



Regional Action Plan for the Protected Areas of East Asia

2006–2010



World Commission on Protected Areas

Regional Protected Areas Programme Asia



Ministry of Environment
Government of Japan



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IUCN Asia Regional Office
63, Soi Prompong, Sukhumvit 39
Wattana, Bangkok 10110
Thailand
Tel: +662 662 4029
Fax: +662 662 4388

Email: iucn@iucnt.org
www.iucn.org

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2006–2010

Compiled and edited by
J. MacKinnon (IUCN Consultant) and Xie Yan (WCPA Vice-chair for East Asia)

IUCN

World Commission on Protected Areas (WCPA)

Regional Protected Areas Programme Asia

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Regional Action Plan for the Protected Areas of East Asia

1. INTRODUCTION TO THE PLAN

The East Asian region is a collection of eight areas – China, Hong Kong, Macau, Taiwan, Japan, DPRK, ROK and Mongolia. These have a combined land area of 11.79 million km² and constitute a large and important part of the eastern Palearctic. In 1996 IUCN published *A Regional Action Plan for Protected Areas in East Asia* (IUCN 1996). The plan included, besides improving management and the legal framework for protected areas, the goal of reaching 10 per cent PA (protected area) coverage by 2000 as advocated in the Caracas Action Plan from the IVth World Congress on National Parks and Protected Areas. In 1996 the PA coverage of East Asia stood at 5.7 per cent. The plan noted, “There are gaps in the protected area coverage in most, if not all East Asian countries and areas. However, some areas have much further to go than others in putting into place an effective system. Particular examples include Mongolia and DPRK.” Ten years later, we are happy to note that East Asia has passed these targets and now has a total PA coverage of about 16 per cent of its land area.

This new plan examines other areas of PA development in the region, questions whether the actions, projects and objectives of the 1996 action plan have been achieved, and identifies new problems and issues that have emerged in the past decade. The plan builds on the continued interest of the eight areas in promoting the objectives of the Convention on Biological Diversity (CBD) for protected areas, and identifies a number of key actions and projects requiring further regional attention. It also outlines various national actions essential to ensuring a strong regional PA network.

In 2005 the UNEP World Conservation Monitoring Centre (WCMC) prepared a GIS Assessment of the PA system for East Asia on behalf of WCPA. This assessment forms a sound basis for the revised action plan. Parts of that assessment are reproduced with some changes in this action plan. A number of other key documents developed by WCPA are also of general or specific relevance to this region, including the *CBD Programme of Work on Protected Areas* (2004); *Towards Effective Protected Area Systems: An Action Guide to Implement the CBD Programme of Work on Protected Areas, CBD Technical Series No. 18* (2005); *Benefits Beyond Boundaries, Proceedings of the Vth IUCN World Parks Congress* (2005); *Guidelines for Financing Protected Areas in East Asia* (2005); *Guidelines for Tourism in Parks and Protected Areas in EA*; *Guidelines for the Implementation of an Exchange Programme for Protected Areas in East Asia*; *Directory of Protected Areas in East Asia – People, Organizations and Places* (2002); and *21st Century Strategies for Protected Areas in East Asia* (Sheppard 2001).

Part One – Assessment of the PA System of East Asia

2. OVERVIEW OF THE EAST ASIAN REGION

2.1 Extent and areas of the region

The East Asian region comprises China, Hong Kong, Macau, Taiwan, Japan, Mongolia, DPRK and ROK. This is by no means a biologically meaningful region of the world, as its boundaries are political rather than ecological. Nevertheless it constitutes a convenient portion of the extensive Palearctic realm, together with a small portion of the Indo-Malayan Realm's northern fringes.

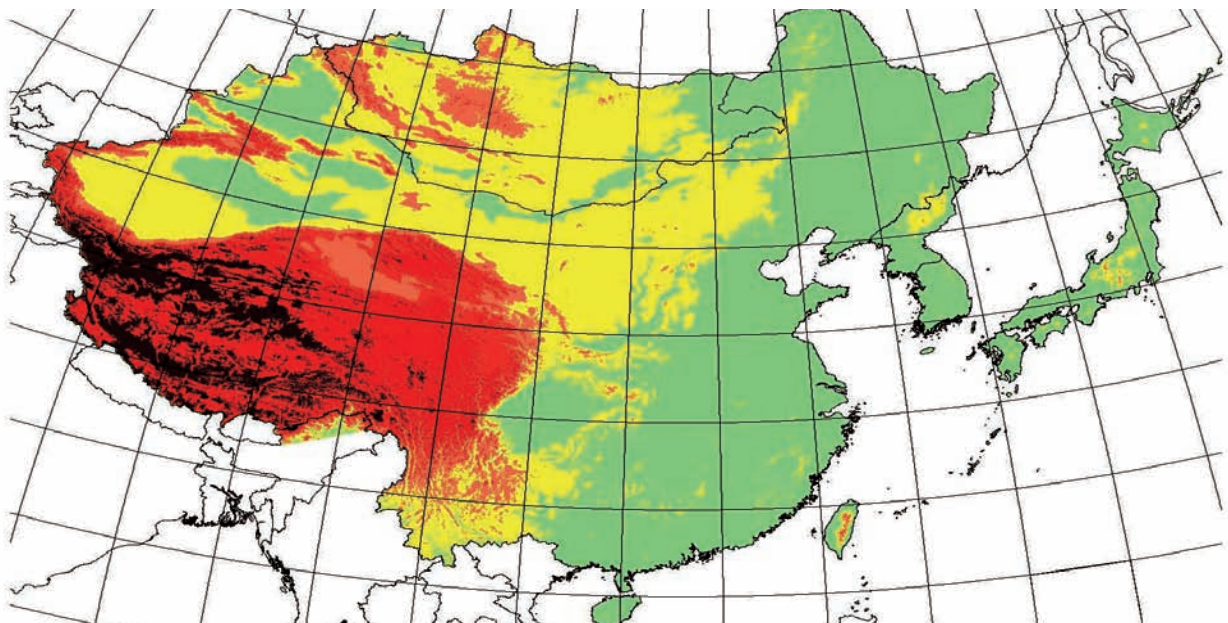
The region has a total land area of 11.79 million km², and includes a diverse range of habitats from the Altai Mountains in the west to the great arc of Japanese islands in the east and the tropical seas and coral reefs of the extreme south. The region boasts the planet's largest and highest plateau, its highest peaks, and some of its deepest land depressions and most forbidding deserts.

2.2 Landform and geography

The region's landform is ancient but has been extensively affected by tectonic activity. Much of the continental landmass was formerly the great Sea of Tethys, but since the Indian subcontinental plate crashed into the belly of Asia about 15 million years ago the landscape has been raised ever higher to create the great Tibetan-Qinghai Plateau. The lofty Himalayas mark the line of collision (Map 1). To the east, where the Asian continental plate is subducting under the Philippine plate, volcanic and tectonic forces have formed the mountains of Taiwan and the archipelago of Japan.

The region boasts the planet's largest and highest plateau, its highest peaks, and some of its deepest land depressions and most forbidding deserts

Map 1. Physical relief of the East Asian region (5 degree grid)



2.3 Population and economic indicators

The human population of the region is over 1.5 billion, or about a quarter of the global total. Fully 84 per cent of the region's people live in China, which also accounts for 81 per cent of its area. The region contains both well-developed areas with high per capita GDP such as Japan, Hong Kong, Macau and ROK, and poorer areas such as Mongolia and DPRK. China is an intermediate area with strong development in its coastal provinces, the fastest growing economy in the world and huge global trade levels, but a per capita GDP depressed by the large number of poor people living in its less-developed interior. Standards of living and consumption of natural resources are closely tied to wealth. The wealthier countries in the region have lower levels of forest loss but are buying up forest products from their poorer neighbours. [Table 1](#) lists some key statistics of the countries and areas of the region.

2.4 Major ecosystems

The East Asian region exhibits a wide range of ecosystems, ranging from permanent ice and glaciers on

the highest peaks to tropical lowland forests and various other forest types, warm and cold deserts, steppe grasslands, lakes, rivers, marshes and marine habitats. The region supports a large human population and many ecosystems have been extensively modified over the course of 8,000 years of human activity.

Habitats across the region are moulded by three factors: altitude, latitude and rainfall. The western portions of the region are at high altitude and have low levels of rainfall. The Tibetan plateau is both high and dry, and is pocked with thousands of lakes fed by melting snow from various high mountain ranges. Many of these lakes are saline. To the north of the Tibetan-Qinghai Plateau several basins have formed between the Altai, Tianshan and Kunlun mountain chains. These depressions are sandy and stony deserts, which become moister and more grassy as one travels further east. Great steppes (named after the *Stipa* grasses which dominate them) stretch through much of Mongolia, Inner Mongolia and the Ordos Plateau. Northeast China and the Korean Peninsula consist of temperate forest habitats – conifers on the uplands and northernmost

latitudes, and oak forests in the valleys with extensive swampy wetlands and lakes in the broader valley bottoms. To the east of the Tibetan-Qinghai Plateau the land falls quickly to rolling plains, the great valleys of the Yellow and Changjiang (Yangtze) rivers, and smaller mountain ranges. These were once forested lands; temperate in the north and on the mountains, subtropical to the south and in the valleys. The great island of Taiwan is mountainous with a narrow subtropical lowland fringe and a tropical southern tip. The tropical zone extends around the southern coast of China, Hainan Island and into southwest Yunnan and southeast Xizang (Tibet). Tropical coral islets are found in southernmost Japan, Taiwan and the South China Sea.

[Map 2](#) shows the region classified into nine habitat classes derived from the Global Land Cover Characteristics database (GLCC). This groups together vegetation classes with similar remote-sensed albedos rather than similar ecological characteristics. [Table 2](#) lists the major subtypes.

Table 1. Basic statistics of the East Asian region

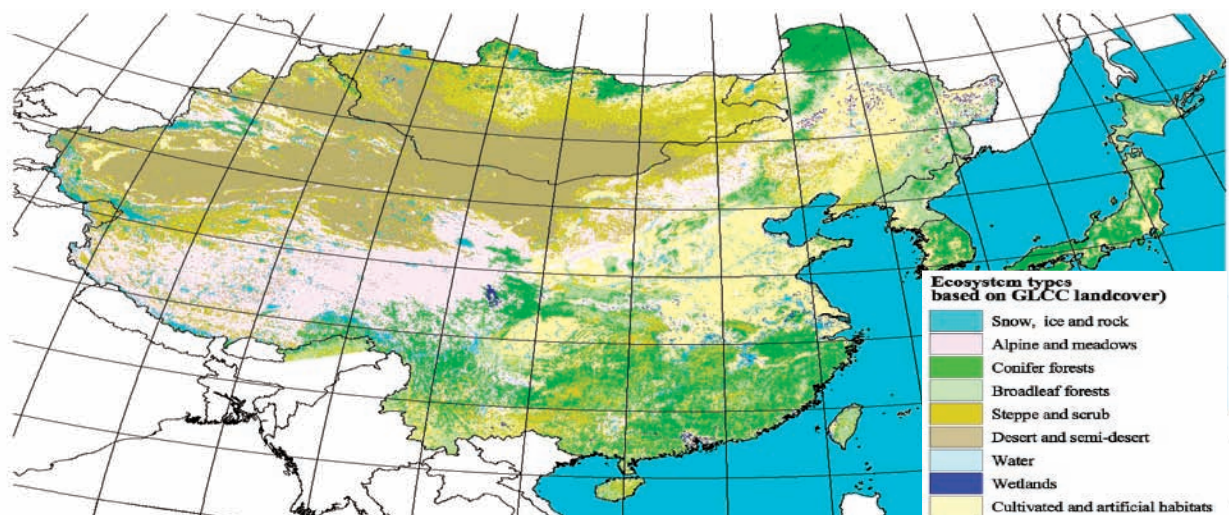
Area	Area (1000 km ²)	Population (millions)	% popn. growth	% forest cover	% forest loss	% PA cover	GDP per capita (US\$), 2002
China	9,597	1,300	1.4	20	0.6	15.0	c. 5,000
Hong Kong	1	6.8	0.5	5	0	51.5	28,700
Japan	370	124	0.6	20	0.2	17	28,000
Taiwan	38	53	1.5	29	0.6	12.1	23,400
Macau	0.03	0.44	0.87	0	0	0	19,400
DPRK	122	22	1.2	c. 12	no data	2.6	c. 1,000
ROK	98	48	1.2	c. 15	no data	7.9	17,700
Mongolia	1,565	2.5	2.8	c. 20	no data	13.9	1,800

Source: WCMC database, IUCN (2002); Global economic data, expert's update(2006).

Table 2. Major habitats and sub-habitats of the East Asian region

Major habitat class	Habitat subtypes
Ice and rock	Glaciers Barren screes above snowline
Alpine and meadows	Alpine pasture Alpine scrub Alpine meadows
Conifer forest	Taiga larch forest Sub-alpine cold fir/spruce/hemlock Temperate pine Mixed conifer/broadleaf forest Tropical pine forest <i>Casuarina</i> beach forest Conifer plantations
Broadleaf forest	Temperate oak Temperate poplar Subtropical evergreen forest Tropical monsoon forest Tropical evergreen/semi-evergreen forest Tropical limestone forest Secondary forest Mangrove forests
Steppe and grass	Steppe grassland Highland grassland Floodplain grassland Scrub vegetation
Desert/semi-desert	Cold alpine desert Sandy desert Stony desert <i>Artemesia</i> scrub
Urban/artificial	Irrigated cropland Dry cropland Shifting agriculture Urban areas Secondary grassland Orchards
Freshwater	Freshwater lakes Saline lakes Large rivers Reservoirs
Wetlands	Alpine marshes Swampy reedbeds Coastal wetlands

Map 2. Major habitat types of the East Asian region (5 degree grid)



2.5 Biological richness

The East Asian region is one of great biological richness. China itself is one of the five richest countries in the world in terms of species numbers. Several biological hotspots are recognised in the region, including the Eastern Himalayas and Hengduan Mountains. Southwest Yunnan falls within the Indochina hotspot.

That the tropical and subtropical parts of the region rank as biologically rich is perhaps to be expected, but the region also contains the richest temperate ecosystems on the planet. The rich mesophyll forests of temperate central China are particularly rich in trees and other plant species, including several relict species. The single World Heritage site of the Qionglai Mountains in Sichuan has over 10,000 plant species, about as many as the whole of Germany.

Levels of endemism are high in some areas. The islands of Japan, Taiwan and Hainan contain many endemic forms, but China also has several regions of high endemism. These are demarcated by the distribution of identified Endemic Bird Areas (EBAs) and Endemic Mammal Areas (EMAs), though they are also rich in endemic plant species.

Table 3. Species richness of East Asian countries/areas

Area	Mammals			Birds			Higher Plants		
	Total	End	Thr	Total	End	Thr	Total	End	Thr
China	580	77	42	1,244	67	86	30,000	17,500	343
Japan	132	38	17	583	21	31	4,700	200	706
Mongolia	134	6	8	390	2	11	2,272	229	1
ROK	49	0	6	390	0	19	2,500	224	69
DPRK	55	0	7	371	0	16	2,500	107	7
Taiwan	63	10	6	445	14	12	4,000	1,075	95

Source: WCMC (2003). End = Endemic species; Thr = Globally threatened species.



Maolan Nature Reserve, Guizhou, China

2.6 Features of special interest

East Asia boasts the highest mountains, largest plateau and greatest temperate deserts and steppes in the world. Other unique features include the Three Rivers Region of southwest China, where the great rivers of the Nujiang (Salween), Lancangjiang (Mekong) and Changjiang (Yangtze) run close together before parting ways to flow into the Indian Ocean, South China Sea and Pacific Ocean respectively. The great loess plain of north-central China is another unique feature, and the large yellow dust storms it generates still plague the lives of hundreds of millions of people. Unique karst limestone scenery dominates much of the south of the region.

Some of the most famous and striking species of the region include the comically coloured giant panda (*Ailuropoda melanoleuca*), other endemic mammals such as the red

panda (*Ailurus fulgens*), takin (*Budorcas taxicolor*) and golden monkey (*Rhinopithecus roxellana*), also fabulously coloured pheasants and great congregating areas for wintering cranes and geese.

2.7 Zoogeographic divisions

Most of the East Asian region lies within the Palearctic Realm, but tropical regions in southern China (including Taiwan) and southern Japan lie within the Indo-Malayan Realm. The Japanese Pacific Ogasawara Islands are normally classed as part of Oceania. The region contains 17 biomes as classified by Udvardy (1984) and has been further classified into 76 ecoregions by WWF (Olson, D. M., Dinerstein, E. (2002). [Table 4](#) compares the Udvardy biomes with WWF's ecoregional classification. More details of the ecoregions concerned are given under the country summaries in Section 3.

East Asia boasts the highest mountains, largest plateau and greatest temperate deserts and steppes in the world

Table 4. Comparison of Udvardy biomes and WWF ecoregional classification of East Asia

Realm	Biome	Ecoregion
Palearctic	2.1.2 Chinese Subtropical Forest	PA0101, PA0118, PA0437
	2.2.2 Japanese Subtropical Forest	PA0440, PA0441, PA0439
	2.4 Siberian Boreal Taiga	PA0609, PA0601, PA0805
	2.14.5 Manchu-Japanese Mixed Forest	PA0511, PA0510, PA0414 PA0426, PA0901, PA0907, PA0903, PA0505
	2.15.5 Oriental Deciduous Forest	PA0413, PA0428, PA0427, PA0511, PA0417, PA0415, PA0424, PA0902, PA0908, PA0411, PA0430
	2.22.8 Taklimakan-Gobi Desert	PA1314, PA1315, PA1302, PA1317, PA1316, PA1013, PA0508, PA1302, PA1324, PA1330, PA0442,
	2.23.8 Tibetan	PA1002, PA1011, PA1006, PA1020, , PA1022, PA0517, PA1015
	2.29.11 Pontian Steppe	PA0806
	2.30.11 Mongolian-Manchurian Steppe	PA0815, PA0804, PA0816,
	2.35.12 Altai Highlands	PA0502, PA1001, PA0512, PA1007, PA0815, PA0519, PA1016
	2.36.12 Pamir-Tian Shan Highlands	PA1019, PA0521, PA1014
	2.38.12 Himalayan Highlands	IM0401, IM0501, PA1003, PA1021,
2.39.12 Szechwan (Sichuan) Highlands	PA0102, PA0509, PA1017, PA0518,	
Indo-Malayan	2.41 Ryukyu Islands	IM0170
	4.6.1 South Chinese Rainforest	IM0149, IM0172, IM0171, IM0169
	4.10.4 Thailand Monsoon Forest	IM0137, IM0140
Oceania	Ogasawara Islands	OC0109

Whether we look by geographic region, altitude band, ecoregion or species distributions, all variations are to some extent covered by the PA system

2.8 Summary of PA development

At 16 per cent of the region's inland area, the overall areal coverage of PAs in East Asia is excellent. The GIS analysis by WCMC (2005), however, reveals that this coverage is uneven, varying by country and area. Hong Kong has about 50 per cent PA coverage, whereas DPRK has only 2.6 per cent. Coverage is biased towards regions with low human densities, high mountains and barren, unproductive areas. Nevertheless it is difficult to find any major gaps in the system. Whether we look by geographic region, altitude band, ecoregion or species distributions, all variations are to some extent covered by the PA system.

Data from the World Database on Protected Areas reveal that a much larger number and area of sites are terrestrial rather than marine. These figures are not reproduced here since many sites are not included in the database.

Poor reporting, incompatible data sources and sites that do not fit into

IUCN categories are the main reason for these discrepancies. More recent and complete data are presented under the various area treatments in Section 3. Some countries also disagree with the categories assigned to their sites by IUCN and WCMC. This highlights the need for improved data reporting to the database by areas and the need for more involvement by national experts in the WCPA.

The growth in the region's PA systems has been rapid. China alone has established an average of more than 100 new protected areas a year for the past 17 years. The region now has a total protected area of 1.8 million km², illustrated in [Map 3](#).

Despite the gaps in the data holdings of the World Database on Protected Areas, it does show this rapid increase in PA area and numbers over time (see [Figures 1 and 2](#)).

International sites

Besides the national PA systems, several of East Asia's best protected areas are also important international sites. [Table 5](#) summarises the details by country.

Map 3. The PA system of East Asia, 2003 (5 degree grid)

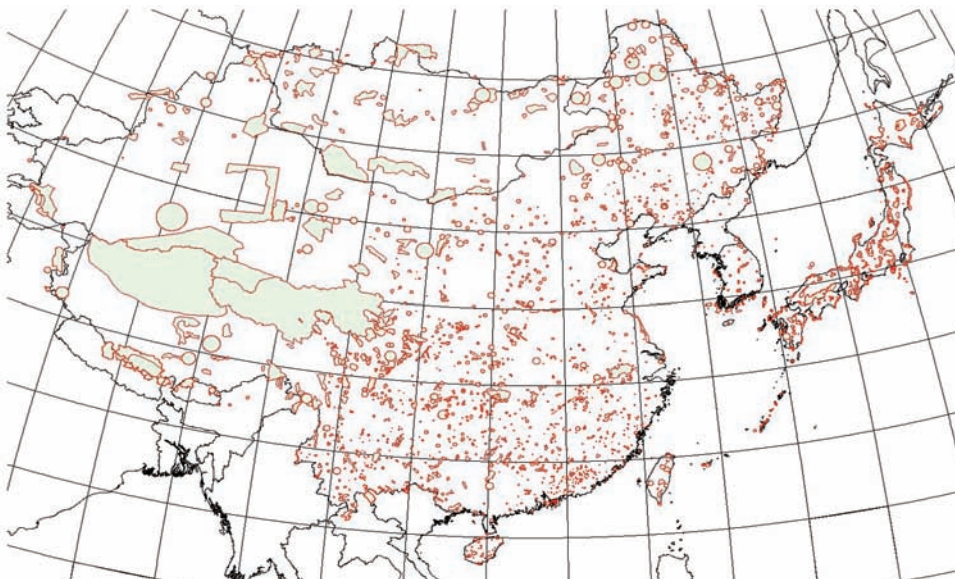


Figure 1. Growth of PA system by area in East Asia

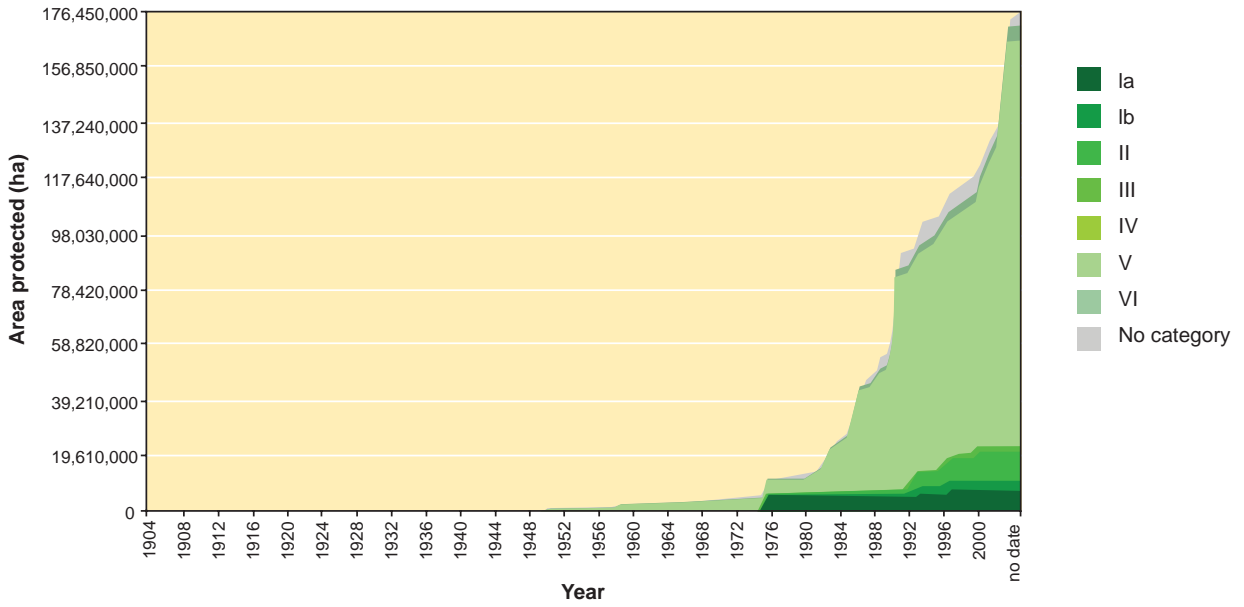
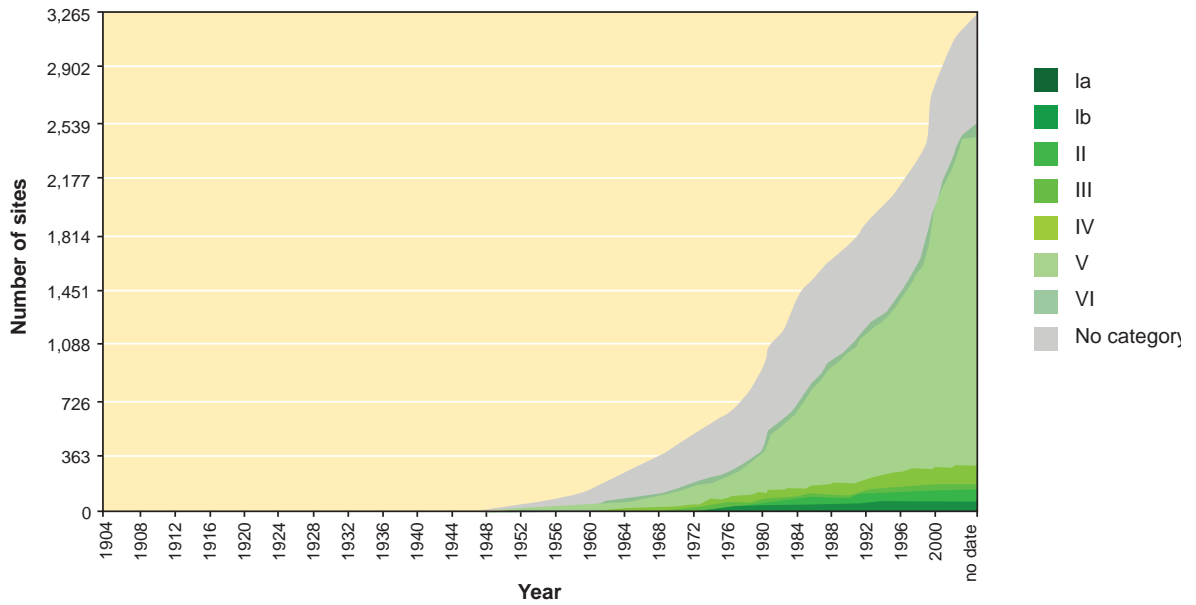


Figure 2. Growth of PA system by number of sites in East Asia



3. COUNTRY/AREA SUMMARIES

3.1 Mainland, People's Republic of China

Extent and landform

China has a total land area of 9.6 million km², or 81 per cent of the region (Hong Kong, Macau and Taiwan are described separately below). With a population of 1.3 billion people and the fastest growing economy in the world, China is poised to become the next economic superpower.

Its capacity to conserve or consume natural resources is crucial to conservation in East Asia and beyond.

China has a huge range of biological features, from mountain chains and deserts to grasslands and forests ranging from boreal to tropical evergreen and mangroves. It contains parts of 58 of the 81 WWF ecoregions identified in East Asia. Apart from the island groups of Japan and Taiwan, both of which have endemic forms and formations, it exhibits all of the features already described for the region as a whole.

China contains parts of 58 of the 81 WWF ecoregions identified in East Asia

Table 5. East Asian international sites, 2006

Country	No. of sites	Protected area (km ²)
Biosphere Reserves		
China	26	63,776
Japan	4	1,158
DPRK	2	1,847
ROK	2	1,224
Mongolia	5	153,461
Total	39	221,466
Ramsar Sites		
China	30	29,359
Hong Kong	1	15
Japan	33	1,303
ROK	4	45
Mongolia	11	14,395
Total	78	45,117
World Heritage Sites (Natural and mixed)		
China	9	29,471
Japan	3	987
Mongolia	1	9,467
Total	13	39,925

Table 6. Ecoregions of China

Ecoregion	Number	National area (km ²)	% of world total within area
Guizhou Plateau broadleaf and mixed forests	PA0101	269,500	100
South China – Vietnam subtropical evergreen forests	IM0149	183,692	82
Jian Nan subtropical evergreen forests	IM0118	661,110	100
Yunnan Plateau subtropical evergreen forests	PA0102	240,300	100
Northern Indochina subtropical forests	IM0137	144,758	33
Northern Triangle subtropical forests	IM0140	2	<1
Nujiang Langcang Gorge alpine conifer and mixed forests	PA0516	82,000	100
Hengduan Mountains subalpine conifer forests	PA0509	99,400	100
Southeast Tibet shrublands and meadows	PA1017	460,800	100
Qionglai-Minshan conifer forests	PA0518	80,200	100
Sichuan Basin evergreen broadleaf forests	PA0437	98,100	100
Daba Mountains evergreen forests	PA0417	168,300	100
Changjiang Plain evergreen forests	PA0415	438,000	100
Huang He Plain mixed forests	PA0424	434,200	100
Bohai Sea saline meadow	PA0902	11,600	100
Yellow Sea saline meadow	PA0908	5,300	100
Central China loess plateau mixed forests	PA0411	359,600	100
Northeast China Plain deciduous forests	PA0430	232,500	100
Manchurian mixed forests	PA0426	354,143	70
Changbai Mountains mixed forests	PA0414	46,154	49
Amur meadow steppe	PA0901	51,672	42
Suiphun-Khanka meadows and forest meadows	PA0907	14,410	43
Mongolian Manchurian grassland	PA0813	578,094	65
Nenjiang River grassland	PA0903	23,200	100
Da Hinggan-Dzhagdy Mountains conifer forests	PA0505	151,479	61
East Siberian taiga	PA0601	282	<1
Daurian forest steppe	PA0804	2,610	1
Eastern Gobi desert steppe	PA1314	178,315	63
Ordos Plateau steppe	PA1013	215,500	100
Helanshan montane conifer forests	PA0508	24,700	100
Alashan Plateau semi-desert	PA1302	217,967	32
Qilian Mountains conifer forests	PA0517	16,700	100
Qilian Mountains subalpine meadow	PA1015	73,200	100
Qin Ling Mountains deciduous forests	PA0434	123,279	100
Qaidam Basin semi-desert	PA1324	192,000	100
Taklimakan desert	PA1330	741,900	100
Tarim Basin deciduous forests and steppe	PA0442	54,500	100
Tian Shan montane steppe and meadow	PA1019	190,209	68
Tian Shan montane conifer forests	PA0521	12,787	46
Jungger Basin semi-desert	PA1317	304,200	100
Emin Valley steppe	PA0806	44,916	69
Altai montane forest and forest steppe	PA0502	16,986	12
Altai alpine meadow and tundra	PA1001	15,337	17
North Tibetan Plateau – Kunlun Mountains alpine desert	PA1011	374,400	100
Pamir alpine desert and tundra	PA1014	30,806	26
Karakoram – West Tibetan Plateau alpine steppe	PA1006	25,093	18
Tibetan Plateau alpine shrublands and meadows	PA1020	272,100	100

Table 6. Ecoregions of China (continued)

Ecoregion	Number	National area (km ²)	% of world total within area
Central Tibetan Plateau alpine steppe	PA1002	629,500	100
Western Himalayan alpine shrub and meadows	PA1021	33,354	48
Yarlun Tsangpo arid steppe	PA1022	59,500	100
Northeastern Himalayan subalpine conifer forests	PA0514	40,626	88
Altai steppe and semi-desert	PA0802	1,970	2
Tian Shan foothill arid steppe	PA0818	8,027	6
Northwestern Himalayan alpine shrub and meadows	PA1012	635	1
Eastern Himalayan alpine shrub and meadows	PA1003	86,389	71
Eastern Himalayan subalpine conifer forests	IM0501	651	1
Eastern Himalayan broadleaf forests	IM0401	Marginal	<1
Hainan Island monsoon rainforests	IM0169	15,500	100

Biological characteristics

As a consequence of its size, varying nature and complex geological history, China has a wide range of habitats and large numbers of species. About 30,000 species of higher plants belonging to 353 families and 3,184 genera of which 190 are endemic genera occur here. China contains the richest temperate regions in the world and ranks globally as one of the richest countries in terms of overall plant diversity. The country is also recognised by Conservation International (CI) as a mega-diversity country because of its rich vertebrate and other zoological wealth. About 10 per cent of all vertebrates on the planet occur here, including many rare and endemic forms such as the famous giant panda.

Population and economy

China is the most populous country on earth. Although the majority of the population are ethnic Han, 56 smaller “nationalities” still exist, especially in the northeast, southwest and west of the country. The religion of the Han was formerly Taoism and

Confucianism, but few now follow these faiths. The dominant religion in northwest China is Islam; in Xizang (Tibet) and extreme southwest Yunnan it is Buddhism.

The population density of eastern China, especially in the fertile valleys and plains, is high, but the population density of the west is very low. Standards of living and economic development are growing fast, especially in the coastal regions. This is putting great pressure on natural resources as well as causing impacts on environmental quality in the form of pollution, acid rain and siltation. Deforestation has been seen as a contributing factor in the denuding of upper catchments and silting of drainage channels and lakes, resulting in regular devastating floods. Overgrazing and deforestation, combined with climate change, are having serious effects on the water supply and much of northern China now faces annual water shortages. Major engineering schemes designed to meet these two challenges, such as dams and canals, are having further impacts on the natural environment.

Harvesting traditional medicines from the wild and the consumption of animal species are placing an additional burden on wildlife populations. The wildlife trade threatens the timber and wildlife resources of neighbouring countries, while also exposing China to new threats from invasive alien species (IAS).

Conservation policy and law

China’s policy on nature conservation and environmental protection is very good. Dozens of laws and regulations have been issued by departments at different levels. Separate laws cover wildlife protection, forestry, marine conservation, wetlands conservation and EIA. China has adopted the policy of establishing a national system of PAs to protect species, ecosystems and natural sites. The national policy on protected areas is set out in several key documents and regulations. Some important examples are listed in [Table 7](#).

Table 7. Some key national policies, documents and regulations of China

Policy	Date	Instrument
First PA established in China	1956	Declaration of Dinghushan as PA
PAs recognised as important part of national planning	1979	Notice of Strengthening, Planning and Scientific Investigation in Nature Reserves
First three Man and Biosphere (MAB) reserves established	1980	National MAB Committee
PAs recognised as legal entities	1981	Forest Law
Regulations for PAs promulgated	1985	Management Approaches of Nature Reserves of Forest and Wildlife, Law of Grassland
China recognises heritage value of PAs and joins World Heritage Convention	1985	World Convention on Protection of Cultural and Natural Heritage
PA role in ecological conservation recognised	1987	Principles on China's Ecological Conservation
Need for species protection recognised	1988	Law of Wild Animal Protection
Recognition of important wetlands	1988	Ramsar Convention
China accepts global responsibilities and need to share benefits from uses of biodiversity	1992	Convention on Biological Diversity
Recognition of need to protect geological sites	1994	Rules for Conservation Management of Geological Relics
Rules for Nature Reserves endorsed by State Council	1994	Regulations for Nature Reserves
Regulations for Marine reserves established	1995	Management Approaches of Marine Nature Reserves
Wide range of policy issues restated and approved	1992	China Biodiversity Action Plan
Logging ban applied to large areas following disastrous floods.	1998	Prime Minister's Decision
Programme launched to reverse clearing of steep land for farms	1999	Programme for returning farmland to forest and grassland
Programme launched to narrow economic gap between rural interior and urban east/south of China	1999	Great Western Development Programme
Programme launched to improve rural livelihoods	2003	Decree Number One

Despite this long list, China has no comprehensive law for the establishment of PAs. Currently these are established under ministerial regulations only. Moreover, existing laws provide limited flexibility in terms of zoning and management options. As a result most protected areas are managed in ways that flout the word and spirit of the law. Work is ongoing to develop new legislation for PAs and zonation, as well as wetlands regulations at national and provincial levels.

PA history

China has been actively establishing protected areas since it created the first such area in Dinghushan in Guangdong province in 1956. Since then new PAs have been regularly added to the national list, slowly up to 1979 and then at an accelerating pace after the Cultural Revolution to the present time.

Since only one regulation exists to define a nature reserve, all such sites have the same legal status, though small parks are very different in character from large reserves. Further, protected areas are established for a variety of purposes by different agencies and at different levels of government (national to county). More than ten different agencies establish and manage protected areas.

Most nature reserves are assigned to one of three main types – wildlife protection, ecosystem protection or natural relic protection, though the distinction is unclear and most reserves have elements of more than one type. Table 8 details the numbers of each major type.

Work is ongoing to develop new legislation for PAs and zonation, as well as wetlands regulations

Qiangtang Nature Reserve, for instance, the second-largest nature reserve in the world, is the same size as Italy

PA extent

By the end of 2005 China had established over 5,000 protected areas. These cover more than 18 per cent of the country's land area, which is somewhat higher than the global average. The most important of these areas are nature reserves. By the end of 2005 there were 2,349 nature reserves (Hong Kong, Macau and Taiwan not included). Of these, 265 are national nature reserves (in July 2006) with a total area of about 1.5 million km². Terrestrial nature reserves cover about 15 per cent of China's land area (SEPA 2006). Besides nature reserves there are 1,400 forest parks (627 national), over 800 scenic landscape and historical sites (187 national), over 138 national geological parks, over 50 water conservation scenic areas, and over 1,000 small nature reserves and agricultural reserves covering about 3 per cent of China's land area. These different types of protected sites all qualify as "protected areas" according to the IUCN definition of the term.

Table 8 gives the basic statistics of nature reserves in China and Map 4

shows their spatial distribution. In the populated east and south of China there are large numbers of small reserves, whereas in the depopulated west there are a few large reserves. The combined area of the 20 largest nature reserves is nearly 60 per cent of the total area of all reserves. Qiangtang Nature Reserve, for instance, the second-largest nature reserve in the world, is the same size as Italy. The size of the smaller reserves can be as small as 1 ha. The 512 smallest nature reserves account for 21.78 percent of the total number of reserves but only 0.13 per cent of their total area (SEPA 2006).

The allocation of most of China's protected areas to IUCN Category V in the 2006 World Database on Protected Areas (WPDA Consortium, 2006) is arguable. These sites have many human activities but their declared management objectives are closer to Category I than Category V. National experts should reclassify the list as soon as possible.

Table 8. Types of native reserves in China

Type	Number by the end of 2005	Area, 2005 (km ²)
Natural Ecosystems Type		
Forest ecosystem	1,205	323,361
Prairie and meadow ecosystem	46	32,382
Desert ecosystem	29	399,688
Inland wetland and watershed ecosystem	245	255,962
Ocean and coast ecosystem	66	9,798
Wildlife Type		
Wild animals	483	435,655
Wild plants	144	24,883
Natural Relics Type		
Geological relics	103	12,019
Fossil relics	29	5,743
Total	2,349	1,499,490

Source: SEPA (2006)

PA management agencies and standards

Most of China's nature reserves are managed by the State Forestry Administration (SFA). Others are established by the State Environment Protection Agency (SEPA), Ministry of Construction, Ministry of Water Conservation, Ministry of Agriculture or State Oceanic Administration.

Figure 3 illustrates this distribution. Coordination between the different agencies needs to be improved. A few sites are managed by multiple agencies

Many of the larger nature reserves have been classed as national nature reserves, as opposed to being managed by provinces or counties. Xie and Li (2004) point out that the proportion of protected area managed at the national level is too great (67 per cent), and that more should be managed by provinces.

Standards of management are rather poor. The PA system has grown rapidly, most staff lack specialist training, there are no accepted standards, operational budgets are often inadequate, supervision is limited and flexible regulations are lacking. As a result many money-making ventures have sprung up within protected areas, often in conflict with their legal status and stated management objectives. This makes it difficult to assign IUCN categories to most sites.

Transfrontier initiatives

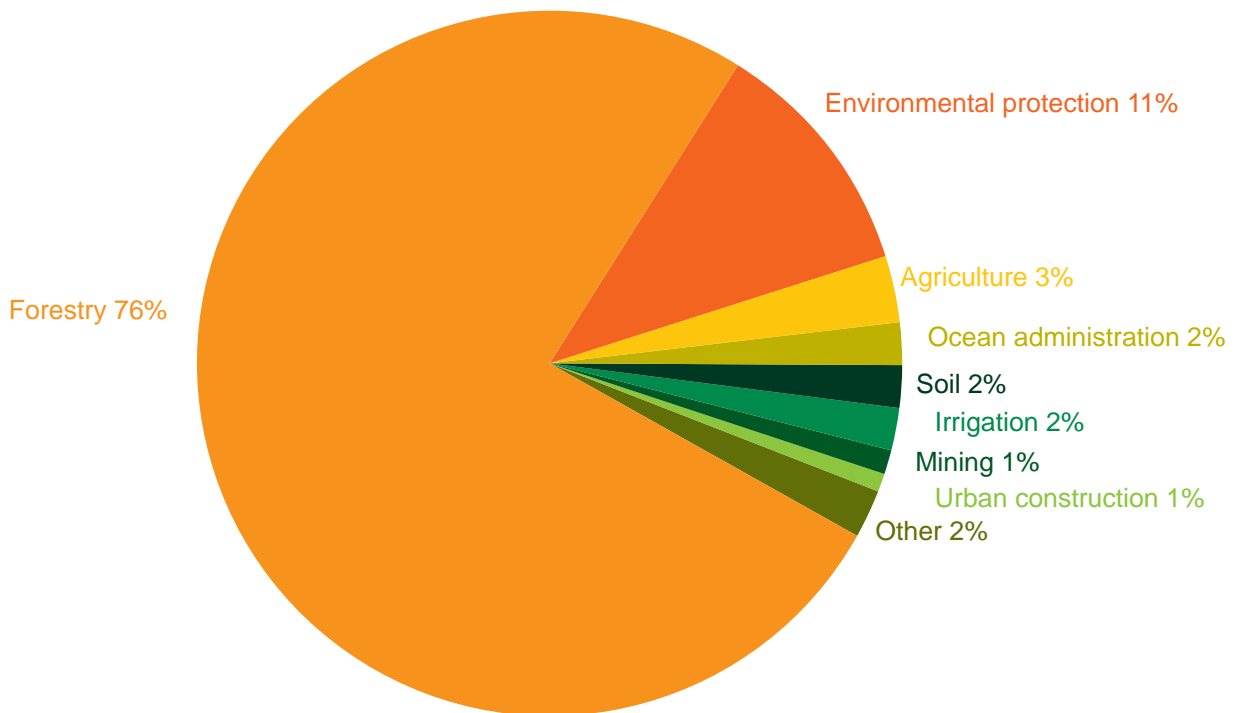
China borders on 14 different countries. Many examples exist of transfrontier connections between protected areas in China and those in neighbouring countries. Important ones include the Lake Xingkai/Kanka reserve between northeast China and Russia, the Changbaishan/Baekdu Mountain between China

and DPRK, the Gobi desert reserves and Altai Mountain reserves between China and Mongolia, the Karakoram reserves in China and Pakistan, the Qongmalonga/Everest and other Himalayan connections with Nepal, the Gaoligong Mountains between China and Myanmar, the Shanyang-Hanma connection between China and Lao PDR, and the Lian Shan mountains and Guangxi Limestone reserves between China and Vietnam.

Many of China's wetland reserves form part of international flyways and migration pathways, so are connected through migration with other sites in Russia, ROK and Southeast Asia.

There is concern about China's international trade, especially its wildlife trade. China is tackling this problem domestically and in various bilateral and international fora.

Figure 3. Proportion of PA system in China managed by different agencies (by area, 2002)



Nature Reserve System in China
中国自然保护区体系



Source: Xie and Li (2004)

Hong Kong has undergone at least two phases of almost total deforestation followed by reforestation

3.2 Hong Kong

Extent

Hong Kong became a Special Administrative Region (SAR) of the People's Republic of China on 1 July 1997. It has a total land area of 1,104 km², consisting of part of the Chinese mainland plus Hong Kong Island, Lantau Island and some smaller islets.

Biological characteristics

Hong Kong falls within the South China-Vietnam subtropical evergreen forest ecoregion. However, it has undergone at least two phases of almost total deforestation followed by reforestation. Secondary forests now cover 16 per cent of its land area, but the rural landscape is dominated by bare hills covered in secondary grasslands. Bush fires are a regular problem. The only semi-natural forests left are probably the small patches preserved by villagers behind their homes for *feng shui* purposes. Forest cover is increasing and

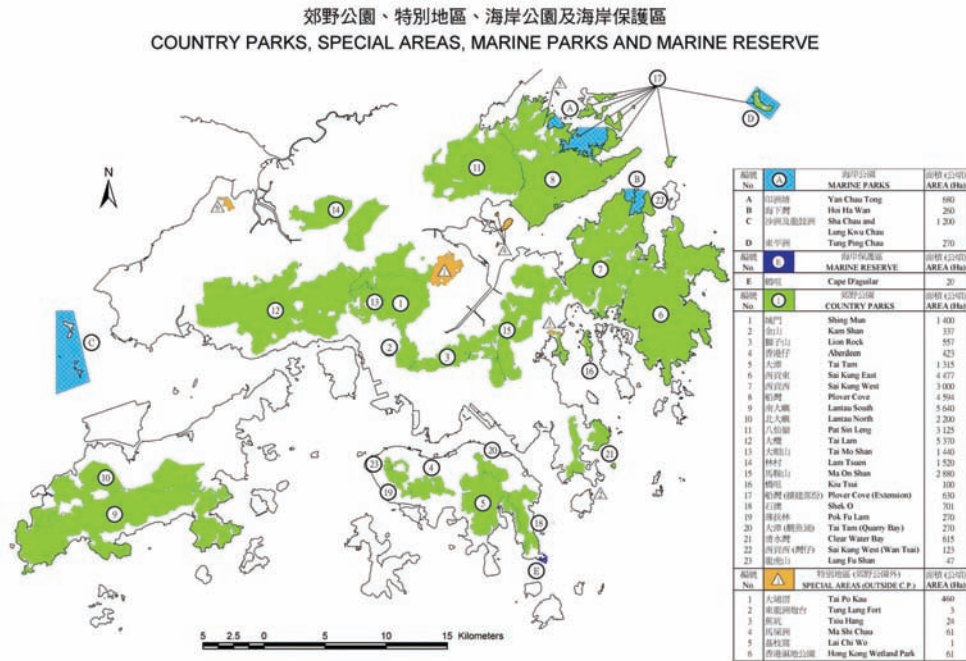
new species are constantly being identified and added to the Hong Kong lists as the SAR government and naturalists document its wildlife. Wildlife from the more degraded forests in adjacent Guangdong province probably also seeks refuge here.

Significant mangroves, reedbeds and fishponds are found in the Mai Po Inner Deep Bay Ramsar site. Coral communities are protected in marine parks in eastern waters, and Chinese white dolphins (*Sousa chinensis chinensis*) are protected in the marine park in western waters.

Population

Hong Kong is home to 6.9 million people who enjoy a per capita GDP of US\$28,700 and high living standards (2002). The population is mostly Chinese, but as a major international trading and services centre Hong Kong has attracted a wide range of nationalities. Buddhism and Christian are the main religions but most other faiths are practised.

Map 5. The PA system of Hong Kong, 2003



Conservation policy and law

Hong Kong enjoys a high degree of autonomy in land management and conservation. It participates as part of China in many international conventions and programmes limited to states, or on its own in those not limited. Its nature conservation policy is to regulate, protect and manage natural resources that are important for the conservation of the area's biological diversity in a sustainable manner, taking into account social and economic considerations, for the benefit and enjoyment of the present and future generations. The Wild Animals Protection Ordinance (1994) prohibits the hunting, sale, export or possession of protected wild animals and restricts access to three ecologically important areas. The Forests and Countryside Ordinance (1993) provides similar protection to protected plants. The County Parks Ordinance (1976, 2005) and Marine Parks Ordinance (1995) enforce the conservation and management of protected areas. The Environmental Impact Assessment Ordinance (1998) helps to protect

ecologically important areas from adverse development impacts. As a part of China Hong Kong implements the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the Ramsar Convention.

PA history

By 2006, 23 Country Parks and 17 Special Areas (11 of them within Country Parks) had been designated under the Country Parks Ordinance, covering a total area of 41,644 ha. Four Marine Parks and one Marine Reserve covering 2,430 ha of open sea with a high conservation value have been designated under the Marine Parks Ordinance. There are also 66 Sites of Special Scientific Interest, one Ramsar Site and three Restricted Areas for the protection of wild animals and plants.

PA extent

Hong Kong has a high rate of protected area coverage. This is almost entirely composed of Country Parks, which consist of open wild secondary habitat and are managed for conservation, recreation,

education and tourism. Mai Po and Inner Deep Bay, part of which was originally established as a Restricted Area, was listed as a Ramsar Site in 1995. A system of marine protected areas established in 1996 covers the major ecologically sensitive marine and coastal sites.

PA management agencies and standards

The extensive system of Country Parks is managed by the Agriculture, Fisheries and Conservation Department of the Hong Kong government. Standards of management are high and there are close links between universities, NGOs and the Department.

Transfrontier initiatives

Hong Kong has no international borders. It does however share an administrative boundary with Guangdong province of China, and in 1996 began cooperative programmes with the authorities of Futian nature reserve next to the Mai Po Inner Deep Bay Ramsar Site. This is an important stopping point for migratory waterfowl and forms part of the East

Asian–Australasian Shorebird Flyway Network. The site is also used as a training centre for wetland managers from China and other Asian countries.

The Kadoorie Farm and Botanic Garden has been working closely with several provinces of southern China, assisting with the surveying, planning and extension of tropical forest protected areas.

The SAR government maintains close contacts with its counterparts in Guangdong, with whom it holds regular meetings on issues of mutual interest in forestry, nature conservation and protected area management.

3.3 Japan

Extent and landform

Japan is an archipelago stretching 3,000 km from the subarctic zone in the north to the subtropical zone in the extreme south, comprising four large islands and over 3,000 small islands. Its total land area is 378,000 km². Japan has a high human population density and is economically advanced. Nevertheless it has been able to preserve about 67 per cent forest cover, comprising 27 per cent natural forest, 36 per cent secondary forest and 37 per cent planted forest. Four per cent of Japan

consists of grasslands, including some natural alpine meadows. The country has a small area of wetlands, including peaty moorland, reedbeds, lakes, rivers and coastal mudflats. The southern islands have coral reefs.

Biological characteristics

Biologically Japan is moderately rich with about 8,800 known vascular plant species, 241 mammal species and about 700 bird species (Nature Conservation Bureau, Ministry of the Environment, Government of Japan, 2002). A large proportion of these species are endemic to Japan.

The archipelago sits on the junction between the tectonic plates of continental Asia and the Philippines. As a result the position of the islands has changed dynamically over time, creating various connections among the islands and between the continent and various island groups. These have had profound effects on the islands' colonisation and evolution. Several mountains exceed 3,000 m and some are active volcanoes. Earthquakes are common.

The three large islands of Honshu, Shikoku and Kyushu once formed part of the same landmass (called Hondo) and share a similar biota. The northern island of Hokkaido has

been separate from Honshu in the recent geological past but has had connections via Sakhalin Island with Siberia. The Ryukyu and Ogasawara island groups in the extreme south have remained isolated for long periods of time and show high levels of endemism.

Nine of the WWF ecoregions lie entirely within Japan (Table 9).

The National Survey on the Natural Environment found that forests occupy 67 per cent of Japan's land area, of which 27 per cent are natural forests, 36 per cent secondary, including wooded areas in the countryside, and the remaining 37 per cent planted forest. Large natural forests are concentrated mostly in Hokkaido, with only smaller areas in other regions. Most of the remaining forests are montane coniferous forests. Evergreen broadleaved forests are now rarely found in large tracts. Tidal flats and mangrove forests growing in estuaries have high levels of biological diversity. The mangrove forests of Iriomote Island are the largest in Japan. Secondary forests are used to produce charcoal and firewood. As a result of decreasing human intervention, forest succession has proceeded unhindered and a sharp reduction in certain species is feared.

Table 9. Ecoregions of Japan

Ecoregion	Number	Area km ²	% of world total within area
Taiheyo evergreen forests	PA0440	138,300	100
Taiheyo montane deciduous forests	PA0441	41,900	100
Nihonkai montane deciduous forests	PA0428	82,300	100
Nansei Islands subtropical evergreen forest	IM0170	4,100	100
Ogasawara subtropical moist forests	OC0109	100	100
Nihonkai evergreen forests	PA0427	21,600	100
Honshu alpine conifer forests	PA0511	11,500	100
Hokkaido montane conifer forests	PA0510	45,800	100
Hokkaido deciduous forests	PA0423	25,500	100

Natural alpine grassland and subalpine meadows occur on high mountains. Secondary grasslands have replaced forests at lower altitude and are used for grazing. Japan also has some important moorlands.

Japan's lowland wetlands have been largely converted into rice paddies. Extensive coastal mudflats are important for resident and migrant waders and other waterfowl. Rivers and lakes serve as important habitats for aquatic plants and animals. Many rivers are traversed by structures that make it difficult for fish to pass from upwater to estuaries.

As an archipelago, the marine areas of Japan are important sources of fish, crustaceans and edible seaweeds. The warm and cold currents between the islands have a dramatic enriching effect. Corals grow mainly on the southernmost islands.

A sharp decrease in coral reefs is evident in the Ryukyu Islands, caused by damage from feeding crown-of-thorns starfish (*Acanthaster planci*) and sedimentation of red clay.

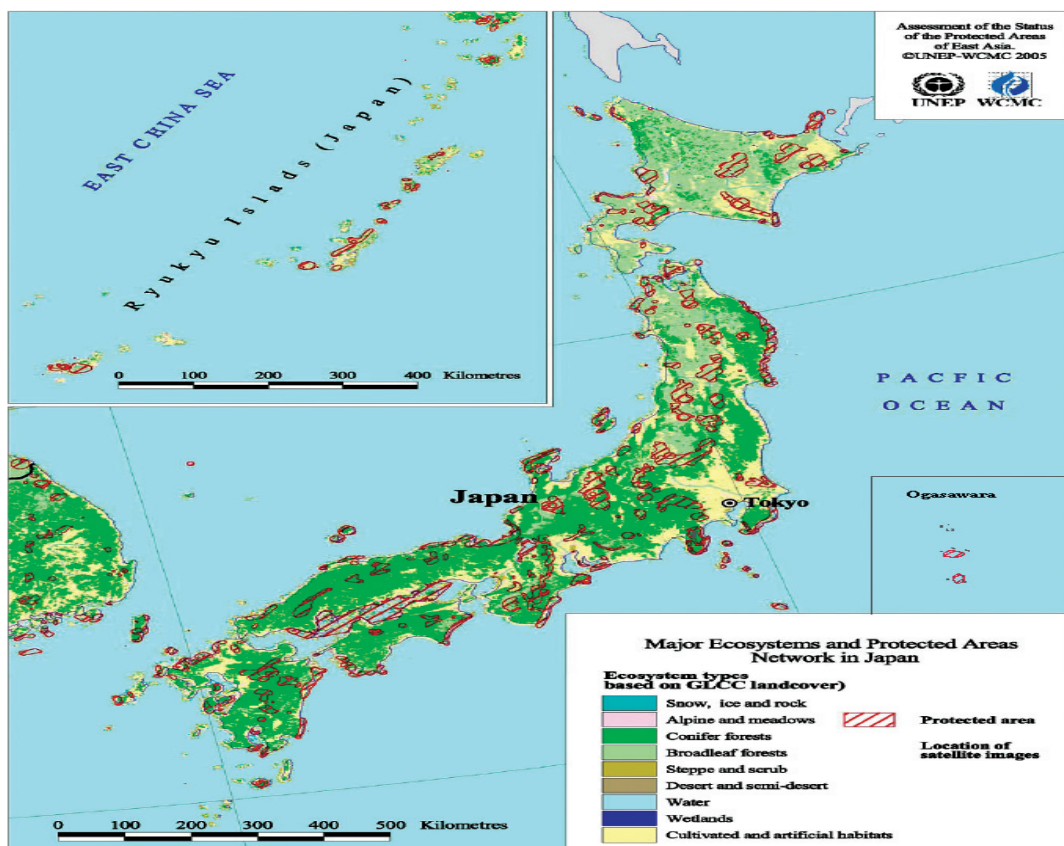
Population and economy

Japan is a highly developed nation with a population of 124 million and a per capita GDP of US\$28,000 (2002). The main religion is Shinto. Japanese cuisine is based largely on rice and noodles with plenty of fresh seafood. There is little consumption of wildlife and little pressure on timber resources. The main pressure on natural forests has come from clearing of land for agriculture and development.

Japanese culture has for centuries valued the balance of nature and respected the need to conserve forests in water catchments.

Japanese culture has for centuries valued the balance of nature and respected the need to conserve forests in water catchments

Map 6. The PA system of Japan, 2005



Conservation policy and law

Japan has a strong policy towards nature conservation. The Third National Biodiversity Strategy of Japan, adopted in 2007, is the basic policy of the Japanese government for conservation and sustainable use of biodiversity. Several laws are relevant to PA development. These include:

- Basic Environmental Law (1993)
- Nature Conservation Law (1972)
- Natural Parks Law (1957), amended in 2002
- Law for the Conservation of Endangered Species of Wild Fauna and Flora (1992)
- Wildlife Protection and Appropriate Hunting Law (2002)
- Law for the Protection of Cultural Properties (1950)
- Forest Law (1951)
- Forestry Basic Law (1964)
- Fishery Basic Law (2001)
- Preservation of Fisheries Resources Law (1951)
- Urban Green Space Law (1973)
- City Parks Law (1956)
- Law for the Promotion of Nature Restoration (2003)
- Cartagena Protocol Domestic Law (2003)
- Invasive Alien Species Act (2004)
- Landscape Law (2004)
- Law for the Promotion of Ecotourism (2007)

Japan is active in many international fora such as CBD, the World Heritage Convention, CITES, the Ramsar Convention and the MAB programme.

PA history

Japan currently has 668 PAs covering 17 per cent of the country. [Map 6](#) shows the distribution of the main sites.

Japan's first National Park was established in 1934. The park system has expanded gradually over the years. Pursuant to the Natural Parks Law, the government has designated as parks outstanding natural scenic areas representative of Japan. Three categories of PA exist in Japan: National Parks, Quasi National Parks and Prefectural Natural Parks. There are 29 National Parks and 56 Quasi-National Parks, which rank after National Parks.

A further 309 outstanding natural scenic areas representative of the various prefectures have been designated as Prefectural Natural Parks, which rank after the National and Quasi-National Parks. As of December 2007 natural parks totalled 5,398,036 ha, or 14 per cent of Japan's land area.

To maintain seascapes, Marine Park Zones are designated within National and Quasi-National Parks. As of December 2007 Japan had designated 86 Marine Park Zones (totalling 2,359 ha) in 11 National Parks, and 67 Marine Park Zones (totalling 1,385 ha) in 14 Quasi-National Parks.

The Nature Conservation Law was enacted in 1972. On this basis, areas uninfluenced by human activities and areas with outstanding natural environments can be designated as Wilderness Areas and Nature Conservation Areas (or Prefectural Nature Conservation Areas) respectively to conserve the natural environment. Currently there are 551 such sites covering 103,565 ha.

In accordance with the Wildlife Protection and Appropriate Hunting Law, 66 Wildlife Protection Areas have been designated by the national government (as of December 2007), and 3,831 by prefectures (as of March 2007), for the protection and propagation of wildlife. Capturing wildlife is prohibited in these areas, which currently total about 3,650,000 ha.

Pursuant to the Law for the Conservation of Endangered Species of Wild Fauna and Flora, Japan has designated nine Natural Habitat Conservation Areas totalling 885 ha (as of December 2007) for designated national endangered species to prevent the extinction of wild fauna and flora.

PA management agencies and standards

Japan's PAs are managed mainly by the Nature Conservation Bureau of the Ministry of the Environment, though other agencies are also involved. Japan maintains high standards of research, monitoring, protective management, habitat restoration and ecotourism. More than 900 million visitors enjoy the parks each year. National parks in particular are managed with local communities, including local authorities and local residents, such as the Green Worker Programme and the Park Management Organizations.

Transfrontier initiatives

Japan has no land border with neighbouring countries. However, it does participate in regional and global programmes for conserving coral reefs and migratory birds and their habitats, and in several joint projects with neighbouring countries, including conservation of the crested ibis (*Nipponia nippon*).

3.4 Democratic People's Republic of Korea (DPRK)

Extent and landform

DPRK has a total area of 120,540 km². It lies between China and ROK, and has a small stretch of border with Russia.

The landform is rugged with mostly hills and mountains separated by deep, narrow valleys; the coastal plains are wide in the west and discontinuous in the east.

Baekdu-Changbai mountain is the highest peak at 2,744 m. About 59 per cent of the country's area is covered by forests, 15 per cent by scrub, 5 per cent by urban areas and 21 per cent by agricultural land. Deforestation rates are high.

Biological characteristics

Apart from its forests, the country has some important wetlands. DPRK contains parts of three WWF ecoregions (Table 10).

Population and economy

The population of DPRK is only 22 million people. Economic conditions and standards of living are the lowest in the region, with an estimated per capita GDP of US\$1,000 (2002). Much of the population is concentrated near the capital of Pyongyang. In rural areas the main economic activities are farming and coal mining.

Conservation policy and law

The government of DPRK has for many years recognised the importance of protecting the environment and particularly rare species and important biological sites. Legislation for establishing protected areas dates back to 1946.

Important laws include:

- Law on Forests (1992)
- Law on City Management (1992)
- Law on Construction (1992)
- Law on Survival of Cultural Relics (1995)
- Law on Water Resources (1997)
- Law on Prevention of Sea Pollution (1997)
- Law on Useful Animal Protection (1998)

Protected areas are established and managed by the Department of Forest Management, Ministry of Forestry, with advice from the DPRK Academy of Sciences (IUCN 1996). DPRK has two MAB Reserves and is a signatory to the CBD. It recently joined the World Heritage Programme of UNESCO and has created one cultural World Heritage site. The Global Environment Facility (GEF) ratified the medium-sized project "Biodiversity management of Mount Myohyang Natural Park" in January 2000, and is now reviewing the project "Biodiversity management of Korean West coast in DPRK". Otherwise DPRK participates little in international conservation programmes and, in line with other aspects of its development, its environmental programmes remain isolated and poorly known.

Development of National Biodiversity Strategy and Action Plan (NBSAP)

DPRK ratified the CBD in October 1994 and completed its NBSAP in October 1998. The Plan is closely

related to the General Land Construction Programme completed in July 1999. The major principles of this Programme were:

- arable land should not be encroached by land construction and resource development, but should be protected and spared as far as possible.
- the scale of cities should not be too large, and many small cities should be built.
- climatic and soil conditions in the various regions of the county should be taken into account.
- Construction should be scientific and comply with the economic development direction of the country and regions.

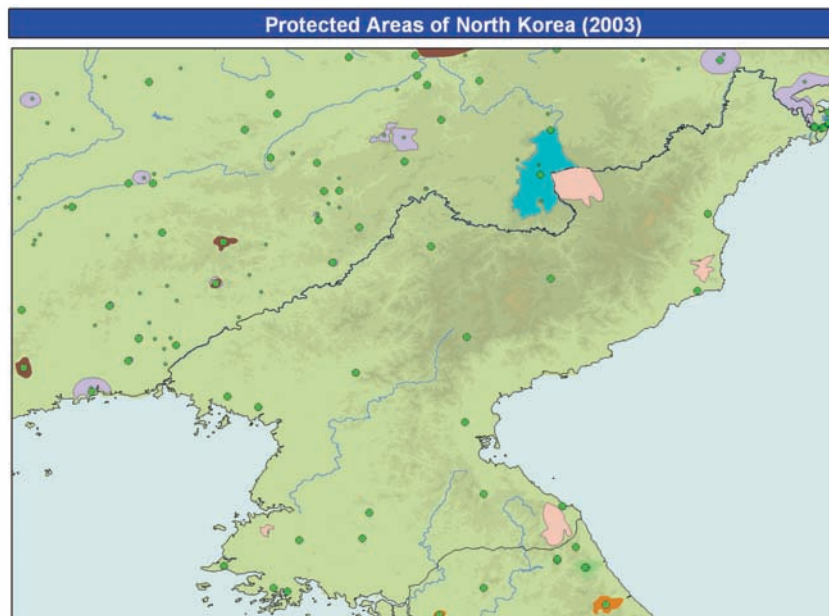
The General Land Construction Programme included protection and restoration of forest resources, protection and proliferation of useful animals and plants, establishment and management of protected areas, conservation and development of coastal areas and territorial waters, protection and proliferation of marine resources, and prevention of environmental pollution.

Positive measures have been taken under the NBSAP to increase the number of protected areas, improve protection and management capabilities, and manage wild animal and plant resources for biodiversity conservation.

Table 10. Ecoregions and PA cover of DPRK

Ecoregion	Number	National area Km ²	National (%)
Changbai Mountains mixed forests	PA0414	47,281	51
Manchurian mixed forests	PA0426	46,195	9
Central Korean deciduous forests	PA0413	27,992	27

Map 7. Existing PAs in DPRK, 2003



The NBSAP confirmed targets for natural protected areas covering 696,927 ha (5.68 per cent of the land area) out of a total protected area of 2,428,600 ha (19.78 per cent). The Plan emphasized the need for greater efforts to protect and manage the natural protected areas.

The NBSAP also reconfirmed 12 freshwater fishery resource reserves covering 3,395 ha and 15 coastal fishery resource reserves covering 19,450 ha.

The NBSAP confirmed 20 priority projects:

- Biological inventory and biodiversity evaluation
- Monitor and control biodiversity
- Establishment of national natural protected area system
- Management of Mount Baekdu Biosphere Reserve
- Biodiversity management of Mount Kumgang and Mount Myohyang National Parks
- Wetland protection in the estuary of the Chongchon River and the estuary of the Tuman River, Taedong Bay

- Improved management of marine resource reserves
- Publication of Red Data Book and protection of endangered and rare species
- Enhancement of *ex-situ* conservation capacity in botanical gardens, arboreta and zoos
- Establishment of a gene bank
- Protection of black-faced spoonbill (*Platalea minor*) and Chinese egret (*Egretta eulophotes*)
- Restoration of degraded forest ecosystems and enhancement of tree nursery capacity

Table 11. Number and area of major natural protected areas planned for DPRK (in NBSAP)

IUCN Category	Protected area	Number	Area (ha)
Strict Nature Reserve	7 Nature Reserves excluding Mount Baekdu Nature Reserve	8	60,600
Nature Park	20 Nature Parks excluding Mount Keumgang Nature Park	21	169,900
Nature Monuments	Districts for preserving natural monuments	291	51,191
	Special Reserve	12	19,000
Wild Reserve	Plant Reserve	14	29,330
	Animal Reserve	14	94,071
	Seabird Reserve	6	189
	Migratory (wetland) Reserve	12	19,000
Landscape Reserve	Supung Lake	24	147,646
	Landscape Reserve	23	108,000
Total			698,927

- Establishment of ecological agriculture and a model district for resource cycle agriculture
- Protection and proliferation of marine resources and freshwater and marine biodiversity conservation
- Protection and proliferation of Koryo medicinal resource
- Tree planting and forestation in urban areas
- Biodiversity conservation and sustainable development in the Chongchon River Basin
- Mapping out a national biodiversity programme
- Developing provincial Biodiversity Protection Plans
- Training officials in biodiversity and intensifying mass propaganda

PA history

Protected areas have developed gradually over many years. The first protected area was established in 1946. Other PAs were established on the basis of the original area in 1976 and 2003.

PA extent

DPRK's protected area system remains limited but has already surpassed its NBSAP targets. The total area of PAs is already 724,000 ha (5.12 per cent of the land area), but sites are distributed across all three ecoregions of the country. There are 170 PAs and 34 Natural Monument Reserves. These include two biosphere reserves (covering 125,120 ha), 78 natural parks (382,227 ha), four natural protected areas (62,810 ha), 22 plant protected areas (83,750 ha) and 20 marine resources reserves (45,510 ha).

There is plenty of scope to strengthen this system, since DPRK's remaining natural habitat is extensive, its population density mostly low, and pressure from other development still limited.

PA management agencies and standards

Almost nothing is known of DPRK's standards. Law enforcement is quite strict, but poverty may be expected to put great pressure on wood and other forest resources. It is clear that the government has limited resources or equipment to undertake research and protective management.

Transfrontier initiatives

The country undoubtedly contains significant populations of some endangered species, and could form important transfrontier linkages with neighbouring countries to establish protected areas.

DPRK is home to important wetlands forming part of the network of East Asian flyway reserves, as well as staging points for other migratory waterbirds such as geese, swans and cranes.

3.5 Republic of Korea (ROK)

Extent and landform

ROK has a total land area of 99,000 km², comprising the southern half of the Korean peninsula plus 3,153 islands (464 of which are inhabited). The country consists of several mountain ranges divided by wide valleys and contains a variety of forest types, wetlands and coastal areas.

Biological characteristics

ROK is moderately rich in terms of species numbers and endemism. Only in the evergreen forests of the extreme south are there many endemic plants and high levels of species richness. Jeju Island, for instance, has many endemic species. The lower elevations of the country are more or less developed, so rich forests are found mostly at higher elevations.

The country contains one WWF ecoregion and parts of two others (Table 12).

Table 12. Ecoregions of ROK

Ecoregion	Number	National area (Km ²)	National (%)
Central Korean deciduous forests	PA0413	75,625	73
ROK evergreen forests	PA0439	14,060	100
Manchurian mixed forests	PA0426	5,713	1

Population and economy

ROK has enjoyed rapid economic growth and development for several decades. It has a relatively high population of 48 million people. Per capita GDP was estimated at \$17,700 in 2002. The main towns are industrialised but extensive areas of farmland and forested countryside remain.

Conservation policy and law

The government of ROK was much influenced by the first World National Parks Congress held in the United States in 1962, which prompted it to pay greater attention to conserving ROK's natural resources. The Ministry of Construction was originally entrusted with the development of national parks in 1967. A National Parks Association of Korea was established in 1971. The Korean Ministry of Environment has managed the country's system of natural ecosystem conservation areas since 1989. A new Natural Environment Conservation Act was passed in 1991.

Other legal instruments relevant to PA establishment and management are the Wetlands Conservation Act (1999), Natural Parks Act (last revised 2001) and Special Act for the Ecosystem Conservation of Uninhabited Islands such as Tokdo (1997).

ROK also ratified the Ramsar Convention in 1997 and had established six Ramsar Sites by 2008.

PA history

The first national parks were established in 1967. Growth since then has been steady. In 2005 a special law brought the 2,634 km² Baekdu-Daegan Mountain system into the protected area network to protect the mountainous backbone of the Korean peninsula.

PA extent

ROK currently has 20 national parks, 23 provincial parks and 33 county parks covering 7.3 per cent of its land area. Other protected area categories

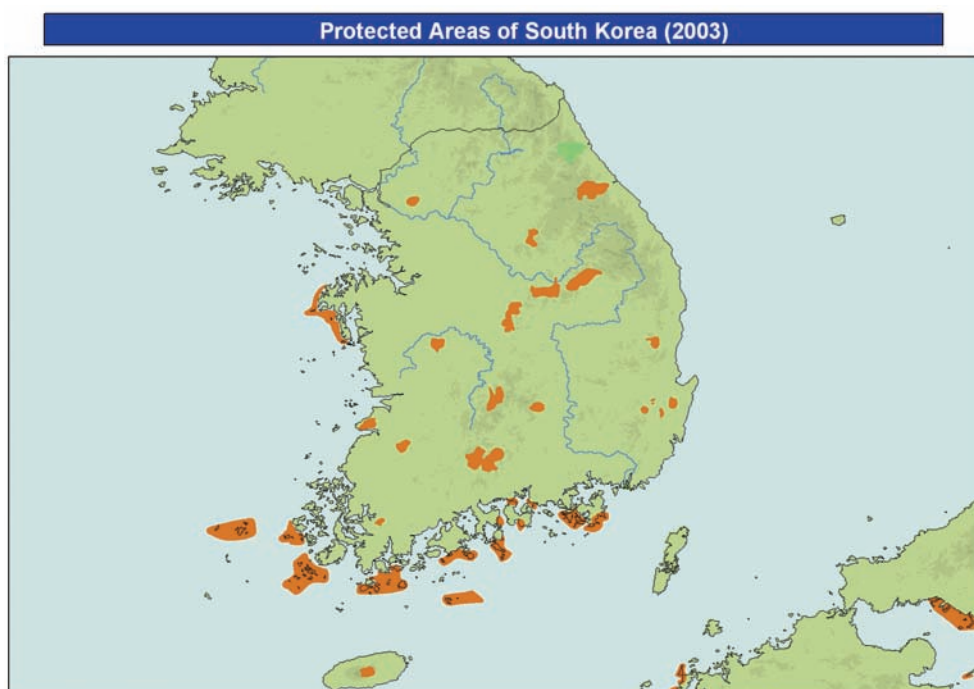
are natural ecosystem conservation areas, natural monuments including natural reserves, habitats for wild animals and plants, and scenic areas. These bring the total area under protection to 15,621,435 km², or 15.6 per cent of the land area, well above the 10 per cent target established at Caracas in 1994. Coverage could still be increased in the southern tip of the country, which is biologically the richest and most distinct region and constitutes a WWF ecoregion lying entirely within ROK. Sixty-three important wetland sites have been identified, including 48 along the Yellow Sea ecoregion, but only a handful are so far protected.

Map 8 shows the distribution of PAs.

PA management agencies and standards

Relevant divisions of the Ministry of Environment undertake the planning, establishment and management of the protected area system. Standards of effectiveness are quite high.

Map 8. PA system of ROK, 2003



Transfrontier initiatives

A major transfrontier initiative is the development of a protected area along the 250 km by 4 km Demilitarized Zone (DMZ) with assistance from UNDP. Negotiations have been held with DPRK to gain its cooperation in establishing a transfrontier Biosphere Reserve in this area. The combined area would also be suitable as a Peace Park.

3.6 Macau

Extent

Macau is a tiny area of only 25 km². The highest point is 172 m. The area consists of an island and small piece of adjacent mainland. This former Portuguese colony became a Special Administrative Region of China on 20 December 1999.

Biological characteristics

Macau lies within the South China-Vietnam subtropical evergreen forests ecoregion (PA0149). The climate is subtropical maritime monsoonal. Macau is entirely urban, though green areas (parklands) cover 20 per cent of its area. It has a coastline of 41 km, including some beaches.

Population and economy

The population is 0.44 million, with an annual growth rate of 0.87 per cent. Standards of living are high with a per capita GDP of US\$19,400 (2002).

Conservation policy and law

The urban nature of Macau leaves little room for nature conservation. Although its policy is to retain 20 per cent of the land as green spaces, these are secondary and artificial and there have been no attempts to establish protected areas.

PA history

Macau has no listed protected areas meeting the IUCN criteria. Its only World Heritage site is a cultural site.

3.7 Mongolia

Extent and landform

Mongolia is one of the largest landlocked countries in the world, covering an area of 1.56 million km². But, with a population of only 2.5 million, it remains one of least densely populated nations of East Asia. Mongolia is a land of diverse landforms including lakes, wetlands,

grasslands, forests, deserts and mountains. Moving across this broad mosaic are the traditional pastoralists who make up its population. Semi-nomadic herders ride horses and camels to take their herds of sheep, cattle and goats from one pasture to another in wide annual cycles.

Ecologically Mongolia constitutes a meeting zone in Central Asia where the Gobi Desert, Altai Mountains, Siberian taiga forest and Central Asian steppes converge. Much wild habitat and important species populations remain, though worsening climate and intensifying hunting are growing problems.

Biological characteristics

Mongolia is not rich in species but has some unique ecosystems and rare species.

Mongolia contains important sections of 15 WWF ecoregions (Table 13), and a marginal part of the Sayan intermontane steppe (PA815).

Table 13. Major ecoregions of Mongolia

Ecoregion	Number	National area Km ²	National (%)
Daurian forest steppe	PA0804	94,614	45
Mongolian-Manchurian grassland	PA0813	308,600	35
Trans-Baikal conifer forest	PA0609	38,060	19
Selenge-Orkhon forest steppe	PA0816	202,301	89
Sayan montane conifer forest	PA0519	38,294	11
Sayan alpine meadow and tundra	PA1016	21,540	27
Khangai Mountains alpine meadow	PA1007	37,167	100
Khangai Mountains conifer forest	PA0512	2,900	100
Gobi Lakes Valley desert steppe	PA1315	139,703	100
Eastern Gobi desert steppe	PA1314	178,315	63
Alashan Plateau semi-desert	PA1302	217,967	32
Junggar Basin semi-desert	PA1317	33,899	11
Altai montane forest and forest steppe	PA0502	90,369	63
Altai alpine meadow and tundra	PA1001	25,559	28
Great Lakes Basin desert steppe	PA1316	135,197	86

Mongolia's grasslands comprise over 6 per cent of the world's grasslands and constitute the largest and least disturbed area of temperate grasslands anywhere in the world

Mongolia's grasslands cover 66 per cent of its area and globally are of special significance. They comprise over 6 per cent of the world's grasslands and constitute the largest and least disturbed area of temperate grasslands anywhere in the world.

Species for which Mongolia remains an important refuge and of whose presence Mongolia is justly proud include the snow leopard (*Uncia uncia*), Mongolian saiga antelope (*Saiga tatarica mongolica*), argali (*Ovis ammon*), wild camel (*Camelus bactrianus*), brown bear (*Ursus arctos*), wild ass (*Equus hemionus*) and white-naped crane (*Grus vipio*).

Conservation policy and law

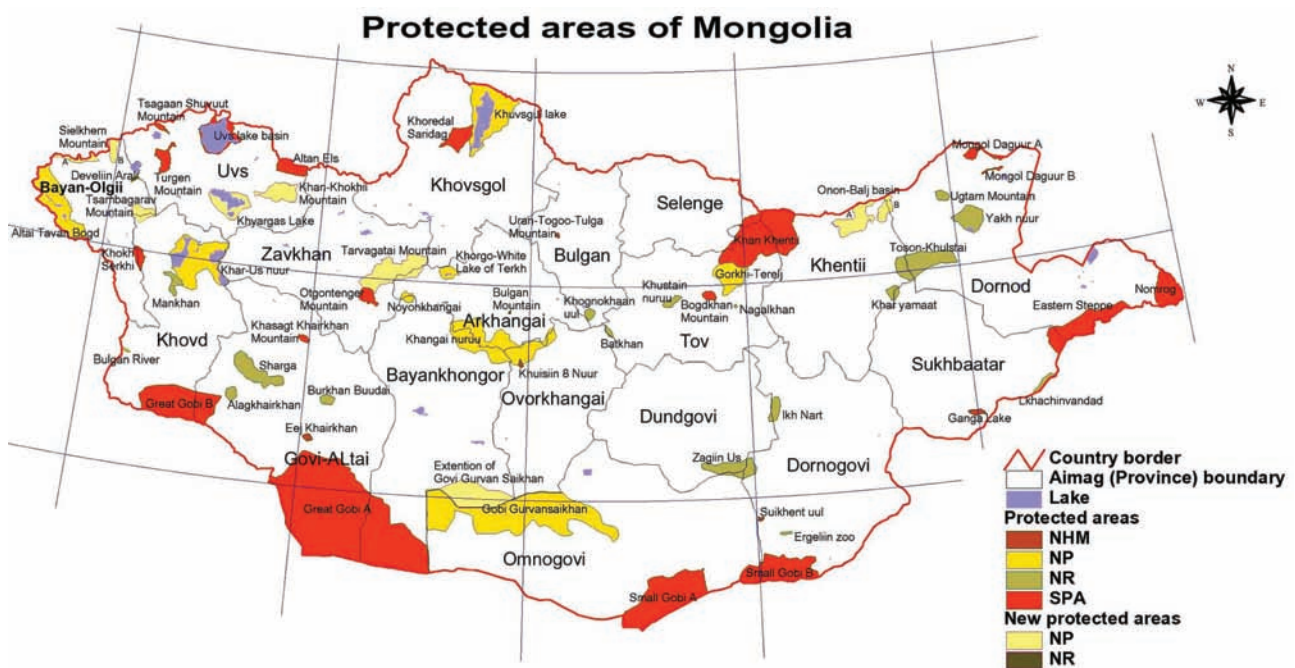
Mongolia's good environment has been important to its traditional herding way of life, and remains essential for fostering tourism, but is being threatened by economic development and a fast-growing

urban population. New roads are opening up formerly inaccessible areas and the liberalisation of markets, plus the introduction of firearms and international trade links, are putting increasing pressure on biological resources.

Mongolia has 24 environmental laws but those most relevant to protected area management are:

- Law on Environmental Protection (1995)
- Law on Special Protected Areas (1995)
- Law on Buffer Zones of Special Protected Areas (1997)
- Law on Forests (1995)
- Law on Natural Plants (1995)
- Law on Plant Protection (1996)
- Law on Hunting (1995)
- Law on Fauna (1995)
- Law on adoption of the International Trade of Endangered Species (1995)

Map 9. PA system of Mongolia, 2003 (6 degrees grid)



The government has adopted a policy of strong environmental protection and established a Ministry of Nature and Environment. UNDP has provided assistance in planning a national system of protected areas which resulted in publication of the Biodiversity Conservation Action Plan (BCAP) for Mongolia in 1996.

PA history

The BCAP divided the country into six major biogeographical zones and 45 subdivisions, and these units form the basis of a PA network. The 26 protected areas existing at the time have since been increased to 61, covering 13.7 per cent of the country. More sites are proposed.

Extent of PA system

Mongolia has a total of 55 protected areas covering 21.5 million ha or 13.8 per cent of the country's area. Protected areas are classed as Strictly Protected Areas (15), National Parks (18), Nature Reserves (19) and Monuments (8). Map 9 shows the distribution of PAs.

PA management agencies and standards

Protected areas are established and managed by the Ministry of Nature and Environment. The Ministry has limited resources to manage such large areas but has received assistance from UNDP, GEF, WWF and others in planning and building capacity.

Major problems have been caused by worsening climate, illegal settlement and increased hunting. One of the most pressing problems is degradation of grasslands. Today about 78 per cent of Mongolia's pasturelands are degraded and a further 20 per cent are being degraded by overgrazing in areas close to markets and water sources, a failure to manage and maintain deep water wells, mining operations

(especially gold mining), and a lack of land rehabilitation.

Transfrontier initiatives

There are great opportunities to improve collaboration with neighbouring countries for managing adjacent reserves along its borders. Several such efforts have already started, including four sites along the Russian border: Tes River Village, Tun Kun Lake, Sokhoud and the Dauren areas. Potential areas of collaboration also exist along the China border, especially in Altay, Great Gobi, the Southern grasslands and the Northeast Dalai Lake/Buir Nur and Mongol-daguur. The Numrug reserve also lies next to adjacent sites in China.

3.8 Taiwan

Extent and landform

Taiwan comprises one large island and 88 islets straddling the Tropic of Cancer. Its total land area is 36,000 km². To the east of the main island the ocean floor drops to deep-sea trenches of 3,000–6,000 m.

Two-thirds of Taiwan is dominated by the main mountain chain with 62 peaks over 3,000 m. The highest peak of Yu Shan reaches 3,997 m. Small, swiftly flowing rivers drain down to narrow coastal plains wider to the west than the east. The 1,100 km of coastline include several bays with mangrove forests. Offshore islets have some coral reefs. The climate is subtropical maritime monsoon with a small tropical zone at the extreme southern tip of the island.

Biological characteristics

Although Taiwan is moderately rich in species (see Table 3 above), biologically it is most important for high levels of endemism in almost all taxa. These reflect its long isolation from the Asian mainland.

Although Taiwan is moderately rich in species, biologically it is most important for high levels of endemism in almost all taxa

Taiwan's 81 protected areas cover 21 per cent of its land area

Table 14. Ecoregions of Taiwan

Ecoregion	Number	Area km ²	National (%)
Taiwan subtropical evergreen forests	IM0172	33,400	100
South Taiwan monsoon rain forests	IM0171	2,600	100

Two WWF ecoregions fall entirely within the area (Table 14).

Population and economy

Taiwan has a population of 23 million, mostly Chinese descended from those who moved with the Kuomintang from China after the civil war. The area has enjoyed several decades of spectacular economic growth and per capita GDP is now US\$23,400 (2006). The population is concentrated along the west coastal plain, so the central mountains and narrow eastern coastal plain remain rather wild and sparsely populated. About 29 per cent forest cover still remains.

Conservation policy and law

Taiwan's policies on nature conservation have four main components: habitat preservation, forest resources conservation, protection of endangered species

and participation in international species protection. Three main laws protect its natural ecosystems:

- National Parks Law (1972)
- Cultural Heritage Preservation Law (1982)
- Wildlife Conservation Law (1989)
- Together with the Forest Law, Environment Impact Evaluation Law and Water and Land Conservancy Law these provide a firm basis for conservation activity. A Biodiversity Action Plan was completed in 2002.

PA history

Over the past 30 years Taiwan has developed a PA system comprising Nature Reserves, National Parks, Wildlife Refuges, Major Wildlife Habitats, National Scenic Areas and Forest Reserves (Table 15).

Table 15. Taiwan's system of protected areas

Type	IUCN Category	Number	Size (ha)
Nature Reserves	I	19	64,777
National Parks	II	6	322,845
Wildlife Refuges	IV	17	25,819
Major Wildlife Habitats	IV	31	321,744
Forest Reserves	VI	8	21,348
Total		81	756,623

Source: Council of Agriculture (2006)

PA extent

Taiwan's 81 protected areas cover 21 per cent of its land area. Map 10 shows the distribution of the major sites. Prominent among these are the national parks which contribute to a large part of the PA coverage as well as provide recreation for millions of visitors (see below).

PA management agencies and standards

The Council of Agriculture oversees nature conservation works, while the Ministry of Interior's Construction and Planning Administration and individual National Park

Headquarters manage national parks. The Environmental Protection Administration is in charge of Environmental Impact Assessment (EIA) and pollution prevention. These agencies are assisted by the Taiwan National Park Society, other NGOs and universities.

Standards of management, research and ecotourism management in Taiwan are generally high.

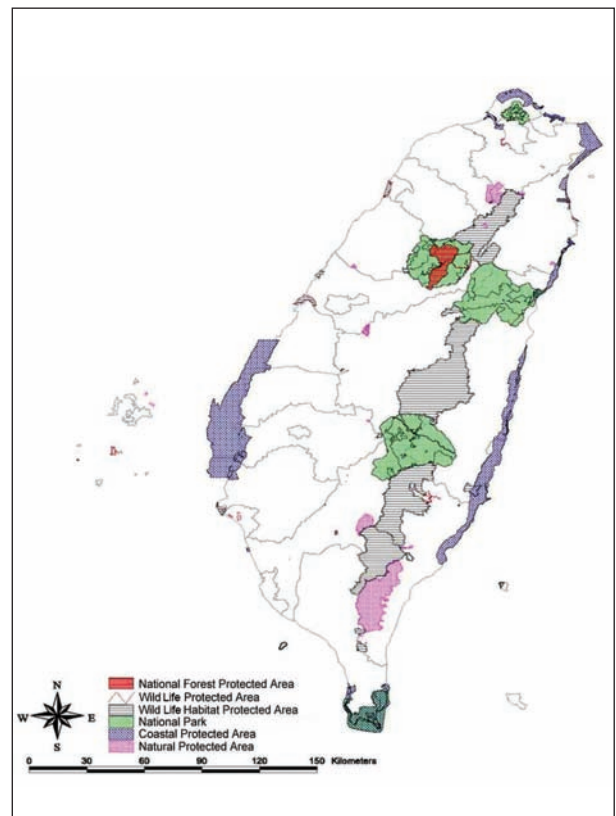
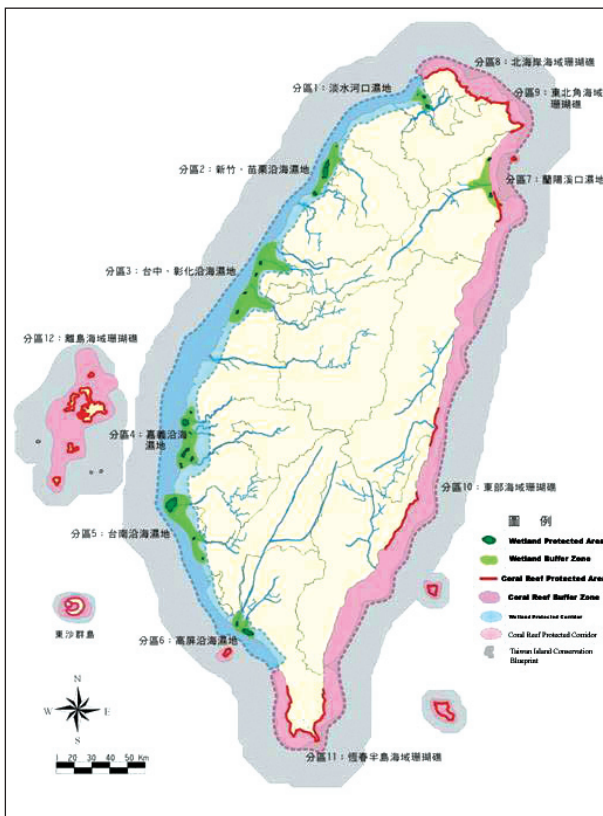
As mentioned above, many of the national parks have large numbers of visitors. Besides Yangminshan, which has 12 million visitors a year, Kenting and Yu-shan have 4 million and 2 million visitors a year respectively.

Transfrontier initiatives

Taiwan has no direct land neighbours.

In regard to the conflicting claims to parts of the South China Sea, China, Taiwan and several countries of the Association of South East Asian Nations (ASEAN) should work together to develop appropriate conservation measures for these important sources of coral community species and fish species.

Map 10. The PA System of Taiwan, 2005 (left marine, right terrestrial)



4. CONCLUSIONS ON PA COVERAGE IN THE EAST ASIAN REGION

The problem facing East Asia's threatened wildlife is not a lack of PAs but weaknesses in managing and protecting existing reserves

WCMC has conducted a GIS analysis of East Asia's PA coverage focusing on altitudinal coverage, territorial coverage, ecoregion coverage, habitat type coverage and cover for endangered and endemic species (MacKinnon et al. 2005). The main results are reproduced in Appendix V.

The WCMC analysis clearly shows that the countries/areas of East Asia have made and continue to make tremendous strides in developing a wide-ranging and diverse PA system. It is hard to find serious gaps in habitat or species cover. The bias towards commercially less valuable lands also of less value to biodiversity is noted but understandable. Yet, despite the large number and area of protected areas, most specialist group reports and national studies reveal ever-growing lists of threatened species and continuing damage and degradation to important sites. The problem facing East Asia's threatened wildlife is not a lack of PAs but weaknesses in managing and protecting existing reserves.

The analysis identifies some gaps where more PAs may need to be established, enlarged or linked via corridors of natural or semi-natural habitat. These are presented in the recommendations below.

Although not the prime focus of the analysis, the authors note that, as stressed in IUCN's *A Regional Action Plan for Protected Areas in East Asia*, the development of marine PAs still lags far behind terrestrial PAs. Given the growing threats from marine pollution and sedimentation, mining of coral, over-fishing and use of destructive fishing practices, excessive harvesting of sharks and turtles, and pressures to re-start

whaling, it is clear that this weakness should be addressed urgently.

There is a much higher degree of PA allocation in mountains, deserts and rough lands of low agricultural or forestry value. Indeed some of the reserves in these areas are as large as countries. These cheaply available lands are generally much less biodiverse than fertile lowland areas. They have great wilderness value and may be important water catchments, but they have low biodiversity values.

A second feature of protected areas in highly populated or more developed regions is that they tend to be much smaller than those in areas where there is less competition for land. The small size of these reserves may undermine their ecological sustainability, and island biogeographical effects may result in high levels of local extinction even within well-protected sites. The need to make small protected areas effective demands highly efficient planning of buffers and corridors to allow the dispersal of key species among protected areas or adjacent natural or semi-natural habitats. For instance, it may be impossible to link two nearby nature reserves with protected areas, but it may be possible to create a corridor of plantations and parkland, rather than crops and urban sprawl, which would serve as a corridor for many woodland species.

We cannot emphasise enough the need for effective protective management. The establishment of a large protected area does not in itself guarantee protection of component species. Quite low levels of human hunting can decimate slow-breeding species.



The giant panda – a flagship species

Although the vast expanses of the Tibetan Plateau and Gobi desert within East Asia contain some huge protected areas, species such as the wild yak (*Bos grunniens*), snow leopard, wolf (*Canis lupus*), chiru (*Pantholops hodgsonii*), Przewalski's gazelle (*Procapra przewalskii*) and wild bactrian camel (*Camelus bactrianus ferus*) are all critically endangered as a result of human pressures. Many of the early protected areas in China were selected to protect single high-profile species. This has given rise to some imbalance in PA distribution. Some species have almost their entire range protected, for example the giant panda (though this is an excellent flagship species for a wide region of endemic forms), while other, less well regarded species such as some of the endemic pikas (*Ochotona spp.*) lack protection and are even actively persecuted as agricultural pests.

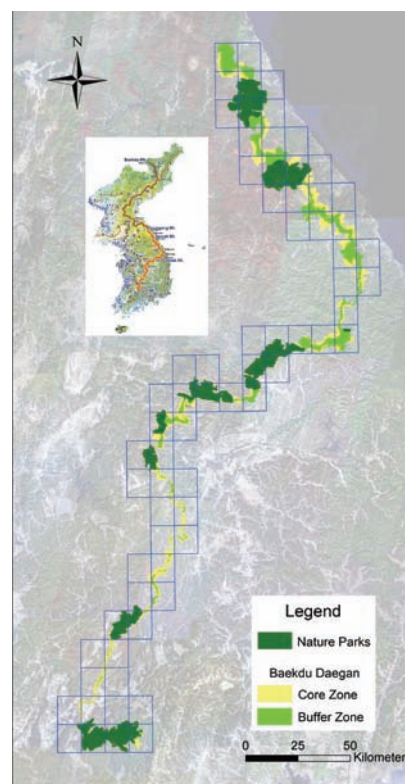
Among the keystone species in the great grasslands of northern and western China and Mongolia are the pikas. These live in burrows in colonies and feed on leaves, roots and seeds of various herbs and grasses. They are an essential part of a healthy grassland ecosystem,

feeding on many plants that are toxic to domestic stock, maintaining a low dense turf of mutually compatible plant species, cycling nutrients, and providing aeration and drainage to the turf allowing melting snow to drain into the land rather than be lost in spring run-off. Moreover, the abandoned burrows of pikas are used by a great number of other grassland fauna such as snakes, owls, other birds and reptiles. Pikas do eat some of the grazing of cattle or sheep, but on the whole their presence is ecologically enriching, even essential for maintaining healthy grasslands. Yet agriculturalists have identified these animals as serious pests and mobilised vast poisoning programmes whereby poison is sprayed from planes over thousands of square kilometres of grassland at a time. This spraying kills not only pikas but also a great variety of other harmless or even beneficial fauna.

Other problems in grasslands include the enclosure of grazing areas, which separates a wide area of the best winter pasture from both the herds of pastoralists and of wild grazers such as antelopes, yaks and horses.

China has made great progress in establishing a national system of protected areas in terms of number of sites, area, completeness of coverage, staffing, budget allocations, studies and projects, but several weaknesses remain (Protected Areas Task Force of CCICED, In: Yan et al. (2004). The most important is the lack of a comprehensive PA category system and associated legislative framework. Other major problems include a lack of funding, management capacity and supervisory mechanisms. Unless these matters are urgently addressed, the great investments of land and funds may be largely wasted, biodiversity losses will continue and the reduced ecological services provided by PAs will cost China heavily in terms of lost revenue and social benefits.

Map 11. The Baekdu-Daegan programme



Japan and ROK are wealthy and advanced enough to manage their own affairs regarding PA development, and are generally doing a good job of this. They do face problems with the private ownership of large areas of important conservation lands, and they could play a greater role in helping the weaker countries of the region improve their PA management.

DPRK remains underdeveloped and isolated as a result of its nuclear policy, which has led to economic sanctions and the withholding of large amounts of international aid that could be used for economic and environmental assistance. We hope that politics can be divorced from urgent environmental and human needs, and that the East Asian

countries and international community will support DPRK in its efforts to protect the environment. There are excellent opportunities for transfrontier collaboration with China in the Baekdu and Tumen River border areas, and with ROK along the DMZ. An ambitious long-term plan is to create a connected corridor along the entire mountain chain of the Korean Peninsula – the Bekdu-Daegan programme (Map 11).

Consideration should be given to including the eastern portions of Russia into the IUCN's East Asian region. Russia is biologically an essential element of the region. The major Amur River basin is arbitrarily cut in half by the current

classification, yet it is here that integrated management approaches are urgently needed to combat pollution and over-fishing, and to save shared wildlife populations. Mongolia already has four transboundary arrangements with Russia for sites along this border. China has three. Russia is also an important stakeholder in conservation efforts and fishing regulations in the northern seas of East Asia, and contains breeding grounds for all of the shorebirds and many of the raptors and waterfowl that are the focus of wetland conservation in the East Asian Flyway.

Map 12. The Amur River Basin



Part Two – The Action Plan 2006 – 2010

5. EVALUATION OF 1996 ACTION PLAN

The 1996 action plan outlined an ambitious programme of improvement for the East Asian region. It identified more than 120 separate actions covering a wide range of components and 13 priority projects. Yet, despite all the good thinking and good intentions of the planning meetings and follow-up sessions, most of these actions are incomplete and still just as relevant today. Several of the 13 priority projects identified by the action plan have been completed, but with little regional input and with more reports than action on the ground. The plan was a long wishlist of things that could be done to strengthen national PA systems. What achievements have been made have largely addressed obvious needs and are attributable to individual country actions rather than the influence of the action plan.

Although many excellent tools and best practice guidelines have been developed for the region by IUCN, they are unavailable in many national languages and used only on an *ad hoc* basis. IUCN itself has a weak presence in the region and has been unable to push these tools more forcefully into routine national programmes.

The greatest achievements have been in the doubling of the overall PA system, with notable increases in coverage in China, Mongolia and even DPRK.

There has been a marked increase in the number of protected areas accepted under international categories – Ramsar sites, World Heritage natural sites and Biosphere Reserves. DPRK has joined the World Heritage Convention though as yet has not inscribed any natural or mixed sites.

It is heartening to see DPRK increasingly showing concern for environmental protection, conservation and the establishment of a system of protected areas.

Little headway has been made in the many actions listed to strengthen the marine PA system. This is largely because conflicting territorial claims hinder either individual country actions or collaboration.

There has been little improvement in training for PA management, monitoring management effectiveness, or data management and sharing of data. There has been little progress in exchange programmes for training or reducing poaching and wildlife trade.

Clearly the action list was too long, too general, and lacked clear responsibilities and budgets. The plan was an academic appraisal of what needed to be done rather than an integral part of the official plans of the respective governments.

The greatest achievements have been in the doubling of the overall PA system, with notable increases in coverage in China, Mongolia and even DPRK

The new action plan attempts to be better linked to specific responsible actors

Legal frameworks in China and some other areas lack the breadth and scope to ensure that PA development is progressive and can deliver the many benefits that a well-planned and well-managed system of PAs should be able to demonstrably supply.

Compared with other groupings such as the European Union (EU) and ASEAN, cooperation among the East Asian countries/areas needs to be strengthened. A number of political sensitivities continue to hinder collaboration.

While China's economy and general development have surged ahead, the other more developed areas – Japan, ROK, Hong Kong – have faced

recession, and DPRK and Mongolia still lag far behind.

Meanwhile, new issues have emerged requiring urgent attention: invasive alien species, climate change, pollution of marine and freshwater systems, emerging wildlife diseases (SARS, avian flu, etc.), and illegal wildlife trade.

The new action plan attempts to be less ambitious, shorter in length (five years), more focused and better linked to specific responsible actors expected to take the lead in the actions proposed. The activities identified by the 1996 Action Plan and their current relevance are detailed in Appendix II.

6. FILLING GAPS IN THE PROTECTED AREAS NETWORK

Part 4 of this report found that despite a large overall area, there are many gaps in the habitat coverage of East Asia's PA system. Greater efforts are needed to achieve full representation of the richer, lower altitude habitats, many of which are highly threatened and reduced by human development. Of course it is not easy to acquire valuable development land for conservation. One way countries/ areas can do this is through regional zoning, whereby certain types of development for construction or industry are prohibited in areas of environmental, recreational or biodiversity value, thus reducing their commercial value and making it easier to acquire land or justify the establishment of protected areas there.

The following areas have an identified need for more PAs: Tianshan, Jinji Mountains, eastern border of Qinghai province, southeast Yunnan-Guizhou Plateau, Hengduan Mountains, Huangtu Plateau, Ordos Plateau, northern Guangxi, downstream of the Huaihe and Yellow Rivers in China; Altai Mountains, Great Lakes Plain and southeast corner of Mongolia, southern tip of ROK, lowland forest in west-central Taiwan, Lanyu Island of Taiwan and marine areas generally.

Many other gaps have been identified in the Species Action Plans of IUCN. These include:

Antelopes require stricter enforcement of China's Wildlife Protection Law, strengthening of anti-poaching measures in Qiangtang and Arjin Shan reserves, creation of new PAs in the Tarim Basin and Chaidam (Quaidam) Basin, establishment of a PA to protect Przewalski's gazelle in

the Hudong-Ketu area east of Qinghai Lake, establishment of PAs in Xinbaragyouqi and Dongwuqi on the Mongolian border to save the Chinese populations of Mongolian gazelle (*Procapra gutturosa*), reintroduction of the Mongolian saiga antelope to the Altai region of northwest China, and wider measures to control the *shahtoosh* trade of chiru wool.

Improve knowledge of the distribution of free-ranging sika deer races (*Cervus nippon*), Chinese water deer (*Hydropotes inermis*) and endangered musk deer (*Moschus spp.*). Control trade in musk, strengthen protection of the rare black muntjac (*Muntiacus crinifrons*) in southeast China.

Establish a network of four protected areas, including an extension of the Mabian Dafengding Nature Reserve, to protect the rare endemic Sichuan hill-partridge (*Arborophila rufipectus*) (Fuller *et al.* 2000).

Identify areas outside the range of the giant panda where the red panda needs protection in China.

Enlarge or link PAs as far as possible to protect wild cat species. Tighten control of trade in cat furs.

Strengthen control of illegal hunting in the forests of northern China to protect rare grouse species and moose (*Alces alces*). Greatly enlarge protected areas in the Amur tiger habitat.

Strengthen protection of several sites identified by the Crane Specialist group as important for breeding or wintering crane populations.

Improve the knowledge base on the distribution of wild canids and strengthen PAs where necessary. Status surveys are needed for poorly known weasel populations and strengthening of PAs as appropriate for the Tsushima marten (*Martes tsuensis*), wolverine (*Gulo gulo*), Taiwan yellow-throated marten (*Martes flavigula chrysospila*), spotted linsang (*Prionodon pardicolor*) and Owston's palm civet (*Chrotogale owstoni*).

Identify and add suitable habitat for the endemic Hainan hill-partridge (*Arborophila ardens*) to the protected areas of Hainan (Fuller *et al.* 2000).

Specialised studies by BirdLife International and the "hotspot" approach of Conservation International (CI) and other agencies have identified other gaps in species coverage. These should be addressed in national System Reviews.

The approach used by BirdLife International to identify specific sites of importance to threatened birds should be extended to other taxa. It is clear that plants and invertebrates have narrower distributional ranges and will require additional sites. As sites are identified, they need to be presented to national authorities with a fuller justification than just species protection. The boundaries and zoning of sites must be integrated into the regional ecological and developmental context. Most of the countries are facing habitat loss, water shortages, desertification, floods or pollution. Sites must play strong ecological roles in mitigating these phenomena to warrant priority attention for gazettelement.

Corridors may need to be established between PAs to allow migration and genetic exchange between otherwise isolated and inbred populations

6.1 National systems planning

Sound PA planning must take place at two levels: a national PA system plan that sets out the objectives of the system and the criteria for selecting and managing PAs; and individual management plans for each PA.

Action 1: Each country should undertake a National Protected Areas Systems Plan to identify additional PA needs and identify national priorities.

Such plans should follow latest best practice approaches such as: use of landscape concepts; use of broadening stakeholder involvement; more use of IUCN categories V and VI; responsibilities for monitoring and reporting; combining zones with categories; refinement of gap identification through combination of GIS habitat analyses; and meeting other PA needs – species, ecological services, cultural, recreational and so on. These approaches were clearly outlined in David Sheppard's excellent paper, *Twenty-first Century Strategies for Protected Areas in East Asia* (2001).

Because of its huge size, China could consider undertaking systems reviews at both the provincial and national levels.

Many PAs are too small to retain their original complement of species. They will lose species as a result of island biogeography processes (the number of species that can be supported is proportional to the area occupied), but this effect can be minimized if connectivity is maintained or recreated, if distances to other similar habitat are not too great, or if habitat islands are available to act as stepping stones between habitats. Corridors may need to be established between PAs to allow migration and genetic exchange between otherwise isolated and inbred populations.

PA effectiveness can be greatly enhanced if some level of connectivity can be established between areas, or if organisms are moved artificially to maintain outbreeding between otherwise isolated populations.

In some cases where *in-situ* conservation alone seems likely to fail, higher levels of management intervention or *ex-situ* conservation actions may also be needed.

Where intervening lands cannot be acquired as strict protected areas, establishing multiple-use protected areas in categories V and VI may also be a valid strategy to create some level of connectivity.

New threats such as invasive alien species are becoming more important. These must be tackled at frontiers or, if the species have already arrived, addressed by the management staff of protected areas in collaboration with other agencies.

PA categories encompassing the full range of management objectives and a variety of zones for different types of permissible uses allow PA planners and managers to adapt to the local realities of each PA and its surrounding communities. IUCN defined six PA categories focusing on management objectives and differentiating among degrees of protection and permissible use. In addition, different types of zones within each category allow PA planners and managers the flexibility to adapt the administration of individual PAs to local situations.

A fundamental stumbling block in PA planning and management in China is the inadequate flexibility of zoning. As most PAs are on mountains, the biologically richest habitats are invariably at lower altitudes in surrounding areas. Core areas, which are usually placed in the centre of the PA, thus cover the least threatened and biologically poorest areas.

Table 16. Proposed scheme for categories and permitted zones as a proportion of total PA area in China (percentages)

Zone	Strict Protection Reserve I	Habitat/species Management Reserve IV	Recreational Nature Park II	Multiple-use Reserve VI
Strict protection	>80	>20	>20	>10
Management	<20	<80	<50	<90
Visitor use	<10	<20	<80	<50
Resource harvest	<10	<10	<10	<80
Intensive use	<10	<10	<10	<20
External buffer	Optional	Optional	Optional	Optional

Action 2: Countries/areas should review their range of PA categories and zones in ways that offer more management options, especially for integrated management within protected areas (e.g. by more than one agency), sustainable use of some resources, and greater involvement of local communities. Table 16 gives an example of a recommendation being considered by the legal review for China.

Sub-activities:

- Development of national/territorial/provincial systems plans
- A conference on ways and means of designing PAs for climate change

6.2 Marine Protected Areas

Marine habitats remain seriously underprotected. Data in the World Protected Areas Database indicate that East Asia has only 252 marine PAs covering 4.3 million ha, compared with 2,430 terrestrial PAs covering 188.8 million ha. The attention given to developing marine PA systems clearly lags far behind that given to terrestrial ecosystems, while the damage to coastlines from rapid development and to marine areas from over-fishing,

pollution and other causes is worsening. Kelleher et al. (1995) identified marine protection priorities. More attention must be paid to the development of marine protected areas or marine protection measures (quotas, agreements on fishing areas, agreements on equipment allowed and so on). In this regard it is important to reach international agreement about resource use within disputed waters. Much of the offshore marine area of East Asia is disputed. Countries/areas should be able to conduct cooperative research and protection activities in the South China Sea despite disagreeing over political boundaries.

Action 3: Within PA Systems Plans or as a separate plan each country with marine areas should undertake a review of marine PA needs. This should include consideration of the needs of multiple users and the participation of local fishermen.

Sub-activities:

- Conference on East Asian Seas Strengthening Marine PA network
- Conservation plan for Spratly Islands

6.3 Transfrontier initiatives

Much more could be achieved by strengthening the links between management of adjacent PAs straddling national or internal borders. IUCN's excellent guidelines on this subject should be followed (Sandwith et al. 2001).

Map 13 illustrates a number of opportunities for transfrontier collaboration where protected areas lie on or close to the border of the region. These can be explored and international agencies can act as brokers where appropriate. The map also shows opportunities within the region itself – along the Mongolia-China border, on the China-DPRK border, and at the DMZ between DPRK and ROK.

Action 4: Each country/area should pay special attention to identifying and acting on opportunities to strengthen the PA system by developing transfrontier collaboration and alignments with PAs in adjacent areas (both intra-regional and inter-regional).

It is hoped that a special effort can be made to establish protection of important island and source reef communities in the South China Sea.

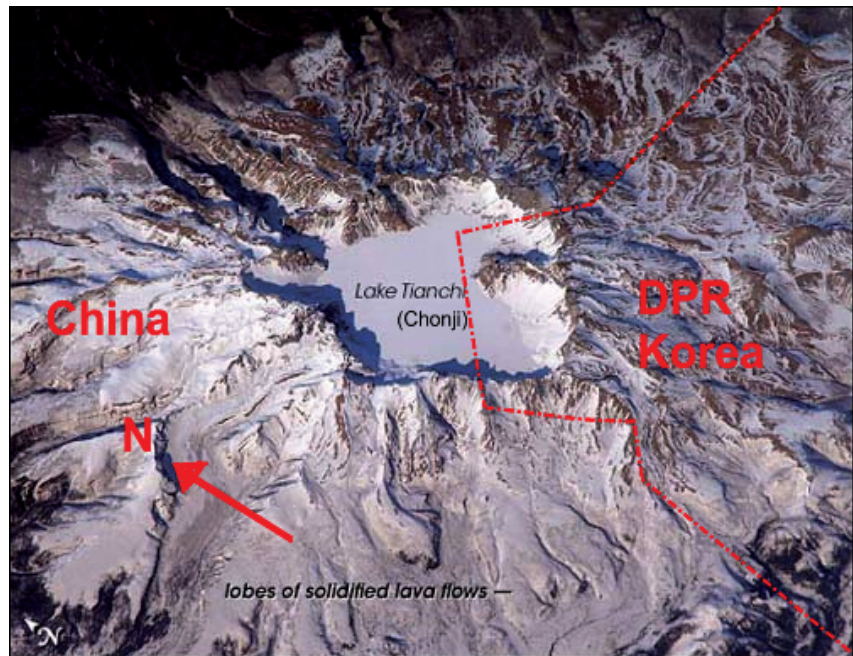
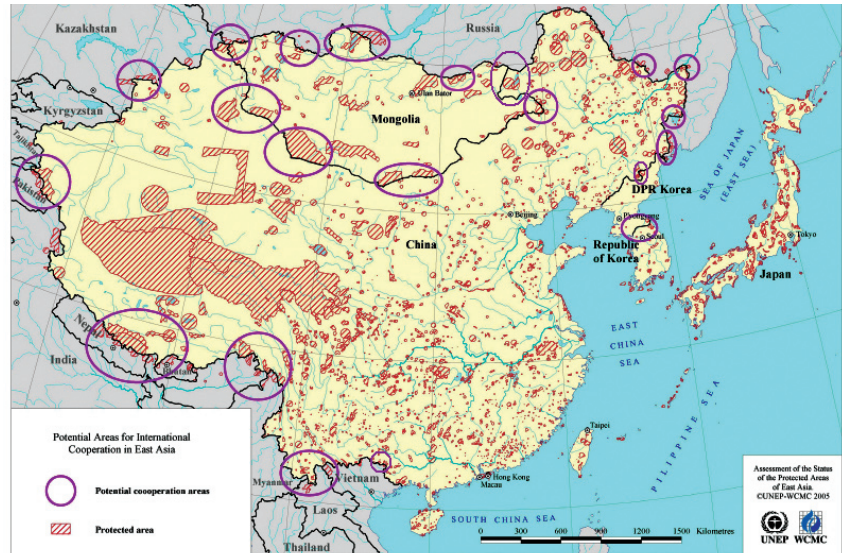
Sub-activities:

- Formalise Changbaishan-Baekdu collaboration under the MAB and World Heritage Programmes
- Mongolia to develop transfrontier relationships with PAs in China (Altai Mountains, desert and eastern Mongolia) and with Russia (Khovsgol Lake, Khan Khenti and Mongol Dagurian)
- China to link Qongmalongma with neighbouring PAs in Nepal.

Action 5: Strengthen East Asian Flyway Programme

- Analyze data from many years ringing and observing
- Identify important sites for migratory birds
- Promote further development of Site Networks of internationally important sites
- Other conservation measures (awareness programmes, capacity building of local birdwatching groups etc.)

Map 13. Transfrontier PA potential in East Asia



Changbai and Baekdu Mountains Transfrontier Site

7. STRENGTHENING THE LEGAL FRAMEWORK

7.1 Improving PA-related national law

Action 6: Each country/area should review its existing PA legislation in relation to emerging trends and new needs.

Laws narrowly focused on protection, laws that are prohibitive rather than provide incentives to promote conservation and sustainable use, and inflexible laws lacking provisions for adapting regulations to local conditions, should be replaced as soon as possible with more progressive instruments that:

- broaden the objectives of conservation and protected areas;
- provide greater flexibility for management to be adapted to varied social and geographic conditions;
- include provisions for more decisions to be made at the local level (more participatory and bottom-up approaches in decision making);
- show consideration for the welfare, rights and involvement of local communities;
- promote greater scope for synergy with other sectors and integration into larger landscapes; and
- are able to respond to emerging threats, for example living modified

organisms (LMOs), IAS, bio-terrorism, bio-piracy, international smuggling, zoonoses (diseases shared by animals and humans) and climate change.

Sub-activities:

- IUCN to develop basic structure, modules and comments of each national law.
- China law revision underway with the Asian Development Bank and IUCN assistance and a draft is already available.

7.2 Implementing global conventions

Action 7: Regional meetings should be used to formulate shared viewpoints to be delivered to important Conferences of the Parties (COPs) of international conventions.

The agenda of forthcoming COPs should be discussed in advance from a regional perspective so that issues of regional importance can be presented with more confidence, greater coherence and stronger regional support. If a WCPA-EA Secretariat is formed it can assist in preparing for such meetings.

If a WCPA-EA Secretariat is formed it can assist in preparing for such meetings



Red-crowned cranes (*Grus japonensis*) on migration

8. IMPROVING PA MANAGEMENT

8.1 Management planning

In China, an overall plan is required for each nature reserve, but most PAs lack a management plan for routine operations. Existing PAs have not been adequately integrated into economic development planning. Management planning in other countries could also be improved.

Action 8: Each country/area should develop management plans for all PAs. Standards for preparation and approval of such plans should be issued. Funding for PAs should be partly conditional on approval of such plans. Plans should follow IUCN best practices, include a greater landscape vision beyond PA boundaries, and address the needs of local communities. They should be better supervised to ensure that developments in PAs match their plans.

8.2 Adoption of competence standards

Action 9: Adopt competence standards that list the various professional skills and knowledge (competences) required for different positions and levels within a Protected Area management organisation. China has yet to establish a structured professional service for the staffing and management of its PA system. There are no recognized standards of competence, no consensus on the skills and knowledge base required in this profession, and no professional society to set such standards. Most staff have limited professional training.

Such a set of standards has already been developed and implemented in the neighbouring ASEAN region, and is also available in Chinese. It comprises 250 different skills needed within the framework of protected area management. Each skill is linked to the levels and types of job that require it. Some skills are needed across the entire staff of PAs; others are specific to just one or two special jobs.

Staff positions have been assigned five levels of seniority and responsibility, from level 1 (untrained hired workers) up to level 5 (the director of a major national park or provincial system of PAs).

The use of such standards has many advantages, including:

- Staff know which roles they are expected to perform.
- Clear terms of reference can be drawn up for each job on the basis of these standards.
- Hiring can be guided by whether the applicant has the necessary skills. Training can be individually tailored to bring staff up to the standard needed to fulfil their roles.
- Training courses can be redesigned to ensure they deliver the exact skills needed by the profession.
- Staff can plan their own training to upgrade their skills.
- Projects with funds for staff training can ensure they are spent on courses complying with the standards adopted for the needs of trainees.
- Expertise requirements for special jobs can be precisely defined in terms of standardised skills.
- Professional societies can emerge based on recognised qualifications.

One interesting observation is that whereas project training is usually directed either at junior guards (level 1) or at senior managers and directors (level 5), the level that requires the widest range of skills is at the middle (level 3). This level rarely receives training in conservation projects.

Sub-activities:

- Translation of standards into each national language
- Conference of members to discuss standards
- Revision and adoption of standards
- Use of standards in hiring, preparing terms of reference, career advancement and training

8.3 Making better use of global programmes

Action 10: Regional governments and related international organisations should implement the CBD Programme of Work on Protected Areas (PoWPA) as the global standard for the comprehensive and effective management of protected areas.

Action 11: Promote biodiversity through the World Heritage Convention. Although the region boasts a long list of cultural sites under the World Heritage Convention, mixed and natural sites are poorly represented (13 sites), and even fewer are listed for biodiversity criteria. This clearly does not adequately reflect the wide range of wonderful natural habitats of the region. World Heritage listing can bring great benefits in terms of recognition, support in management,

access to financing and increased revenues from tourism. Countries are urged to make better use of this opportunity, and to take the trouble to prepare and submit nominations.

New options are being adopted such as cluster nominations, serial nominations and transfrontier nominations.

Sub-activities:

- IUCN Project “World Heritage Biodiversity Support for China” aimed to strengthen the biodiversity component of the China World Heritage Programme
- WCPA’s project “Enhancing our Heritage” follow up using East Asian test cases.
- Adoption of IUCN monitoring tools as routine in national monitoring

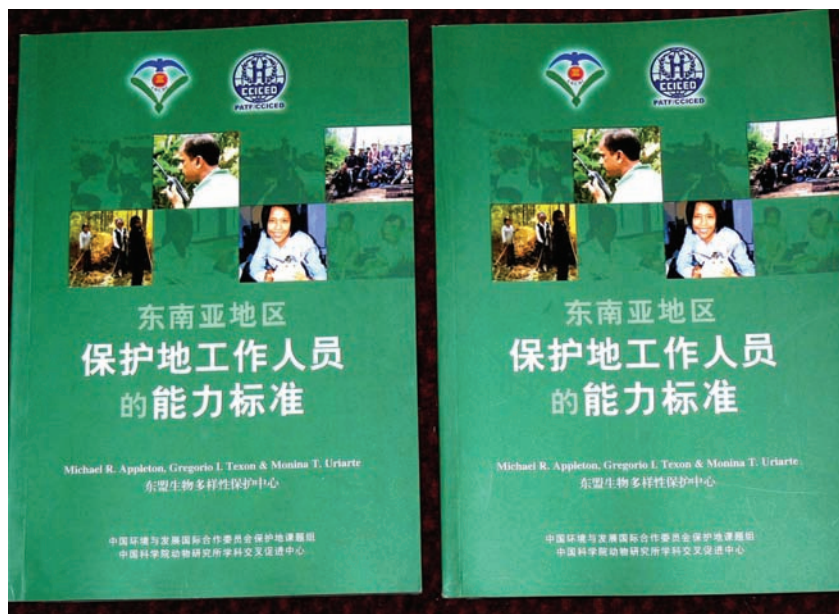
Action 12: Promote PA development through other international programmes: MAB, Ramsar, Bonn Convention, etc.

Sub-activities:

- Develop more MAB reserves, Wetlands International, GEF and Ramsar support projects. Strengthen Asian Flyway programme (see 6.3 above).
- Implement and revise Asia-Pacific Migratory Waterbird Conservation Strategy

Action 13: Highlight the linkages between PAs and climate change.

Although PAs will be affected by climate change, they can also contribute to mitigation efforts. Studies should be undertaken to monitor the effects of climate change, and PA designs and management developed to give PAs greater resilience in the face of change.



Standards book already available in Chinese

8.4 Monitoring, information management and sharing of information

Action 14: Establish routine PA monitoring of biodiversity impacts, management effectiveness and socio-economic conditions in local communities. Procedures for such monitoring, together with the necessary training, should be delivered, and data should be fed into appropriate data management centres for performance evaluation, state of environment reports and international reporting obligations. Data should be available online so that other government agencies, as well as relevant NGOs and researchers, can use them.

WCPA has developed guidelines for evaluating management effectiveness. WCMC has developed a series of protocols for recording biodiversity information. The ASEAN Regional Centre for Biodiversity Conservation (ARCBC) has developed a comprehensive biodiversity website (www.aseanbiodiversity.org) for the ASEAN region which can serve as a model for East Asia.

The use of modular reporting and virtual reporting should be promoted. Modular reporting allows authors to draw a subset of data needed for a specific report from a pool of data provided by several agencies. The advantages of this approach are consistency, more timely data and less duplication of effort, though it requires sharing of data and some coordination. Virtual reporting means making reports available on websites rather than printing them, thus avoiding editing, publishing and distribution costs and ensuring the report can be regularly updated.

Sub-activities:

- Laws should identify monitoring needs and reporting responsibilities
- Establishment of data clearing house for national and international data access
- Development of harmonised reporting system
- Development of virtual reporting system on the web to allow specialised access to harmonised data and meet international reporting obligations (CBD Clearinghouse, Ramsar, CITES, etc.)

- Establish baseline data and appropriate monitoring and evaluation programmes for all PAs (the assistance of local communities in monitoring should be encouraged)
- Develop risk assessment procedures for IAS and LMO releases, and put in place appropriate operational measures, for example checkpoints, barriers and chemical and physical control equipment.

Action 15: Establish a PA database and a database and network of experts for the region. This can be housed and managed by the planned WCPA-EA Secretariat.

Action 16: Establish an invasive species information and alert website. This should provide information on IAS, identification, distribution, threats, treatments, news and links to other IAS sites. Initially this can be developed as an extension to the existing IAS website for China. The database should have links to the Global Invasive Species Programme (GISP).

Action 17: Share experiences in ecological recovery. Most countries of the region are facing the challenge of restoring widespread areas of degraded natural habitat. Initial efforts to re-green such spaces using standard forestry techniques have proven expensive and only moderately successful. Most successful approaches use natural processes and imitate nature with regard to seral succession, natural regeneration, mixed species communities, vegetation structure and mixed age classes. Great success has been achieved by simple procedures such as closing areas to wood cutting, fire, grazing and other degrading activities. The

science of ecological restoration is still in its early stages and sharing of experiences would be valuable. Two useful books on the subject (in Chinese only) are Xie Yan (2002) and MacKinnon et al. (2002).

Sub-activities:

- Hold conference on ecological restoration experiences
- Establish special web-based information site
- Continue to restore degraded habitat

8.5 Species conservation needs

Despite the extensive PA system developed by Mongolia, populations of large ungulates are under threat from official harvesting and increased poaching. The recommendations of the SSC Antelopes Specialist Group (Mallon and Kingswood 2001) include better control of poaching, setting sustainable quotas for legally hunted species such as the Mongolian gazelle, captive breeding and relocation projects where necessary for Mongolian saiga antelope and Przewalski's horse (*Equus ferus przewalskii*), gazetting outstanding PA proposals and regulating water resources.

Action 18: Take firm action to curtail large-scale illegal hunting and wildlife trade within the region. This is a major task which will involve strengthening law enforcement over a huge area, upgrading the capacity of law enforcement agencies, giving greater police powers to PA guards, tightening trade point controls, creating more awareness among police and the courts, generating public awareness, improved information sharing between law enforcement units, and controlling wildlife restaurants and markets.

Action 19: Halt the rodent and pika spraying programmes in northern China. These are counterproductive and may also contribute to limiting water resources by reducing the permeability of grasslands (which is enhanced by rodent and pika burrowing). Pikas are a keystone species and their burrows are needed for shelter by other animals including birds and reptiles.

Action 20: Establish links between species monitoring databases in different countries on shared species of wide regional concern e.g. cranes, migratory turtles, etc.

This action can be linked with implementation of the Convention on Migratory Species (CMS).

Action 21: Promote East Asian field guide series. Field guides are available for the Korea Peninsula, Hong Kong and Taiwan for most major taxa. China now has a comprehensive field guide for birds and new handbooks and field guides for mammals have been recently completed. It would be straightforward to develop field guides for Mongolia, the Koreas and Taiwan (mammals) from these volumes. More effort should be directed at other taxa such as butterflies, fish, amphibian and reptiles. Keys to plants should also be promoted. In the case of China it would be useful to develop provincial field guides rather than wade through hundreds of irrelevant species for the whole country. Such guides would allow better inventorying, monitoring and reporting of species at local levels. Field guards could be trained to recognize common and important species of their own PAs. Often all that is needed are some funds for translation, editing and printing.

8.6 Adoption of best practices

IUCN has assembled the most successful global experiences as a series of best practice guidelines. Compilations by the World Bank, CI, WWF and others are also useful. More work must be done to promote and apply these practices in East Asia.

Action 22: Translate and distribute IUCN's best practices series

Countries are encouraged to modify for local conditions and translate short versions of IUCN's best practices series or other important publications (<http://www.iucn.org/themes/wcpa/pubs/guidelines.htm#planning>).

National System Planning for Protected Areas. 1998. Adrian G. Davey. Series editor: Adrian Phillips. Best Practice Protected Areas Guidelines No. 1. IUCN.

Economic values of protected areas: guidelines for protected area managers. 1998. IUCN World Commission on Protected Areas, Task Force on Economic Benefits of Protected Areas; the IUCN Economics Service Unit and the Cardiff University – Gland. Best Practice Protected Area Guidelines Series No. 2. IUCN.

Guidelines for Marine Protected Areas. 1999. Edited and coordinated by Graeme Kelleher. Series editor: Adrian Phillips. Best Practice Protected Areas Guidelines No. 3. IUCN.

Indigenous and Traditional Peoples and Protected Areas: Principles, Guidelines and Case Studies. 2000. Edited and co-ordinated by Javier Beltrán. Series Editor: Adrian Phillips.

Best Practice Protected Areas Guidelines No. 4. IUCN.

Guidelines for Cave and Karst Protection. 1997. Prepared by the WCPA Working Group on Cave and Karst Protection, synthesised and edited by John Watson, Elery Hamilton-Smith, David Gillieson, Kevin Kiernan.

Financing Protected Areas: Guidelines for Protected Area Managers. 2000. Prepared by the Economic Benefits of Protected Areas Task Force, World Commission on Protected Areas and the IUCN Economics Service Unit. Series Editor: Adrian Phillips. Best Practice Protected Areas Guidelines No. 5. IUCN.

Evaluating Effectiveness: A Framework for Assessing Management of Protected Areas. 2000. Prepared by Marc Hockings, IUCN World Commission on Protected Areas Management Effectiveness Task Force, with Sue Stolton and Nigel Dudley, WWF/IUCN Forest Innovations Project. Series Editor: Adrian Phillips. Best Practice Protected Areas Guidelines No. 6. IUCN.

Transboundary Protected Areas for Peace and Co-operation. 2001. Trevor Sandwith, Clare Shine, Lawrence Hamilton and David Sheppard. Series editor: Adrian Phillips. Best Practice Protected Areas Guidelines No. 7. IUCN.

Sustainable Tourism in Protected Areas: Guidelines for Planning and Management. 2002. Paul F.J. Eagles, Stephen F. McCool and Christopher D. Haynes Adrian Phillips, Series Editor. Best Practice Protected Areas Guidelines No. 8. IUCN.

Countries are encouraged to modify for local conditions and translate short versions of IUCN's best practices series or other important publications

Tourism can generate income for PAs, but must be carefully managed to avoid undermining conservation and protection functions

Management guidelines for IUCN category V protected areas, protected landscapes/seascapes. 2002. Phillips, Adrian. Best Practice Protected Area Guidelines Series No. 9. IUCN.

Guidelines for Management Planning of Protected Areas. 2003. Lee Thomas and Julie Duff. Best Practice Protected Areas Guidelines No. 10. IUCN.

Indigenous and Local Communities and Protected Areas. 2004. Grazia Borrini-Feyerabend, Ashish Kothari and Gonzalo Oviedo. Series Editor: Adrian Phillips. Best Practice Protected Areas Guidelines No. 11. IUCN.

IUCN East Asia Guidelines:
Guidelines for Tourism in Parks and Protected Areas of East Asia. 2001. Paul F.J. Eagles, Margaret E. Bowman, Teresa Chang-Hung Tao. Series editor: Adrian Phillips.

Guidelines for Financing Protected Areas in East Asia. 2001. Andrea Athanas, Frank Vorhies, Fernando Gherzi, Peter Shadie, John Shultis. Series editor: Adrian Phillips.

Guidelines for Management Planning of Protected Areas. 2003. Lee Thomas and Julie Middleton.

8.7 Development of ecotourism

Tourism can generate income for PAs, but must be carefully managed to

avoid undermining conservation and protection functions. Whether tourism activities are permitted in a PA should be determined by the category and zoning of the PA, and should be allowed only as specified in the approved management plan. Specifications for facilities and services for tourists should be included in the management plan and operated by concessionaires, rather than by PA staff. Well-controlled PA tourism:

- increases the awareness of the value of PAs among government and the general public,
- provides jobs and income opportunities to replace income lost from restrictions on allowable uses in PAs,
- increased recreational use may reduce illegal use of resources such as poaching, collection of endangered plant species, logging of protected hardwoods, agricultural land clearing and so on,
- reliable methods of measuring and valuing recreational use have been established and can be used to convince key decision makers that the establishment and sustainable management of PAs offer “win-win” options.

Action 23: Adopt and enforce ecotourism codes of conduct.

ROK has developed a certification programme to improve the quality of ecotourism. This experience should be shared with other countries in the region.

9. INTEGRATION WITH OTHER SECTORS

9.1 Alliances for conservation

Action 24: Develop broader alliances for PA support. Many of the activities identified as necessary for improving PAs extend far beyond the mandate of a PA management authority. These include law reform, EIA, landscape planning, IAS and biosafety issues, research, tourism and the delivery of ecological services. It is clear that the PA management authority cannot tackle these issues alone and must develop appropriate alliances with other ministries and sectors. Agencies responsible for water resources, hydropower, agriculture and tourism derive great benefits from strong PA management and would make excellent partners in planning, lobbying and securing local government budgets (see Section 11 on funding). Many universities and institutes across the region have well-qualified scientists and technicians who would be willing to assist in research, surveys and management planning. NGOs are

under-used, the private sector ignored and local communities excluded from use, monitoring, planning and management activities. The Korean Protected Areas Forum, recently established with the involvement of all sectors including business and NGOs, can serve as an excellent model.

PA legislation must recognise that private individuals or institutions already own or may be able to acquire tracts of lands to develop as private nature reserves. Laws should allow non-State PAs and private sector management of State-owned PAs. They should specify that private sector involvement in providing services and facilities within PAs is subject to concession agreements, and provide tax credits and other incentives to encourage private sector investment in PA support and management. In Japan and ROK, where much of the land within PAs is privately owned, laws should be reviewed to ensure that private land managers can participate in PA management.

Agencies responsible for water resources, hydropower, agriculture and tourism derive great benefits from strong PA management



Jiuzhaigou tourism contained to boardwalks

The selection of protected areas purely on the basis of species needs or habitat cover may fail to win support from other strong agencies who can help PA establishment. PA selection should pay more attention to the ecological services and economic or social benefits that habitat protection and restoration can supply in the local development context.

9.2 Co-management and involvement of local communities

Governments are urged to pay greater attention to involving local communities in establishing and managing protected areas.

Governments can no longer dictate to rural communities. Whether a protected area succeeds or fails will depend on whether it is accepted and actively supported by local communities.

Action 25: Develop more effective ways of involving local communities in PA establishment, planning and management. Allowing greater involvement by local people is prudent for two main reasons: pragmatism and social fairness. From the pragmatic viewpoint, it is better to establish good cooperation and collaboration with local people than to alienate and exclude them. They can help in much of the protection work, boundary maintenance, fire fighting and wildlife reporting. They can be given privileges of access and use to certain resources or jobs that will encourage them to protect the site

and prevent encroachment. If people living adjacent to a PA can enjoy some of the benefits and profits it generates, they will be more sympathetic and respectful of the conservation objectives of the site. From the viewpoint of social fairness, protected areas are in most cases lands that local communities have for centuries protected and respected. It is only fair that they should retain some of the responsibility for stewardship of these areas, and their motivation for protecting revered sites is generally stronger than that of local governments.

East Asian countries are already experimenting in several ways with involving local communities in protecting and planting shelter forests, fire-fighting and restoring forests and grasslands on steep slopes. They have also undertaken a number of integrated conservation and development (ICD) projects with mixed success. Additional possibilities need to be considered in planning and managing PAs, and sharing their benefits.

PA legislation should specifically require the participation of local communities in PA establishment, planning and management. It should also provide for sharing economic benefits derived from the PA, including from ecotourism and related private sector services. This requirement for fair benefit-sharing is also a requirement under the CBD.

One way in which local communities can benefit from PAs is through sustainable harvesting of renewable resources from certain categories and zones of PAs, where such activities are compatible with management objectives. PA law should specify that resource extraction in PAs is allowed only as provided for in the approved PA management plan. It must establish mechanisms for coordinating the powers of various sectors to allocate resources with the powers of the PA management authority to protect and conserve resources in protected sites. The EIA process is one tool that may be used to do this. The law should enable legitimate sustainable extraction to support the livelihoods and needs of communities adjacent to PAs who depend on natural resources.

The law should clarify the types of zoning allowed in different categories and zones of PAs, and should ensure that when extraction is permitted in a PA, the PA and its surrounding communities share in the benefits derived from the extractive activity. The law should also provide for the development of guidelines for fees to be paid for permitted extractive activities in PAs.

Local villagers make excellent PA staff and can rise through the system with in-service training, even if they lack advanced formal education.

Sub-activity:

- Review of PA laws, categories and zones to facilitate local community involvement
- Establish model homestays in local villages around major tourism sites
- Promote hiring of local staff

10. TRAINING FOR PA MANAGEMENT

PA management should be recognized as a profession with a proper career structure, in-service training and a financial package including housing, insurance, medical cover and a pension scheme. Without such support and recognition, it is likely that staff performance, loyalty and motivation will remain poor, forcing staff to pursue other economic avenues often in direct conflict with PA objectives.

10.1 At national level

Action 26: Develop a training course for PA managers in each country/area and establish a regional course for training of trainers to promote some level of standardisation. The training offered should be tailored to the precise skills identified in the competence standards for staff at certain levels and positions. By insisting that training offered under assistance projects complies with these standards, both national and international training centres will be forced to improve and focus their courses. IUCN is asked to help find support and trainers for this action.

Action 27: Supplement formal training with in-service training for PA staff. This is needed especially for explaining ecological

principles to managers and planners. Many staff in PA services today were originally seconded from other sectors such as production forestry.

Recruitment and promotion are rarely based on competence and there is a general reluctance to employ people from local communities whose greater familiarity with and love for the landscape and its resources are not seen as compensating for a lack of high school certificates. This is rather like expecting town boys to become farmers (see Action 25).

10.2 At regional level

Action 28: Establish an East Asian Technical Cooperation Programme. This would involve staff exchanges and provision of training at centres of excellence within the region for officials from other East Asian countries. Raising the standards of weaker regional countries is an important responsibility. More developed countries should offer assistance to the less-developed, for example through placement scholarships (Taiwan, Japan, ROK, Hong Kong). IUCN has made some efforts to develop training in DPRK, which specifically requested assistance in establishing Mount Guwol Biosphere Reserve and publishing a Red Data Book.

Raising the standards of weaker regional countries is an important responsibility

11. FUNDING MECHANISMS

Action 29: The East Asian governments should explore ways to substantially increase levels of funding for PA establishment and development. A number of options include:

- Ecotourism development/gate revenue
- Nature conservation tax
- Ecological service provider awards, e.g. from water user tax
- Headwater conservation programmes
- Sale of bioprospecting licenses and options

Conservation taxes are used in some countries (e.g. Kenya, Costa Rica) as a way to raise earmarked funds for use in conservation. The tax can be levied on international travel (as part of the airport tax) or on international hotel room tariffs.

IUCN has developed guidelines for sustainable funding of protected areas. These include tapping unconventional sources such as private enterprise, compensatory measures by developers, and so on.

Richer and more developed countries should help weaker neighbours either with direct support or with assistance for preparing sound grant proposals. Countries should pool their efforts to secure more regional funds from international sources.

The downstream beneficiaries of a good water supply (such as industry, irrigated agriculture, hydropower, transport and residential areas) are mostly located in wealthier coastal provinces and should pay a tax for this benefit. Tax revenues should be reinvested in those water catchment areas where development is limited by the imperative to protect water sources. This money could be spent on compensation schemes, forest expansion or restoration, or PA development and protection.

Because PAs frequently protect important examples and concentrations of biological resources, they have potential for bioprospecting. This is the process of surveying and collecting species – usually for their genetic resources – and the traditional knowledge associated with them for research and development leading to commercial applications. Laws on PAs should regulate such access to genetic resources.

Bioprospecting should require a permit and be confined to certain zones, and fees should be charged at different stages from baseline surveys to commercial applications. The CBD obliges member countries to institute mechanisms of prior informed consent (PIC) as a precondition of granting bioprospecting permits. This offers scope for PAs and/or local communities to negotiate (in return for an agreed fee) before bioprospecting is undertaken in their vicinity. Revenues could be increased if bioprospecting opportunities were advertised and offered internationally.

In the past decade, financial and human limitations, amongst other restrictions, have prompted many countries to experiment with non-State management of national PAs and PAs on private land. These countries have found it feasible and effective to allow non-State actors to manage state-owned PAs, and to allow non-State actors to establish and administer PAs on non-State land. In Hong Kong, for example, WWF runs education programmes in Mai Po Marshes and Hoi Ha Wan Marine Park. In the United Kingdom, several thousand examples of wildlife habitats, geological features and landforms on private lands have been identified as Sites of Special Scientific Interest (SSSIs). Landowners are required by law to protect these.

12. WORKING TOGETHER TO IMPLEMENT THE PLAN

12.1 At national level

Much of the implementation of this plan will have to be done at the national level. Priority tasks have been identified under the area treatments in Section 3 above and in the preceding actions. However, IUCN and the WCPA can play an important role in lobbying for the inclusion of these actions in national plans and budgets, offering technical support at various levels, and securing additional external finance to cover non-routine costs.

12.2 At regional level

Action 30: Establish a WCPA-EA secretariat. The role of the secretariat will centre on strengthening the regional network and promoting implementation of the action plan. With assistance from the secretariat, the EA areas should explore the possibility of establishing an East Asia Biodiversity Centre. Experience in ASEAN, where such a centre (ARCBC) has been operating for seven years with EU support, demonstrates the many benefits in fields such as research, awareness, capacity development, information management and networking. The Wildlife Institute of India (WII), which also trains nationals from other South Asian countries, is another model that should be studied in designing such a regional centre for East Asia. The secretariat should also develop the regional PA website and database. This could eventually be housed in an East Asian Biodiversity Centre if one is established, though several modules of the database can be developed immediately by existing institutions.

Sub-activities:

- Study tour to ARCBC
- Study tour to WII
- Present plans for adoption at WCPA-EA meeting
- Fund-raising
- East Asia database/website

Action 31: Disseminate and promote multi-stakeholder implementation of the Action Plan.

Review and monitor the success of the Plan during Regional Committee Meetings and regional workshops. Evaluation will help to identify the next steps to be taken to implement the plan. Some of the actions will need further development as fully-fledged priority projects, especially those more regional than national in nature.

Action 32: Develop links to neighbouring regions'

programmes. As the world becomes more closely linked by trade and tourism, and more concerned by global phenomena such as climate change, IAS, LMOs and animal-borne diseases, the need for a transboundary approach to biodiversity issues has become critical. Even dealing with issues at a regional level is no longer adequate. The East Asian region should create avenues for dialogue and collaboration with neighbouring regions. Links should be developed with appropriate biodiversity centres and programmes.

Sub-activity:

- ASEAN links (ARCBC)
- South Asia links
- Russia links

The East Asian region should create avenues for dialogue and collaboration with neighbouring regions

Appendices

APPENDIX I: LIST OF PRIORITY PROJECTS (actions needing regional level action highlighted)

No.	Actions	Lead Agents	Funding Source
1	Each country should undertake a National Protected Areas Systems Plan to identify additional PA needs and identify national priorities	National	National
2	Countries/areas should review their range of PA categories and zones in a ways that offer more management options, especially for integrated management within protected areas (e.g. by more than one agency), sustainable use of some resources, and greater involvement of local communities.	National	National
3	Within PA Systems Plans or as a separate plan each country with marine areas should undertake a review of marine PA needs	National	National
4	Each country/area should pay special attention to identifying and acting on opportunities to strengthen the PA system by developing transfrontier collaboration and alignments with PAs in adjacent areas (both intra-regional and inter-regional).	Bilateral initiatives	National and International
5	Strengthen East Asian Flyway Programme	Secretariats of various migratory conventions	National and international
6	Each country/area should review its existing PA legislation in relation to emerging trends and new needs	National	National
7	Regional meetings should be used to formulate shared viewpoints to be delivered to important COPs of international conventions	WCPA-EA	National contributions plus international sponsors
8	Each country/area should develop management plans for all PAs. Standards for preparation and approval of such plans should be issued	National	National
9	Adopt competence standards that list the various professional skills and knowledge (competences) required for different positions and levels within a Protected Area management organisation	IUCN	International sponsorship
10	Regional governments and related international organisations should implement the CBD PoWPA as the global standard for the comprehensive and effective management of the protected areas	National	National and International
11	Promote biodiversity through the World Heritage Convention	Regional	International funding sources
12	Promote PA development through other international programmes: MAB, Ramsar, Bonn Convention, etc.	Regional	International funding sources
13	Highlight the linkages between PAs and climate change.	National	National
14	Establish routine PA monitoring of biodiversity impacts, management effectiveness and socio-economic conditions in local communities	IUCN	International funding sources
15	Establish a PA database and a database and network of experts for the region	WCPA-EA secretariat with WCMC	International funding to be sought
16	Establish an invasive species information and alert website	Chinese Academy of Sciences	International funding to be sought
17	Share experiences in ecological recovery	Host to be sought	International sponsorship required
18	Take firm action to curtail large-scale illegal hunting and wildlife trade within the region	National with NGO support	Many sources
19	Halt the rodent and pika spraying programmes in northern China	Ministry of Agriculture, China. IUCN leverage needed	National

20	Establish links between species monitoring databases in different countries on shared species of wide regional concern e.g. cranes, migratory turtles, etc.	East Asia Biodiversity Centre, when established	Links can be set up before centre established using existing centres
21	Promote East Asian field guide series	National requests	World Bank support sought
22	Translate and distribute IUCN's best practices series	IUCN	International funds to be sought
No.	Actions	Lead Agents	Funding Source
23	Adopt and enforce ecotourism codes of conduct	WCPA and NGO lobbying needed	Voluntary adoption by industry
24	Develop broader alliances for PA support	National with NGO encouragement	Private sector and others
25	Develop more effective ways of involving local communities in PA establishment, planning and management	IUCN through promotion of good experiences	Funds for models and pilots to be sought
26	Develop a training course for PA managers in each country/area and establish a regional course for training of trainers to promote some level of standardisation	IUCN and national	International and national sources
27	Supplement formal training with in-service training for PA staff	National	National plus international sources
28	Establish an East Asian Technical Cooperation Programme	National	National and international
29	The East Asian governments should explore ways to substantially increase levels of funding for PA establishment and development	National following IUCN guidelines	National and private development funds
30	Establish a WCPA-EA secretariat	Host country with IUCN support	Major funding to be sought
31	Disseminate and promote multi-stakeholder implementation of the Action Plan. Review and monitor the success of the Plan during Regional Committee Meetings and regional workshops	WCPA/IUCN secretariat and membership	Small funding to be found
32	Develop links to neighbouring regions' programmes	All agents	Little funding required

APPENDIX II: ACTIVITIES IDENTIFIED IN 1996 ACTION PLAN

Activities identified in 1996 Action Plan	Current relevance
2.1.1 Include protected areas in national development plans	Generally this is done
2.1.2 Promote comprehensive land-use planning and integrate protected areas into it	Generally not done
2.1.3 Implement zoning systems for both protected areas and the surrounding land	Generally not done
2.1.4 Implement effective procedures for Environmental Impact Assessments (EIAs)	Remains weak
2.1.5 Involve the public in the planning process as far as possible	Not done
2.2.1 Promote environmentally friendly forms of sustainable agriculture	Not done
2.2.2 Ensure nature conservation is taken into account in forestry practices	Monocultures still dominant
2.3.1 Establish and implement national strategies for sustainable tourism	Not done by PA sector
2.3.2 Encourage assistance and cooperation between countries and areas to develop and manage tourism	Very little
2.3.3 Create a non-governmental or quasi-governmental organization in each country or area, or provide a new mandate for an existing organization, to oversee ecotourism research and the development of tourism in protected areas	Not done
2.3.4 In each country and area, develop a Code of Practice for Ecotourism operators	There are codes, not followed by most operators
2.3.5 Assign some tourism revenue to local communities and some to the protected area	Ad hoc
2.4.1 Reduce pollution at source	Little done
2.4.2 Monitor pollution in protected areas	Not done
3.1.1 East Asian governments should develop formal policy directives or statements that specify protection of the natural environment as a national objective equivalent to other development objectives	Little done
3.2.1 Apply full-cost accounting techniques to show economic benefits of protected areas to local economy	Not done
3.3.1 Ensure every protected area has a realistic, agreed budget	Not done
3.3.2 Encourage innovative methods for raising revenue for protected areas	Little new
3.3.3 Encourage the private and voluntary sectors to invest in protected areas	Not done
3.4.1 Increase funding from international development organizations for protected areas	Little progress
3.4.2 Sensitize development funding to protected area needs	Not done
3.4.3 Seek funding from conservation sources	Moderate success
4.1.1 Establish a national plan to establish protected areas in a range of management categories	Not done
4.1.2 Develop national or sub-national biological census programmes	Little progress
4.2 Create more biosphere reserves	A few created
4.2.2 National priorities	
a) In Japan, there is a need to boost programmes to purchase privately owned land within National Parks, Quasi-National Parks and Prefecture Parks.	Little progress
b) In ROK, government funds are needed to acquire ecologically sensitive sites in National Parks, especially where compensation schemes for private inholders (who own much of ROK's National Parks) have been ineffective or where conflicts over land-use restrictions persist.	Little progress
c) Also in ROK, additional national parks and other protected areas are needed to protect sites of high biological diversity. Most national parks in ROK were established to protect cultural sites, often of historical importance. Much of ROK's biodiversity is inadequately protected.	Little progress
4.2.3 Individual protected area needs	
a) A transprovincial national park over part of the Qinghai-Xizang plateau between Xizang, Qinghai and Xinjiang provinces of China, with a single, unified management authority;	Huge reserves established but lack unified MP
b) Additional nature reserves in Xinjiang, China, especially to protect Bosten Lake, Ulunguhia, Salimn Lake and the Erqisi River;	Some progress
c) A protected area or areas to conserve the threatened Shennongjia old growth sub-tropical/subalpine forest in Taiyangping region, China, which forms an important transition belt between the Xizang Plateau in western China and the low montane zone in eastern China;	Some progress
d) Additional protected areas in biological diverse areas and/or ecologically critical regions of the Himalayan and Hengduan Mountains.	Done

Activities identified in 1996 Action Plan	Current relevance
e) Nature reserves to conserve the last remaining isolated lowland forest stands in Taiwan, with protected corridors between them where the forest would be restored;	Done
f) Additional Multiple-Use Management Areas (Category VI) to conserve arid and semi-arid ecosystems in the desert and steppe regions of northwestern China to connect to existing protected areas of Mongolia, to ensure that hunting, grazing and other resource uses continue to be sustainable and to provide for the economic welfare of local people in the long term;	Partial
g) A Biodiversity Conservation Region to protect the fragile ecosystem of the Interior Taklamakan Desert in China, so as to ensure that oil and gas exploration is carefully regulated, and does not damage the moist "green corridor" oasis and "mountain island" ecosystems in the desert;	Not done
h) Protected areas to conserve threatened wetlands, mountain/taiga forests, and non-game species in Mongolia;	Mostly done
i) Additional protected areas in the tropical and moist subtropical forests of China, as these forests are threatened by logging but contain a large share of East Asia's biodiversity and endemic species;	Done
j) Additional marine protected areas for the threatened coastal mangrove forests of southern China;	Partial
k) Additional protected areas in the northern forests, southern limestone mountains, and northwestern dry and semi-arid regions of China;	Mostly done
l) Several small Category VI protected areas on Macau to conserve the few remaining natural areas;	Not done
m) Protected areas for the last remaining, unprotected lowland forests in DPRK;	Partial; more to do
n) Protected areas along the western coast of DPRK to conserve biologically important islet ecosystems in the Yellow Sea threatened by blast mining.	Still to do
4.3.1 Establish at least one Biodiversity Conservation Region in each country and area of East Asia. The region should cover a substantial area (a minimum of 100,000 ha is suggested).	Not done
4.3.2 China, together with Hong Kong and Macau, is encouraged to explore the possibility of delineating the marine area in the Zhujinag River Estuary as a Biodiversity Conservation Area with special reference to the protection of the Indo-Pacific Humpbacked Dolphin.	Not done
4.3.3 China is encouraged to establish three other Biodiversity Conservation Regions in the following biologically rich and severely threatened areas: a) The central and southern mountain range of Hainan province; b) The Xishuangbanna region of Yunnan province; and c) The southwestern limestone hills and mountains of Guangxi	Not done
5.1.1 Establish and ensure the effective management of a representative system of marine protected areas in East Asia	Not done
5.1.2 Promote the concept of protected areas for "large marine ecosystems"	Not done
5.1.3 Undertake further study of potential new marine protected areas	Little progress
5.1.4 Ensure that traditional owners and local people participate in establishing and managing marine protected areas, and in the planning process for integrated multiple-use management areas	Little progress
5.2.1 Adopt and implement policies and programmes for integrated, multiple-use management of the marine environment	Little progress
5.2.2 Develop and implement programmes to minimize pollution affecting the marine environment	Not done
5.3.1 Resolve conflicting claims to fishing rights where these jeopardize protected areas	Not done
5.3.2 Promote the use of marine protected areas as a means of protecting critical areas for fisheries	Little progress
5.3.3 Integrate fisheries management with marine protected areas as part of a sustainable multiple-use management plan.	Little progress
6.1.1 Provide effective national laws on protected areas	Little progress
6.1.2 Use legislation to ensure procedures for the effective integration of protected area planning into land-use and sea-use planning.	Not done
6.1.3 Ensure that environmental legislation is relevant and achievable	Little progress
6.2.1 Convention on Biological Diversity	Progress
6.2.2 The World Heritage Convention	Progress
6.2.3 The Ramsar (or Wetlands) Convention	Progress

Activities identified in 1996 Action Plan	Current relevance
7.1.1 Provide adequate institutional structures to manage protected areas	Rare
7.1.2 Develop National Systems Plans and policies for protected areas	Still incomplete
7.1.3 Develop a management plan for each protected area	Some progress
7.1.4 Improve inter-agency communication	Little progress
7.1.5 Improve support and communication between central departments and field staff	Still poor
7.2.1 In each protected area, build up a skilled and enthusiastic team of managers and support staff	Rare
7.2.2 Develop and exchange information on management techniques	Little progress but IUCN fills this gap
7.2.3 Establish a few high-profile model protected areas to demonstrate sound management practices	Attempts are too expensive to be good models
7.2.4 Develop means for monitoring management effectiveness	IUCN done
7.2.5 Develop new techniques for sustainable management of protected areas under pressure from human needs, with particular emphasis on the Managed Resource Protected Area (IUCN Category VI)	Theory but not practice
7.2.6 Where appropriate, permit NGOs from other regions to assist NGOs from other parts of the world to play a valuable role by assisting those responsible for managing protected areas in East Asia.	Not done
7.3.1 Protect critical habitat for rare, threatened and endangered species, including by establishing protected areas along migratory routes for species	Partial
7.3.2 Establish corridors between protected areas, based on the migration routes and dispersal needs of threatened and endangered species	Partial
7.3.3 Enforce hunting and poaching restrictions in protected areas	Enforcement still poor
7.3.4 Involve local people (especially hunters who have proven wilderness survival and wildlife tracking skills) in the protection of species	Little progress
7.3.5 Use the Convention on Migratory Species of Wild Animals (Bonn Convention)	Limited
7.3.6 Increase cooperation with the Convention on International Trade in Endangered Species (CITES)	Limited
7.3.7 Halt or reduce the trade in threatened medicinal species	Limited
7.3.8 Implement SSC Action Plans for threatened species in the region	Haphazard
7.4.1 Create more transboundary protected areas	Slow progress
7.4.2 Share experience on transboundary protected areas	IUCN theory
8.1.1 Establish research priorities for protected areas	Little progress
8.1.2 Make closer links with scientific institutions	Little progress
8.1.3 Give special priority to research on threatened species, especially those dependent on protected areas for their survival	Little progress
8.1.4 Provide national and international support	Inadequate
8.2.1 Provide protected area authorities with the resources and training they need	Inadequate
8.2.2 Provide external support	Inadequate
8.2.3 Develop guidelines on data collection and monitoring.	WCMC have done this to limited degree
Each country and area is recommended to:	
9.1.1 Issue a policy statement on training protected area managers	Not done
9.1.2 Prepare and implement a training strategy to provide an effective management training programme at all levels	Not done
9.1.3 Provide training seminars for protected area staff as part of the training strategy	Ad hoc

Activities identified in 1996 Action Plan	Current relevance
At the regional level	
9.2.1 Provide more training opportunities across the region	Little done
9.2.2 Prepare model training strategies, programmes and instructional materials.	Little done
9.2.3 Encourage exchange programmes to share information and experience	Not done
9.2.4 Make key international documents available in local languages	Some progress IUCN and WB
9.2.5 Provide international support	Some progress
10.1.1 Promote long-term respect and appreciation for protected areas through educational programmes	Little progress
10.1.2 Increase understanding of protected areas in China	Some progress
10.1.3 Encourage NGOs to establish public education programmes on protected areas and environmental conservation	Some progress
10.1.4 Establish community-level environmental education programmes in primary and secondary schools	Some progress
10.1.5 Promote support for protected areas through public relations and publicity	Little done
10.2.1 Resolve conflicts on ownership of protected areas and adjacent land	Little progress
10.2.2 Involve local people in park planning and management	Mostly not
10.2.3 Consider local styles, attitudes and needs in establishing a protected area	Generally ignored
10.2.4 Ensure local people receive an economic advantage from the protected area and provide compensation where communities lose rights or resources because of its establishment	Some progress
10.2.5 Where facilities are needed in a protected area, use buildings in harmony with local surroundings	Generally ignored
10.2.6 Encourage community NGOs	Little progress
10.2.7 Design and implement integrated conservation development projects	Yes but success limited
11.1.1 Establish networks at local and national levels	
11.2.1 Promote networking for collection and exchange of data on protected areas at local, national, regional and international levels.	Little progress
11.2.2 Support and increase IUCN activities in East Asia	Partial
11.2.3 Hold regional conferences every 2–3 years on protected areas issues	Mostly
11.2.4 Hold regional forums every year	Some
11.2.5 Publish a directory of protected areas personnel and governmental and non-governmental organizations involved in protected areas in East Asia.	Done

APPENDIX III: THE FRAGRANT HILL DECLARATION, BEIJING 1993

We, the 260 participants from East Asia countries and areas, as well as international organizations, met as experts in protected areas management at the First Conference on National Parks and Protected Areas in East Asia (at Fragrant Hill, Beijing, China, 13–18 September 1993) respectfully request the leaders of the governments of the region:

1. To recognize that certain areas of land, fresh water, and sea make greater contributions to human welfare when they are managed for long-term conservation rather than for exploitation to maximize short-term economic return.
2. To provide such protected areas with the resources of staff, infrastructure, and knowledge to enable them to yield a continuous stream of benefits to local people, the wider community, and the world at large.
3. To heed the call of the “Earth Summit,” Agenda 21, and grassroots organizations in all parts of the world to adjust human relationships with nature and natural resources in ways that will provide a sustainable stream of goods and services, and use protected areas as a primary means for doing so.
4. To mobilize the necessary resources to support protected areas, including the World Bank, The Asian Development Bank, UNDP, UNEP, UNESCO, IUCN, WWF, bi-lateral assistance agencies and the many other sources of funding, expertise and moral support that are vitally interested in the welfare of East Asian nature.
5. To establish in each country and area, at the highest possible level, an appropriate coordinating and oversight mechanism to ensure that the many institutions involved in protected areas will together guard the integrity of the region’s heritage and will conserve it for the benefit of present and future generations.
6. To foster conditions that will enable local people, scientists and government officials to work together in productive partnership in support of protected areas and their many values.
7. To invest today, when global concern for the environment is a major issue, to ensure the continuing productivity of natural systems of outstanding importance to people, thereby ensuring the future productivity and prosperity of human societies.
8. To utilize protected areas as important instruments for international cooperation, through technology transfer, training, research, and information-sharing. The conventions on World Heritage, Biological Diversity, Climate Change, Regional Seas, Law of the Seas, Wetlands of International Importance (Ramsar), Migratory Species, and Trade in Endangered Species (CITES) all offer support in this regard and are highly relevant to protected areas.
9. To take advantage of the increasing mobility of people to use protected areas as an important economic asset for tourism, and as a superb opportunity to communicate to people about the multiple benefits they derive from protecting nature. Great care must be taken to ensure that tourism is managed appropriately in support of protected areas and does not contravene the values for which each area is established.
10. To launch a major initiative in the East Asia region which will establish appropriate planning and management mechanisms, including research, restoration, public participation, training, and education, on all areas of land, sea and fresh water with significant conservation value.

We are convinced that the general population in East Asia, and the rest of the world, are part of nature and they realize that their welfare can not be separated from that of the plants, the animals, the soil, the water, and the air. As experts from within the region and from many international organizations, we call for your urgent attention to the need to conserve nature. It is a matter of life or death, and of now or never.

APPENDIX IV: THE KUSHIRO DECLARATION, KUSHIRO 1996

We, the 300 participants at the Second Conference on National Parks and Protected Areas of East Asia, convened by the IUCN Commission on National Parks and Protected Areas (CNPPA), meeting in Kushiro, Japan, 30 June – 5 July, 1996, have reached agreement as follows:

To **RE-AFFIRM** the contents of the Fragrant Hills Declaration, adopted at the First Conference in September 1993, in which the importance of protected areas was highlighted and leaders of Governments in the region were respectfully requested to give priority to the planning and effective management of such areas within East Asia.

To **ADOPT** the Regional Action Plan for Protected Areas in East Asia, which contains recommendations on best practice in protected areas planning and management.

To **COMMEND** this plan to the relevant organizations and individuals of the region, and in particular to encourage them to:

- integrate the planning of protected areas into other sectors, such as economic and physical planning, agriculture, forestry, tourism development and pollution control,
- develop support for protected areas by demonstrating the economic value of such areas, providing adequate funding for them and using sources of international development assistance to assist communities living in and around protected areas,
- expand national networks of protected areas, using the full range of IUCN protected area management categories,
- improve and expand marine protected areas by establishing a representative system of such areas and adopting integrated coastal zone management,
- strengthen and enforce national protected areas legislation, and make full use of international agreements affecting protected areas, notably the Convention on Biological Diversity, the World Heritage and Ramsar Convention and the Biosphere Reserve concept,
- improve the management of protected areas, through better management planning, by involving provincial and local governments, local communities, non-governmental organizations and private sector interests as appropriate, by developing trans-boundary protected areas, and by encouraging Park-twinning programmes between protected areas within and beyond the region,
- promote research and data gathering about protected areas, including the development of networks for the better collection and use of such information,
- boost the training of protected areas personnel at all levels, through local, national and regional programmes,
- develop public support for protected areas through the involvement of local people, through environmental education and by raising public awareness generally on protected areas, and
- co-operate with other governments of the region, and beyond, in the pursuit of the aims of the plan.

And to **AGREE** that we will:

- Support the central role of the Regional Steering Committee for CNPPA in East Asia in encouraging implementation of the plan,
- Strengthen and develop the CNPPA network in East Asia, through an active programme of international co-operation, so as to help secure the place of protected areas in the region and at the global level, and
- Generally further our collaboration so as to give regional leadership in this vital area of human endeavour.

APPENDIX V: THE YANGMINGSHAN DECLARATION, TAIWAN 2002

We, more than 300 participants at the Fourth Conference on the Protected Areas of East Asia, convened by the IUCN World Commission on Protected Areas (WCPA), meeting in the Yangmingshan National Park, Taiwan from the 18th to the 23rd of March 2002, have reached agreements as follows:

To **RE-AFFIRM** the contents of the Fragrant Hills Declaration adopted at the first conference in September 1993, those of the Kushiro Declaration adopted at the second conference in June 1996, and those of the Pukan-San Declaration in September 1999, in which the importance of protected areas was highlighted and leaders of the Governments in the region were respectfully requested to give priority to the planning and effective management of such areas within East Asia.

To **WELCOME** the progress made in implementing the Regional Action Plan for Protected Areas, particularly in respect to four priority projects from this action plan, dealing with: tourism, exchange programme, directory of protected area personnel, and financing protected areas.

To **URGE** all relevant organizations and individuals in the East Asia region to recognize the vital importance of protected areas for the people of East Asia in this century, and in particular to encourage them to:

- review the range of protected areas within East Asia and ensure that use is made of the full range of IUCN protected area categories;
- facilitate the establishment of important Marine Protected Areas, such as Dong-Sha atoll (Pratas) as indicated in “Global Representative System of Marine Protected Areas (Great Barrier Reef Marine Park Authority, World Bank and IUCN, 1995)” and the “Coral Reefs and Mangroves of the World (WCMC 1996)”.
- promote research and data gathering about protected areas, including the development of networks and systems for the better collection and use of such information;
- boost the training of protected areas personnel at all levels, through local, national, and regional programmes;
- increase public awareness and support for protected areas at all levels, particularly through educational programmes and sustainable ecotourism, as well as clearer demonstration of the many benefits that such areas provide to society and through the more effective involvement of local communities in protected areas;
- strengthen and enforce national protected areas legislation, and make full use of international conventions and agreements affecting protected areas, such as the Agenda 21, Convention on Biological Diversity, the Ramsar Convention, the World Heritage Convention, and the Biosphere Reserve concept;
- improve the management of the protected areas, particularly through provision of adequate financial and human resources, and involvement of local governments, local communities, non-governmental organisations, and private sector as appropriate;
- consider planning and management of protected areas at broader scales so that protected areas are managed as integral elements of regional planning, including integrated coastal management, rather than as “isolated islands”, using measures such as green corridors, buffer zones, and potentially national scale conservation corridor, and
- expand cooperation on protected areas within and beyond the region, such as through exchange programmes and cooperative research on endangered species, habitat restoration and as appropriate informal and formal trans-boundary alliance.
- engage first peoples (that is, indigenous and/or aboriginal people) into knowledge, planning and management system of protected areas.

And to **AGREE** that we will:

- encourage governments and other potential sources of assistance to continue to support the central role of the Regional Steering Committee for WCPA in East Asia in ensuring implementation of the Regional Action Plan and other associated activities;
- strengthen and develop the WCPA network in East Asia, through an active programme of international cooperation, so as to help secure the place of protected areas in the region and at the global level;
- participate fully in the preparations for the 5th World Park Congress, to be held in Durban, South Africa in September 2003, as well as in the Congress itself;
- further our collaboration generally so as to give regional leadership in this vital area of human endeavour;
- facilitate core participation of first peoples in our discussions and meetings.
- participate, as appropriate, in the International Year of Mountains 2002, and
- meet again in Durban, South Africa in 2003, China in 2004 and Hong Kong in 2005.

Annex:

An annex is attached to this declaration. This annex was developed during conference symposia held during the 4th WCPA/East Asia Conference at the Yangmingshan National Park, Taipei, Taiwan. The recommendations brought forward in the annex are presented as a basis for proper and adequate implementation.

APPENDIX VI: TOLO HARBOUR DECLARATION, HONG KONG 2005

We, the 250 participants at the Fifth Conference on Protected Areas of East Asia, convened by the IUCN World Commission on Protected Areas (WCPA), meeting at the Chinese University of Hong Kong, Hong Kong Special Administrative Region, China, from the 21st to 25th June 2005, agree as follows:

To **RE-AFFIRM** the contents of the Fragrant Hills Declaration, Beijing 1993, the Kushiro Declaration, Kushiro 1996, the Pukan-San Declaration, Seoul 1999, and the Yang Ming Shan Declaration, Taiwan 2002.

To **RECOGNIZE** the Durban Accord (2003); the recommendations and suggestions at the WCPA Members Meeting in Bangkok (2004); the CBD Programme of Work on Protected Areas; and the key future directions set at the World Conservation Congress in Bangkok, November 2004.

To **WELCOME** the progress made by countries and areas of the East Asia Region in the establishment of both terrestrial and marine protected areas (PAs) as well as the continued improvements in the management capacity of protected areas for the conservation of biodiversity.

To **RECALL** the role of the WCPA East Asia Region in supporting the establishment and management of Protected Areas in the Region, and in building networks with members of the Region, sharing management experience and knowledge, and strengthening links with IUCN regional and country offices.

To **RECOMMEND**

- establishing PAs and enhancing standards for the planning and management of PAs, aimed at better conservation outcomes and greater social benefits;
- extending and strengthening marine protected areas;
- responding to the challenge of the Convention on Biological Diversity and the targets identified in the Programme of Work on Protected Areas adopted by the seventh meeting of the CBD Conference of Parties in 2004;
- facilitating the contribution of PAs to sustainable development including sustainable tourism;
- empowering stakeholders, policy makers, managers, NGOs and scientists to work in an integrated manner to promote effective environmental governance at all levels.

To **URGE** all relevant organizations and individuals in the East Asia region to recognize the vital importance of protected areas for the people of East Asia, and to encourage them to:

- provide young people with the education, training and opportunities needed to develop their interest in and commitment to the planning and management of protected areas;
- pay special attention to the linkages between protected areas and surrounding land uses, while ensuring socio-economic and cultural concerns, in particular the livelihoods and property rights of indigenous people and local communities are respected;
- share knowledge, experience, and technology, including data bases, for protected areas through training, workshops, seminars and publications and to make the best use of the WCPA Protected Areas Learning Net (PALNet) to serve the protected area community;
- establish a comprehensive inventory of the protected area system of East Asia and to identify gaps in the current system;

- develop and implement best practice guidelines and indicators for the management, monitoring and evaluation of protected areas and their flora and fauna;
- generate wider public support for the Protected Area system and to demonstrate the value and benefits of Protected Areas to the community, especially the urban sector;
- provide sufficient resources for PAs through sustained financing and policy support by relevant authorities;
- develop transboundary protected areas;
- investigate opportunities for ecological restoration in PAs;
- facilitate scientific research.

And to **AGREE** that we will:

- enhance and update the Protected Areas Action Plan for East Asia and translate this document together with other key WCPA documents and guidelines into the languages of the region for better understanding by people in the respective areas;
- organize regional activities or programmes between the triennial meetings, which can be in the form of special work shops, seminars, site-specific brainstorming sessions, or youth exchange visits;
- implement where appropriate, the guidelines and measures developed by WCPA in managing Protected Areas in respective countries and districts;
- communicate this declaration to relevant networks and organizations;
- meet again in China in 2008 for the 6th Regional Conference WCPA/EA.

APPENDIX VII: DRAFT JEJU DECLARATION, REPUBLIC OF KOREA 2006

The International Workshop for Better Management of Protected Areas was held at Jeju Island, Republic of Korea between 23-27 October 2006. As the result of presentations and discussions, the participants of the Workshop have reached the following consensus:

- Protected areas are appropriate instruments for conservation of biodiversity, provision of multiple benefits to humanity, and further, attainment of the global biodiversity conservation targets of 2010 for terrestrial and 2012 for marine;
- While much progress has been made and the number of protected areas in the region doubled in the past decade, the Regional Action Plan adopted by the WCPA - East Asia (WCPA-EA) in 1996 remains largely unimplemented; and
- There is growing recognition that the revision of the 1996 Regional Action specifying new targets and priorities for action over the next five years is needed to accommodate the CBD PoWPA.

In the light of the above-stated consensus, the participants of the Workshop:

1. *Call on* the Governments of the East Asian region, and international and other organizations active in the region to enhance implementation of CBD PoWPA so as to achieve the target of establishing and maintaining comprehensive, effectively managed, and ecologically representative PA system by 2010 for terrestrial and by 2012 for marine areas.

For this purpose, it is desirable to:

- prepare with UNEP-WCMC a comprehensive inventory of protected areas of East Asia that would update a new and improved version of the WDPA and thus the UN World List of PAs;
 - assess the representativeness of existing systems of protected areas and fill gaps in biomes, habitat and species coverage to ensure an adequate ecological representativeness of protected areas in the region
 - expand the coverage of their protected areas, with a particular emphasis on marine ecosystems; and
 - undertake management effectiveness evaluation, and where management effectiveness is inadequate, address the issues.
2. *Call on* the Governments and organizations to develop and strengthen cooperation in the region to promote exchange of information and experiences, organization of training workshops including on the application of the ecosystem approach and facilitate transboundary work.
 3. *Call on* the Governments of the East Asian region and partners to work towards mobilizing additional financial resources for the above activities, in particular for addressing the human and institutional capacity needed for improved management performance. In this context, it is desirable to:
 - use internationally recognized protected area designations such as World Heritage, Man and Biosphere and Ramsar sites in order to raise an awareness of those globally important sites in East Asia and to improve conservation;
 - use IUCN management categories whilst recognizing each nation's protected area classification systems;
 - integrate protected areas into the wider land and seascape with more attention given to connectivity, corridors and transboundary cooperation;
 - take concerted effort to engage indigenous and local communities in the establishment and management of protected areas; and
 - take concerted efforts to raise public awareness and support based on the value and benefits emanating from protected areas.
 4. *Continue to* explore ways and means to establish a small Secretariat to ensure and facilitate the implementation of the above activities, including a progress review at a meeting before 2010.

The 170 participants of the Workshop expressed sincere appreciation to the IUCN/WCPA as well as the concerned authorities of the Republic of Korea, in particular to the Ministry of Environment, Ministry of Maritime Affairs and Fisheries, and the Jeju Special Self-Governing Province for hosting and organizing the Workshop.

APPENDIX VIII: GIS ANALYSIS OF GAPS IN EAST ASIAN PA SYSTEM

VIII.1 Areas and administrative units

By overlaying the GIS cover for PAs with national or territorial boundaries we see that the high rate of PA cover is not uniform. Table 1 below gives the figures for each area. The tiny SAR of Macau has no scope for PA development. Both DPRK and ROK have some way to go before they catch up with other areas and exceed the 10 per cent target.

Table 1. PA cover of East Asia

Area	Total area by GIS (km ²)	PA area by GIS (km ²)	% PA cover by GIS
China	9,346,685	1,558,351	16.67
Hong Kong	1,009	393	38.96
Japan	373,737	60,904	16.30
DPRK	122,393	3,200	2.61
ROK	98,930	4,060	4.10
Macau	19	0	0.00
Mongolia	1,564,707	208,836	13.35
Taiwan	36,120	4,152	11.49
Total East Asia	11,543,600	1,839,896	15.9

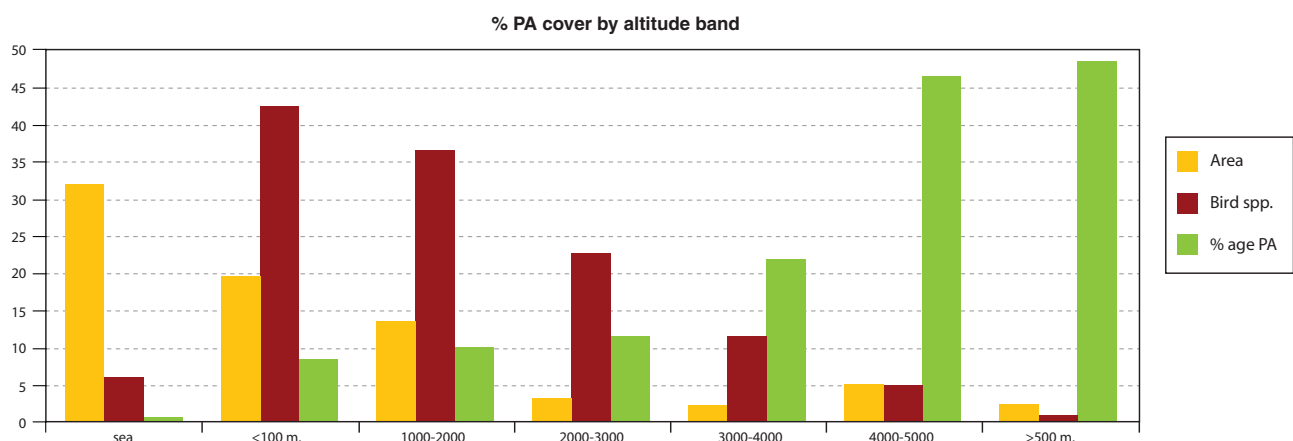
VIII.2 Altitude

A similar analysis shows the level of protection in relation to altitude (Table 2 and Figure 1).

Table 2. PA cover of East Asia at different altitudes

Altitude (m)	Total area (km ²)	In PA (km ²)	% Protected
< 1000	4,899,352	412,012	8.41
1000–2000	3,385,485	338,761	10.01
2000–3000	811,843	94,111	11.59
3000–4000	564,015	123,228	21.85
4000–5000	1,250,112	579,917	46.39
> 5000	602,160	291,867	48.47
Total	11,512,967	1,839,895	15.9

Figure 1. Relationship between extent, bird species richness and degree of protection at different altitudes



The analysis reveals that although all terrestrial altitude bands have more than 5 per cent PA cover, there is a marked bias towards greater PA coverage at increasing altitude, indicating mountains are more readily protected than lowlands. This bias runs counter to either the total area of the altitude band or its relative biological richness. Selection has favoured the inclusion of rare bio-poor habitats rather than common bio-rich ones. Moreover, quite large areas of so-called PAs at lower altitudes are identified by the GLCC as cultivated or artificial.

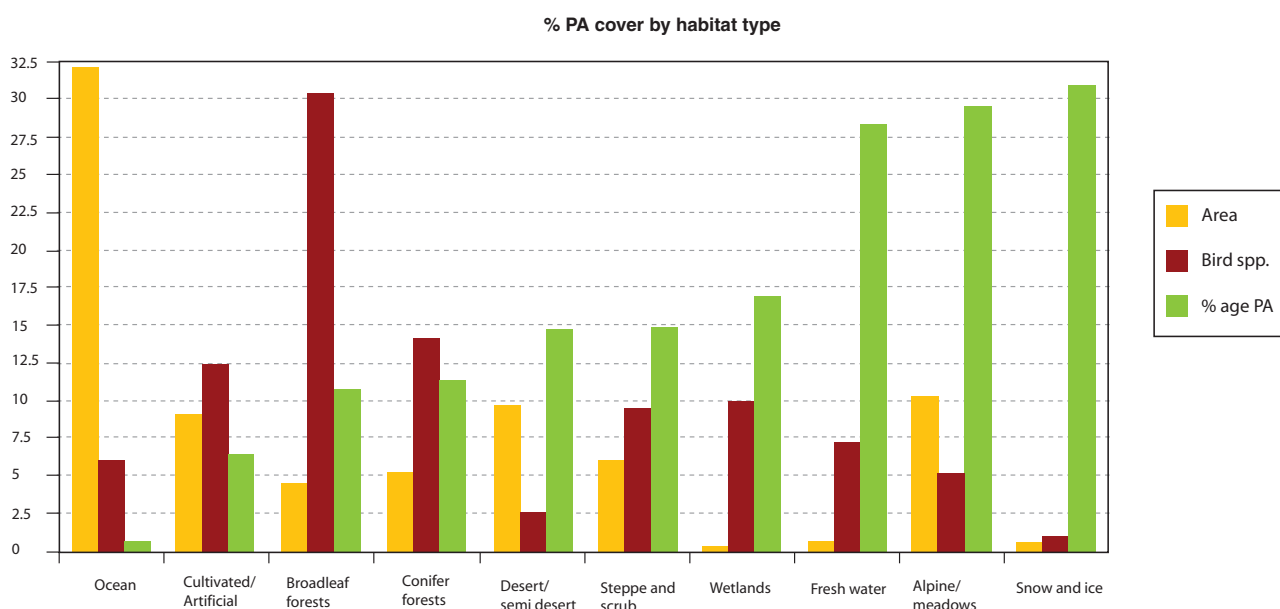
VIII.3 Habitat type

To examine whether the PA system is protecting examples of all habitat types, the PA GIS cover was overlaid with a habitat classification drawn from the GLCC database. This exercise allows us to score the total area and total protected area of each major habitat type. Table 3 details the results of the analysis.

Table 3. PA cover for major habitats in East Asia

Habitat type	Total area (km ²)	In PA (km ²)	Protected (%)
Cultivated and artificial habitats	2,268,098	141,787	6.25
Desert and semi-desert	2,417,030	356,555	14.75
Alpine and meadows	2,574,592	758,838	29.47
Broadleaf forests	1,134,983	122,914	10.83
Wetlands	48,540	8,231	16.96
Steppe and scrub	1,469,219	218,670	14.88
Snow and ice	117,488	36,243	30.85
Conifer forests	1,316,075	149,569	11.36
Inland waterbodies	166,943	47,090	28.21
Total inland	11,512,968	1,839,895	15.98

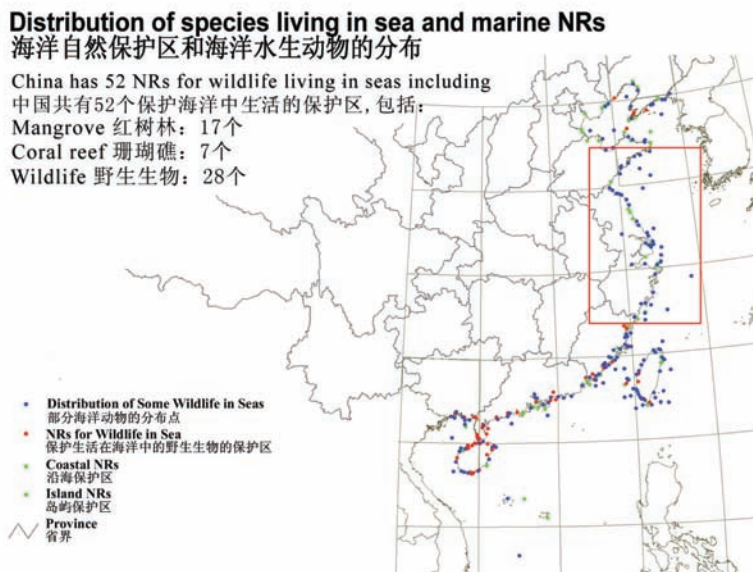
Figure 2. Relationship between extent, bird species richness and PA coverage of different habitat types



The analysis shows that all major terrestrial habitat types are fairly well represented within the PA system, but again there is a clear bias towards open and mountainous areas with low value for agriculture or other economic uses. The least well covered types are broadleaf and conifer forests, which happen to be the most valuable in terms of biodiversity (as evidenced by bird species numbers). A moderate area of PAs is classed as cultivated or artificial lands, mostly at low altitude.

Xie and Li (2004) have mapped 80 marine protected areas for China (Map 1). They point out that 52 of these are selected for species rather than habitat protection, and that most of these are actually coastline and islands. So there is not a single protected area from Shandong to Zhejiang specifically for the protection of marine life. Clearly there are gaps in the marine environment coverage.

Map 1. Marine protection gaps in China (5 degree grid)



n.b. no marine protected areas in red square.

VIII.4 Ecoregions

We have overlaid the GIS cover of East Asian PAs with a map of 77 WWF ecoregions. Map 2 shows the ecoregions shaded as to the degree of PA cover. We have measured the area of protected areas in each and allocated the totals to five categories:

- Exceptional coverage (> 20 per cent)
- Well covered (10–20 per cent PA coverage)
- Moderately covered (5–10 per cent PA coverage)
- Poorly covered (< 5 per cent PA coverage)
- Not covered (zero coverage)

The result shows that 57 per cent of ecoregions have more than 10 per cent PA cover, and 19 per cent have between 5 and 10 per cent PA cover. Three ecoregions apparently lack PA cover within the East Asian region and a further 16 have less than 5 per cent cover. Table 4 below lists these less well protected ecoregions and provides some comments on their status.

Map 2. Degree of PA coverage by ecoregion

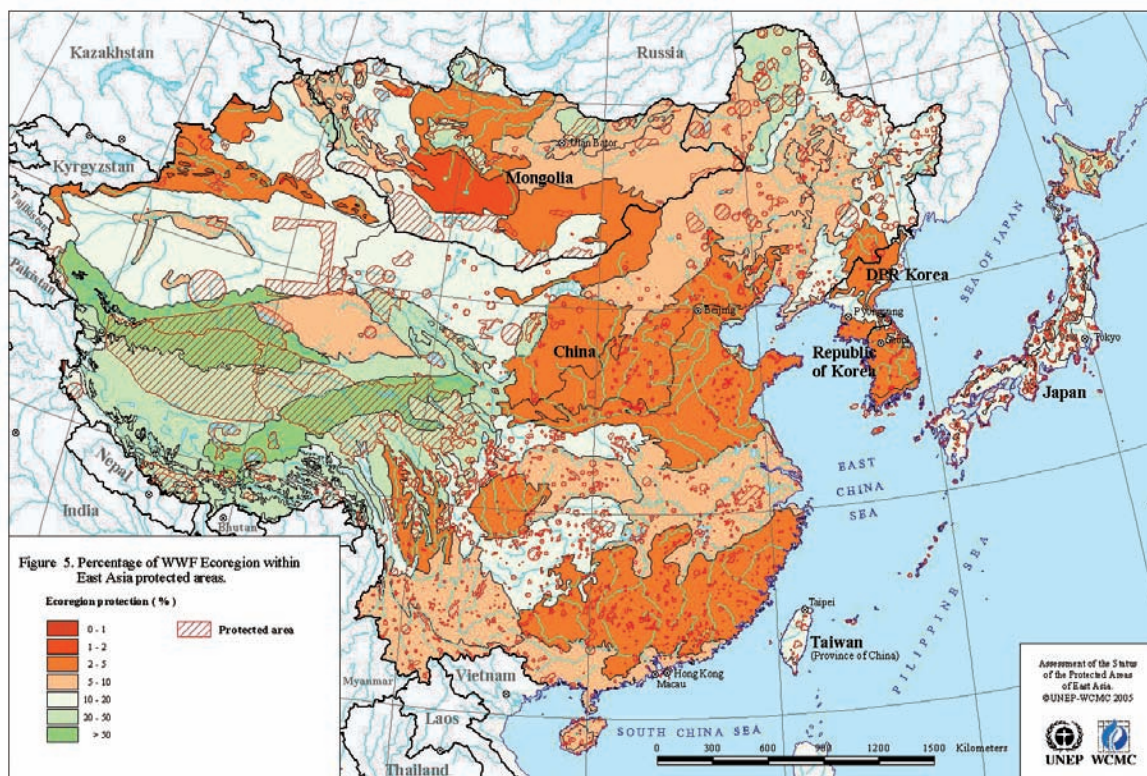


Table 4. WWF ecoregions in East Asia with less than 5 per cent PA cover

Ecoregion Name	East Asian area Km ²	% PA cover	Biodiversity significance	Comments
Central China loess plateau mixed forests	359,865	4.95	Not very significant.	Ecological arguments for forest protection remain high and greater efforts are needed to restore good cover.
Central Korean deciduous forests	103,617	2.97	Moderate interest, low endemism	Little forest remains but there is scope for increased PA cover and DMZ efforts by UNDP are proceeding.
Huang He Plain mixed forests	433,474	3.29	Formerly very valuable.	Now so populated and degraded that options for PA development are very limited
Sichuan Basin evergreen broadleaf forests	98,010	3.48	The unit is not particularly important.	The basin is so highly populated that very little suitable habitat for PA development remains.
Southern Korea evergreen forests	14,057	2.50		
Hengduan Mountains subalpine conifer forests	99,298	4.84	A temperate area of unique richness, recognized as a biodiversity hotspot.	CI and other agencies are working closely with Chinese authorities to increase and upgrade the PA cover within this important ecoregion.
Tian Shan montane conifer forests	12,787	1.86	Important for water catchment, moderate biological interest	Very remote region, few government resources available but there is scope for additional PAs
East Siberian taiga	282	0.00	A rare habitat type within the region but very common further north in Siberia	Only very marginal in China and largely destroyed by a disastrous forest fire in 1997.
Altai steppe and semi-desert	1,970	0.12	Moderate importance for some ungulates	Saiga are being reintroduced.
Emin Valley steppe	44,916	3.98	A rare type within China but largely used for farming and grazing.	Some scope for more PAs.

Table 4. WWF ecoregions in East Asia with less than 5 per cent PA cover (continued)

Ecoregion Name	East Asian area Km ²	% PA cover	Biodiversity significance	Comments
Selenge-Orkhon forest steppe	202,301	3.44		
Tian Shan foothill arid steppe	8,027	4.37	Low biodiversity interest.	Largely used for winter grazing
Nenjiang River grassland	23,259	6.66	Important wetlands.	Largely used for agriculture and reed cutting but some scope for further PA development.
Northwestern Himalayan alpine shrub and meadows	635	0	Only very marginally included in China	Easy to declare examples as PAs.
Ordos Plateau steppe	215,596	3.66	Moderate significance	Urgently needs habitat restoration for ecological functions
Tian Shan montane steppe and meadow	190,209	4.57	Low biodiversity interest but should be represented.	Largely used for summer grazing. Some additional PAs could be established.
Eastern Gobi desert steppe	282,357	3.61	Important for Mongolian gazelle and some local forms	Largely fenced as ranch lands. Two proposals for transfrontier PAs with Mongolia are under consideration. Some reserves exist on Mongolian side of border.
Gobi Lakes Valley desert steppe	139,703	1.58	Significant scenery and some spectacular wildlife	Surprisingly there are few PAs. Should be flagged as a priority.
Ocean	8,346,294	0.67	Very important gap	Not mapped to territorial limits but clearly an urgent gap

VIII.5 Centres of endemism

To test whether the PA system focuses on areas identified as having high endemism value, we have overlaid the GIS cover of PAs with maps of Endemic Bird Areas and Endemic Mammal Areas.

Seventeen EBAs occur within East Asia. These are areas where the ranges of more than one restricted-range bird species overlap. In practice EBAs are one of the best strategies for protecting bird species, as EBAs globally protect more than 85 per cent of all known bird species on only 3 per cent of the world's land area.

The results of the analysis (Table 5) show that all EBAs are relatively well covered by the PA system in East Asia, though some of the most important EBAs are the least well covered, namely, Yunnan mountains, Shanxi mountains, Southeast Chinese mountains, Chinese subtropical forest and, to a lesser extent, Taiwan.

The same exercise can be repeated for EMAs. The distributions of 112 East Asian mammals with restricted ranges were mapped. The areas where the ranges of more than three of these overlapped were classed as endemic mammal areas. Twenty EMAs were identified for the analysis, the results of which (Table 6) are similar to those for EBA cover. Most EMAs have good PA coverage but the least well covered are some of the most important and bio-rich EMAs, for example Southwest Yunnan, Southwest Guangxi, Hengduan Mountains Hainan Island, Changbai Mountains, Southeast China Mountains, Qilian Mountains, and Daba-Qingling Mountains.

VIII.6 Threatened species

When we look at specific species we start to see some gaps in species cover. For instance, we have overlaid PA cover with the geographical ranges of 93 threatened and endangered bird species. The analysis reveals that 60 per cent of these species have more than 10 per cent PA cover within their gross geographical ranges, while about 30 per cent have between 5 and 10 per cent PA cover. Only nine species suffer from inadequate PA cover (Table 7).

Table 5. PA coverage in EBAs

EBA no.	EBA name	Number of restricted range species	EBA area (km ²)	Area within PAs (km ²)	% PA cover
127	Taklimakan Desert	2	60,418	4,790	7.93
134	Eastern Tibet	2	63,225	30,729	48.60
133	Southern Tibet	2	59,695	11,597	19.43
130	Eastern Himalayas	22	18,038	9,625	53.36
135	Qinghai mountains	2	232,628	27,619	11.87
137	Central Sichuan mountains	11	115,242	22,087	19.17
138	West Sichuan mountains	3	175,672	60,816	34.62
140	Chinese subtropical forest	5	129,458	10,078	7.78
139	Yunnan mountains	3	185,652	11,327	6.10
142	Hainan	4	13,201	1,586	12.01
136	Shanxi mountains	2	188,631	12,169	6.45
141	Southeast Chinese mountains	5	595,382	39,771	6.68
149	Taiwan	15	35,904	4,148	11.55
148	Nansei Shoto	10	4,734	1,114	23.53
147	Ogasawara Islands	1 + 3 extinct	64	64	100.00
129	Central Himalayas	3	28	28	100.00
146	Izu Islands	3	306	244	79.61

Table 6. PA coverage in EMAs

EMA no.	EMA name	Number of restricted range species	EMA area (km ²)	Area within PAs (km ²)	% PA cover
1	Gaoligong Mountains	18	40,850	7,302	17.88
2	Southwest Yunnan	10	143,764	10,156	7.06
3	Southwest Guangxi	3	35,720	3,466	9.70
4	West Sichuan Mountains	12	139,565	24,181	17.33
5	Northeast Guizhou Mountains	2	47,548	5,336	11.22
6	Hengduan Mountains	6	166,577	12,214	7.33
7	East Himalayas	7	284,968	51,265	17.99
8	Hainan Island	5	23,666	1,956	8.26
9	Taiwan Island	14	30,996	3,931	12.68
10	Changbai Mountains	2	118,927	8,789	7.39
11	Southeast China Mountains	2	123,445	8,180	6.63
12	Qilian Mountains	2	97,429	6,664	6.84
13	Helan Ningxia	2	92,718	11,758	12.68
14	Daba-Qingling Mountains	3	120,402	10,588	8.79
15	Hokkaido Mountains	2	19,898	4,530	22.77
16	Central Honshu Mountains	2	30,575	8,610	28.16
17	Sado-Niigata	3	4,733	489	10.34
18	Tsushima Islands	2	640	228	35.61
19	Ryukyu Island Chain	10	2,972	801	26.97
20	Ogasawara-Bonin	2	49	49	100.00

Table 7. Threatened bird species with inadequate PA cover

Species	% PA cover	Red Data Category	Comments
<i>Brachypteryx hyperythra</i>	0	Vu	Occurs in northeast India. Will be protected in Nujiang PA in marginal Chinese range
<i>Columba punicea</i>	0	Vu	Himalayan species protected in neighbouring Nepal PAs.
<i>Nipponia nippon</i>	1.33	Cr	Extirpated from most of former range. Last wild breeding colony is within PA. Captive breeding and release programme in place.
<i>Polysticta stellata</i>	0	Vu	Winter visitor only. Breeding range is in Russia.
<i>Sterna bernsteini</i>	0	Cd	Almost extinct. No breeding colonies known.
<i>Tadorna cristata</i>	0	Cr	Possibly extinct. No wild populations known in Russia, Korea, China junction region.
<i>Arborophila rufipectus</i>	3.98	Cr	Protected in Mabian Dafending PA. Recommendations for additional sites have been made by SSC.
<i>Liocichla omeiensis</i>	3.75	NT	Well protected in Mount Emei PA but more forest could be protected.
<i>Spelaeornis badeigularis</i>	0	Vu	Never recorded in China but probably occurs on north side of Mishmi Hills. Protected in Indian administered area.

We have undertaken a similar analysis for the distributions of all Chinese endemic mammals. Endemic mammals whose ranges do not appear to be covered by any PA are *Soriculus fumidus*, *Soriculus sodalis*, *Rhinolophus osgoodi*, *Plecotus taivanus* and *Murina puta*. These are two shrews and three bats. It is likely that these much-overlooked species would be found in existing PAs if their full ranges were better known.

Species with only limited PA cover (less than 5 per cent) include *Eospalax fontanierii*, *Eothenomys proditor*, *Ochotona iliensis*, *Sorex cansulus* and *Myotis pequinus*. Two of these are small overlooked mammals but the pika *Ochotona iliensis* appears to be very restricted and the Rabbit and Pika Specialist Group of IUCN's SSC is proposing additional PAs for its protection. *Eospalax fontanierii* is both widespread and well-reported but occurs in the Loess plateau region of China which has extremely poor PA cover.

BirdLife International has been compiling a directory of Important Bird Areas (IBAs), sites where the several Red-listed bird species are known to occur together. We were able to use a point GIS cover of the East Asian IBAs. Using circles to represent the known sizes of each IBA, plus information from the names of IBAs (which sometimes refer directly to protected area polygons), we have undertaken a rough analysis of how many of these sites fall within the PA system (Table 8).

The results show that although the bulk of IBAs are inside or close to existing PAs, many important areas remain outside the PA system. Clearly some sites may prove to be duplicates of protected sites, or may have no scope for PA development, but when full details are available each site should be examined on a case-by-case basis to assess their potential value as PAs.

Table 8. PA coverage in IBAs

Relation of IBA to PA	Number	Area (ha)	Proportion (no.)	Proportion (area)
Far outside PA (relative to size or 10 km for IBA with unknown size)	319	13,030,417	40.8	11.9
CENTRE WITHIN PA	233	61,972,214	29.8	56.6
Within 10 km from PA	74	2,896,604	9.5	2.6
Large area relatively close to PA	23	22,148,099	2.9	20.2
Centre further than 10 km from PA	133	9,415,267	17.0	8.6
Total	782	109,462,601		

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LIST OF ABBREVIATIONS

ARCBC	ASEAN Regional Centre for Biodiversity Conservation
ASEAN	Association of South East Asian Nations
BCAP	Biodiversity Conservation Action Plan
CBD	Convention on Biological Diversity
CI	Conservation International
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMS	Convention on Migratory Species (Bonn Convention)
COP	Conference of Parties
DMZ	Demilitarized Zone
DPRK	Democratic People's Republic of Korea
EA	East Asia
EBA	Endemic Bird Area
EIA	Environmental Impact Assessment
EMA	Endemic Mammal Area
EU	European Union
GDP	Gross Domestic Product
GEF	Global Environment Facility
GIS	Geographic Information System
GISP	Global Invasive Species Programme
GLCC	Global Land Cover Characteristics
IAS	Invasive alien species
IBA	Important Bird Area
ICD	Integrated Conservation and Development
ICF	International Crane Foundation
IM	Indo-Malayan (in ecoregion codes)
IUCN	International Union for Conservation of Nature
LMO	Living Modified Organism
MAB	Man and Biosphere Programme
NBSAP	National Biodiversity Strategy and Action Plan
NGO	Non-governmental organisation
NR	Nature Reserve
OC	Oceania (in ecoregion codes)
PA	Protected Area
PA	Palaearctic (in ecoregion codes)
PIC	Prior Informed Consent
PoWPA	Programme of Work on Protected Areas (CBD)
ROK	Republic of Korea
SAR	Special Administrative Region
SARS	Severe Acute Respiratory Syndrome
SEPA	State Environment Protection Agency (China)
SFA	State Forestry Administration (China)
SSC	Species Survival Commission of IUCN
SSSI	Site of Special Scientific Interest
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational Scientific and Cultural Organization
WCMC	World Conservation Monitoring Centre
WCPA	World Commission on Protected Areas
WII	Wildlife Institute of India
WWF	World Wide Fund for Nature

CONTACTS OF WCPA-EA

Country/Area	Affiliation	Address	Tel/Fax	Email
China				
BAI, Chengshou	Director, Division of Nature Reserves and Species Management, State Environment Protection Agency	115 Nanxiaojie, Xizhimennei, Beijing, 100035, China	86-10 6655 6316 (Tel); 86-10 6655 6304 (Fax)	chshbai@zhb.gov.cn
ZUO, Xiaoping	Director, Office of National Park, Ministry of Construction	9 Sanlihe Lu, Baiwanzhuang, Beijing, 100835, China	86-10 5893 3014 (Tel); 86-10 5893 3014; 86-10 5893 4062 (Fax)	zuoxp@mail.cin.gov.cn
WANG, Bin	Director, Department of Marine Environmental Protection, State Oceanic Administration	No. 1 Fuxingmenwai Ave., Beijing, 100860, China	86-10 6804 7632 (Tel); 86-10 6803 0799 (Fax)	soawb@sina.com
LI, Zhong	Chief, Division of Nature Reserve Management, State Forestry Administration	18 Hepingdongjie, PO Box 1428, Beijing, 100714, China	86-10 8423 8525 (Tel); 86-10 8423 9211 (Fax)	lizhong@forestry.gov.cn
XIE, Yan	Institute of Zoology, Chinese Academy of Sciences China Program Director, Wildlife Conservation Society	C206, Institute of Zoology, CAS, Datunlu, Beijing, 100101, China	86-10 6480 7291 (Tel); 86-10 6480 7289 (Fax)	xieyan@ioz.ac.cn
DPRK				
PAEK Sung Ik	Director of Foreign Affairs Department, NCUK	DPRK		ncuk3@co.chesin.com
Hong Kong				
JIM, Chi Yung	Chair Professor and Head, Department of Geography, The University of Hong Kong	Pokfulam Road, Hong Kong	(852) 2859 7020 (Tel); (852) 2859 7020 (Fax)	hragjcy@hkucc.hku.hk
Joseph Chun-hung SHAM	Assistant Director, Agriculture, Fisheries and Conservation Department	7/F, Cheung Sha Wan Government Offices, 303 Cheung Sha Wan Road, Kowloon, Hong Kong	(852) 2150 6606 (Tel); (852) 2311 3731 (Fax)	joseph_ch_sham@afcd.gov.hk
ANG, P.O. Jr.	Professor, Department of Biology, The Chinese University of Hong Kong	Department of Biology, The Chinese University of Hong Kong, Shatin, N.T. Hong Kong	(852) 2609 6133 (Tel); (852) 2603 5391 (Fax)	put-ang@cuhk.edu.hk
Richard CORLETT	Associate Professor, Department of Ecology and Biodiversity, The University of Hong Kong	Pokfulam Road, Hong Kong	(852) 2299 0601 (Tel); (852) 2517 6082 (Fax)	corlett@hkucc.hku.hk
CHAU, Kwai Cheong	Associate Professor, Department of Geography and Resource Management, The Chinese University of Hong Kong	Department of Geography and Resource Management, The Chinese University of Hong Kong, Shatin, N.T. Hong Kong	(852) 2609 6533 (Tel); (852) 2603 5174 (Fax)	kwaicchau@cuhk.edu.hk

Japan				
KANDA, Shuji	Director, National Park Division, Ministry of the Environment	1-2-2 Kasumigaseki, Chiyoda-ku, Tokyo, 1008975, Japan	++81 (3) 5521-8277/++81 (3) 3595-1716	koen_kento@env.go.jp
YONEDA, Kumiko	Senior Research Scientist, Japan Wildlife Research Centre	Taito-ku, Tokyo, 110-8676, Japan	++81(3) 5824-0963/++81 (3) 5824-0964	kyoneda@jwrc.or.jp
HIGASHIOKA, Reiji	Assistant Director, National Park Division, Nature Conservation Bureau, Ministry of the Environment, Japan	1-2-2 Kasumigaseki, Chiyoda-ku, Tokyo, 1008975, Japan	81-3-5521-8279 (Tel) 81-3-3595-1716 (Fax)	REIJI_HIGASHIOKA@env.go.jp
YOSHIDA, Masato	Chairperson of Japan Committee for IUCN c/o Nature Conservation Society of Japan	Mitoyo Building, 2F, 1-16-10 Shinkawa, Chuo-ku, Tokyo, 1040033, Japan	81-3-3553-4109 (Tel) 81-3-3553-0139 (Fax)	mail@iucn.jp myoshida@iucn.jp
SHIKANO, Hisao	Head Director, National Park Association of Japan	Toranomon Denkibilu, 4F, 2-8-1 Toranomon, Minato-ku, Tokyo, 1050001, Japan	81-3-3502-0488 (Tel) 81-3-3502-1377 (Fax)	shikano@npaj.or.jp
NAKAYAMA, Naoki	Chief, National Park Division, Nature Conservation Bureau, Ministry of the Environment, Japan	1-2-2 Kasumigaseki, Chiyoda-ku, Tokyo, 1008975, Japan	81-3-3581-3351 (Tel) 81-3-3595-1716 (Fax)	NAOKI_NAKAYAMA@env.go.jp
Macau				
LEONG Kun Fong				fongl@iacm.gov.mo
PUN Wing Wah				wingp@iacm.gov.mo
Mongolia				
ENEBISH Tumurbaatar	Director, Center for Ecosystem Management	Ih surguuliin gudamj Bldg 16B Ulaanbaatar Mongolia	Mobile: 976-99260600	etumur@magicnet.mn or etumur@yahoo.com
NAMKHAI.A	Director, Department of Protected Area Management, Ministry of Nature & Environment, Mongolia	Bag toiruu-44, Gov Bldg-3 Ulaanbaatar Mongolia	Tel: 976-11-312428 Fax: 976-11-321401	namkhai@mne.gov.mn
BADAMDORJ Bayartogtokh	Head, Department of Zoology, Faculty of Biology National University of Mongolia	P.O. Box 377 Ulaanbaatar 210646 Mongolia	Tel: 976-11-323970 Fax: 976-11-320159	bayartogtokh@num.edu.mn

ROK				
KIM, Ji-Tae	Director General, Nature Conservation Bureau, Ministry of Environment	Government Complex-Gwachon 1, Joongang-dong, Gwacheon-si, Gyeonggi-do, 427-729, Korea	(822)2110-6505 (822)504-9207	jtkim221@me.go.kr
SHIN, Won-Woo	Executive Director, Park Conservation, Korea National Park Service	Taeyoung Bldg. 9th FL. 252-5 Gongdeok-dong, Mapo-gu, Seoul, Korea	(822)3279-2718; (822)3279-2804	wowshin@knps.or.kr
CHO, Do-Soon	Professor, Department of Life Science, The Catholic University of Korea	43-1, Yeokgok 2-dong, Wonmi-gu, Bucheon-si, Gyeonggi-do 420-743, Korea	(822)2164-4357; (822)2164-4765	dscho@catholic.ac.kr
KIM, Seong-II	Professor, Dept. of Forest Sciences, College of Agriculture and Life Sciences, Seoul National University	Seoul National University, 559 Gwanangno, Gwanak-gu, Seoul, 151-742, Korea	(822)880-4756; (822)873-3560	seongil@snu.ac.kr
HEO, Hag-Young	Senior Researcher, Korea National Park Service	Taeyoung Bldg. 9th FL. 252-5 Gongdeok-dong, Mapo-gu, Seoul, Korea	(822)3279-2960; (822)3279-2804	mudae4@paran.com
CHUNG, Heuk-Jin	Professor, Dept. of Environmental Engineering, College of Engineering, Chung-Ju National University	123. Geonmdan-ri, Iryu-myeon, Chungbuk, 380-702, Korea	(8243)841-5351; (8243)841-5350	hchungmoe@hanmail.net
PARK, Yong-Ha	Director of Land and Ecosystem Management Division, Korea Environment Institute	613-2, Bulkwang-Dong, Eunpyung-Gu, Seoul, 122-040, Korea	(822)380-7631; (822)380-7644	yhpark@kei.re.kr
YOOK, Keun-Hyung	Researcher, Coastal & Ocean Policy Research Department, Korea Maritime Institute	Sooam Bldg, #1027-4, Bangbae 3-Dong, Seocho-Gu, Seoul, 137-851, Korea	(822)2105-2757; (822)2105-2779	ykh690@kmi.re.kr
Taiwan				
LIN, Yi Hou	President, National Park Association in Taiwan	No. 15, Alley 70, Lane 12. Section 3, Bade Road, Taipei, 105 Taiwan	886-2-25778725 (Tel); 886-2-25778134 (Fax)	yhlin@faculty.pccu.edu.tw
KUO, Monica	Chair, Department of Landscape Architecture Chinese Culture University	55, Hwa Kang Road, Yang Ming Shan, Taipei, Taiwan	886-2-2861-8694 (2543) (Tel); 886-2-2861-7507 (2560) (Fax)	epdc2000@ms42.hinet.net
CHIAU, Wen Yan	Professor and Director, Institute of Marine Affairs and Resource Management National Taiwan Ocean University	Keelung City 20224, Taiwan	886-2-2462-2192 ext. 5605 (Tel); 886-2-2463-3986 (Fax)	chiau@mail.ntou.edu.tw or chiauzyw@mail.nsysu.edu.tw
FANG, Kuo Yun	Director, Nature Conservation Division, Forest Bureau	2, Sec. I, Hang Chow South Road, Taipei, Taiwan		kyfang@forest.gov.tw
LEE, Kuang Chung	Assistant Professor, National Hualien Teachers College	No. 123, Hua Shi Road, Hualien City 97003, Taiwan	886-3-8227106 (1909) (Tel); 886-3-8222961 (Fax)	kclee2000@hotmail.com
WANG, Shin	Professor, National Taiwan University	P.O. Box 23-1175, Taipei, Taiwan	886-2-23627052	swang@ntu.edu.tw

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63 Sukhumvit Soi 39
Wattana, Bangkok 10110, Thailand
Tel: + 66 (0) 2 662 4029
Fax: + 66 (0) 2 662 4387
iucn@iucnt.org

www.iucn.org

Asia Regional Office
International Union for Conservation of Nature