uruguay. En el ámbito de la COTAMA se creó un Grupo de Trabajo Multisectorial a los efectos de preparar la posición del Uruguay para la Tercera Conferencia de las Partes del CDB y continuar el trabajo en vista de la Cuarta Conferencia, contribuyendo además a la tarea de implementación del Convenio a nivel nacional.

d) Ley 16.408 y Decreto No. 487/993

Aprueba el CDB, lo convierte en Ley y el Decreto asigna sus competencias al MVOTMA-DINAMA.

e) Vegetación y Fauna

Uruguay cuenta con numerosas leyes y regulaciones para la protección de la fauna y flora indígena. La Ley No. 9481, prohíbe la caza de animales de la fauna autóctona.

La Ley Forestal No. 15.939, establece la prohibición genérica de corta del bosque nativo del Uruguay

f) Proyecto de Ley sobre Sistema Nacional de Areas Naturales Protegidas

Como se ha expresado, si bien cuenta Uruguay con algunas áreas bajo protección legal, es la misma una normativa algo dispersa y no establece un Sistema, como lo pide el CDB.

A tales efectos se encuentra actualmente aprobado por el Senado un Proyecto de Ley que da el marco normativo para la creación de un Sistema Nacional de Areas Protegidas.

El MVOTMA colaboró instensamente con la Comisión de Medio Ambiente del Senado en la elaboración de este proyecto, el que también recibió aportes desde otros sectores del Poder Ejecutivo, las ONGs y otros sectores de la sociedad civil. Está pendiente aún la aprobación por parte de la Cámara de Diputados para convertirlo en Ley.

g) Artículo 47 de la Constitución

En diciembre de 1996 se aprobó un nuevo texto constitucional en el Uruguay, en cuyo Artículo 47 declara de interés general la protección del medio ambiente.

Aparece entonces esta temática dentro del más alto rango legal del Uruguay, factor que contribuirá a que todos los temas ambientales, incluida la diversidad biológica, su conservación y uso sostenible, reciban mayor reconocimiento y consideración por parte de la sociedad y del poder político.

V) ESTRATEGIA NACIONAL Y PLAN DE ACCION

El Proyecto financiado por el GEF: URU /96/ G31 Formulación de la Estrategia Nacional sobre la Diversidad Biológica, Plan de Acción y Reporte a la Conferencia de las Partes, comenzó a desarrollarse a fines del mes de octubre de 1997 en URUGUAY a través del MVOTMA y la DINAMA, con la Oficina local del PNUD como agencia implementadora. Los principales objetivos del Proyecto son:

- formular la estrategia nacional en biodiversidad y un plan de acción detallado que defina claramente las actividades multisectoriales necesarias para el cumplimiento del CDB en Uruguay.
- preparar los reportes para la Conferencia de las Partes, sobre las acciones que Uruguay desarrolla en relación a los compromisos asumidos en el CDB.

El Proyecto tiene una duración de 10 meses y comprende las siguientes actividades:

- 1) Recopilación de los antecedentes e información para actualizar la base de datos sobre flora, fauna, ecosistemas terrestres, ecosistemas acuáticos y aspectos legales y socio-económicos en relación con la biodiversidad en Uruguay.
- 2) Identificación de lagunas de información, así como también los usos y valores de la biodiversidad.
- 3) Preparación de un informe de avance para la Conferencia de las Partes del CBD.
- 4) Realización de Seminarios-Taller a los efectos de elaborar los documentos de la estrategia y el plan de acción; para tales actividades será necesaria una amplia participación de los sectores involucrados en la temática de biodiversidad.

A manera de ejemplo podemos citar los Ministerios del gobierno, las ONGs ambientalistas, el sector académico y científico, el sector educativo, las asociaciones de productores rurales, etc.

Los temas estarán en relación con los Artículos del CDB, de manera de usar el CDB como "paraguas" bajo el cual tratar los temas de estrategia y elaborar los planes de acción:

- Conservación In-situ (Artículo 8)
- Conservación Ex-situ (Artículo 9)

- Investigación, capacitación, educación y redes de información (Artículos 7, 12 y 13)
- Evaluación de impacto ambiental (Artículo 14)
- Diversidad Biológica y políticas de desarrollo (Artículos 10 y 11)
- Acceso a los Recursos Genéticos y Biotecnología (Artículos 15 y 19)

De cada uno de estos eventos saldrá un borrador con lineamientos para la estrategia y el plan de acción; posteriormente y a partir de estos documentos se elaborarán los documentos definitivos y los lineamientos para desarrollar una normativa legal que permita las acciones.

Montevideo, diciembre de 1997

GENERAL INFORMATION ABOUT THE BIODIVERSITY IN URUGUAY

1) INTRODUCTION

a) NATIVE FLORA

Depending on the methodology used and the origin and year of the data, the surface area covered by indigenous flora oscillates between almost 400,000 and 667,000 hectares. The former represents 2.3% of the national territory, while twenty years ago that figure would have been 3.8%. Nonetheless, the present situation evidences a rapid reduction in the area covered by natural flora since 1970, due to its increased exploitation for energy purposes.

To these causes are added the traditional cutting for fencing agricultural fields, cooking and heating, clearing for agricultural production, and losses due to the flooding of forests with the construction of the Palmar, Salto Grande, and Paso Severino dams on the Río Negro, Río Uruguay, and Río Santa Lucía Chico, respectively.

There are various groupings of natural Uruguayan flora corresponding to the transition area between the sub-tropical forests of the north and the predominance of vegetation of the pampas bio-geographic province. Its differentiation is related with the availability of permanent soil water, the edaphic base, and the climatic conditions.

Accordingly, the following is observable: park forest; ridge vegetation, varying according to the degree of degradation and invasion from the prairie; gallery forest along the rivers and streams, showing a greater presence from north to south and with compositional modifications. These represent phyto-sociological, taxonomic, and faunistic phenomena common to the largest forests of South America; they functioned in the past and still do today as wildlife corridors, fundamentally for mammals. Furthermore, they play a role as a fundamental protector of the bodies of water.

Finally, the palm groves are particularly interesting, including an endemic species in Rocha, the butía palm (*Syagrus capitata*), and the yatay (*Syagrus yatay*) palm groves, with the most important examples in Uruguay found in the department of Paysandú.

Beginning in 1989, the native flora of the country has been legally protected (Law 15939) and legislation has been passed against illegal traffic and commerce of native species (Decree 23/990).

b) NATIVE FAUNA

The modifications suffered by the natural ecosystems with the incorporation of first livestock, and later agriculture,

has meant a general loss of habitat for native animal species. Various species have disappeared, particularly the large carnivores, the peccary, and the swamp deer, that loss having been encouraged by hunting.

Other species are threatened due to the value of their skins, meat, or feathers, as there are no management plans that ensure their conservation. Exceptions are the successful management of the sea lions and the specific efforts of some landowners who have defended and preserved the pampas deer.

The use of agrottoxics with a greater or lesser intensity in agricultural areas has meant modifications in the trophic chains, leading to the impoverishment of the autochthonous fauna.

Productive management projects of economically valuable species are still experimental or marginal due to their scarcity, and other species are exploited unsustainably, as in the case of the nutria (in Uruguay, that is not an otter, rather a larger member of the rodent family). The creation of the Pan de Azúcar Fauna Breeding Center in Piriápolis is an effort to revitalize the native fauna. Supporting education, the center has been a key experimental mechanism for saving species and reintroducing them into their natural habitats. The latter has been rather difficult, as there has not yet been much experimentation in the topic.

A particular problem is that of the migratory birds, for whose protection the country has ratified the international RAMSAR convention. That seeks the conservation of the most representative habitats, which are the Bañados del Este (Eastern Wetlands). Initial difficulties and lack of information and studies led to an inadequate delimitation, including zones of no particular interest and leaving out others of major interest. From that stems the need to deepen the physical-biological knowledge of the wetlands of the eastern littoral region of the country in order to reach a more correct and operative definition of the areas to be conserved.

2) BIOGEOGRAPHY AND MAJOR ECOSYSTEMS

a) General remarks

Given that Uruguay presents scarce climatic and altitudinal variations, major ecosystemic divisions are not identified, apart from the large units defining the terrestrial and aquatic systems and their corresponding interfaces (fluvial coastal and aquatic ecosystems). Of those, aquatic ecosystems are not treated in this report, although their fundamental importance is recognized, and their treatment is recommended in a following phase in order to maintain an integrated orientation of the general environmental analysis.

In regard to the terrestrial ecosystems, particular analyses have not been made, and therefore there is no precise ecological map for the country.

On the other hand, in the Uruguayan case, clearly all the territory has been affected from the pressures and modifications of use, being more or less affected, depending on the characteristics of the area and the form of resource use.

Apart from this basic homogeneity, the geologic and edaphic factors as well as their relation to the bodies of water and their characteristics can determine differences within the major ecosystem. To deal with these differences, we go to the studies of phytogeography and zoogeography within the biogeographic studies.

These will be fundamentally characterized by the general differences caused by the previously mentioned factors. In that respect it is necessary to deepen the knowledge of the relationships and specific processes of interaction between the physical and biological aspects in order to support more concrete and valid recommendations concerning the use capacity of the natural resources.

Despite the lack of knowledge on the particular Uruguayan ecosystems, it is possible to show that for certain reasons, some natural areas have remained largely unmodified. Today, some of those remaining examples appear threatened, making necessary and urgent the definition of a strategy and the instrumentation of protectionist actions able to achieve their conservation.

At the level of conflicts, three ecosystems stand out: the Eastern Wetlands (Bañados de Rocha), biologically considered one of the most productive and diverse areas; the Atlantic coastal ecosystem, in part neighboring the previous wetlands; and the native forests, essential for the maintenance of numerous species of flora and fauna as well as the protection of the country's watersheds.

In addition to the protection of these ecosystems for

their biogenetic value and for the economic implications they hold for the country, it is also essential to deepen the knowledge of the prairie ecosystems that have been the basis of the livestock production that has been and remains characteristic of Uruguay.

To locate these areas contextually, the area's biogeographic location is considered.

Biogeography, as its name indicates, is the branch of the sciences which studies the geographic distribution of living beings. In its broadest sense, it is the geography of the biosphere. In more restricted terms, it can be said to deal with the geographic distribution of plants (phytogeography) and animals (zoogeography), with the exception of man.

b) Continental Biogeographical Context, Pampas Province.

Uruguay is included within the broader biological entity called the Pampas Province. That province is characterized by a dominance of steppe and psuedosteppe vegetation made up of grasses, among which grow various herbaceous species and some shrubs, conditioned by the described climatic characteristics. The range lands have dormant periods during the winter and summer, conditioned by the soils which sustain them. There are numerous edaphic communities, including halophilic steppes and riparian forest, commonly called gallery forests, which are made up of species originating in the neighboring Paraná Province. Spots of lithophilic community forests are also identified (ridge vegetation).

As it deals with territory of great agricultural potential, the pristine vegetation of this province was almost entirely destroyed or modified and replaced by crop species.

Under these conditions, the remnant natural fields are found to be very altered by livestock.

The characteristics of the natural vegetation must be deduced from these remaining examples, whose pure originality is doubtful.

These plants are the basic members of a biocoenosis, forming the framework or habitat within which the animals live. The plant-animal associations of prairies, or prairie biocoenosis, is characterized by its simplicity.

From the zoogeographical point of view, the areas of the Pampas Province are considered to be integrated with subtropical species originating in the north by means of the riparian forests of the large rivers which act as distribution corridors for these species as well as for species of the pampas.

Uruguay shares with the entire Pampas Province and with the subtropical areas of the planet in general the fact of having been strongly effected by people through agricultural exploitation. Nevertheless, due to its particular edaphic and geological characteristics which limited its usability for crop production, approximately 80% of the land is still covered with natural prairies, strongly modified by the prolonged and in some cases intense use in raising livestock.

4) PHYTOGEOGRAPHY

a) Temperate Grasslands / Prairies

The prairie, as the dominant natural ecosystem in Uruguay, is a heterogenous herbaceous community of relative diversity, given the complex geological base and edaphic sustenance. Among the prairie community, the grasses stand out with more than 400 species of summer and winter cycles, both annuals and perennials. According to O. Del Puerto (1987) the heterogeneity of species, habitats, and annual cycles, among other characteristics, indicates that it is not a climax community and is not in equilibrium with the edapho-climatic conditions. The non-climax situation has been provoked by livestock pressure, which has grown since 1616.

Investigations of aerial photographs and field studies realized by the Soils Directorate of the MGAP with the objective of classifying soils, identify 14 basic natural vegetative associations. Of the fourteen, nine represent prairie land forms characterized by the growth of summer or winter cycle grasses, which form a mat during the growth epoch. In some of them, the presence of park forest and remnant fluvial jungle vegetation is evident.

Numerous investigators synthesized the characteristics of the Uruguayan vegetation, establishing different classifications (Rossengurt 1944, Chebataroff 1947, del Puerto 1969, 1987); some refer only to prairie communities, and others include arboreal flora. Although there is no total coincidence on the points listed, they can be grouped by large categories of communities on the basis of the predominant prairies, as done by the Soils Directorate:

- 1 prairie, predominantly winter cycle
- 2 prairie, predominantly summer cycle
- 3 prairie, winter/summer cycles
- 4 prairie, winter cycle with park land
- 5 prairie, winter cycle with lithophilic communities
- 6 prairie, summer cycle with park land
- 7 prairie, summer cycle with thicket, ridge vegetation, and lithophilic communities
- 8 prairie, winter/summer cycles with park forest
- 9 prairie with park land and hydrophilic communities
- 10 ridge thicket and lithophilic communities

- 11 psamophilic, hydrophilic, halophilic, and marsh(??) communities, and prairie, summer cycle
- 12 hydrophilic communities
- 13 halophilic communities, uliginous with hydrophilic communities
- 14 typical fluvial jungle with park land and prairie

In the plant communities of vernal predominance, the following genera stand out: **Paspalum, Axonopus, Andropogon**, among others.

Among the communities in which predominate winter cycle species, **Stipa charuana** is notable. To the north, in the sandy soils of Rivera and Tacuarembó, species like **Andropogon lateralis** are predominant.

The most frequent perennial species of vernal growth are of the genera: **Paspalum, Panicum, Rotboelia, Andropogon, Chloris, Sporobolus**, etc. The most frequent winter growth perennials are of the genera: **Stipa, Piptochaetum, Poa, y Bromus**.

There are legumes recognized as important for forage such as **Trifolium polimorphum** and **Adesmia bicolor**. In any event, these legumes are totally dominated by the abundant grasses.

The most conspicuous grass species are: **Aristida spp.** (flechilla), **Axonopus spp.**, **Briza spp.**, **Bromus aulecticus**, (cebadilla), **Bromus unioloides** (cebadilla), **Chloris spp.**, **Coelorachys selloana** (cola de lagarto), **Eragrostis spp.**, **Eryanthus spp.**, **Paspalum dilatatum** (pasto miel), **Paspalum notatum** (pasto horqueta), **Paspalum plicatulum**, **Piptochaetium spp.** (flechilla), **Stenotaphrum secundatum** (gramillón), **Schyzachirium spp.**, **Stipa spp.** (flechilla).

In addition, a series of shrubs and bushes stand out on the herbaceous plant stratum (**Eryngium spp.**, **Baccharis spp.**, etc.) and other smaller plants are found as well.

b) Dune Vegetation

The psamophilic or sand dune vegetation is found distributed accidentally along the length of the sea coast, and in some zones in the interior of the country.

Given its location and fragility, the dune ecosystem is perhaps the most modified. The soils where they develop are very poor which means that livestock grazing or human activity easily breaks the equilibrium.

The dune colonizer species are: **Hydrocotyle bonariensis** (redondita del agua), **Panicum racemosum** (pasto dibujante),

Paspalum sp., Senecio crassiflorus, (senecio), Spartina coarctata, (espartillo).

c) Halophilic vegetation

Saline soils are found fundamentally along the length of the coast from Punta del Tiger (San José) to Brazil. In this area are found small areas that are presently very disturbed. On a lesser scale in the rest of the country one finds soils with varying degrees of alkalinity called "blanqueales". Some of the characteristic species of these soils are: Chloris spp., Cynodon dactylon (pasto bermuda), Juncus acutus (junco), Spartina coarctata (espartillo), and Sporobolus pyramidatus.

d) Wetlands, swamps and lagoon vegetation

The type of vegetation present in these areas is determined fundamentally by the hydromorphic gradient. The following are some descriptions of the different types of plants that are found in the wetlands of the Laguna Merín watershed:

The largest species tend to form pure stands with distinct boundaries with a height of approximately 2 meters.

- Espadaña (Zizaniopsis bonariensis)

This takes root directly in the soil, being found in deep water; the communities are dense, but other species appear interspersed within them, such as: Cyperus giganteus, Dryopteris rivularioides, Dryopteris gongylodes, Bhemeria cylindrica, Carex pseudocyperus, etc.

- Tiricia (Scirpus giganteus)

In contrast to espadaña, this occupies places with lower water levels, although it also forms pure stands. It often occurs in disturbed areas.

- Paja brava (Panicum prionitis)

This is found in sporadically flooded fields, is very frequent, and is considered a good indicator of fields apt for rice cultivation. The regeneration of the paja brava swamp is very slow.

- Paja estrelladora (Eryanthus angustifolius)

Like paja brava, this also occurs in sporadically flooded places; it forms communities of disperse individuals and is

very common throughout the country.

- Junco (Scirpus californicus)

This is found in permanently or semi-permanently flooded fields. It forms pure stands or is associated with other species, and is common throughout the country.

- Totorá (Typha dominguensis)

This plant habituates permanently flooded places, developing very well in disturbed areas. It occupies large sites and is common throughout the country.

- Caraguatá (Eryngium pandanifolium)

Caraguatá occupies semi-permanently flooded places, frequenting the edges of deep wetlands. It is amply dispersed in the wetlands zone.

- (Thalia multiflora)

This makes up extensive pure stands, growing in an environment of permanent or semi-permanent water. It is found in different zones of the country, and is frequent in disturbed areas.

- Camalotes (Pontederia lanceolata, Eicchornia azurea and E. crassipes)

Here there is a distinction between the free floating plants and those that root in the soil. E. crassipes is a free floater, and the rest, found in deep water zones and along the edges of wetlands, are always rooted in soil.

Other common wetland species are: Hibiscus cisplatinus (hibisco), Senecio matfeldianus (senecio), Echinidorus grandiflorus (cucharones), Sagittaria montevidiensis (flecha de agua), Lemna giba (lenteja de agua), Lemna valdiviana (lenteja de agua), Pistia stratiodes (repollito de agua), Azolla filiculoides (helechito de agua), Salvinia auriculata (acordeón de agua), and Salvinia rotundifolia (acordeón de agua).

e) Native Forests

The total coverage of native vegetation includes between 2% and 3.5% of the national territory, according to the research methods used. These values do not incorporate the palm groves which cover more than 70,000 hectares concentrated mainly in the departments of Rocha (butiá palms) and Paysandú (yatay palms), with smaller amounts found in Treinta y Tres, Durazno, y Artigas. Based upon their characteristics and

composition, the native flora can be divided as follows:

- gallery or riparian vegetation (or fluvial jungle)
- park land
- inclined drainage vegetation (sub-tropical spots)
- ridge vegetation
- palm groves

The most common species of the native vegetation in Uruguay are : espinillo (Acacia caven), quebracho blanco (Aspidosperma sp.??), espinilla amarilla (Berberis laurina), arrayán (Blepharocalyx twedieii), tala (Celtis spinosa), Cinamonum porosum, tarumán (Citharaxylum montevidiense), Combretum fruticosum, camboatá (Cupania vernalis), envirá (Daphnopsis racemosa), chirca de monte (Dodonaea viscosa), timbó (Enterolobium contortisiliquum), tembetarí (Fagara rhoifolia), chañar (Geoffroea decorticans), tacuarazú (Guada agustifolia), aruera (Lithraea molloides y L. brasiliensis), caá-obeti (Luehea divaricata), guabiyú (Mircianthes pungens), guayabo colorado (Mircianthes cisplatensis), laurel (Ocotea acutifolia y O. puberula), cina-cina (Parkinsonia aculeata), mataojos (Pouteria salicifolia), ñandubay (Prosopis algarrobilla), algarrobo (Prosopis nigra), árbol de jabon (Quillaja brasiliensis), canelón (Rapanea laetevirens y R. ferruginea), molle (Schinus longifolius), coronilla (Scutia buxifolia), lapacho (Tabebuia ipe), and corondá (Xylosma warburgii).

Two vegetation types are named specifically for their almost pure compositions of a single species each: the algarrobales or mesquite groves, park lands stands made up of two species of mesquite (Prosopis algarrobilla and Prosopis nigra), and the espinillares, where espinillo (Acacia caven) is predominant.

Espinillares are common in low areas throughout the country, while the mesquite groves are generally found in alkaline soils. These occur in the Littoral roughly between National Route No. 3 and the Río Uruguay, reaching the department of Colonia in the south.

a) Gallery vegetation

In the gallery forests or fluvial jungles, there exists a great variety in the phyto-sociological structure which depends upon ecological variables such as the place and soil type.

In the north of the country by the Río Uruguay there is a clear influence of subtropical environments, with indicator species from the genera: **Inga**, **Tabebuia**, **Peltophorum**, etc. In these regions, the original vegetation is exuberant, and it is

extremely important for the dispersal of fauna. Towards the south, the forest grows poorer, its composition varying and height diminishing.

This vegetation results from massive forest formations stemming from the north (sub-tropical flora), existing in Brazil, Argentina, and Paraguay. That influence is manifested through the network to which this "gallery vegetation" conforms, extending down from the original phyto-morpho-climatic domain. Thus the gallery vegetation of Uruguay, particularly that found along the Río Uruguay and its tributaries, carries phyto-sociological, taxonomic, and faunistic components of the larger forest masses of South America. The patches of subtropical forest occurring in Uruguay are further evidence of that connection and influence.

In addition to the importance of conserving the network of gallery vegetation as corridors providing distribution routes, habitat, and protection for the prevailing fauna, these areas also include remnant flora communities of certain extension and density which are among the last examples of these formations in a relatively natural state. The following are outstanding examples:

the Mandiyú area in Artigas, Rincón de Pérez or Rincón de los Gauchos along the Río Queguay (Paysandú), some islands in the Río Uruguay, the mouth and islands of the Río Negro, gallery vegetation along the Río Yaguarí and along the Río Tacuarembó up to its entry into the Río Negro, and the Río Cebollati on the border between Treinta y Tres and Rocha.

b) Drainage vegetation

This vegetation also corresponds to the so-called "tropical patches" which penetrate from the north and include species of that origin. The important drainage vegetation communities from the departments of Rivera and Tacuarembó (Valle del Lunarejo, Gruta de los Helechos, and Valle Edén, among others) are characteristic, as is the Quebrada de los Cuervos in the department of Treinta y Tres.

c) Ridge vegetation

This is characteristic of the ridges in the south of the country, and corresponds to vegetation of lesser altitude and generally of twisted bole. On the slopes, the ridge vegetation becomes more shrub-like; principal species are the following: espina de la cruz (Colletia paradoxa), molles (Schinus longifolius and S. lenticifolius), romerillo (Heterothalamus alienus), chircas (Eupatorium buniifloium, Baccharis spp., and Baccharidastrum argutum), etc. According to O. Del Puerto, it is difficult to establish whether the shrubs are pristine

vegetation or whether they correspond to regeneration or degeneration stages of more developed firewood-type vegetation. There are examples which seem to show that the shrub communities are the result of forest destruction.

On the rocky flats, the vegetation is much more sparse, and we find fundamentally: arrayanes (Blepharocalyx tweedieii), murtas (Myrceugenia glaucescens), canelón (Rapanea laetevirens), and espinilla amarilla (Berberis laurina). There are also cactuses of various species.

Del Puerto (1987) recognizes three types of ridge vegetation, depending on the degree of degradation or invasion of the prairies. In the more protected drainage areas, the forest is made up of various tree species associated with shrubs. The vegetative cover made up by the flora varies in the lower areas and where there are sandy soils with an important degree of micro-environments. The presence is noted of arueras (Lithraea sp.), molle (Schinus), and temberatí (Fagara sp.). These habitats contain about 50 shrub species, with approximately 1000 species of herbaceous plants.

A situation of intermediate disturbance is indicated by the appearance of associations of coronillas with arueras and arrayanes. In places where there has been an advance of grasses (prairies), coronillas are predominant, in the form of park forest. Areas of interest for their remaining richness are found in the Sierra Mahoma, in the department of San José, as well as in the departments of Lavalleja and Maldonado, and on the ridges of Rocha.

It should be noted further that three groups of native fauna, the carnivores, the edentates, etc; basically depend on the refuge provided by the ridge forest, occasionally leaving to graze in open areas.

d) Palm Groves

Among the Uruguayan flora there are five species of palms which occupy different zones, having few points of contact between their natural areas of distribution.

According to O. del Puerto (1987), the palm groves are remnants of past communities of which the adult, older examples remain. Both the density as well as the extension of these groves could have been greater. The regeneration has been impeded by the grazing of cattle which feed on the young plants, eliminating them.

In Uruguay, there are two large areas covered with palms. One is made up of butiá palm (Syagrus capitata) in the departments of Treinta y Tres and Rocha, that species being endemic to that zone. The other is made up of yatay palm

(Syagrus yatay) in the northeast (department of Paysandú), a patch which continues in Argentina.

The other three types of indigenous palms are : the yatay or yatay pony palm (Syagrus paraguayensis), which only grows at the highest altitudes of the table hills of Tacuarembó and Rivera; the pindó palm (Syagrus romanzaffianum), which is found on ridges and in drainages connected with the tropical patches, or mixed with the butiá palm in the ridge zones of Rocha; and the caranday palm (Trithrinax campestris), a small palm disseminated among the park vegetation of the littoral and northern regions of the country.

5) ZOOGEOGRAPHY

The aforementioned biogeographic characteristics of the country give place to a practically null endemic vertebrate fauna. Nonetheless, its taxonomic diversity and status as a natural resource make evident the necessity of a fauna conservation and management program for the country.

The existing animal species correspond to the available habitats. Those, as stated, correspond to the penetration from the north of the sub-tropical systems and the biogeographic connection with the Argentine pampas, with a predominance of prairies. Of those, the importance of the first stems from its position as the corridor through which animal species have penetrated from the north, while the prairie fauna is associated with that present in the Argentine pampas.

Some 1035 species of vertebrates have been identified in Uruguay, divided approximately as follows: 400 fish, 38 amphibia, 62 reptiles, 426 birds, and 109 mammals.

The support capacity of the pastures for wildlife has never been determined. However, new livestock management practices substitute the high diversity of natural forage for the homogeneity of artificial pastures which are more productive commercially, but from the ecological point of view, support a lower diversity of fauna.

In regard to protected forests or areas, there has been a tendency to forest with introduced tree species, such as eucalyptus and pine. In areas where tree plantations have been substituted for natural forest, the diversity of fauna has clearly been harmed.

Of the groupings of ecosystems which, in conjunction with the microorganisms and climate have given place to these biocoenoses, the grouping of ecosystems "Bañados del Este" (Eastern Wetlands) stands out for its biological wealth.

According to studies, the wetlands are the habitats which lodge the greatest diversity of bird life. However, the

gallery forests are extremely important from the point of view of the branching and dispersal of the non-flying vertebrate fauna, such as terrestrial mammals, and of invertebrates and other groups.

Diversity of the Uruguayan Fauna

Analyzing the vertebrate fauna of the country, the list of mammals is ample, with 4 species of marsupials, 17 bats, 5 edentates, 17 carnivores, 2 artilodactyls, close to 20 rodents, and 18 cetaceans. Among the indigenous mammals, there are some introduced species, such as the deer **Axis axis** and in lesser number **Dama dama**, the hare (**Lepus europaeus**), and the wild boar (**Sus scrofa**). It is good to point out that these mammal species depend on the forested areas as shelter in order to survive; the presence of dense gallery forests, natural prairies, and wetlands are crucial for their survival.

With regards to the birds, today with total of 426 species, including 161 genera with 244 non-Passeriformes species and 105 genera with 160 Passeriformes species. Of this total, more than half are found in aquatic habitats, such as wetlands, marine waters, the Río de la Plata estuary, lakes, and river mouths. A little more than 100 species are of brush or forest habitats, while the fields and prairies are inhabited by only 80 species.

There are 62 identified species of reptiles (Achaval y Olmos, 1997). The caiman (**Caiman latirostris**) has particular problems due to the reduction of its habitat and its persecution by hunting. The snakes, as the Cascabel (**Crotalus durissus terrificus**), poisonous or not, are invariably persecuted, the populations of many of those species have also diminished.

Among the amphibians, there are 38 catalogued species, all dependant on humid habitats which should be protected.

There are 400 species of fish in lakes, large courses of water (rivers and streams), and the sea. The river and stream ichtyo-fauna is naturally affected by the problems of dragging and sedimentation. To this is added the presence in the waters of agro-toxics (agro-chemicals) and of industrial chemical residues which, in a direct or indirect fashion, strongly modify the trophic chain in the water ways.

Rare Species, Species Threatened with Extinction, and Species of Conservationist Concern

The International Union for the Conservation of Nature (IUCN) recognizes the following categories:

Extinct: A species which has not been located in its habitat in the last 50 years.

Threatened: A species whose survival is uncertain if the factors causing its diminishment continue operating.

Vulnerable: A species whose density is diminished or whose habitat is under pressure of deterioration or diminishment, such that the species will be considered threatened if the factors causing its diminishment continue to operate.

Rare: A species of reduced number of individuals which is not yet vulnerable nor threatened, but which today suffers (or the habitat of which suffers) risks. This includes species of restricted geographic distribution.

Undetermined: A species known to be endangered, but whose categorization according to the above definitions is difficult.

Two categories remain: **Species Out of Danger** and **Species Insufficiently Known**.

Achaval et al (1982) and Vaz Ferreira (1970) do a good review of the problem of Uruguayan fauna in danger of extinction. The following mammals are considered extinct in Uruguay: jaguar (**Panthera onca**), collared peccary (**Tayassu tajacu**), the giant anteater (**Mirmecophaga tridactyla**), and the wetlands deer (**Blastoceros dichotomus**).

The species threatened with extinction owe their status to the fact that they have low actual population densities, and in some cases to the fact that their distribution is restricted, Uruguay generally being their southern limit.

These species are the following: 1) The pampas deer (**Ozotoceros bezoarticus**), legally declared a national monument, is now primarily restricted to two important populations in the country. One is located on the ranch "El Tapado" in the department of Salto, where there are about 400-500 individuals. The other population is in the Sierra de los Ajos in Rocha, with less than 100 individuals in a 500 hectare area surrounded by rice farms.

2) The situation of the other autochthonous deer species (**Mazama goazoubira**) is a bit better; this species exposes itself less in open areas, preferring areas of dense vegetation. 3/4) Other species of this status are the small and large river otters (**Ptenura brasiliensis** and **Lutra platensis**). These have extremely low populations and suffer constant pressure from hunting for their skins.

5) The grasslands cat (**Felix colocolo**) is rare and threatened with extinction, like all the other Felidae species. 6/7) The two Canidae species present in Uruguay are very persecuted for their skins, and also because ranchers mistakenly believe that

they prey on sheep. Thus the grey fox (**Pseudalopez = Cerdocyon gymocercus**) and the dog fox (**Dusicyon = Cerdocyon thous**) are now rare.

Among the birds, the criollo duck (**Cairina moschata**) is already a rare species due to hunting pressure. Equally, the red-legged seriema (**Cariama cristata**), which feeds in open areas and is exposed to hunting. In the same manner, the greater rhea (**Rhea americana**), despite being legally protected, is hunted for its feathers and decimated by the use of its eggs. In the zone of wetlands and lakes, the black-necked swan (**Cygnus melancorphys**) and the coscoroba swan (**Coscoroba coscoroba**) have suffered drastic reductions in their numbers due to the destruction of habitat, among other environmental disturbances. Also the dusky-legged guan (**Penelope oscura**) has declined in population. Species highly appreciated for hunting, like the ducks in general and specifically Anatidae species of the genera **Dendrocygna, Chloephaga, Anas, Netta, Amazonetta, Sarkidiornis, Cairina, Oxyura, and Heteronetta, suffer reduction.** Nonetheless, some duck species can become pests for rice farms. Similarly, some dove species can grow a lot in number, become serious pests. The belief that the black vulture (**Coragyps atratus**) attacks lamb has led to a fight against that species. Thus, the turkey vulture (**Cathartes aura**) and the yellow-headed vulture (**Cathartes burrovianus**) have apparently become more common. In Quebrada de los Cuervos, various individuals of **C. atratus** are still seen. Likewise, the crested caracara (**Polyborus plancus**) is heavily combated by ranchers. There are also a large number of birds in Uruguay which are captured as pets.

The Tinamiformes, a typical group of birds in the Neotropical Region, include various species which are very sought after for sport hunting. Their similarity with European Gallinaceae species explains the common name "perdiz," which they were given in South America.

In Uruguay there are only two species of the order: the spotted tinamou (**Northura maculosa**) and the red winged tinamou (**Rhynchotus rufescens**). The former is subject to annual hunting seasons according to legislation in effect in the country (Decree 261/978, 10 May, 1978). The same legislation prohibits the hunting of the red-winged tinamou.

The migratory birds are also considered threatened, given the loss of the quality of the habitat that they need. There are three large groups of migratory birds. One group of migrants from the north, like the golden plover (**Pluviales dominica**) which breeds in northern Canada and completes a spectacular migration to South America, including Uruguay.

There is also another group of birds, like the Tiranidae, which migrate to the central Brazil region. Diverse studies detail these migratory routes (Cuello - 1969, 1985; Escalante -

1963). More than 60% of the Uruguayan birds are permanent residents. Almost 10% are summer migrants that come from the northern hemisphere. In addition, there are a group of migrants that reproduce in the antarctic and sub-antarctic islands (Escalante y Palmero, 1973). These data point out the importance of habitat protection, for which the review and adequate management of the "Ramsar" area defined by Uruguay is of first priority.

Among the reptiles, the caiman merits special conservation care, principally for two reasons. Firstly, considered dangerous to people, the caiman is attacked, and secondly its habitat is being reduced. The "common lagarto" (**Tupinambis teguixin**), a large lizard, is captured for its skin. The population of queloniaceas has declined due to reproductive and alimentary habitat restrictions. Also, some small turtles of the genera **Trachemys**, **Phrynops**, and **Platemys** are captured and commercialized as pets.

Similarly, the 34 Uruguayan amphibian species require the integrity of their habitats in order to maintain their population levels. For now there is no species which is listed as in danger of extinction.

The protection of these and other Uruguayan fauna species depends on political will and conservationist practice, developed on two levels: The preservation of representative natural habitats, and the protection of the species. This action should concentrate principally on those species listed as threatened, and should apply a management plan with conservationist criteria.

The Intendencia Municipal (local government) of Maldonado has developed an Experimental Wildlife Breeding Center in Pan de Azúcar, neighboring Piriápolis, where they have had success in breeding in semi captivity certain species, such as the pampas deer.

SOURCE: URUGUAY NATIONAL REPORT TO THE UNITED NATIONS CONFERENCE ON ENVIRONMENT AND DEVELOPMENT, RIO DE JANEIRO, 1992 (UPDATED 1997)