

BIODIVERSITY CONSERVATION
ACTION PLAN
FOR
MONGOLIA

Ulaanbaatar

April 1996

PREFACE

by Dr. Z. Batjargal, Minister for Nature and the Environment

Biodiversity conservation is one of Mongolia's priority issues. Biodiversity conservation requires more than just the traditional classic way of nature protection, which is important but responds to only part of the need. Conservation must be integrated into development which must be sustainable and compatible with the survival of living nature.

Most of Mongolia's area is still pristine and its biodiversity is relatively little influenced by human activities, due to low population density and less developed industry. But Mongolia has an extreme continental climate, and its ecosystems are rather fragile and sensitive to unnatural pressure from human activities.

To conserve biodiversity the government has been following a policy of protecting ecosystems, threatened species and species of economic importance. To date this has been done through appropriate management, habitat protection of species such as snow leopard and saiga and some species of plants, and preserving the gene pool of threatened species such as gobi bear and wild camel by restoring breeding populations. Another important effort is the reintroduction of the Przewalskii horse, which is extinct in the wild. The government has achieved some positive results. Many remaining issues will be solved through improved enforcement of environmental laws, economic incentives to protect the environment, combining of traditional and modern conservation methods, and increased public concern for biodiversity.

In order to conserve Mongolia's biodiversity, ecological training is required for scientists and decision makers and certain advanced technologies are needed. This requires much more funding than the Mongolian government or even the entire nation can provide. Therefore, the government, in coordination with UNDP, and with the financial support of GEF, developed the Biodiversity Project with the aim of protecting biodiversity. The implementation of its first phase is nearing completion with good success.

This Biodiversity Conservation Action Plan was developed within the framework of the Biodiversity Project with assistance from experienced foreign specialists and Mongolian scientists. The Plan's concept was discussed with many representatives from governmental and non-governmental organizations.

Mongolia is a large country with rich and unique biodiversity, but its economic base is small compared to many countries. For example, although Mongolia's territory is three times greater than France's, her per capita GDP is fifteen times smaller. For this reason and because the Biodiversity Conservation Action Plan is intended to solve both national and global biodiversity conservation problems, its

implementation requires incremental cost support from the GEF. Consequently, the Implementation Phase 2 has been developed. But it can not cover the cost completely. Therefore the establishment of a Trust Fund is needed in order to provide sufficient and sustainable support for critically needed actions identified in this document.

If the latter projects and planned actions can be implemented, it will not only rescue the regional and global biodiversity from loss by saving the very rare species that are left in Mongolia's territory, but it will effect the restoration of species in neighboring countries as well. It will provide a possibility to save habitat and species, which will be a great charity for the entire human race. Mongolia's government and the people are willing to make such a contribution. However, appropriate support is needed from the international community.

TABLE OF CONTENTS

Preface, by Dr. Z. Batjargal, Minister for Nature and the Environment	iii
List of Tables	ix
List of Figures	x
List of Appendices	x
List of Acronyms, Terms, and Organizations	xi
Biodiversity Conservation Action Plan Process in Mongolia	xiii

INTRODUCTION 1

CHAPTER 1 THE STATUS OF MONGOLIAN BIODIVERSITY 5

1.1 Overview of biological diversity in Mongolia	5
1.1.1 Ecosystem diversity	6
1.1.1.1 Natural diversity	6
1.1.1.2 Anthropogenic diversity	9
1.1.2 Species diversity	12
1.1.3 Genetic diversity	14
1.1.3.1 Wild animals and plants	14
1.1.3.2 Domestic animals and plants	15
1.1.4 Special features of Mongolia's biodiversity.	15
1.1.4.1 Ecological and evolutionary features	16
1.1.4.2 Species endemism	17
1.1.4.3 Endangered species	18
1.1.4.4 Economically important wild species	19
1.1.4.5 Regional and global importance of Mongolia's biodiversity	19
1.2 Threatened status of biodiversity	20
1.2.1 The threats	20
1.2.1.1 Ecosystems	20
1.2.1.2 Species	21
1.2.1.3 Genetic varieties	21
1.2.2 Causes of threats	22
1.2.2.1 Population increases	22
1.2.2.2 Industrialization, past and present economic policies, and pollution	22
1.2.2.3 Increase in per capita consumption of resources.	24
1.2.2.4 Destruction of habitat.	25
1.2.2.5 Over-exploitation	26
1.2.2.6 Inadequate natural resource management	27
1.2.2.7 Threats from outside national borders.	28
1.2.2.8 Climate change	29
1.2.3 Need for sustainable development of resources	29

CHAPTER 2	STATUS OF CONSERVATION IN MONGOLIA	31
2.1	Description and assessment of conservation in the wild . . .	31
2.1.1	Protected areas	31
2.1.1.1	History of establishment	31
2.1.1.2	Numbers of different types of protected areas	32
2.1.1.3	Legal status	40
2.1.1.4	Protected area zonation	41
2.1.1.5	Buffer zones around protected areas	42
2.1.1.6	Management, staff and budgets	42
2.1.1.7	Research and monitoring	43
2.1.1.8	Enforcement of laws and regulations	44
2.1.1.9	Community support	45
2.1.1.10	Ecotourism	45
2.1.2	Conservation of wild species	46
2.1.2.1	Legal status	47
2.1.2.2	Administration	51
2.1.2.3	State Inspectors and Rangers	51
2.1.2.4	Enforcement of laws and regulations	52
2.1.2.5	Community support	52
2.1.2.6	Protection of species with ranges crossing international borders	52
2.1.3	Conservation outside protected areas	53
2.1.3.1	Soil conservation and agriculture	53
2.1.3.2	Range management	53
2.1.3.3	Forest management	54
2.1.3.4	Restoration of disturbed and damaged lands	55
2.2	Description and assessment of other conservation actions	55
2.2.1	Conservation of wild plants in botanical gardens	55
2.2.2	Conservation of wild animals in captive collections	56
2.2.3	Conservation of wild relatives of crops and livestock	56
2.2.4	Conservation of varieties of crops, livestock and domestic animals	56
2.2.5	Pollution control	57
2.3	Assessment of availability of data and scientific research necessary to achieve biodiversity conservation	58
2.3.1	Inventory and baseline data	58
2.3.2	Monitoring	59
2.4	Assessment of institutional framework	59
2.4.1	Government - central	59
2.4.2	Government - local	61
2.4.3	Private - non-governmental Mongolian organizations	62
2.4.4	Private - for profit	62
2.5	Assessment of law and policy	63

2.5.1	Legislation: laws, regulations, resolutions, conflicts	63
2.5.2	Strategy	64
2.6	Assessment of public information and education programs related to biodiversity conservation	65
2.6.1	Formal education: schools, colleges, universities.	65
2.6.2	Books, magazines, newspapers, TV, radio	66
2.7	Assessment of personnel training for biodiversity conservation	67
2.8	Description and assessment of international cooperation on biodiversity conservation	67
2.8.1	Multilateral cooperation	67
2.8.2	Bilateral cooperation	68
2.8.3	Non-governmental cooperation	69
 CHAPTER 3 ACTION PROGRAMS		71
3.1	Overall objectives	71
3.2	Specific objectives and actions	71
3.2.1	Establish complete protected area system representative of all ecosystems and protecting endangered species, including joint actions with the Russian Federation and the People's Republic of China	71
3.2.2	Establish effective population control measures to limit human impact on the nation's biodiversity	80
3.2.3	Implement an effective environmental impact assessment program to understand the effects of proposed actions on biodiversity . . .	81
3.2.4	Establish a research program that improves knowledge of biodiversity and relevant threats	83
3.2.5	Establish a nationwide information and monitoring system for biodiversity conservation	84
3.2.6	Establish national education and training programs for biodiversity conservation	85
3.2.7	Establish a public information program to improve people's knowledge of biodiversity and the importance of conserving it . .	86
3.2.8	Control pollution of air, water and soil	87
3.2.9	Control hunting and fishing	88
3.2.10	Prevent pasture deterioration through overgrazing	88
3.2.11	Establish effective land-use planning control and transportation planning to protect biodiversity	89
3.2.12	Develop strong regulations to protect biodiversity from effects of mining	90
3.2.13	Support tourism while developing sensible regulations to protect biodiversity	90

3.2.14	Ensure that agriculture and forestry are carried out in ways compatible with biodiversity conservation	91
3.2.15	Identify and restore damaged lands.	92
3.2.16	Develop renewable, clean energy sources and ensure environmentally safe transport of fossil fuels	92
3.2.17	Improve ex-situ management for species conservation and conserving genetic resources	94

CHAPTER 4

LEGAL AND INSTITUTIONAL MEASURES NECESSARY TO ENSURE IMPLEMENTATION OF SPECIFIC ACTIONS

4.1.	Adopt legislation and policies to ensure the conservation of biological diversity that require the integration of conservation and environmental protection into sustainable development	95
4.2.	Strengthen institutional arrangements needed to implement the Biodiversity Conservation Action Plan for Mongolia	96
4.3.	Seek finances from all possible sources in order to implement the Biodiversity Conservation Action Plan for Mongolia	97
4.4.	Properly value biodiversity in the national accounting system.	99

List of Tables:

Table 1	Six main vegetation zones according to area and percentage covered of country	6
Table 2	Degradation of pasturelands in arid and semi-arid regions	10
Table 3	Number of species described according to major groups	13
Table 4	Numbers of Domestic Livestock	15
Table 5	The number of species by taxa according to protection status	18
Table 6	History of the establishment of Mongolia's protected areas	31
Table 7	Mongolian protected areas	33
Table 8	Area and percentage of current protection for each major vegetation zone	34
Table 9	Area and percentage of biogeographical zone protected	34
Table 10	List of species that were not included in the analysis because of absence of distribution data	36
Table 11	Species classified by the analysis as not potentially protected with established protected areas	38
Table 12	Area and percentage of protection in aimags	39
Table 13	Established hunting and fishing seasons	49
Table 14	Numbers of State Inspectors and Rangers	51
Table 15	Area of land damaged by anthropogenic activities that require restoration	55
Table 16	Permitted levels of pollution	
Table 17	Number of students graduating with majors related to biodiversity	66
Table 18	List of title of agreement, parties, and date signed for bilateral cooperation agreements	69
Table 19	a) Proposed Strictly Protected Areas and National Conservation Parks	72
	b) Proposed Nature Reserves	73
	c) Proposed Natural and Historical Monuments	75
Table 20	The area and percentage of current and proposed protection in each biogeographical zone	77
Table 21	Species classified as not potentially protected with established and proposed protected areas by the analysis	78

List of figures:

After

page:

Figure 1	Location of Mongolia in Asia	6
Figure 2	Political map of Mongolia	6
Figure 3	Orographic map of Mongolia	6
Figure 4	Major soil groups.	6
Figure 5	Biogeographical zones of Mongolia	6
Figure 6	Vegetation zones of Mongolia	6
Figure 7	Protected areas of Mongolia	32
Figure 8	Biogeographical zones and established protected areas	32
Figure 9	Protected areas on or near the Mongolian border	38
Figure 10	Established and proposed protected areas	76
Figure 11	Biogeographical zones, established protected areas, and proposed protected areas	76

Appendices:

1.	List of Participants in Biodiversity Action Plan Workshops	100
2.	Species of fish that appear in the Mongolian Red Book	104
3.	The potential range, area of potential protection, and percentage of range potentially protected with current protected areas for species classified as legally very rare or rare, in the Mongolian Red Book, Threatened by IUCN, and in CITES Appendices I or II	105
4.	Activities prohibited and permitted within protected area zones	109
5.	List of important documents and other studies	115
6.	List of animal species classified as very rare, and rare under the Mongolian Law on Hunting	117
7.	List of plant species classified as very rare and rare under the Mongolian Law on Natural Plants	119
8.	The potential range, area of potential protection, and percentage of range potentially protected with current and proposed protected areas for species classified as legally very rare or rare, in the Mongolian Red Book, Threatened by IUCN, and in CITES Appendices I or II.	124

List of Acronyms, Terms, and Organizations:

ADB	Asian Development Bank
Agenda 21	An Action Program for Twenty First Century, adopted by the United Nations Conference on Environment and Development on 14 June 1992
BAP	Biodiversity Conservation Action Plan
BAPMoN	Background Air Pollution Monitoring Network
BIMS	Biodiversity Information Management System
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMEA	Council of Mutual Economic Assistance
DANIDA	The Danish International Development Agency
EIA	Environmental Impact Assessment
EPA	United States Environmental Protection Agency
GDP	Gross Domestic Product
GEF	Global Environment Facility
GIS	Geographic Information System
GTZ	German Agency for Technical Cooperation
IUCN	The World Conservation Union
IPGRI	International Plant Genetic Resources Institute
MACNE	Mongolian Association for Conservation of Nature and the Environment
MAP21	Mongolia's Program to Implement Agenda 21
MNE	Ministry for Nature and the Environment
NDB	National Development Board
NGO	Non-governmental organization
NOAA	National Oceanographic and Atmospheric Administration of the United States
NSPAE	National Service for Protected Areas and Ecotourism
UNOPS	United Nations Office of Project Services
UNDP	United Nations Development Programme
WCMC	World Conservation Monitoring Centre
WWF	World-Wide Fund for Nature

Note Ton in the text refers to metric ton (1000 kg)

Mongolian terms used in the text:

aimag	- province
bag	- division of a sum
duureg	- district - a division of the capital city
ger	- circular tent
gol	- river
khoroо	- subdistrict, a further division of the capital city
Ikh Khural	- unicameral National Parliament
sum Khural	- local Parliament
nuruu	- mountain range
nuur	- lake
sum	- division of a province
togrog	- official unit of Mongolian currency
uul	- peak, small mountain range

Biodiversity Conservation Action Plan Process in Mongolia

The Ministry for Nature and the Environment (MNE) is the lead agency for the Biodiversity Conservation Action Plan (BAP) in Mongolia. The Action Plan is funded under the Global Environment Facility (GEF) through the United Nations Development Program (UNDP). The Action Plan is an important component of the UNDP/UNOPS Mongolia Biodiversity Project under the direction of D. Batbold, MNE, and Project Manager Dr. Andrew Laurie. The Project was initiated in June, 1993. Subsequently, a workshop was held to collect scientific data about Mongolia's biological resources and a partial draft report was prepared in 1994. Dr. Laurie, who assumed the Project Manager position in April, 1995, and Dr. B. Flamm and short-term consultants assisted in the development of the final BAP. An important early step was planning the information needs for the BAP from the Biodiversity Information Management System. BIMS staff and consultant Dr. B. Baker were active participants throughout the preparation of BAP. Detailed planning, including preparation of the action plan outline and schedule were undertaken in mid-August, 1995. The BAP preparation schedule was constrained by the desire of the Minister of MNE to take BAP to the second Conference of Parties to the Convention on Biological Diversity in Indonesia in early November, 1995. Linkages with the developing MAP 21 (Agenda 21) were made throughout the planning stages.

Experience has shown that plans are most successful when they are prepared by the people most knowledgeable about the country's conditions and who are involved in implementing actions. With this in mind a diverse group was asked to participate in the BAP preparation from the Parliament, local Government, National Development Board, National Academy of Science, and Ministries of Nature and Environment, Infrastructure Development, Labor and Population Policy, Food and Agriculture, Education and Science, Energy, Geology and Mining, Universities, NGO's, private businesses and foreign consultants. In order to avoid the distractions of daily responsibilities, a workshop was held at Terelj in the Gorkhi-Terelj National Conservation Park from 11 Sept to 16 Sept and 25 Sept to 30 Sept, 1995. Most participants spent 18 Sept to 23 Sept in Ulaanbaatar gathering additional data, discussing issues with colleagues, and writing. The sixty-plus participants were divided into fifteen working groups, according to their expertise and contribution to a subject area. The working groups were asked, for their assigned subject areas (Appendix 1), to describe current conditions in Mongolia, the threats to biodiversity and its causes, the status of conservation in Mongolia, and to recommend specific objectives and actions. Dr. Ts. Shiirevdamba, Vice Minister of the MNE, chaired a steering committee which directed the efforts of the workshop participants. The workshop papers and corollary discussions were the primary basis of the October 1995 draft plan which was reviewed by Dr. Z. Batjargal, the Minister of the MNE, by workshop participants and other key persons. Based on comments received, the draft was revised for presentation at the Indonesia meeting. During the time of the Indonesia meeting, further public, government and scientific reviews were sought. These reviews, plus the experiences of Indonesia were subsequently incorporated into the 5th February draft which was again reviewed by the Minister, Vice Minister

and other key persons, before completion of this Final Plan. The recommended actions and the process leading to the Actions are a vital part of the effort to conserve biodiversity. The BAP however should be a living document responding to changing conditions. The implementation of actions cuts across government and private programs and requires cooperative efforts of many. The MAP 21 (Agenda 21) funded by UNDP will assist in coordination and skills building.

Mongolia's biodiversity is of immense value to the Mongolian people, having specially significant cultural values. As it is presently relatively undeveloped, Mongolia has importance for the conservation of species and ecosystems of central Asia.

As a signatory of the Convention on Biological Diversity, Mongolia is committed to strategies and activities to conserve its biodiversity.

BIODIVERSITY CONSERVATION ACTION PLAN FOR MONGOLIA

INTRODUCTION

Human life cannot exist without the other life that is contained on earth. We call the diversity of life biological diversity, or 'biodiversity.' Biodiversity refers to all the earth's living organisms: the species of plants, animals, and microorganisms, their genetic makeup, and the ecosystems of which they are integral parts.

There are three hierarchical components of biodiversity: ecosystem, species, and genetic diversity. An ecosystem is the complex of living species and the non-living environment of those species. Ecological processes, including the cycling of chemicals and energy flows, are essential for the evolution and development of all organisms. Ecosystem diversity is therefore required in order to have species and genetic diversity. Species diversity is the number or richness of plants, animals, and microorganisms, while genetic diversity refers to the variety of genes that are present within individuals, both within a single species and between species. When people reduce biodiversity, they are squandering the greatest resource on which mankind depends for food, clothes, medicines, building materials, energy, clean air, clean water, and many other benefits. Biodiversity conservation can therefore have an important effect on the development and prosperity of a country. Indeed, biodiversity conservation is essential for a country's sustainable development. The only way to assure a more safe and prosperous future is to deal with environmental and developmental issues together.

Worldwide concern for the loss of biodiversity was expressed by Mongolia and the 167 other nations that signed the Convention of Biological Diversity at the U.N. Conference on Environment and Development held in Rio de Janeiro in 1992 and subsequently. This is one of the most significant and far-reaching environmental treaties ever developed. Mongolia is implementing the Convention's promise in its National Strategies and Plans through the Environmental Action Plan, the Biodiversity Conservation Action Plan, MAP 21 (Agenda 21), and through such functional plans as the Protected Area Plan, Desertification Plan, and Climate Change Plan.

The traditions of sustainable lifestyle of the Mongolian people evolved over thousands of years. Mongolian traditional waste-free technologies relating to energy and material consumption have much in their favor over modern technologies. Mongolian people lived in harmony with nature and the environment. In Mongolia there exists the possibility of developing an ecologically integrated model of sustainable development based on the best of what the nomadic civilization and modern science and technology have taught us.

Mongolia's hope is that the proposed actions will ensure for future generations the heritage of its magnificent biodiversity and culture. The guiding principles on which this vision is based include the following:

- all Mongolians depend on biodiversity and have a responsibility to contribute to its conservation;
- an ecological approach to resource management is essential to achieve conservation and sustainable development;
- development must be ecologically and economically sustainable;
- activities within Mongolia's control will not cause damage to the environment of other states;
- cooperation with other nations for the conservation of biodiversity is essential;
- biodiversity is best conserved in natural rather than artificial settings;
- broad public participation in conservation planning and actions is required;
- the knowledge of local people, such as the nomadic herders, should be preserved, respected, and used.

Mongolia occupies an ecological transition zone in Central Asia where the Siberian taiga forest, Central Asian steppe, the Altai mountains and the Gobi desert meet. These different ecosystems provide habitat for a variety of plant and animal species, some of which are globally endangered.

Mongolia has a land area of 1.567 million square kilometers with an estimated current population of 2.25 million people. Of these, 54.6% live in urban areas. Although Mongolia has a low population density, its renewable natural resources are limited. The climate is harsh, with great extremes of temperature, low precipitation, and severe storms. Ecosystems are fragile and extremely vulnerable to many forms of economic exploitation.

Top soils are thin, with low fertility; this, along with permafrost, limits crop production. Semi-nomadic herding of cattle, sheep, goats, camels, and yaks provides seventy percent of agricultural production, but overgrazing is happening, especially near areas of human settlement. Unsustainable uses of Mongolia's natural resources, its soil, surface, and ground water, forests, grasslands, wildlife, and fish, are occurring. In some parts of the country there are signs that pressures on the environment have exceeded permissible limits. Mongolia is undergoing rapid change. The population has doubled in the last twenty-five years, with a strong trend towards urbanization. The 2.9% growth rate in 1980, one of the highest in Asia, has been reduced. However, present government policy encourages population growth, which will further stretch the limited resource base and threaten biodiversity.

During recent decades, government policy has favored industrialization and economic development with little attention to environmental impacts. This is changing. During 1995 the Parliament passed far-reaching environmental laws, and in 1992 re-established the Ministry of Nature and the Environment in its present form to implement policies and programs relating to the environment and conservation. However, industrialization and energy development still prevail. Sustainable development will require new approaches, such as the use of clean.

environmentally safe and renewable energy, and strict pollution control. The carrying capacity of the land and water must not be exceeded.

The conservation of biological diversity in Mongolia requires the expansion of the Protected Area System, improving the protection and management of Protected Areas, improving management of plant and wildlife species, and enforcing environmental laws. These measures are important but respond to only part of the problem. Fundamental problems lie beyond protected areas, in sectors such as mining, agriculture, forestry, pollution, land use and transportation systems, energy development, and population growth and distribution.

This Biodiversity Conservation Action Plan critically examines the status of biodiversity in Mongolia, the threats to the country's biodiversity, and the status of conservation efforts. Based on these analyses, the plan sets forth a detailed action program. In addition, the plan evaluates legal, financial, and institutional measures necessary to ensure implementation of the specific actions.

Under development is the proposed MAP 21 Project to implement Agenda 21, the action plan to implement the principles and agreements of the U.N. Conference on Environment and Development held in Rio de Janeiro in 1992. Rio's message was that "protection of the environment and the achievement of sustainable development must now be shared as our global responsibilities, and that fundamental change is required to replace unsustainable patterns of production and consumption... Agenda 21... is a blueprint for constructing the new world order called for at Rio." (Maurice Strong, Chairman, The Earth Council).

Mongolia's own proposed MAP 21 Project may be important for the achievement of the objectives and accomplishment of the activities outlined in this Biodiversity Conservation Action Plan. The project is proposed to be placed at the highest levels of government and should therefore have influence and the ability to address cross-sectoral problems. An important early step in the project should be the further critical examination of government plans, policies, and programs that are at odds with the vision and objectives of biodiversity conservation and sustainable development. Inconsistent plans, policies, and programs should be remedied. The challenge for Mongolia is immense. Since 1990, Mongolia has been in the process of learning to govern itself democratically and develop a free-market economy after more than six decades as a socialist state with a centrally planned economy. The withdrawal of Russian aid and the dissolution of the CMEA, which accounted for ninety-five percent of Mongolia's exports, created severe economic shocks. As a result of new government interrelated fiscal and monetary policy and dollar cooperation and assistance, the Mongolian economy is showing, for the first time in four years, signs of stabilization and an increase in GDP. As might be expected, the severe financial constraints during this period have severely limited the government's ability to protect biodiversity.

Recognizing the continued problem of providing adequate funds for needed conservation work, this plan examines means of financing programs. However, most

importantly, if biodiversity is to be conserved, environmental protection must be integrated into the country's development projects and resource use. Economic development must be sustainable if there is to be real progress. At Rio, Minister Batjargal proposed that Mongolia has the "rare opportunity to choose the optimal strategy of sustainable development and to abandon the former system, which led to the wasteful and lopsided exploitation of natural resources and the destruction of ecological equilibrium."

President P. Ochirbat put it well: "Eternal sustainable development is better than a too-rapid leap forward that leads to destruction." Prime Minister P. Jasrai further observed that "making environmental conservation and sustainable use our immediate national goal is to create the socio-economic basis for a proper relationship between people and nature. This, in turn, makes possible a healthy living environment and the resources needed to improve living conditions."

Mongolian people have a close association with the natural world and a "deep reverence for the environment." (L. Bagabandi, Chairman of the Great Khural). Therefore, the Biodiversity Conservation Action Plan for Mongolia is of special interest to the nation. The proposed actions are also important for biodiversity conservation in Central Asia, and will have a positive impact on global biodiversity conservation. Since its flora and fauna are less exposed to the artificial ecological systems that exist in other areas of the world, Mongolia could serve as an ideal example of the existence and evolution of various natural ecosystems under extreme conditions. In this way Mongolia can contribute to the activities of the world community in regard to the protection of biological diversity. In this connection, at Rio Mongolia took the bold step of proposing that the whole country of Mongolia be designated as a biosphere reserve. This proposal demonstrates Mongolia's commitment to conservation. The Biodiversity Conservation Action Plan for Mongolia is a further statement of that commitment.

CHAPTER 1 THE STATUS OF MONGOLIAN BIODIVERSITY

1.1 Overview of biological diversity in Mongolia

Mongolia has a territory of 1.567 million square kilometers, larger than the combined area of Great Britain, Germany, France and Italy. It lies in a transitional zone at 42°-52° N, between the boreal forests of Siberia and the Gobi desert, spanning the southernmost border of the permafrost and the northernmost deserts of Central Asia (Figures 1&2). Mongolia is separated from the oceans by large distances and high mountain chains, and has an extreme continental climate with marked differences in seasonal and diurnal temperatures and low rainfall. Mean annual rainfall ranges from 38.4 mm at Ekhiin Gol in Bayankhongor aimag to 389.3 mm at Dadal in Khentii aimag. Most rainfall occurs in summer, between June and August. Mean monthly temperatures for the last thirty years range from -11.8°C (Jan) to 25.2°C (July) at Ekhiin Gol, the warmest place, and from -32.4°C (Jan) to 12.8°C (July) at Richinlumbe, the coldest place.

Although most of the country is flat, with rolling hills, there are several significant mountain ranges, notably the Altai, Khangai, Khentii and Khovsgol. About half of the land is at 1,400m or more above mean sea level, with the lowest point, Khokh Nuur in the eastern steppes, at 560m (above mean sea level) and the highest, Khuiten peak in the Altai mountains, at 4,374m (above mean sea level) (Figure 3). Total mean annual precipitation over Mongolia is estimated to be 360 cu km of water; about 90% of this is lost through evapotranspiration, 4% infiltrates to aquifers, and 6% contributes to surface flow. There are three major drainages: rivers in the west drain to the enclosed Great Lakes Basin; rivers in the east drain to Russia, via the Onon Gol and Ulz Gol, and to China; and rivers in the north drain via the Selenge Gol to Lake Baikal in Russia. There are glaciers in the Altai mountains, including the 19 km-long Potanin glacier, and during the glacial period the Mongolian Altai, Sengilin, and Khangai Mountains and highlands were subject to glaciation, leaving behind signs such as U-shaped valleys and moraines. The lower limit of greatest glaciation extended below the Terelj Gol which now flows into the Tula Gol.

Approximately 220 soil types have been identified in Mongolia and are grouped into the major categories of mountains soils, steppe with rolling hills, plains and intermountain hollow, hydromorphological, alluvial, solonetz and solonetz-solonchaks soils, and sands and rocky outcroppings. These are shown in Figure 4. Permafrost occurs in the wetter soils such as mountain meadow, dark gray and gray forest soils and chernozems at depths of 70-100 cm.

This vast country, which has been relatively lightly influenced by human activity, has a unique biodiversity that forms an important part of the global ecosystem.

1.1.1. Ecosystem Diversity

1.1.1.1 *Natural Diversity*

Mongolia's position, size and topography have resulted in a unique assemblage of ecosystems or natural zones. Studies of the flora and fauna of the country, together with climatic and geographic data, have resulted in the classification of Mongolia into six broad ecological regions, sixteen provinces and forty-seven biogeographical zones (districts) (Figure 5). Mongolia has also been divided into six broad vegetation zones which are shown in Figure 6 and the area summarized in Table 1.

Table 1 Six main vegetation zones according to area and percentage covered of country

Vegetation zone	Area (hectares)	% of land
1. Desert	34 million	22
2. Desert-Steppe	30 million	19
3. Steppe	33 million	21
4. Forest-Steppe	40 million	26
5. Taiga	13 million	8
6. Alpine	6 million	4

A further one million hectares of Mongolia's territory consists of lakes.

1. Desert

Desert occurs predominantly in the south. The Mongolian desert is extremely dry, with mean annual rainfall lower than 100 mm, and some areas remain without rain for several years at a time. Mean monthly temperatures range from -15°C in winter to +30°C in summer, falling as low as -40 °C in winter and rising as high as +42 °C in summer. High winds and dust storms are frequent in spring and summer. The vegetation cover, where it exists, includes Gobi feathergrasses (*Stipa glareosa* and *S. orientalis*), black sympegma (*Sympegma regelii*) and glasswort (*Anabasis brevifolia*). There are oases with poplar (*Populus diversifolia*) and *Elaeagnus moorcroftii*, but for the most part the desert consists of bare sandy plains and rocky mountains. Saxaul (*Haloxylon ammodendron*) is an interesting tree that rarely grows more than two meters tall, and other typical plants include *Tamarix dioica*, *Salsola arbuscula*, desert rhubarb (*Rheum nanum*) and yellow ephedra (*Ephedra przewalskii*). Some of the more interesting mammals of the desert include the Bactrian camel (*Camelus ferus*), the Gobi bear (*Ursus arctos*), the Asiatic wild ass (*Equus hemionus*), various species of jerboa, and the northern mole vole (*Ellobius talpinus*). Some of these, such as the Gobi bear, are now very rare. Birds such as Pallas's sandgrouse (*Syrrhaptes paradoxus*) and the saxaul sparrow (*Passer ammodendri*) also make their home in the desert. The sand grouse fly long distances to collect water in their breast feathers so that their chicks can drink; they congregate

LOCATION OF MONGOLIA

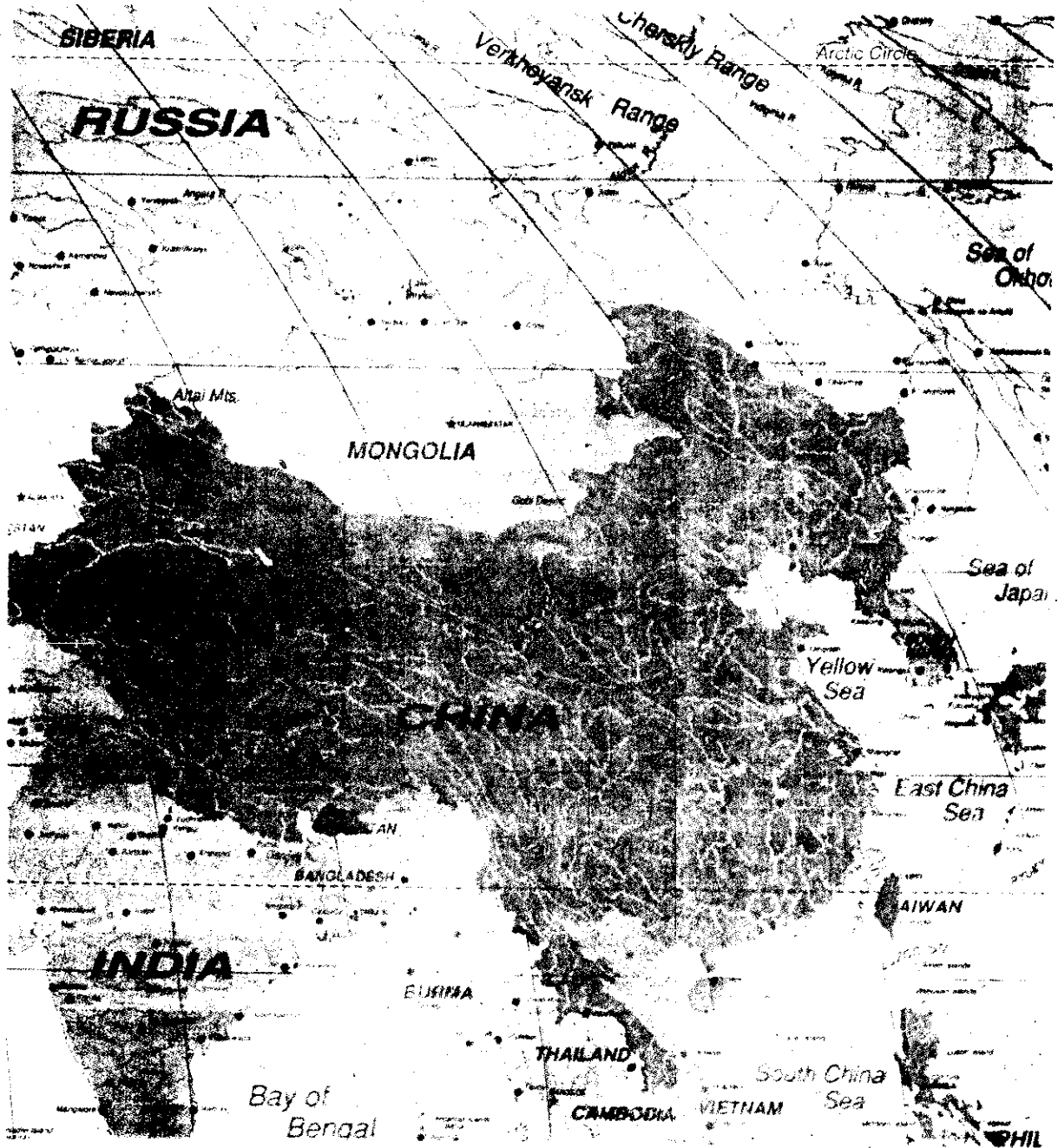
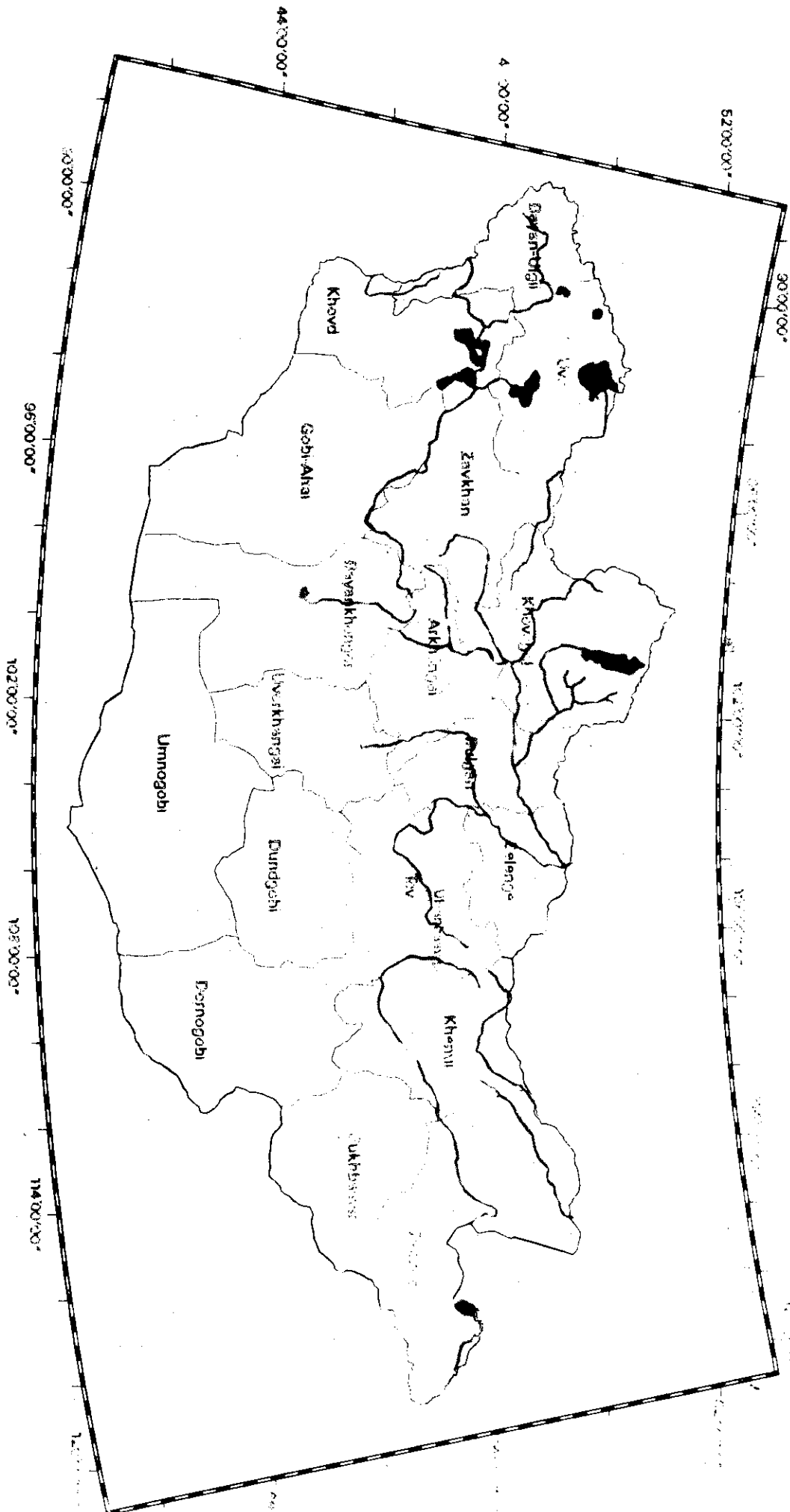
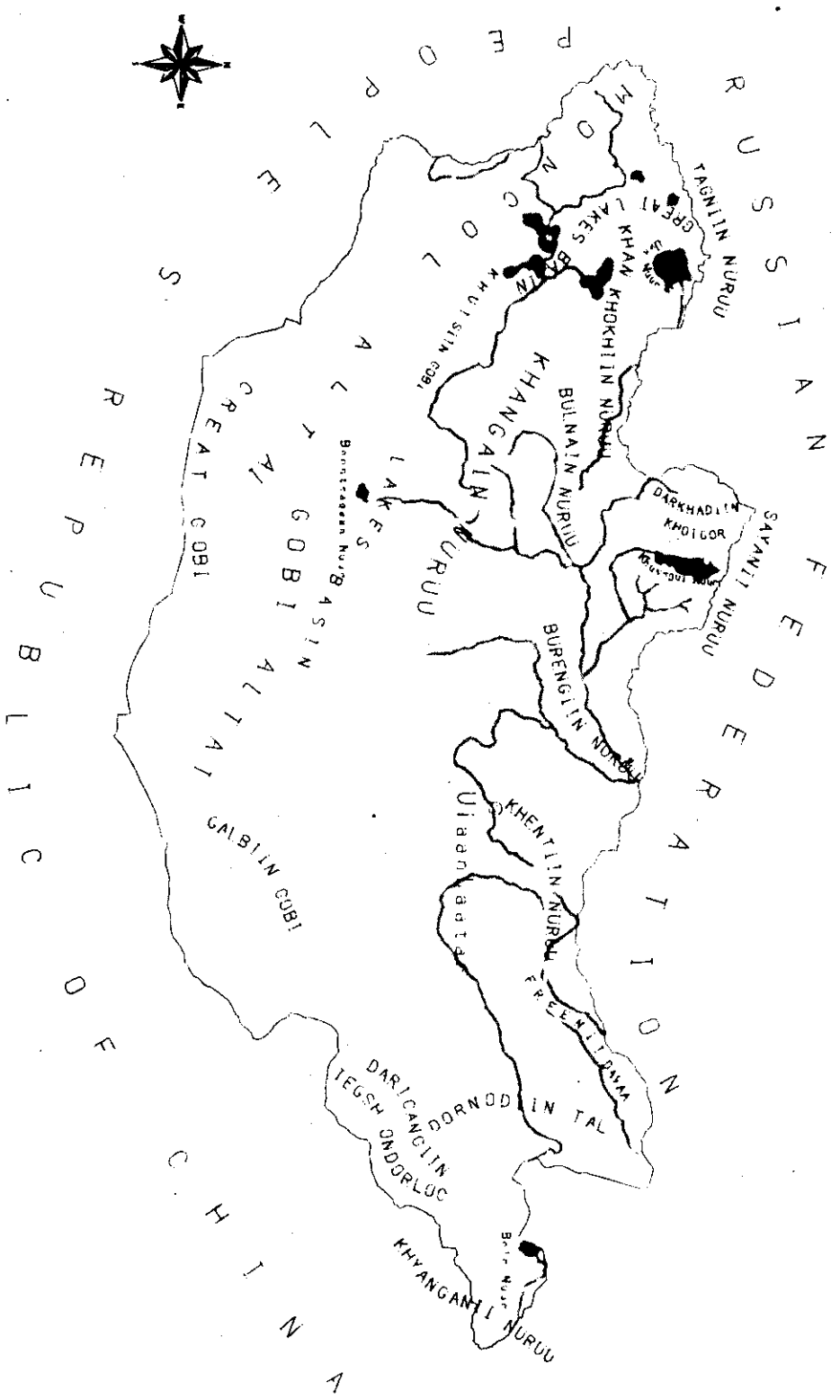


Figure 1. Location of Mongolia in Asia.

POLITICAL MAP OF MONGOLIA



TOPOGRAPHIC MAP OF MONGOLIA

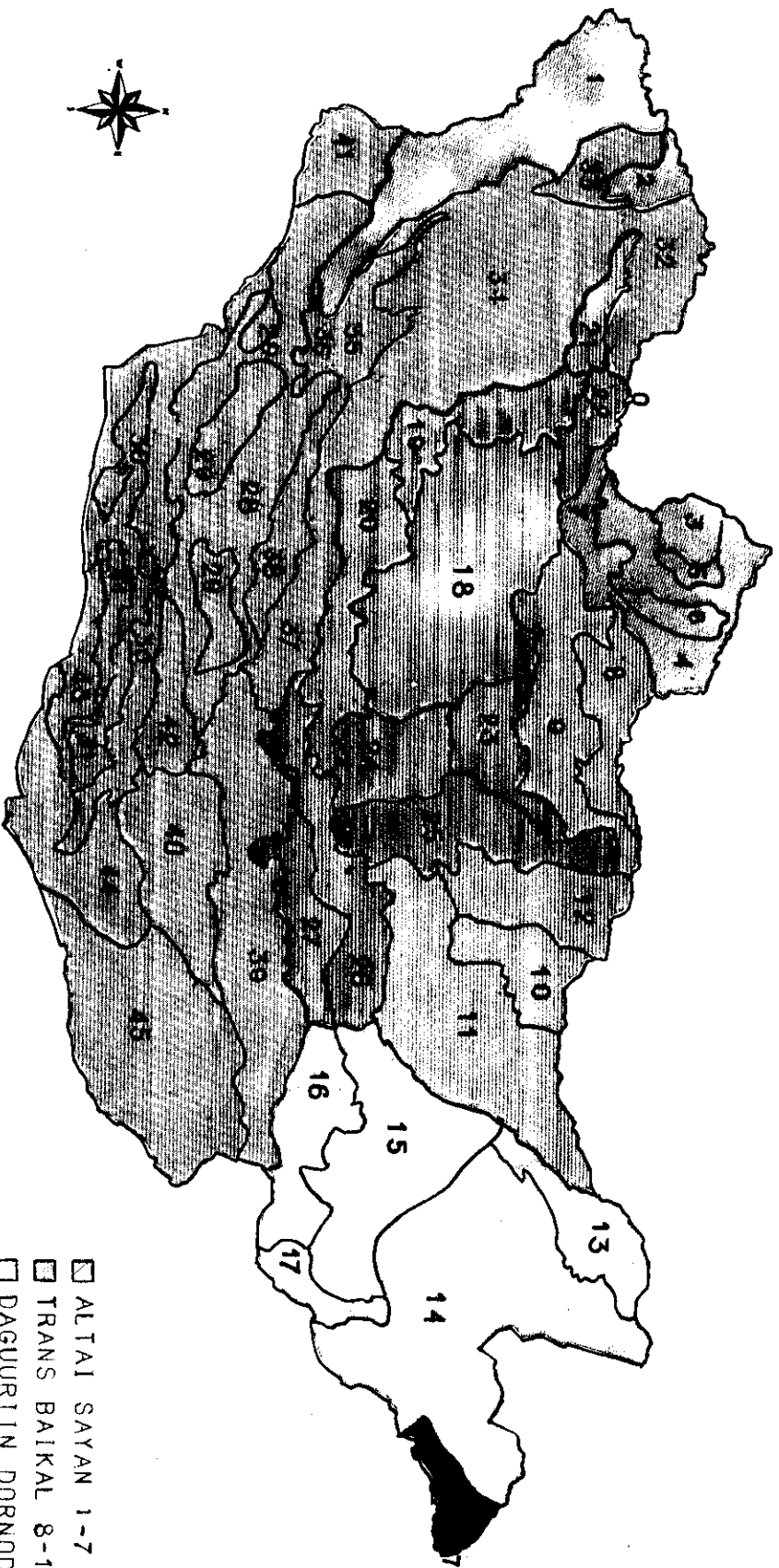


MAJOR SOIL GROUPS



- MOUNTAIN SOILS
- STEPPES WITH ROLLING HILLS
- PLAINS AND INTERMOUNTAIN HOLLOW
- HYDROMORPHOLOGICAL SOILS
- ALUVIAL SOILS
- SOLONCHETS AND SOLONCHETS-SOLONCHAKS
- SANDS AND ROCKY OUTCROPPINGS
- GLACIERS
- WATER SURFACE

BIOGEOGRAPHICAL ZONES OF MONGOLIA



- ▣ ALTAI SAYAN 1-7
- ▣ TRANS BAIKAL 8-12
- ▣ DAGURIIN DORNOD MONGOL 13-17
- ▣ TOV MONGOL 18-27
- ▣ TOV AZI 28-45
- ▣ KHYANGAN 46-47

VEGETATION ZONES OF MONGOLIA



- ALPINE
- ▨ TAIGA
- ▩ FOREST STEPPE
- ▧ STEPPE
- ▦ DESERT STEPPE
- ▤ DESERT
- LAKES