CHAPTER 2 STATUS OF CONSERVATION IN MONGOLIA

2.1. Description and Assessment of Conservation in the Wild

Conservation of wild species in their natural habitats is the most effective way of conserving biodiversity. A network of protected areas managed according to sound principles of ecology and conservation biology is required. Apart from this there must be legal protection for species and habitats outside protected areas. Mongolia has taken substantial steps towards achieving these requirements. The traditional nomadic lifestyle has made many Mongolians acutely aware of man's close dependence on natural processes. Conservation strategies in Mongolia are based, where possible, on traditional knowledge and practices.

2.1.1 Protected Areas

2.1.1.1 *History of Establishment of Protected Areas.*

The tradition of protecting nature, fauna and flora has a long history in Mongolia. There were closed seasons for hunting rabbits, deer, antelope, saiga and gazelles in the time of Marco Polo; later the laws of Khakh Juram between 1709 and 1799 set aside sixteen mountains that were to be protected from hunting, cultivation and timber felling. Bogd Khan mountain has been protected since the twelfth or thirteenth century as a holy mountain. It was established as Mongolia's first official protected area in 1778. A further two sites were accorded protected area status in 1957 and another five in 1965; the Great Gobi Strictly Protected area was established in 1976. Since 1990, environmental protection has been given high priority by the Government and a total of twenty-six protected areas covering 12.6 million hectares, 8% of the country, have been established to date (Table 6).

Table 6 History of the establishment of Mongolia's protected areas

Year	Cumulative number	Cumulative area (hectares)	Cumulative percentage of territory
1778	1	41,600	0.03
1957	3	66,400	0.04
1965	9	236,200	0.15
1976	10	5,547,900	3.52
1977	11	5,613,800	3.56
1992	19	8,793,100	5.58
1993	26	12,629,800	8.01

2.1.1.2 *Numbers of different types of protected areas.*

Protected areas are divided into four categories according to the nature of the sites and the protection regime under which they are managed.

1. Strictly Protected Areas are ecologically important natural areas with "particular importance for science and civilization," and which protect "natural features" and prevent "environmental imbalance."

2. National Conservation Parks are natural areas with historical, ecological and cultural value that are intended for development of tourism.

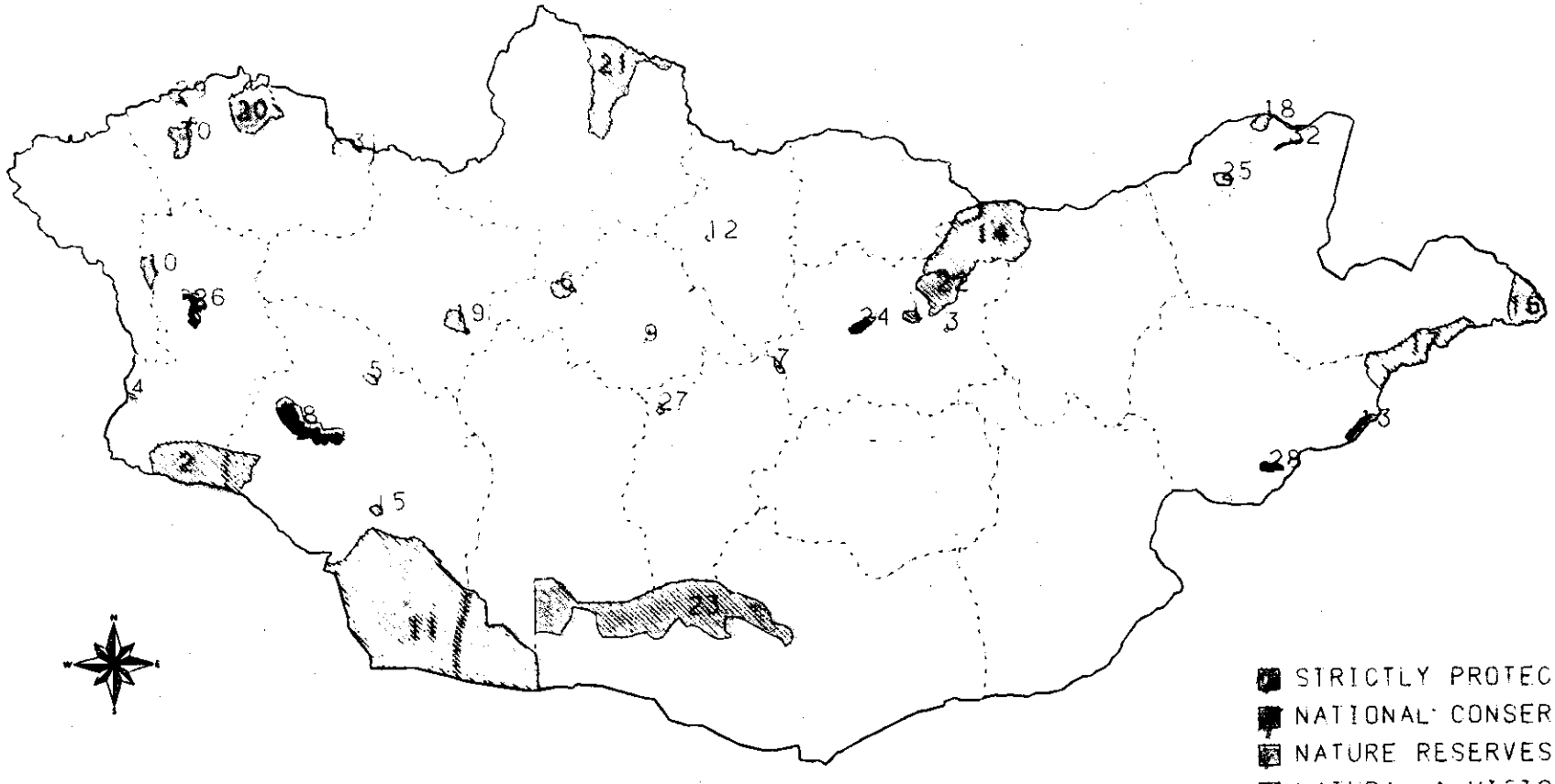
3. Nature Reserves are areas set aside to protect or restore natural features or natural resources. There are four types of Nature Reserve, each protecting a different type of feature or resource:

1) Ecosystems or "natural complexes"
2) Rare and Endangered plants or animals
3) Fossil animals or plants
4) Geological formations.

4. Natural and Historical Monuments are intended to protect Mongolia's historical and cultural heritage. They include natural landscape formations such as waterfalls, caves and volcanic formations, as well as archaeological and religious sites. They are protected by gates and fences where necessary and by regulations controlling land use up to three km from the boundaries.

Table 7 lists the existing protected areas according to their category and gives the gazetted areas, the dates of establishment, and identification code for Figure 7, which shows the location of the protected areas of Mongolia.

PROTECTED AREAS OF MONGOLIA



BIOGEOGRAPHICAL ZONES AND ESTABLISHED PROTECTED AREAS

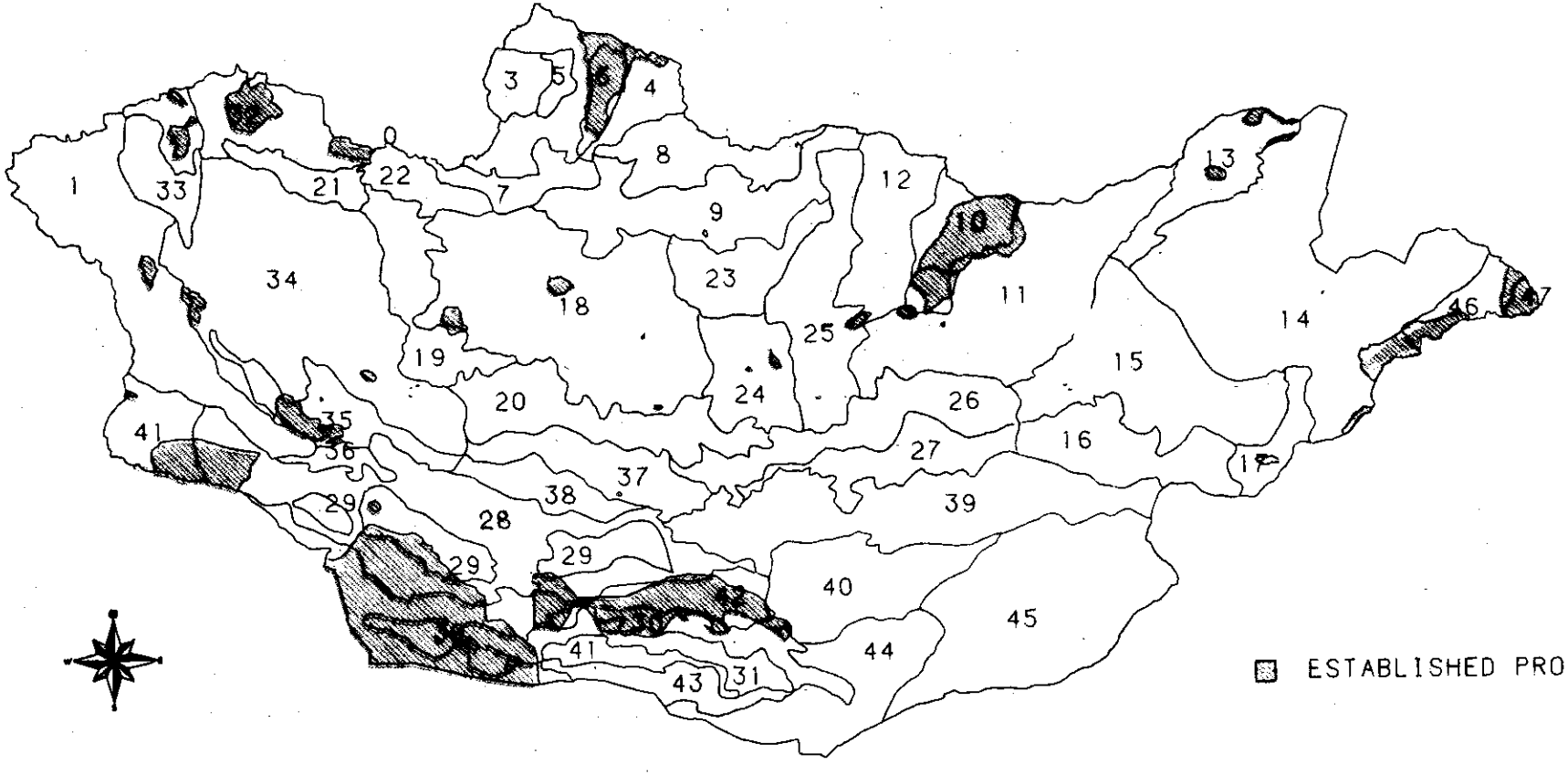


Table 7 Mongolian protected areas

	Code*	Area (thousand ha)	Estab-lished
Strictly Protected Areas			
Great Gobi A and B (Two sites)	2&11	5311.7	1976
Khokh Serkh	10	65.9	1977
Bogd Khan Uul	1	41.6	1778
Khasagt Khairkhan	5	27.4	1965
Khan Khentii	14	1227.1	1992
Nomrog	16	311.2	1992
Dornod Mongol	17	570.4	1992
Mongol Dagurian	18&32	103.0	1992
Otgon Tenger	19	95.5	1992
Uvs Nuur Basin (Four sites)	20, 29, 30, 31	771.6	1993
		8525.4	
National Conservation Parks			
Khovsgol Nuur	21	838.1	1992
Khorgo Tsagaan Nuur Terkh	6	73.0	1965
Gobi Gurvansaikhan Uul	23	2300.0	1993
Gorkhi Terelj	22	286.4	1993
		3497.5	
Nature Reserves			
Nagalkhan Uul	3	3.0	1957
Batkhan Uul	7	21.8	1957
Lhachinvandad Uul	13	58.8	1965
Bulgan Gol	4	7.2	1965
Khustain Nuruu	24	90.0	1993
Ugtam Uul	25	30.0	1993
Sharga-Mankhan (Two sites)	8&26	316.9	1993
		527.7	
Natural and Historical Monuments			
Bulgan Uul	9	1.8	1965
Uran-Togoo Tulga Uul	12	14.6	1965
Eej Khairkhan	15	22.5	1992
Khuisiin Naiman Nuur	27	11.5	1992
Ganga Nuur	28	28.8	1993
		79.2	
TOTAL OF ALL PROTECTED AREAS		**12,629.8**	

* Identification code for Figure 7.

Coverage of ecosystems

Table 8 shows the breakdown of protected areas according to the major vegetation zones, and Table 9 shows how much of each of the forty-seven biogeographical zones is included in the protected area network (Figure 8).

Table 8 Area and percentage of current protection for each major vegetation zone

Vegetation zone	Area protected (10^6 ha)	Percentage of total
Desert	6,635	31.11
Desert-Steppe	1,387	3.41
Steppe	830	1.97
Forest-Steppe	929	2.73
Taiga	1,817	22.14
Alpine	410	5.49

Table 9 Area and percentage of biogeographical zone protected

Region	Biogeographical zone		Area of zone, (1,000 ha)	Area of protection (1,000 ha)	Percent protected
A. Altai Sayan	1	Mongol Altai	6,538	73	1.12
	2	Turgen Nuur	793	139	17.58
	3	Ulaan Taiga	855	0	0.00
	4	Khovsgol Zuun Ereg Orchim	3,213	307	9.56
	5	Darkhad	357	0	0.00
	6	Khovsgol	659	526	79.75
	7	Sengilen	1,211	0	0.00
B. Trans Baikal	8	Buteeliin Nuruu	2,247	0	0.00
	9	Burengiin Nuruu	4,086	5	0.13
	10	Baga-Khentii Nuruu	1,968	1,291	65.59
	11	Onon-Tuul Belchir	7,214	267	3.70
	12	Khentiin baruun Bel	2,825	38	1.35
C. Daguuriin Dornod Mongol	13	Uldzin	2,346	139	5.92
	14	Menengiin Tal	11,990	388	3.23
	15	Dund Kherulen Belchir	5,911	0	0.00
	16	Doloodyn Gobi	2,976	0	0.00
	17	Dariganga	1,062	34	3.18
D	18	Khangain Khoid Bel	9,575	177	1.85
	19	Khangai Baruun Bel	2,561	0	0.00

Tov Mongol	20	Khangain Urd Bel	3,532	0	0.00
	21	Khankhukhei	965	0	0.00
	22	Tesk	1,154	0.261	0.02
	23	Orkhon	2,087	0	0.00
	24	Burgaltai	2,299	20	0.88
	25	Darkhan	3,715	12	0.33
	26	Mandalgobi	3,423	0	0.00
	27	Khoid Gobi	2,203	0	0.00
E. Tov Azi	28	Gobi Altain Nuruu	7,706	1,678	21.78
	29	Uuluudiin Khondii	2,823	345	12.23
	30	Gobi Tienshan	2,489	1,335	53.65
	31	Omnod Tenger Uul	1,797	472	26.29
	32	Uvs Nuur	2,453	580	23.63
	33	Achit Nuur	1,286	0	0.00
	34	Nuur	10,662	116	1.09
	35	Dundad Uul	1,982	288	14.53
	36	Shargiin Gobi	484	0	0.00
	37	Prikhangai	2,318	0	0.00
	38	Boontsagaan-Orog-Nuur	1,336	0	0.00
	39	Ongiingol-Sainshand	6,759	0	0.00
	40	Dalanzadgad	3,636	51	1.41
	41	Gobi-Dzungar	2,565	410	15.97
	42	Altain Tcaasdakhi Gobi	5,234	3,360	64.19
	43	Khukheldziin Gobi	1,651	0	0.00
	44	Bordzongiin Gobi	3,482	0	0.00
	45	Zuun Gobi	7,616	0	0.00
F. Khyanga	46	Khalgingoliin Dund Belc	1,011	348	34.47
	47	Modtoi-Khamar	181	193	100

Of the forty-seven biogeographical zones, twenty are not covered by any protected area, and of the remaining twenty-seven, four have less than 1.0% of their total area protected. Another nine have less than 8% protected. There is a need for a more representative system of protected areas to ensure the conservation of all the ecosystems and species in the country.

A GIS Gap Analysis of vertebrate species distribution data and protected area boundaries showed that 517 species of 595 species of terrestrial vertebrates probably occur in protected areas. There were four amphibians, sixty birds, three mammals and one reptile whose distribution data were unknown (Table 10). The potential range (based on extrapolation within biogeographical zones), area of potential protection, and percentage of range potentially protected, for species that are classified as legally very rare or rare in the Mongolian Red Book, threatened by IUCN and in CITES Appendices I or II, are listed in Appendix 3. Further analysis revealed that there were twelve mammals whose ranges did not contain any

protected areas (Table 11). Additional work is required to determine sufficiency of area to support viable populations and protect migration routes.

Table 10 List of species that were not included in the analysis because of absence of distribution data

CLASS	NAME	LEGAL[3]	REDBOOK	IUCN[4]	CITES
Amphibia	*Bufo bufo*				
Amphibia	*Bufo viridis*				
Amphibia	*Rana arvalis*				
Amphibia	*Rana nigromaculata*				
Aves	*Anser indicus*	R	Y		
Aves	*Anser cygnoides*	R	Y		
Aves	*Aythya ferina*				
Aves	*Aix galericulata*	R	Y	K	
Aves	*Haliaeetus leucoryphus*			R	II
Aves	*Haliaeetus albicilla*		Y	V	I
Aves	*Gypaetus barbatus*				II
Aves	*Neophron percnopterus*				
Aves	*Gyps fulvus*				II
Aves	*Gyps hymalayensis*		Y		II
Aves	*Aegypius monachus*			V	II
Aves	*Aquila rapax*				II
Aves	*Falco peregrinus*				I
Aves	*Grus grus*				II
Aves	*Grus monacha*	VR	Y	V	I
Aves	*Grus vipio*	VR	Y	V	I
Aves	*Grus virgo*				
Aves	*Chlamydotis undulata*	VR	Y	V	I
Aves	*Crex crex*				
Aves	*Pluvialis dominica*				
Aves	*Limnodromus semipalmatus*	R	Y	R	
Aves	*Tringa hypoleucos*				
Aves	*Tringa incana*				
Aves	*Himantopus himantopus*	R			
Aves	*Recurvirostra avosetta*				
Aves	*Syrrhaptes paradoxus*				
Aves	*Dendrocopos major*				
Aves	*Dendrocopos leucotos*				
Aves	*Dendrocopos minor*				
Aves	*Picoides tridactylus*				
Aves	*Prunella koslowi*				
Aves	*Monticola gularis*				
Aves	*Luscinia megarhynchos*				
Aves	*Luscinia calliope*				

[3] R - rare, VR - very rare

[4] V - vulnerable, E - endangered, K - insufficiently known, R - rare

Aves	*Luscinia svecica*				
Aves	*Luscinia cyane*				
Aves	*Luscinia sibilans*				
Aves	*Tarsiger cyanurus*				
Aves	*Zoothera dauma*				
Aves	*Turdus iliacus*				
Aves	*Turdus merula*				
Aves	*Turdus philomelos*				
Aves	*Paradoxornis heudei*		Y		
Aves	*Acrocephalus aedon*		Y		
Aves	*Sylvia curruca*		Y		
Aves	*Megalurus pryeri*		Y		
Aves	*Muscicapa striata*		Y		
Aves	*Emberiza tristrami*		Y		
Aves	*Emberiza hortulana*		Y		
Aves	*Emberiza buchanani*		Y		
Aves	*Emberiza bruniceps*		Y		
Aves	*Calcarius lapponicus*		Y		
Aves	*Plectrophenax nivalis*		Y		
Aves	*Carduelis spinus*		Y		
Aves	*Rhodopechys mongolica*		Y		
Aves	*Uragus sibirucus*		Y		
Aves	*Eophona migratoria*		Y		
Aves	*Montifringilla davidiana*		Y		
Aves	*Sturnus sturninus*		Y		
Aves	*Podoces hendersoni*		Y		
Mammalia	*Lepus tolai*				
Reptilia	*Teratoscincus przewalskii*				

Table 11 Species classified by the analysis as not potentially protected with established protected areas.

CLASS	SPECIES NAME	LEGAL	REDBOOK	IUCN	CITES
Mammalia	*Erinaceus dauuricus*		Y		
Mammalia	*Talpa altaica*		Y		
Mammalia	*Crocidura leucodon*				
Mammalia	*Nyctalus noctula*				
Mammalia	*Vespertilio murinus*				
Mammalia	*Vespertilio superans*		Y		
Mammalia	*Lepus tolai*				
Mammalia	*Alticola strelzovi*				
Mammalia	*Alactaga nataliae*				
Mammalia	*Euchoreutus naso*		Y		
Mammalia	*Stylodipus sungorus*				
Mammalia	*Rangifer tarandus valentinae*	VR	Y		

The Government has announced a long-term goal of giving protected area status to at least 30% of the country. There is a need to assess carefully the priorities for proposed new protected areas and to take into account the importance of size and scope of protected areas. At present there are several extremely large protected areas that are of great importance in protecting ecosystems with sparse vegetation and low animal population densities. Additional protected areas should add to existing ones where possible or be big enough on their own to safeguard such ecosystems and populations. There are protected areas in the People's Republic of China and the Russian Federation that abut the borders of Mongolia: at Uvs Nuur Basin in the north-west, Khovsgol Nuur National Conservation Park in the north, Daurian International Nature Protection Area in the east, and Khan Khentii in the central northeast. In these four areas there are true cross-boundary reserves. Figure 9 shows the relative positions of the border-protected areas of the three countries. Cooperation with the Russian Federation and the People's Republic of China on transboundary reserves will considerably enhance the value of protected areas, and additional transboundary areas are being considered.

Table 12 shows the breakdown of protected areas according to provincial boundaries. In some provinces, such as Khovsgol, the protected area coverage is high whereas in others, such as Dornogobi, there are no protected areas. Wide geographic dispersal of protected areas not only serves biodiversity conservation but also public recreation and education needs.

PROTECTED AREAS ON OR NEAR THE MONGOLIAN BORDER

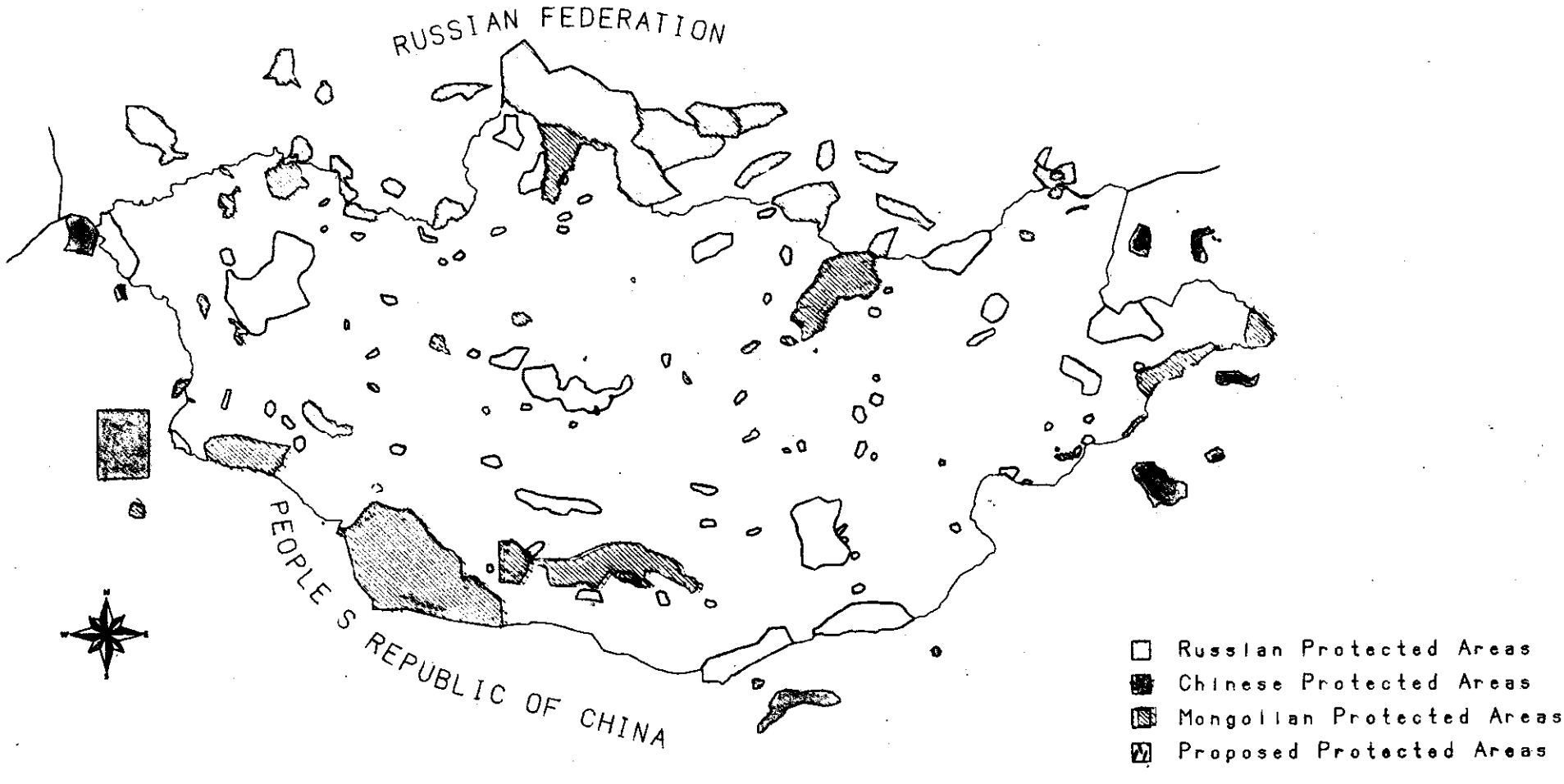


Table 12 The area and percentage of current protection in each aimag

Name	Area of aimag (1,000 ha)	Area of Protection (1,000 ha)	%
Uvs	6,965	719	10.32
Bayan-Ulgii	4,532	27	0.60
Selenge	4,438	89	2.02
Zavkhan	8,104	90	1.11
Khovd	7,561	787	10.41
Khentii	7,969	465	5.84
Arkhangai	5,502	77	1.39
Tov*	7,876	1,064	13.51
Gobi-Altai	14,298	3,931	27.49
Sukhbaatar	8,141	205	2.51
Bayankhongor	11,229	1,233	10.98
Uvorkhangai	6,242	21	0.34
Dornogobi	11,370	0	0.00
Dundgobi	7,459	0	0.00
Umnogobi	16,418	2,151	13.10
Khovsgol	10,045	833	8.29
Bulgan	4,886	5	0.11
Dornod	12,156	897	7.38

*Footnote: Ulaanbaatar data are included in the figures for Tov.

Forest Reserves.

In addition to protection established under the Law on Special Protected Areas there is provision for protected forests under the Law on Forests. Two categories of protected areas are specified:

(a) Strict Zones, in which all activities are prohibited, apart from gathering dead wood and other approved forest resources (i.e. mushrooms, berries, pine nuts, etc.). Also allowed are conservation measures to maintain ecological balance.

All forests within Strictly Protected Area Pristine and Conservation zones, National Conservation Park Special Zones and Subalpine Forest Zones are included in this category. The boundaries for sub-alpine forests will be established by the Ministry for Nature and the Environment.

(b) Protected Zones, in which forest management activities to improve regeneration are also allowed. These zones include some planted forests.

Protected Zone forests include:

- Green zones around towns and villages
- Forests up to five km from lakes and river sources
- Forests up to three km from rivers and springs
- Forests up to one km from railway and important roads
- All saxaul forests
- All forests in oases
- Forests smaller than one hundred ha in area
- Small groups of trees and shrubs
- Forests on slopes of greater than thirty degrees

At present no map has been prepared to show the protected forests of Mongolia, and many of the boundary demarcations remain to be done, Although the Strict Zone and Protected Zone forest designations apply to forests within protected areas established under the Law on Forests, the Law on Protected Areas apparently takes precedence for purposes of conservation and management.

Plant Reserves.

The Law on Natural Plants prohibits the use of plants for commercial purposes in certain areas which are in effect plant reserves but which have not yet been clearly established by the sum Khural who are given responsibility for boundary demarcation under the law. The areas concerned overlap to a large extent with the Forest Reserves referred to above.

Additional protected areas include:
- Habitat areas of very rare animals
- Habitat areas of very rare plants*
- Areas with scant vegetation
- Sand-movement control zones
- Soil-erosion control strips.

* Can only be used for protection purposes and is therefore the strictest plant reserve designation.

Although the law prohibits commercial use of plants, it expressly permits grazing in habitat areas of very rare animals, which may conflict with conservation objectives.

2.1.1.3 *Legal status*

The Mongolian Law on Special Protected Areas was adopted by the Ikh Khural in the autumn session, 1994, and became effective on 1 April 1995. The protected area designations (See 2.1.1.2) is a melding of ideas from the IUCN categories and Biosphere Reserve concepts that have been adapted to Mongolia's situation and rural conditions. The purpose of the Law is to regulate the "use and procurement of land for state protection, to conserve its original condition, to protect specific traits of the natural zone's unique formations, rare and endangered plants and

animals, historic and cultural monuments, and natural beauty, as well as to research and investigate evolution."

2.1.1.4 *Protected area zonation*

The Mongolian Law on Special Protected Areas, 1995, establishes three management zones in Strictly Protected Areas and another three in National Conservation Parks. (See Appendix 4 for details as to activities that are allowed or prohibited for all protected zones established pursuant to the environmental laws.) The result is very complicated.

1. Strictly Protected Areas

(a) Pristine Zones, in which limited human intervention is permitted for protection activities, as well as non-intrusive research.

(b) Conservation Zones, in which are also permitted flora and fauna habitat enhancement and restoration following natural disasters.

(c) Limited-Use Zones, in which tourism, culling of wildlife, traditional religious activities, forest cleaning and maintenance and collection of some plants and other natural resources for household purposes are allowed, subject to obtaining the proper permits. Construction of roads and buildings are permitted subject to approval of the plans and drawings.

2. National Conservation Parks

(a) Special Zones, set aside for research and conservation activities, including certain interventions, such as habitat enhancement and restoration following natural disasters.

(b) Travel and Tourism Zones, where tourism and fishing are allowed with the appropriate permission and with low environmental impact methods, as well as all the activities allowed in the Limited-Use Zone of Strictly Protected Areas.

(c) Limited-Use Zones, where, in addition to the above activities, traditional livestock grazing is allowed.

Extension of settled areas or construction of buildings that are not included on approved plans are prohibited.

Regulations still have to be established to clarify what kind of conservation management activities and harvesting of natural resources are permitted and how they should be controlled at acceptable levels. In National Conservation Park Limited-Use Zones, Nature Reserves, and Natural and Historical Monuments, a large number of activities are permitted, many of them potentially destructive to

biodiversity. The Law on Special Protected Areas does not set limits on these activities: that is left to land-use lease agreements required by the Law on Special Protected Areas and the Law on Land and the project-approval process designated in the Environmental Impact Assessment regulations.

2.1.1.5. *Buffer zones around Protected Areas*

Buffer zones are not clearly defined in the Mongolian Law on Special Protected Areas. They are mentioned as peripheral zones, that should be "clearly defined areas" and should be designed to involve citizens in the protection of Strictly Protected Areas and National Conservation Parks and the improvement of those citizens' living conditions. The Ministry for Nature and the Environment is responsible for designating these buffer-zone boundaries after consultation with the local Khural, but none have yet been established (March 1996) and the scope of citizen involvement in "protection" and how their living conditions might be improved have not been defined.

There is no provision for "buffer" zones, or "peripheral" zones around Nature Reserves, and as Nature Reserves are generally small, they may require buffer zones even more than the larger National Conservation Parks and Strictly Protected Areas. Also, there are no guidelines as to what kinds of activities can be carried out within buffer zones and how their impacts on biodiversity within protected areas will be assessed. A pilot project to develop effective buffer-zone management around the Khan Khentii Strictly Protected Area is in progress.

2.1.1.6. *Management, staff and budgets*

The Law on Special Protected Areas establishes the following institutional responsibilities. The Ikh Khural or Parliament plays a mainly policy role and approves protected area sites and boundaries. Government, or cabinet, is charged with organizing and implementing protected area policies approved by the Ikh Khural, and developing and implementing a National Program for Protected Areas. The Ministry for Nature and the Environment is specifically responsible for the administration of Strictly Protected Areas and National Conservation Parks, in collaboration with, or with the agreement of, local governors. The Ministry is responsible for preparing regulations and guidelines to control resource use inside these protected areas and for setting visiting fees and administering tourism activities. Local citizen Khurals have a minor advisory capacity in the management of national protected areas and are responsible for establishing boundaries and regulations for any land placed under local protection. Local governors work with the Ministry for Nature and the Environment to implement State policy and legislation and to manage Nature Reserves and Natural and Historical Monuments.

The ten Protected Area Administrations of the National Service for Protected Areas and Ecotourism manage Strictly Protected Areas and National Conservation Parks

through their staff of Protected Area Rangers. These are coordinated through a unit of five people at the NSPAE headquarters in the Ministry for Nature and the Environment in Ulaanbaatar. A total of 161 staff work for the Protected Area Service in the ten administrative regions. Twenty-seven of these are professionals, 103 are Rangers and twenty-one are assistants. The budget for the Protected Area Service in 1995 was 39 million togrogs (ca $78,000): for 1996, the budget allocated is 63 million togrogs (ca $126,000). Forty-one million togrogs of this (ca $82,000) will be spent on salaries.

A further 200 Rangers are responsible for the manangement of Nature Reserves and Natural and Historical Monuments at the local government level. The total budget allocated for their activities is difficult to calculate precisely because responsibility is split among so many aimags.

Several problems in the administration of protected areas can be identified at present:

- No one organization has clear overall management responsibility for Nature Reserves and Natural and Historical Monuments.
- There is a shortage of staff in the Protected Area Service.
- The specialists in the protected area service are far from information sources and they lack reliable data.
- The level of training of both specialists and Rangers is inadequate, especially in the field of ecology and conservation biology.
- Training facilities are inadequate.
- There is no effective communication system between protection administration offices and headquarters.
- The budget is too low for effective protection and management.

2.1.1.7. *Research and monitoring*

Research on wild species, geology and landforms in Mongolia has been undertaken for a long time. Much of the work was done before the establishment of the present protected area network. Most data that has been collected still needs to be analyzed in order to provide a comprehensive inventory of the country's biodiversity as well as that occurring in protected areas. The Great Gobi Strictly Protected Area, Khovsgol Nuur National Conservation Park, and Bogd Khan Uul Strictly Protected Area have been comparatively well studied and there are a number of published atlases and research reports (See Appendix 5).

The Mongolian-Russian Biological Expedition has carried out surveys and inventories all over Mongolia and has produced many useful publications, but many specimen collections have still not been studied and some results remain unpublished and unavailable. Recently some detailed single-species studies of ecology and behavior have been carried out, for instance on the Gobi bear, snow leopard and wild ass. Buffer-zone resource exploitation is being studied around

Khan Khentii Strictly Protected Area and Gorkhi-Terelj National Conservation Park, and resource inventories of the Otgontenger and Bogd Khan Uul Strictly Protected Areas are in progress.

Scientific research relevant to protected areas is useful in varying degrees to managers, but there has been no coordinated research plan for protected areas that focuses on the most important issues from the point of view of management, and conservation of biodiversity.

Due to the lack of funds, several research posts in the Protected Area Service have been cut but there are research biologists at ten of the Strictly Protected Areas and a biologist and water chemist at Khovsgol Nuur National Conservation Park.

The Mongolian Law on Special Protected Areas requires that research and monitoring be carried out, but such a monitoring system has not been designed yet. Important information is being collected but much of it remains in Rangers' notebooks. A comprehensive monitoring and research plan and program are required.

2.1.1.8. *Enforcement of laws and regulations.*

There are frequent violations of the existing laws and regulations governing protected areas. Poaching, illegal wood-cutting, water pollution, grazing and cultivation in zones where such activities are prohibited, breaking of tourism regulations and those regulations governing use of minor natural resources, and incursions across the national borders have all been taking place with relatively few cases of arrest and conviction by the law enforcement authorities.

The main reasons for the poor enforcement of the laws and the frequency of violations are:

- poor knowledge of the laws and regulations among the public and the authorities.
- lack of implementing regulations for some laws.
- poor justification for some parts of the laws.
- incorrect implementation of laws by some law enforcers because of lack of training leading to antagonism of local people.
- lack of clear guidelines in passing sentence on offenders.
- ineffective patrolling regimes.
- insufficient personnel, equipment and transport for law enforcers.
- poor economic state of local people and hence an immediate need for them to
- exploit resources without regard for sustainability.

2.1.1.9. *Community support*

Protected area managers have to take into account the needs and aspirations of the people living in and around their parks and reserves. The people have to understand the reasons for conserving biodiversity but that is not enough if their immediate needs for food, water shelter and consumer goods are not being met. Despite numerous projects throughout the developing world in recent years successful and convincing examples of reconciliation of local peoples' social and economic needs and aspirations with biodiversity conservation are difficult to find. It will be a slow process to develop genuine participatory protected area management programs.

So far, an attempt by the UNDP/GEF Biodiversity Project has been made to start small economic development projects in areas adjoining four protected areas and to link these projects to biodiversity conservation by demonstrating economic benefits of protected areas. Nine such projects have been financed with grants for initial start-up costs; the aim is that they should become self-sufficient. The benefits of the program for protected areas have still to be assessed. In another project on buffer-zone management, financed by the German Agency for Technical Development (GTZ), a feasibility study has been carried out to assess the potential for improving the living conditions of the people living near Khan Khentii Strictly Protected Area and Gorkhi-Terelj National Conservation Park and involving them in management of the protected areas. Another project around the Khustain Nuuruu Nature Reserve, implemented by the Mongolian Association for Conservation of Nature and the Environment, is investigating ways of improving living conditions for people in the surrounding area.

2.1.1.10. *Ecotourism*

Although the tourist business started in Mongolia about forty years ago, there was no policy for ecotourism and until recently there was only one authorized travel agent. Today approximately two hundred companies and agencies are engaged in the tourist business, of which about thirty have licenses to cater for foreign tourists. Of these thirty, twenty-five are active in protected areas, operating under licenses issued by the National Service of Protected Areas and Ecotourism. Ecotourism involves visits to wild areas to see natural phenomena, fauna and flora, and cultural and archaeological features included in protected areas. It plays an important role in informing the public about nature conservation.

Each protected area administration regulates the tourist activities on its own territory according to regulations it has developed. These regulations are to be endorsed by the head office of the Protected Area Service in the Ministry for Nature and the Environment. General regulations have been developed establishing fees and governing recreational uses.

Relatively intensive development has taken place at Bogd Khan Uul Strictly Protected Area and at Gorkhi-Terelj, Gobi Gurvan-Saikhan and Khovsgol Nuur

National Conservation Parks. Tourist agencies must have licenses and contracts from the local protected area administration and there has been a steady increase in the number of tourists visiting these areas, both in groups, on organized tours, and as independent travellers who often travel without guides or interpreters. There are problems with many of the agreements drawn up with tourist companies in that environmental effects of the operations are not well enough controlled.

There is potential for ecotourism development in other areas, but in many places it will be more difficult to develop because of the harsh conditions and difficulty of establishing necessary infrastructure without harming the environment. More difficult areas include the Great Gobi, Khokh Serkh, Nomrog and Dornod Mongol Strictly Protected Areas. Certain types of low-impact nature tourism may be permitted in such places.

Tourism can have a positive impact on the socio-economic conditions of local people, although there may be problems in ensuring that the benefits are evenly distributed. Benefits can include:

- improvement in living conditions of the inhabitants of protected areas through increased employment opportunities
- public education about nature and conservation
- increased national and international support for protected areas and conservation.

There are also many potential adverse environmental and social impacts of tourism in wild places. The environmental impacts include:

- destruction of soil and plants leading to erosion and invasions of weed species through increased use of motorized vehicles, footpaths and bridlepaths
- depletion of water resources and lowering of the water table
- changes in behavior, distribution and breeding success of animal species as a result of disturbance
- increased risk of fire
- increased use of firewood and other natural resources
- water and soil pollution as a result of waste disposal problems.

In order to limit such impacts it is necessary to carry out comprehensive assessments of all proposed and ongoing tourism related activities and then consistently apply regulations and limits imposed. Tourist activities should be consistent with protected area master plans.

2.1.2 Conservation of wild species

Biodiversity conservation cannot rely entirely on protected areas. Most of Mongolia's territory will always be outside protected areas, so control of activities that are damaging to the overall environment is essential (See 2.1.3). Apart from the protection afforded to wild species inside protected areas, there are conservation measures taken to protect certain species of plants and animals wherever they occur.

2.1.2.1 *Legal Status*

Animals

From ancient times hunting has been an important aspect of Mongolian life. Wild animals provided and continue to provide food, skins and other economic products.

Mongolia had several ancient laws dating from at least 1041 AD for the preservation of its game animals and the control of hunting. Commercial exploitation of Mongolia's wildlife increased steadily from the 17th to the 20th centuries, but the laws under which it operated were based on top-down quota determinations rather than bottom-up concepts of sustainable harvests.

Two recently passed laws address protection of wildlife. The Mongolian Law on Environmental Protection, which came into effect in June 1995, requires protection of natural resources, including wildlife, from adverse effects and ecological imbalance. It requires that very rare and endangered species be registered in the Red Book of Mongolia (1996) and that these species be given total protection. Enforcement methods and penalties are not clearly specified, however. The Red Book of Mongolia lists ninety-eight species of animals as very rare or endangered (twenty-eight species of mammals, thirty of birds, five reptiles, four amphibians, twelve fish and nineteen insects).

The Mongolian Law on Hunting was adopted in April, 1995, and came into effect on 5 June 1995. This law was passed to "regulate the protection and proper use of Mongolia's game animals" and therefore concentrates mainly on those species that are or were regularly hunted (about fifty-two species of mammal, 130 species of birds and thirty species of fish).

The Law on Hunting gives total protection to certain species and regulates the hunting of other species through permits, fees, closed seasons and banned hunting methods. It also controls the ownership and keeping of animals in captivity. Three categories of species are defined under the law:

1. Very rare species

These species include eleven mammals, six birds and two fish (Appendix 6). They may not be killed or trapped, and the sale of their body parts is prohibited. The Ministry for Nature and the Environment is empowered to make exemptions in special cases, for scientific research or captive breeding. The criteria for allocation to this category include vulnerability, danger of extinction, and no potential for sustainable exploitation.

2. Rare species

These species include twelve mammals, twenty-two birds and three fish (Appendix 6) and are defined as limited in terms of distribution and population size, and potentially in danger of extinction. They may be hunted only for special purposes,

which include scientific, cultural or artistic purposes, and only with a permit obtainable for a fee from the Ministry for Nature and the Environment.

3. Abundant species

This category presumably includes all other species and they may be hunted or trapped with the appropriate permit, which sometimes requires previous training. Commércial exploitation requires an agreement as well as a permit. Closed seasons have been established for some species, and the Ministry for Nature and the Environment is responsible for establishing closed seasons for other species as necessary. Hunting quotas (maximum limits) are established for each aimag by the Ministry for Nature and the Environment, and each aimag's Khural is responsible for setting maximum limits for individual sums. It is then up to the sum Khurals to set actual quotas up to these maxima.

Mongolians can hunt abundant animals for household purposes, or very rare and rare species for special purposes, if they obtain the appropriate permits, namely a license issued by the local government for abundant species or a special permit from the Ministry for Nature and the Environment for very rare and rare species. Foreigners, however require a special permit from the MNE for all species apart from abundant fish, for which they may obtain a permit locally.

There has not yet been a systematic evaluation of rarity and degree of threat across all species apart from in the Mongolian Red Book. Inclusion in that book has questionable legal significance and even the Mongolian Red Book is biased towards species with economic importance, and charismatic species (Table 13).

Prohibited hunting methods.

The Law on Hunting bans certain hunting methods and the taking of animals struggling against natural disasters, "unable to protect themselves," or on their way to water or salt licks. Among the banned hunting practices are use of chemicals, electric shocks and explosives, pit traps, chasing animals in snow or ice, smoking out marmots, chasing animals with vehicles, and use of lights. Nets are not allowed to be used for household fishing, and there are restrictions on the types of firearms that can be used.

Table 13 Established hunting and fishing seasons

Mammals		Hunting permitted
Siberian roe deer	*Capreolus pygarus*	2 Sept - 30 Nov
wild pig	*Sus scrofa*	2 Sept - 30 Nov
Mongolian gazelle	*Procapra gutturosa*	2 Sept - 30 Nov
brown bear	*Ursus arctos*	2 Aug - 15 Nov
sable	*Martes zibellina*	22 Oct - 15 Feb
beech marten	*Martes foina*	22 Oct - 15 Feb
raccoon dog	*Nyctereutes procyonoides*	22 Oct - 15 Feb
Eurasian lynx	*Lynx lynx*	22 Oct - 15 Feb
wolverine	*Gulo gulo*	22 Oct - 15 Feb
red fox	*Vulpes vulpes*	22 Oct - 15 Feb
corsac fox	*Vulpes corsac*	22 Oct - 15 Feb
brown squirrel	*Sciurus vulgaris*	22 Oct - 15 Feb
mountain hare	*Lepus timidus*	22 Oct - 15 Feb
tolai hare	*Lepus tolai*	22 Oct - 15 Feb
alpine weasel	*Mustela altaica*	22 Oct - 15 Feb
Siberian marmot	*Marmota sibirica*	11 Aug - 15 Oct
Altai marmot	*Marmota baibacina*	11 Aug - 15 Oct
muskrat	*Ondatra zibethicus*	17 Oct - 31 Dec
Eurasian badger	*Meles meles*	2 Sep - 30 Oct
Birds		
hazel grouse	*Bonasa bonasia*	2 Sep - 15 Mar
Daurian partridge	*Perdix dauuricae*	2 Sep - 15 Mar
Pallas's sandgrouse	*Syrrhaptes paradoxus*	2 Sep - 15 Mar
black grouse	*Lyrurus tetrix*	2 Sep - 15 Mar
all ducks, geese, and other wetland birds		2 Sep - 20 Oct and 1 Apr - 30 Apr
Siberian whitefish	*Coregonus lavaretus*	21 Oct - 31 Jul
Baikal omul	*Coregonus autumnalis*	2 Sep - 30 Nov
omul	*Coregonus peled*	17 Nov - July 31
Siberian ide	*Leuciscus leuciscus*	2 Aug - 15 Apr
All other species of fish		16 Jun - 31 Mar

All species that occur in Mongolia, even if they are migratory and spend only short periods in the country, are covered by the Mongolian Laws on Hunting and Environmental Protection. Since many of the bird species of Mongolia and some of the mammals are migratory, collaboration with the neighboring states of the Russian Federation and the People's Republic of China is essential to give adequate protection to Mongolia's wildlife.

Plants

Mongolians have had specific laws and regulations on plant protection, collection and utilization for centuries. The Law on Forests, the Law on Environmental Protection and the Law on Natural Plants are the most recent laws to address the issues of plant protection. The Law on Forests regulates the protection, proper utilization and regeneration of forests. The Law on Environmental Protection lists plants specifically as resources to be protected from adverse effects, including both naturally occurring forests and planted forests. It requires that the state prohibit the use of rare and endangered plant species and that it register them in the Red Book of Mongolia. The Law on Natural Plants establishes a classification of plants according to rarity:

1. Very rare plants include those plants that are in danger of extinction and cannot be harvested sustainably. The list of 133 very rare plants identified in the Law is given in Appendix 7. They may be used only for scientific research with a permit from MNE.

2. Rare plants are those with restricted distribution that are vulnerable to extinction but have some potential for sustainable harvesting. They may be used for household and research purposes with a permit from the sum governor, or for drug manufacture with a permit from the MNE.

3. Abundant plants are those with a wide distribution and good regenerative capabilities. They may be used for all purposes, including commercial, with a permit from the sum governor.

Lists of rare plants have been approved by government and abundant plants by the Ministry. Rare plants are shown in Appendix 7. The laws require data collection, monitoring, protection and restoration. Commercial exploitation of plants is prohibited in green zones, oases, within two km of rivers or lakes and in various other protected zones, but the actual boundaries of these areas have not yet been demarcated. In order to protect plants on the Very Rare list, local government is empowered to prohibit the use of land as pasture or hayfield for up to two years. All permits carry rules and permitted collection periods specific to the species and the location.

The system of permits is elaborate as defined in the law. Information on which to base decisions on whether or not to harvest and on harvest levels is lacking, however, and the capacity to maintain a data base and monitor plant species population and distributions is insufficient. Unless very conservative decisions are made on issue of permits, it is difficult to ensure conservation of plant resources.

2.1.2.2. *Administration*

Wildlife management at the local level is the responsibility of State Inspectors and Rangers. They carry out enforcement as well as monitoring of the wildlife resources. State Inspectors have the power to impose administrative penalties on offenders and to confiscate weapons or other equipment, including vehicles. As a result of assessment by State Inspectors and Rangers, hunting can be suspended for certain species, areas can be taken under special protection, and quotas for foreign and local hunters can be increased or decreased.

The State General Environmental Inspector is appointed by the Government upon the recommendation of the Ministry for Nature and the Environment. The State Chief Inspector and other State Inspectors at the Central Government and aimag level are appointed by the Ministry for Nature and the Environment and sum State Inspectors are appointed by aimag governors on the recommendation of the State Chief Inspector. State Inspectors are appointed at specific places and administrative levels but have countrywide powers.

2.1.2.3. *State Inspectors and Rangers*

There are eight State Inspectors at the Ministry for Nature and the Environment and another 394 State Inspectors and 544 Rangers at aimag and sum level, as shown in Table 14.

Table 14 Numbers of State Inspectors and Rangers

	Number of State Inspectors	Number of Rangers
MNE	8	-
Ulaanbaatar city	14	23
Aimag level	51	521 (aimag, sum, bag level)
Sum level	329	
Bag level		

The budget for the State Inspectors and Rangers comes from both central and local Government funds. It is difficult to separate the costs of wildlife management outside protected areas from those of management of Nature Reserves and Natural and Historical Monuments, which are also the responsibility of State Environmental Inspectors and Rangers (see Section 2.1.1.2). State Inspectors are required to have degrees; Rangers are not required to have university or college degrees. State Environmental Inspectors supervise and instruct Rangers; together they are responsible for enforcing the environmental laws and monitoring the environment.

2.1.2.4. *Enforcement of laws and regulations*

All wildlife management legislation is enforced by State Environmental Inspectors and Rangers with the assistance of the police and border patrols. Certain powers of the State Environmental Inspector are delegated to customs and border patrol inspectors by the Ministry for Nature and the Environment. Arrests take place but there are loopholes in the laws that make convictions difficult, and it is relatively easy to escape detection for many wildlife offenders.

The manpower and budget available are too small to ensure effective protection and monitoring of the wildlife resources over such a large area as Mongolia. Sometimes local people take it upon themselves to expose violations of the hunting law. Once arrested, people are usually cooperative, but the fines and other penalties may not be sufficient deterrents to prevent reoffending. Conflicts between poachers and Rangers have escalated at times and Rangers have been killed or wounded in fights.

There are problems in interpreting the laws and there is inconsistency between laws. For example, the Mongolian Law on Environmental Protection states that it is prohibited to hunt or trap very rare animals but the Mongolian Law on Hunting states that these animals may be hunted or trapped for research purposes with the appropriate permit from the Ministry for Nature and the Environment. There are other examples of apparent contradictions that need clarification.

2.1.2.5 *Community support*

Protection of the environment in Mongolia gets substantial support from citizens. For example, in the mid-1980's people resisted the Khovsgol phosphorus mine proposal, considering it damaging to the environment. Mongolian scientists agreed and the government postponed the project.

Populations of both cities and rural areas provide active measures for protection of their local wildlife and endeavor to reveal any shortcomings of the laws and violations of the laws. There are strong feelings among herdsmen against people who come from cities and towns to hunt local wildlife.

The Mongolian tradition of respect for nature is being reinforced by nature-painting competitions and nationwide children's camps.

There are, of course, people in any community who disobey the laws, and the same is true for Mongolia.

2.1.2.6. *Protection of species with ranges crossing international boundaries*

Many species of wild animals range over the national borders between Mongolia and the People's Republic of China or between Mongolia and the Russian Federation or

among all three countries. There has been insufficient coordination of the lists of protected species for the three countries, and insufficient attention to the establishment of contiguous transboundary protected areas.

2.1.3. Conservation outside protected areas

Apart from species protection activities, there are also conservation measures to limit the effects of human activities on wildlife habitats outside protected areas.

2.1.3.1. *Soil conservation and agriculture*

Of the eighty percent of the land of Mongolia that is suitable for farming, 97.3% is pastureland, 1.6 % is hay land and 1.1% is currently or formerly cultivated land. Less than one million ha of land is now cultivated. For over thirty years after the beginning of intensive development of agriculture in Mongolia no soil conservation measures were taken. In the early 1970's soil scientists at the Land Policy Institute reported severe soil erosion through wind action and the government issued a resolution on "Urgent Measures for Protection of Soil from Erosion." At first none of the recommended actions were implemented, but in the 1980's several measures were taken, for example:

- Instead of plowing and harrowing, no-till, or subsurface cultivation methods were introduced, but the area cultivated in this way has now decreased.
- The crop rotation system was improved.
- Straw was spread over the fields to prevent soil loss and 42,700 - 98,600 ha were so treated between 1989-1991. The supply of straw is a problem, however.
- One of the effective ways to prevent wind erosion is by creating strips of forest, or shelter belts. However, in 1986 the whole area protected by shelter belts was only 7,700 ha.

Between 1989 and 1994 the Land Policy Institute carried out research on soil erosion, prepared a map and published some general estimates: 561,500 ha or 46.5% of the 1.2 million ha of cultivated land in twelve provinces are affected by soil erosion caused by lack of or belated introduction of soil conservation measures.

It was concluded that plowing and cultivation cause loss of soil moisture and erosion, and improper irrigation also leads to soil deterioration. Soil compaction by machinery also affects soil fertility.

2.1.3.2 *Range management*

Overstocking and some poor animal husbandry practices are diminishing and damaging Mongolia's grasslands. Traditional nomadic pastoralism is still largely practiced. The frequency and extent of movements depends upon the geographic and

weather conditions. Thus in the northern area where grasses grow densely, herdsmen may move their livestock two to three times per year, in the steppe zones about six to eight times per year and in the desert up to sixteen times per year. When there is heavy snowfall, herds of cattle and horses are put together and taken by appointed herdsmen to remote pastures until the warm season. In the coldest region of Uvs aimag where the temperature regularly falls to -40 C, winter pastures are divided and boundaries are marked to avoid overgrazing. These boundaries are sometimes made with rocks or bones, sometimes they are done on a daily basis with a rope trailed in the snow.

Some attempts are now being made to avoid overgrazing by distributing livestock according to scientific principles, and data received by satellite. The Research Institute on Animal Husbandry is active in investigating livestock grazing regimes and their effects on the rangeland. Animal husbandry production was increased by 15% as a result of research on effective pastureland use on 500,000 ha of land in Uvs, Khentii and Bulgan aimags between 1976 and 1985, but these practices were abandoned later due to financial difficulties. The effects of this increase on grassland health and biodiversity has not been fully evaluated. A recent evaluation of grasslands found in the Altanbulag district of Mongolia shows that most of the vegetation has been highly modified and represents the latter stages of degradation.

Hay crops were increased in the 1970's by the use of chemical fertilizers, then reverted to decreased yields, but recovered by 10% when rotation was introduced. Progressive methods of pasture and hay-field usage need to be introduced or reintroduced.

2.1.3.3 *Forest management*

Forest, primarily larch, pine and birch, covers seven percent of the country. Seventy percent of the commercial forest land lies in the nine north central aimags. Between 1975 and 1990, 37.8 million cubic meters of wood were harvested from 344,400 ha of forest. The ratio of harvested area to replanted area was 8.5:1. During that period, forests were overharvested by 40% to 70%. The annual timber harvests were regulated based on 5-year and long-term plans. The regulations only indicated the volume to be harvested, however, and not the location of harvest areas. Clearcutting was the standard practice in these forests. Forests and woodland around settlements are being cut for firewood and other purposes with little management.

The new Law on Forests establishes three forest categories: Strict Zone, Protected Zone and Utilization Zone. These have been described under Protected Areas in Section 2.1.1.2. The third category of forests is Industrial Zone Forest, which is all other forest not in Strict or Protected zones. Here protection measures include actions against fire, disease and insects, and general forest maintenance to ensure normal growth. It is prohibited to cut any young trees as well as certain named species of rare trees and shrubs, and cutting of cedar, spruce or elm requires a permit

from the MNE. Provision is also made in the law for banning of hay-making and stock grazing in certain forests or where seedlings are planted.

Timber contracts are required to stipulate reafforestation arrangements, and clear cutting is banned under the law.

The Law on Forests has therefore established protection zones and conservation requirements, but on-the-ground management and enforcement is weak. At present, forestry is primarily concerned with fires and insect attacks but little actual control is undertaken. Forest ecology is mostly ignored.

2.1.3.4 *Restoration of disturbed and damaged lands*

Land has been damaged as a result of agriculture, overgrazing, mining, timber felling and extraction, and multiple-tracking.

Table 15 Area of land damaged by anthropogenic activities that require restoration

	hectares
Overgrazed land	7,714,000
Formerly cultivated land	576,000
Areas around mines and oil wells	1,240
Areas affected by commercial timber extraction	176,344
Fuel wood extraction	194,767
Multiple tracking	800,000 - 1,000,000

At present actions are being taken under the National Plan to Combat Desertification to rehabilitate former cultivated land to prevent soil erosion. There are some land reclamation programs at mine sites but they fall far short of what is necessary.

2.2. Description and assessment of other conservation actions

2.2.1. Conservation of wild plants in botanical gardens.

A botanical garden was established in eastern Ulaanbaatar in the 1970's in order to conserve native, rare and economically useful plant species. For the last twenty years research has been carried out on over 100 species at the garden, and plants are provided for the city's green area from this garden. An arboretum was established in the north-east of Ulaanbaatar in the 1980's and has since cultivated about 800 species of native trees and about 50,000 other plants. Operations of both gardens have recently been reduced as a result of financial problems and a shortage of qualified staff.

Several research stations such as at Bogd and Ekhiin Gol in Bayankhongor aimag and Bayantooroi in Gobi Altai aimag have experimented with the cultivation of rare Gobi plants and crop plants. The first two stations concentrate on economic plants.

2.2.2. Conservation of wild animals in captive collections

There is no zoo in Mongolia, although unsuccessful attempts have been made to establish one. Some species of mammals are being kept and bred in captivity preparatory to release or reintroduction to the wild. For example there are two captive breeding stations for Przewalskii's horse through which it is intended to reestablish the species in the wild at Khustain Nuruu Nature Reserve and Great Gobi B Strictly Protected Area. Animals have been brought from abroad to start this program and there are now a total of fifty-nine adults and thirteen young that were born in captivity in these two areas.

Twenty-two camels were taken from the wild between 1987 and 1992 in order to stock a captive breeding program at Bayantooroi, Great Gobi A Strictly Protected Area. Difficulties in animal management have meant that although there have been two births to the captive camels, the total captive population is now only 13 animals and there is a risk of genetic mixing with local domestic camels. Breeding in the wild, if feasible, is always preferable to breeding in captivity.

2.2.3. Conservation of wild relatives of crops and livestock

(a) Livestock
Wild relatives of livestock, such as Przewalskii's horse, argali sheep, ibex, Bactrian camel and wild ass are protected by the protected area system and the hunting law. Genetic material of wild species was collected in the 1950's by taking sperm from wild sheep and ibex, but sperm storage facilities were inadequate. However, the purpose of this effort was to improve domestic livestock rather than conserve wild genetic populations.

(b) Crops
The Law on Special Protected Areas, Law on Forests and the Law on Natural Plants provide legislative authority for plant conservation.

2.2.4. Conservation of varieties of crops, livestock and domestic animals

Livestock and other domestic animals
Livestock breed improvement and conservation was officially regulated in 1923 and over forty breeding farms were established, but after privatization in 1990 selective breeding of livestock was abandoned and some breeds are deteriorating. The Law on Protection of Livestock Genetic Fund and Health (1994) regulates for protection

of native livestock breeds and the import and export of livestock. A joint FAO/Government of Mongolia project is addressing the conservation of livestock breeds of the main five species (camels, cattle, sheep, goats and horses) and establishment of a gene bank.

As conservation by laboratory methods is expensive and requires modern equipment and technology and expertise that is not available in Mongolia, it is more appropriate at this time for Mongolia to use traditional methods of livestock breed conservation. There are no breed conservation measures for pigs, poultry, bees, fur-bearing animals and rabbits: most of these animals are imported from abroad.

Plants

Crop variety conservation activities are being carried out in collaboration with the International Plant Genetic Resources Institute. IPRGI assisted Mongolian scientists in holding a genetics workshop in September, 1995. A priority recommendation of the workshop was to collect and investigate the genetic resources of all cultivated and wild beneficial plants and rare and endemic plant species.

2.2.5. Pollution control

Control of air pollution

Monitoring of air quality has been carried out for over twenty years and there are now three permanent monitoring stations in Ulaanbaatar, two in each of Darkhan and Erdenet and another twenty-four in aimag centers and major settlements. The major stations take samples three times per day and analyze for SO_2, NO_2, CO and particulates. Permitted levels that have been established are listed in Table 16.

Table 16 Permitted levels of pollution

	Permitted level (standard)	
Pollutants	20 minute mean	Daily mean
CO (mg/m^3)	3	1
SO_2 (mg/m^3)	500	50
NO_2 (mg/m^3)	85	40
Particulates (mg/m^3)	500	150

In Ulaanbaatar in 1994, the total amount of pollutants emitted into the air was 302,000 tons greater than the total in 1990. Air monitoring shows that during the last two years concentrations of dust and carbon monoxide were twenty to forty percent greater than permissible levels established by the Ministry of Health on the basis of World Health Organization standards. In the past five years, the daily average concentration of sulphur dioxide was 1.8 to 3.6 times greater than permissible levels and the daily average concentration of nitrogen dioxide was 1.2 times greater than permissible levels.

According to the Mongolian Law on Air (1995) the Ministries of Health, and Nature and Environment are responsible for controlling air pollution, and the principle of "polluter pays" must be observed. If pollution exceeds permissible limits action has to be taken to decrease it, and the public must be informed.

The World Meteorological Organization's chain of BAPMoN pollution-monitoring stations includes Terelj, just outside Ulaanbaatar.

The Central Environmental Research Laboratory has been measuring β radiation of dust in the air, radon content and other radioactive elements. In the five days after the Chernobyl explosion in 1986, radiation rose to over one hundred times the normal level, then returned to the normal level.

The Ulaan Uul monitoring station in Dornogobi monitors greenhouse gas levels far from influences of human activities, under the NOAA (National Oceanographic and Atmosphere Administration) program of the USA. Ozone concentration is measured at the Saynshand monitoring station in Dornogobi aimag.
Atmospheric monitoring and research need improvement, especially with regard to the equipment.

2.3. Assessment of availability of data and scientific research necessary to achieve biodiversity conservation

State Policy on research

The State Policy on Scientific and Technological Development incorporates building of a democratic society with an economic structure based on natural resource utilization in conformity with the natural environment. Biological research has been given high priority, in particular work connected with ecological balance and enumerating, monitoring, protecting and using of wild and domestic species of animal and plants.

2.3.1. Inventory and baseline data

Although much data has been collected on biodiversity and on environmental conditions, the data on wild species is scattered in many different institutions both at home and abroad, especially in the Russian Federation. There is insufficient communication and exchange of data among scientific institutions and no comprehensive database on biodiversity and the environment. Research on wild species is still at an early stage. Increased work on ecosystems, species and genetic diversity will lay a scientific basis for protection of biodiversity. Research on genetic diversity is particularly lacking. Lack of coordination between scientific organizations and lack of state funds for research need attention.

Training and research institutions that carry out research on biodiversity in Mongolia include:

- Institute of General and Experimental Biology, Academy of Sciences
- Institute of Botany, Academy of Sciences
- Institute of Biotechnology, Academy of Sciences
- Wildlife and Forestry Institute, MNE
- Land Policy Institute, MNE
- Water Policy Institute, MNE
- Mongolian-Russian Biological Expedition
- Institute of Biology, Mongolian National University
- Research Institute of General Biology, National Pedagogical University
- Animal Husbandry Research Institute, National Agricultural University
- Plant and Cultivation Institute, National Agricultural University

Over 170 projects in the agricultural and ecological fields have been financed by the central government since 1991. These projects include forty-five organizations, 1,185 scientists and 425 technicians.

One hundred and ten of the projects involve wild species and ecology. For example, Mongolia's ecosystems have been mapped at the scale of one to one million and ecosystem studies have been made of the Eastern steppes and the forests of the Selenge basin.

2.3.2. Monitoring

The meteorological service has a comprehensive network of recording stations over the entire country which report daily to the Ministry for Nature and the Environment in Ulaanbaatar. Most of this information is about weather, agriculture, water, pollution and radiation but there is potential to use the system for monitoring biota.

More use should be made of the routine observations of State Environmental Inspectors and Rangers both within and outside protected areas. These could form the basis of a field monitoring system for biodiversity.

2.4. Assessment of Institutional framework

2.4.1. Government - central

In 1990 Mongolia established a unicameral parliamentary system known as the Ikh Khural with seventy-six members elected on the basis of universal suffrage, each member serving a four-year term. There are two parliamentary sessions each year, one in the spring and the other in the autumn, each lasting at least 75 days. The Mongolian Law on Environmental Protection designates the Ikh Khural as responsible for the following environmental issues:

- Determining government policy on environmental protection
- Environmental conservation
- Proper utilization of natural resources
- Restoration of natural resources
- Ratification and control of enforcement of environmental laws
- Endorsement of and changes to the lists of endangered species
- Designation of protected areas
- Setting maximum and minimum fees for natural resource use.

The Standing Committee on Agriculture and the Environment handles all preparatory work for ratification of pending issues and laws in the environment field.

The President is the Head of State and has the power to veto legislative action. The Government of Mongolia is the highest executive authority and consists of the Prime Minister, and thirteen appointed Ministers. The Cabinet of Ministers is the ultimate authority for most biodiversity conservation activities, including setting protected area boundaries, organizing ecological education and training, encouraging the use of environmentally sound technology, and prohibiting activities that adversely affect the environment.

The Ministry for Nature and the Environment was established in 1987. It was redesignated the State Committee on Environmental Control in 1990, and was established in its present form in 1992. It is charged with formulating and implementing state policy on the environment, including development and enforcement of environmental laws, and regulation of the utilization and protection of natural resources and their restoration.

The Ministry for Trade and Industry is charged with development and exploitation of natural resources, so has to work closely with the Ministry for Nature and the Environment.

An independent judiciary was established in 1992 for the first time in Mongolian history. Judges are appointed by the President and are subject only to the constitution. There are 357 judges appointed for life. They are well qualified but most were trained under the socialist system and are ill-equipped to deal with the new environmental issues.

There are two types of courts in Mongolia: the Tsets, which is responsible for resolving constitutional problems, and the general courts which have three levels: trial, appeal and supreme. The Ministry of Justice plays a significant role in the drafting of legislation and may take over this job completely even in the environmental field. The Ministry of Justice has no staff trained in environmental or biodiversity conservation law.