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SITE NAME: Sichuan Giant Sanctuary

DATE OF INSCRIPTION: 16 July 2006

STATE PARTY: CHINA

CRITERIA: N (x)

DECISION OF THE WORLD HERITAGE COMMITTEE:

Excerpt from the Decisions of the 30th Session of the World Heritage Committee

Criterion (x): The Sichuan Giant Panda Sanctuary includes more than 30% of the world's population of giant Panda and constitutes the largest and most significant remaining contiguous area of panda habitat in the world. It is the most important source of giant panda for establishing the captive breeding population of the species. The property is also one of the botanically richest sites of any temperate region in the world or indeed anywhere outside of the tropical rain forests. Underlining the outstanding value is the large size of the nominated property and the fact that it protects a wide variety of topography, geology, and plant and animal species. The nominated property has exceptional value for biodiversity conservation and can demonstrate how ecosystem management systems can work across the borders of national and provincial protected areas.

BRIEF DESCRIPTIONS

Sichuan Giant Panda Sanctuaries, home to more than 30% of the world's highly endangered pandas, covers 924,500 ha with seven nature reserves and nine scenic parks in the Qionglai and Jiain Mountains. The sanctuaries constitute the largest remaining contiguous habitat of the giant panda, a relict from the paleo-tropic forests of the Tertiary Era. It is also the species' most important site for captive breeding. The sanctuaries are home to other globally endangered animals such as the red panda, the snow leopard and clouded leopard. They are among the botanically richest sites of any region in the world, outside the tropical rain forests, with between 5,000 and 6,000 species of flora in over 1,000 genera.

Les Sanctuaires du grand panda du Sichuan qui abritent plus de 30 % de la population mondiale de pandas géants. Situés dans les montagnes Qionglai et Jiain, les sanctuaires s'étendent sur 924 500 ha et comprennent sept réserves naturelles et neuf parcs paysagers. Ils constituent aujourd'hui la plus grande zone contiguë d'habitat de ce panda - une relique des forêts paléotropiques de l'ère tertiaire – qui est une espèce particulièrement menacée. C'est aussi la plus importante source de grands pandas pour l'établissement de populations de l'espèce en captivité. De plus, les sanctuaires abritent un certain nombre d'espèces en danger à l'échelle mondiale comme le petit panda, la panthère des neiges et la panthère nébuleuse. Sur le plan botanique, il s'agit de l'un des sites les plus riches du monde, en dehors des forêts tropicales ombrophiles, avec sa flore qui compte entre 5 000 et 6 000 espèces appartenant à plus de 1 000 genres.

1.b State, Province or Region: China - Sichuan

1.d Exact location: N 29 53 47 – 31 21 49 E 102 08 45 - 103 23 45

**WORLD HERITAGE CONVENTION
NATURAL HERITAGE: CHINA**

SICHUAN GIANT PANDA SANCTUARY

WOLONG, MT. SIGUNIANG AND JIAJIN MOUNTAINS

**MINISTRY OF CONSTRUCTION
OF THE PEOPLE'S REPUBLIC OF CHINA**

WORLD HERITAGE CONVENTION
NATURAL HERITAGE: CHINA

SICHUAN GIANT PANDA SANCTUARY
—WOLONG, MT. SIGUNIANG AND JIAJIN MOUNTAINS

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MINISTRY OF CONSTRUCTION
OF THE PEOPLE'S REPUBLIC OF CHINA

September 2002



Giant Panda (*Ailuropoda melanoleuca*)

Type locality: Dengchigou of Baoxing County in the Jiajin Mountains, Sichuan Province, P. R. China

English name: Giant panda

Biological features: The adult male is 64~125 kg, 1.5~1.8 m long, 65~70 cm high. Its tail is 12~16 cm long. The female is 10 %~20 % smaller than the male. Giant panda has a round head and rotund body. It is milk white with deep black eye sockets, ears and shoulders. Living in forests between 1300~3600 m high above sea level, its total lifetime is approximately 26 years.

Distribution: West Sichuan Province, South Gansu Province, and South Shaanxi Province.

Protection: National Class I; Appendix I, CITES; IUCN endangered species.

Value: The only one species in its family, a relic from the tertiary paleo-tropical forest period. Due to its special taxonomic position, it is of great significance to the study of species evolution and ancient environment transition. Giant panda is a rare 'living fossil'. Its figure has been chosen as the emblem of WWF, symbolizing natural conservation and world wildlife protection.



Dove Tree (*Davidia involucrata*)

Type locality: Jiajin Mountains in Baoxing County, Sichuan Province, P. R. China

English name: Dove tree

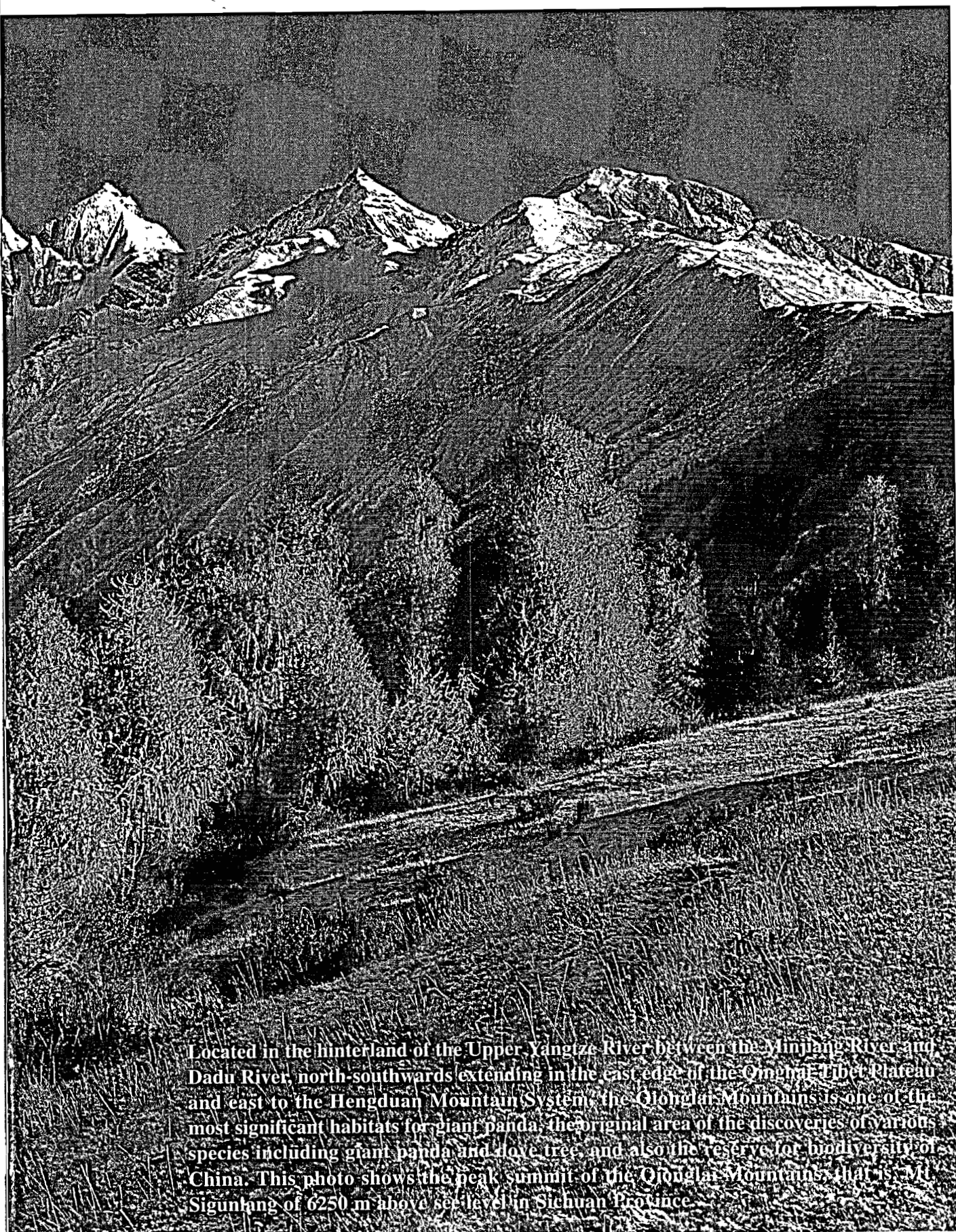
Biological features: Dove tree is a kind of deciduous macrophanerophytes, 15~20 m high, with oval broad leaf 8~14 cm long, and polygamous calathide, one piece of pistillate or hermaphyoditic flower on the tip of the inflorescence surrounded by polyandria. 2 or 3 white oval bracts 7~15 cm long are on the basal part of inflorescence. The blooming period is from April to May. The dove tree has oviform fleshy fruit. Its kernel is 3~4 cm long with 3~5 seeds. The fruiting period is from September to October.

Distribution: west, northwest, and southwest parts of Sichuan Province, and Shaanxi, Hubei, Hunan, Guizhou and Yunnan Provinces as well

Protection: National Class I

Value: One variety, one species, one genus in its own family, a relic of the tertiary paleo-tropical period. Due to its special taxonomic position, it is of importance in terms of studying paleo-flora and phylogenetic development. Dove tree, a rare 'living fossil', is a globally well-known 'sightseer's' tree. In its blooming period, 2 big white bracts under the inflorescence look just like doves on the tree ready to fly away, hence the name 'dove tree'.





Located in the hinterland of the Upper Yangtze River between the Minjiang River and Dadu River, north-southwards extending in the east edge of the Qinghai-Tibet Plateau and east to the Hengduan Mountain System, the Qionglai Mountains is one of the most significant habitats for giant panda, the original area of the discoveries of various species including giant panda and dove tree, and also the reserve for biodiversity of China. This photo shows the peak summit of the Qionglai Mountains, that is, Mt. Siguntang of 6250 m above sea level in Sichuan Province.

SICHUAN GIANT PANDA SANCTUARY

—WOLONG, MT. SIGUNIANG AND JIAJIN MOUNTAINS

An Unique Natural Area

Home to rich biodiversity of threatened species and the species of great scientific importance and value: Unique site of scientific exploration and discovery with unprecedented numbers of type specimens. Site of the original discovery of giant panda and dove tree. Largest, most extensive and most completely representative remaining portion of the habitat of giant panda. Globally richest documented botanical site outside of the tropical region. Long lists of endemic and endangered species of almost all taxa. Important site for protection of China's endemic bird areas. Most important region of China for mammalian conservation.

Site of outstanding examples of evolution progress: Home of many relict species or 'living fossils'. Global center of pheasant diversity. Important center of diversity for rhododendrons and other plant groups. Area of co-adaption, Pleistocene refuge and secondary adaption of giant panda.

Site of exceptional natural phenomena and scenic beauty: Spectacular scenic areas of steep mountains, gorges, waterfalls and glaciers. Richest and lushest alpine flora in the world. One of only two sites in Central China protecting complete continuum from permanent ice to evergreen subtropical forests.

Site of significant geomorphology recording important periods of earth's history: Geological strata spanning from the Tethys Sea period to uplifting of the Tibetan Plateau and formation of the Hengduan Mountain System.

Site of social, cultural and ecological importance: Site of great biological history significance. More than forty years continuous history of pioneering field research and conservation activities. Major collecting locality of seeds that form the foundation of 'English' and western gardens. Additional cultural interests of Qiang and Tibetan minorities and Han temples, Taoism and historical sites including unique Qing Dynasty Catholic Mission. Most important genepool area for Chinese traditional medicine. Largest and most successful captive breeding center of giant pandas in the world. Full documentation of biodiversity collections and reference materials. Important ecological service and watershed regulation functions.

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1 LOCATION OF THE NOMINATED AREA

1.1 Country

The People's Republic of China

1.2 Province and Cities

Sichuan Province: Aba Tibetan & Qiang Autonomous Prefecture
Ya'an City
Chengdu City
Ganzi Tibetan Autonomous Prefecture

1.3 Name of the Nominated Area

Sichuan Giant Panda Sanctuary — Wolong, Mt. Siguniang and Jiajin Mountains

1.4 Location

The nominated area lies between

N 29° 53' 47" ~ 31° 21' 49" and E 102° 08' 45" ~ 103° 23' 45" .

It has a total area of 9 510 km². The elevation ranges from 800 m a.s.l. to the peak of Mt. Siguniang at 6250 m a.s.l.

1.5 Maps

1.5.1 Location Map of the Nominated Area

1.5.2 Topographical Map of the Nominated Area

1.5.3 Geomorphologic Map of the Nominated Area

1.5.4 Geological Map of the Nominated Area

1.5.5 Vegetation Map of the Nominated Area

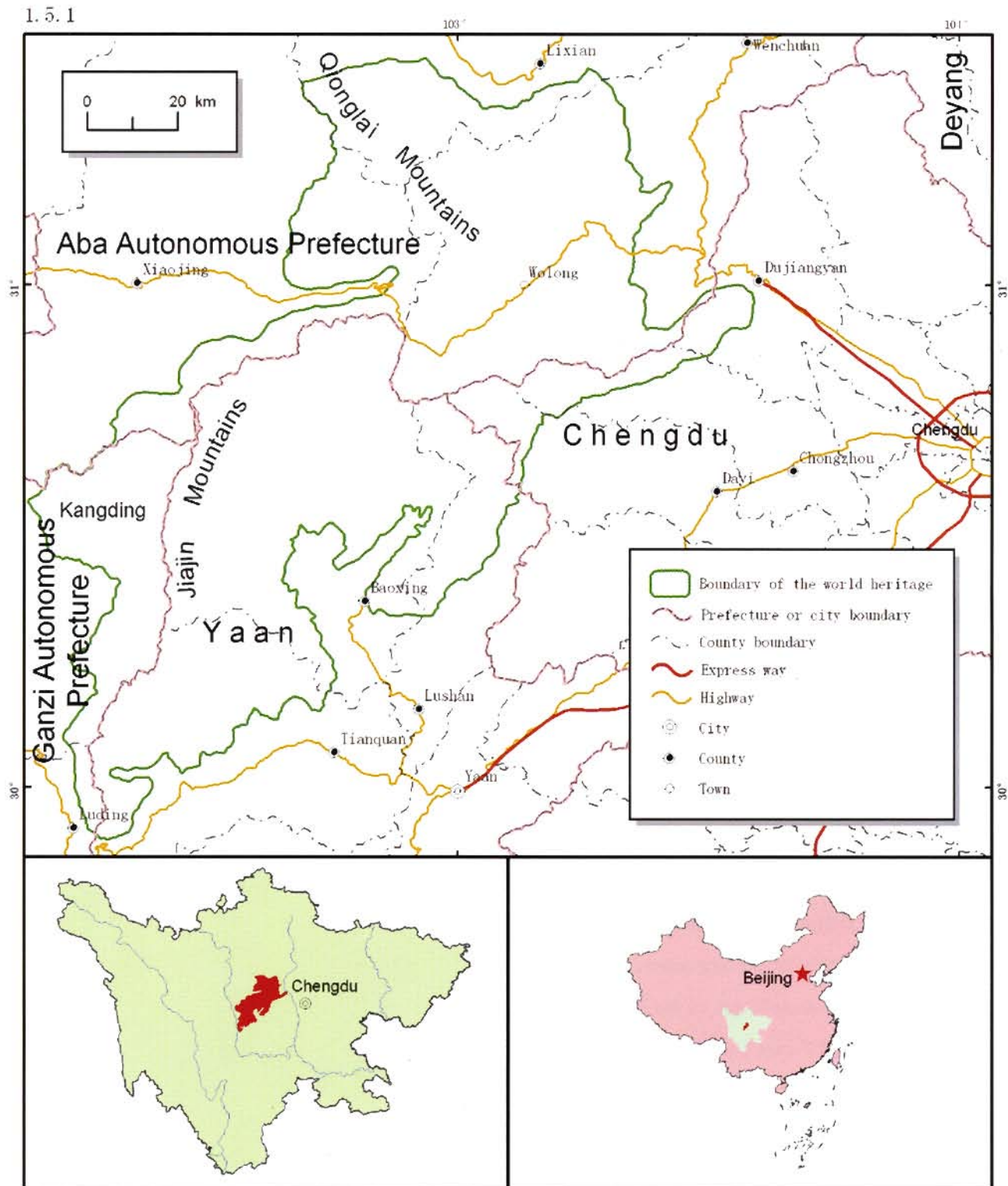
1.5.6 Present Protection Status of the Nominated Area

1.5.7 Map of Giant Panda Distribution and the Nominated Area Plan

1.5.8 Satellite Image of the Nominated Area

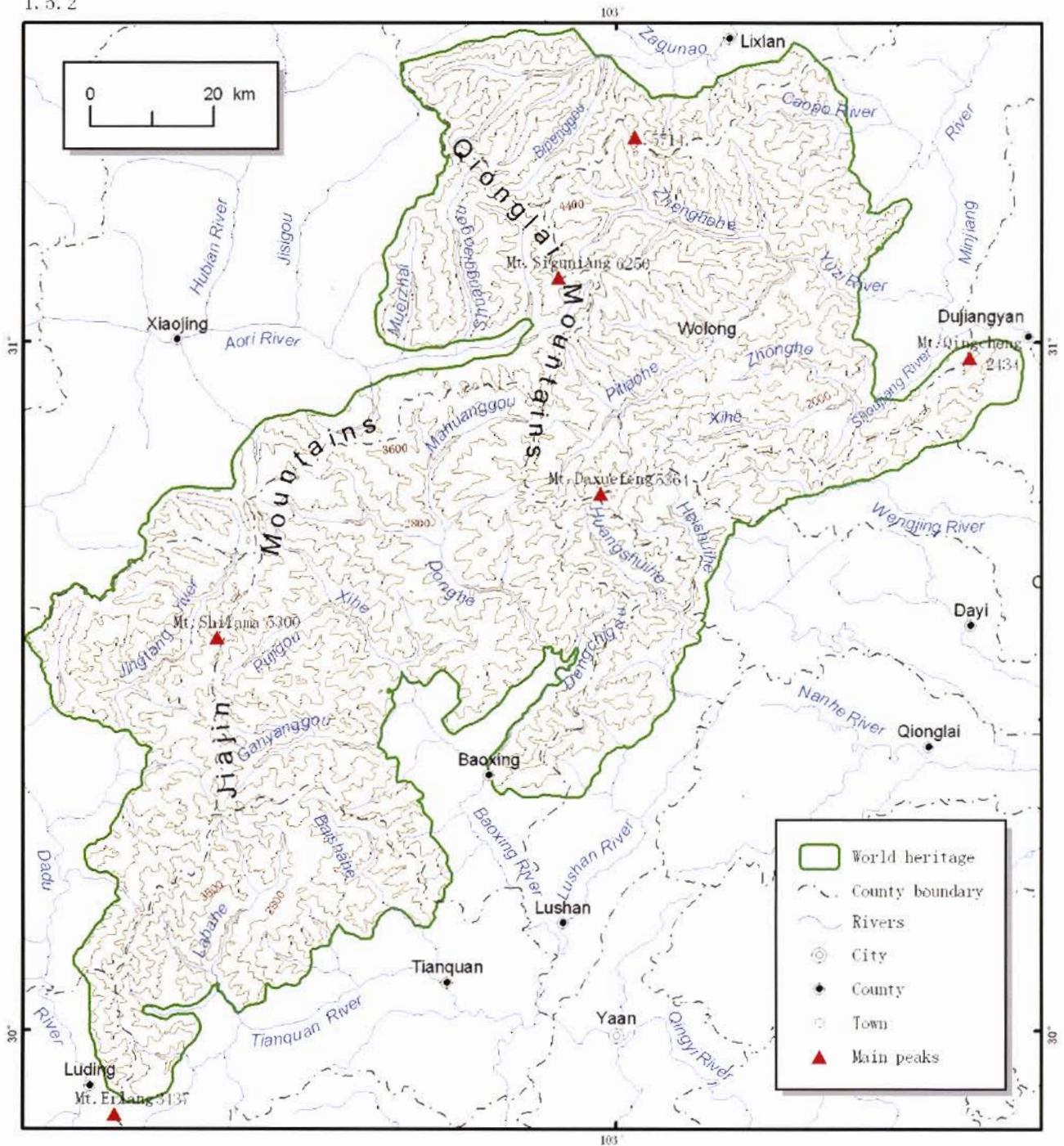
1.5.9 Concise Distribution Map of Giant Panda Habitats in China

Location Map of the Nominated Area



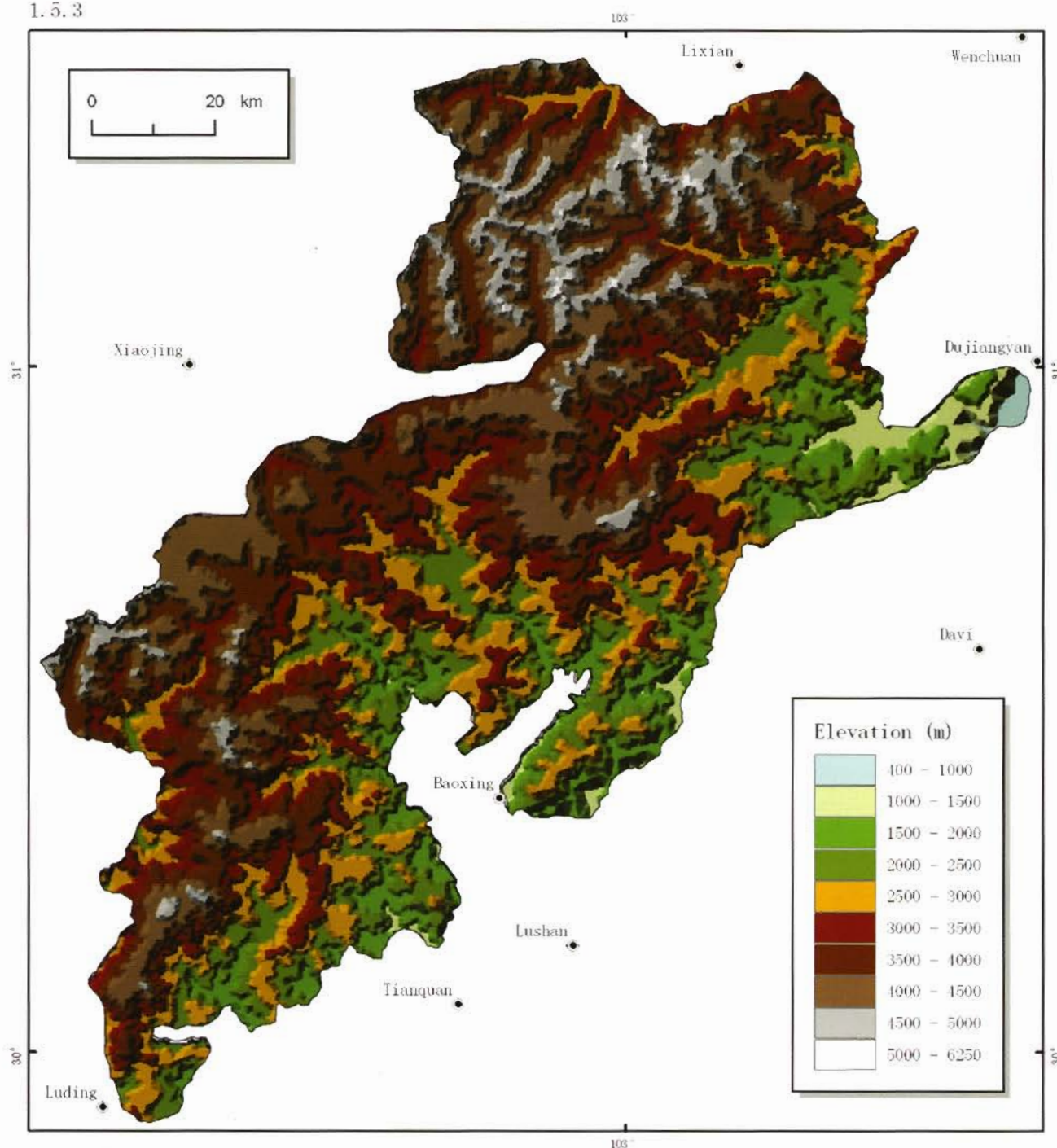
Topographical Map of the Nominated Area

1.5.2



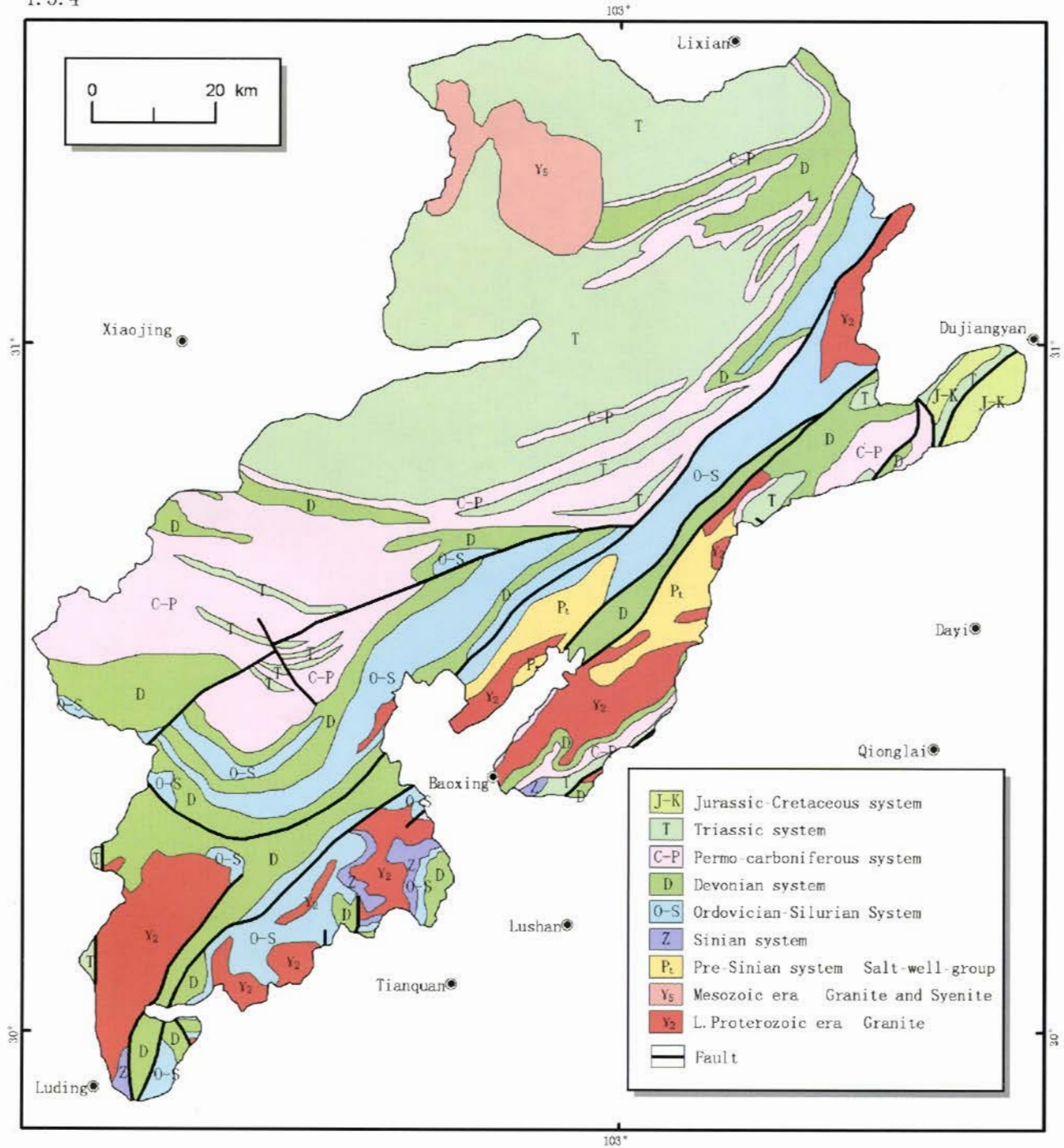
Geomorphologic Map of Giant Panda Habitat of the Nominated Area

1.5.3

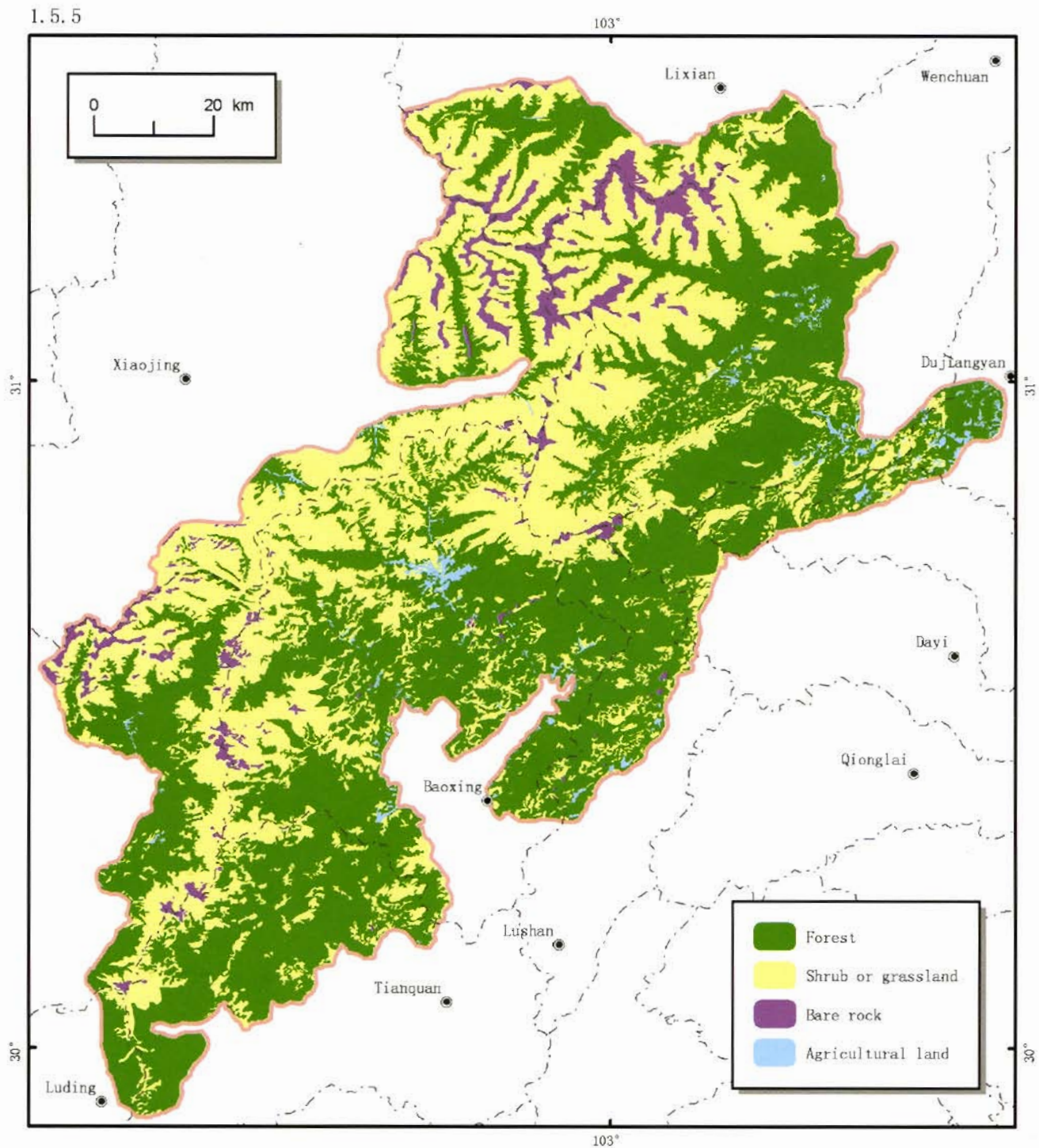


Geological Map of the Nominated Area

1.5.4

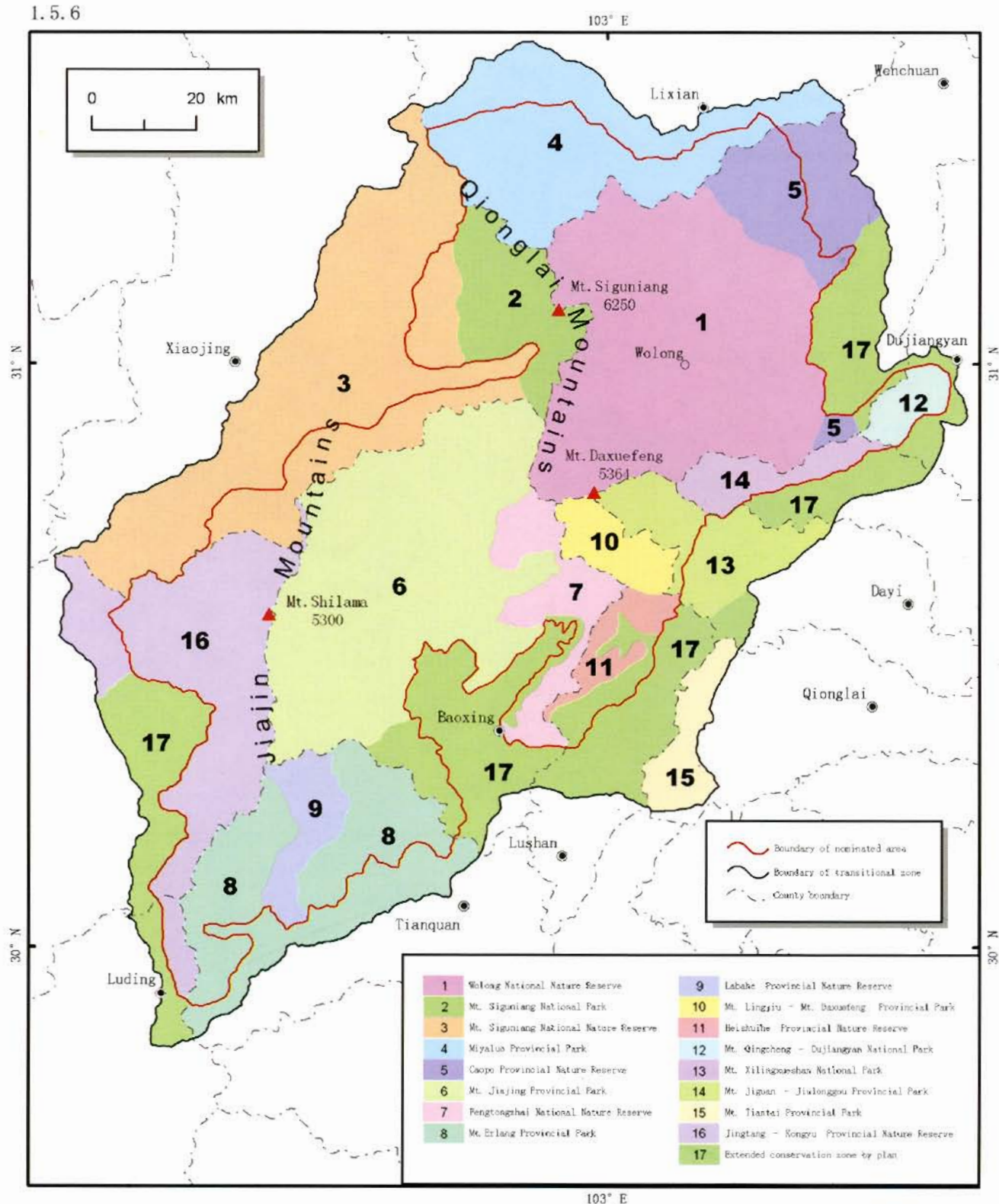


Vegetation Map of the Nominated Area



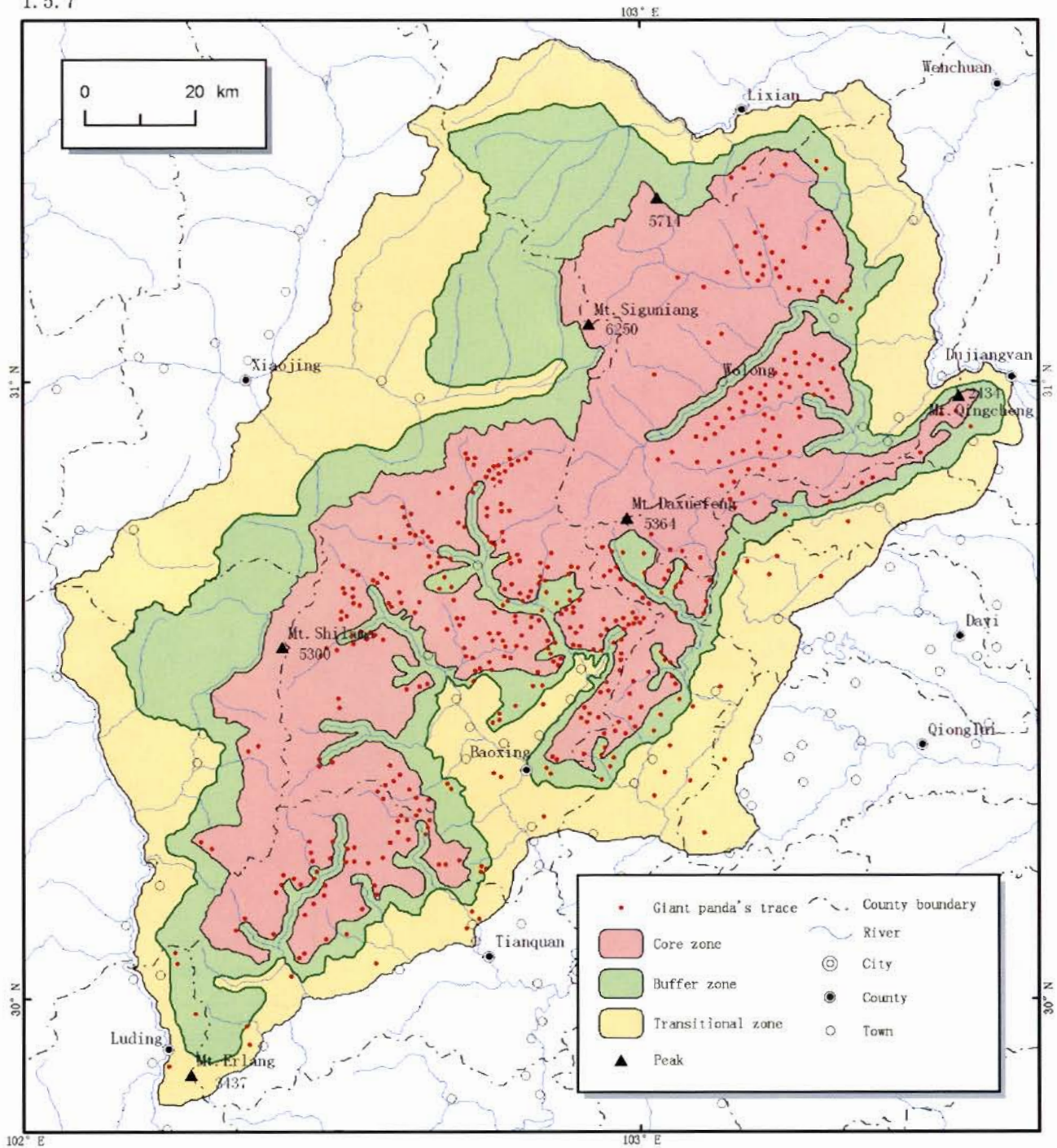
Present Protection Status of the Nominated Area

1.5.6



Map of Giant Panda Distribution and the Nominated Area Plan


1.5.7



Satellite Image of the Nominated Area

1.5.8

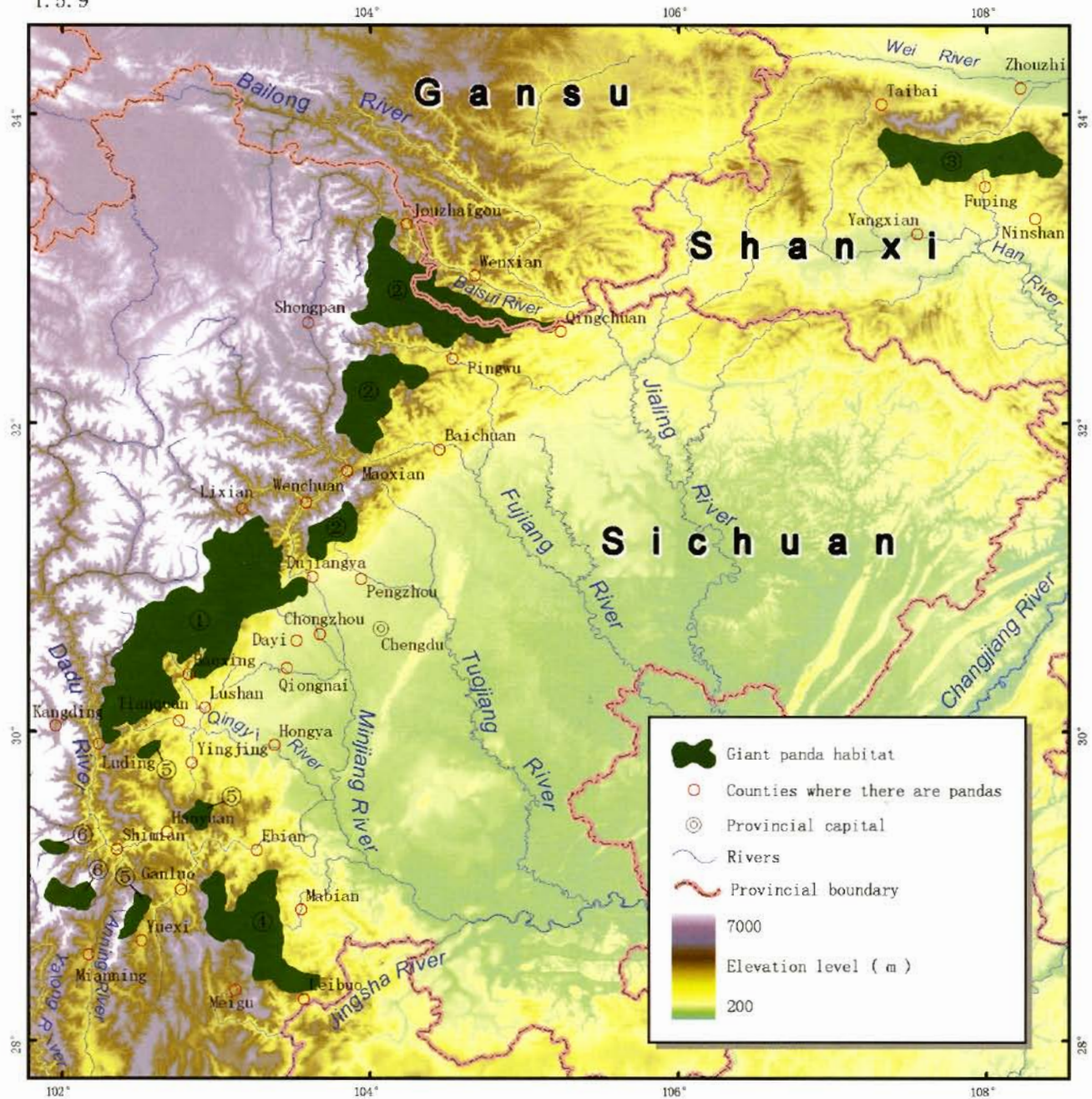


 World heritage boundary

1:1,000,000

Concise Distribution Map of Giant Panda Habitats in China

1. 5. 9



0 100 km



Toponym of giant panda's habitats

- ① Giant panda's habitat in Wolong - Mt. Jiaying (Mt. Qionglai)
- ② Giant panda's habitat in Mt. Minshan
- ③ Giant panda's habitat in Mt. Qinling
- ④ Giant panda's habitat in Mt. Daliangshan
- ⑤ Giant panda's habitat in Mt. Xiangling
- ⑥ Giant panda's habitat in Mt. Daxueshan

Endangered Species) and IUCN (the International Union for the Conservation of Nature and Nature Resource). Furthermore, the WWF (World Wildlife Fund), when it was founded in 1961, chose giant panda as its emblem, symbolizing world wildlife protection and natural conservation. Giant panda is not only the "National Treasure" of China, but also the natural heritage of the world. The striking black and white pattern and cuddly shape of the giant panda have endeared it to humanity so that it is the best recognized and most loved of all the earth's wild animals. The key factor to preserve giant panda shall be stressed as the protection of its habitat, to which objective increasing attention has been paid all over the world.

2.1.2 Largest, most extensive and most completely representative remaining portion of the habitats of giant panda

The nominated area constitutes the most important portion of all remaining panda habitats on the grounds out of the six mountain systems still containing wild pandas. It has the largest connected area of occupied panda habitat in Sichuan, the largest area of suitable 'potential' habitat for giant panda, is less fragmented than other mountain ranges, has a wider range of panda habitat subtypes in terms of altitudinal zones and bamboo species, is a better nominated area than other mountain ranges, has less human pressure and higher reported density of pandas.

According to the preliminary result of the third general survey on giant panda in China, there are more than 400 giant pandas living in the nominated area, which takes 40% of the giant panda's population and 35% of habitat in Sichuan.

For years, the panda population in nominated area has been a major source for the pandas in zoos and breeding centers. For example, since 1955 there had been 148 giant pandas taken into 22 major domestic zoos or breeding centers. In addition, giant pandas from the nominated area have supplied over 50 zoos in 26 countries in the world, some as "state gifts". In the meantime, there had been 212 golden monkeys, 281 takins, 50 Chinese monal, 41 red pandas and 600 other rare and precious animals taken from the nominated area for exhibition or research both at home and abroad. So the nominated area has made a special contribution to the international cooperation, public education, and scientific research.

2.1.3 Site of the original discovery of giant panda, dove tree and unprecedented numbers of type specimens from scientific exploration

Giant panda made its first appearance to the scientific world in 1869 when Pere Armand David, a French missionary and naturalist then in China, collected 4 giant pandas in Dengchigou of Baoxing County. He made the giant pandas as specimens and showed them at the Paris National Museum of Natural History in the same year, and gave a report in the museum bulletin. David was also the first to collect the famous and beautiful dove tree in 1871. This was eventually named in his honour as *Davidia involucrata* by H.E. Baillon.

The nominated area has proved a 'goldmine' in terms of biological discovery. In addition to giant panda and dove tree, Pere Armand David also discovered 65 birds new to science and also large numbers of new plants, mammals and insects in 19th century. Many of these were discovered within the nominated area.

Subsequent explorations have continued to yield an amazing list of new plants, amphibia and other creatures. Protection of such an important type-collecting locality is of enormous biological importance.

Annex 2 lists the following types discovered in the nominated area: 32 mammals, 43 birds, 7 fish and amphibia and 110 higher plants.

2.1.4 Home of many relict species or 'living fossils'

Both of single species representatives of their lines with long evolutionary histories, living in an ancient forest with many other primitive plants and animals, giant panda and dove tree in the nominated area are often referred to as 'living fossils'. The nominated area is also home to many more living fossils trapped in Central China as the great forests around the humid Tethys dried out as the sea disappeared with the rising of the Qinghai-Tibetan Plateau.

Of 50 ~ 60 monotypic genera (43 in Dujiangyan alone) or living fossils from the Tertiary period known from the area include the ancient tree Duyecao or *Kingdonia uniflora*, *Dipteronia sinensis*, *Bretschneidera sinensis*, *Cercidiphyllum japonicum*, *Tetracentron sinensis* and even a 'living fossil' beetle *Amphizoa davidi* originated from the Triassic Era. In addition the ginkgo (*Ginkgo biloba*) has been planted through the area for some centuries and recently the dawn redwood (*Metasequoia glyptostroboides*) has been extensively introduced around the site.

2.1.5 Globally richest documented botanical site outside of the tropical region

The total flora of the nominated area is estimated to be in excess of 5 000 species of which more than 4 000 are flowering plants. This number is comparable to the entire flora of France! It is the richest botanical site documented in the temperate region or indeed anywhere outside of the tropical rain forests. The nominated area falls into top 25 Biodiversity Hotspots selected by CI (Conservation International) and "Global 200" ecoregions defined by WWF.

Richness is conspicuous for the large size, wide altitudinal range and ecological completeness of the site combined with its special phyto-geo-graphical location and the fact that the site is a classical refuge where the decimating action of repeated oscillations from dry cold and hot wet climates during the Pleistocene could be survived by the rich flora because the high plateau wall to the west created a moisture trap that remained humid even in the driest periods and the relief is so steep that changes in world temperature could be easily accommodated by tiny lateral shifts in location by plants through that turbulent era (WWF/MOF, 1989).

2.1.6 Important center of diversity for Rhododendrons and other plant groups, major source of seeds that form the foundation of 'English' and western gardens

The nominated area is also a significant global diversity center for many plant groups such as roses, peonies, magnolias, maples, primroses, bamboos and rhododendrons. More than 100 species of rhododendron are listed for the area. This is more than known from whole countries (Nepal, Bhutan) in the Eastern Himalayan hotspot, a place per se is famous for its diversity of rhododendrons.

Since 19th century, western explorers and collectors had travel extensively in Qionglai Mountains. Famous British botanist E. Wilson alone had shipped 30 tons of plant seeds to England. The resulting plants transformed the development of horticulture in Europe to such an extent that to this day a disproportionate number of species used in classical 'English' landscape gardens are Chinese species. Edinburgh Royal Botanic Garden in UK has introduced more than 50 species of rhododendron from this site.

2.1.7 Richest and lushest alpine flora in the world

Alpine botanists (Wilson, 1916; Baron, 1987) recognized the alpine flora of the nomination unit as being probably the richest and lushest example of its type in the world. The number of different species found per unit area and the luxuriance of forms are astonishing. On the Balangshan, several dozen species of flowers can be identified within a few square metres. The unusual wet cloudy Sichuan summer weather is in complete contrast to almost all other alpine zones, where dry, exposed summers are typical. This nominated area lies within the Western China rain trap and the added moisture has helped to protect the floral richness as a Pleistocene refuge and to create endemism.

2.1.8 A complete continuum from permanent ice to evergreen subtropical forests

Only two sites in Central China offer a protected spectrum of natural vegetation zones from permanent icefields, through alpine, subalpine, temperate mixed forests and down to subtropical evergreen broad-leaved forests. One is the nominated area and the second is the Mt. Gongga in western Sichuan. The latter area lacks giant panda.

2.1.9 Global center of pheasant diversity and important site for China's endemic birds

The nominated area is a special center of endemism for some bird taxa, such as leaf warblers, laughingthrushes, rosefinches and pheasants. China is recognized as the global center of pheasant diversity with a total of 63 species. The nominated area contains 16 different pheasant species; more than known from any other single site. Analysis of the global distributions of birds with restricted ranges undertaken by ICBP (now Bird Life International) identified globally more than 400 EBA's or endemic bird areas where the ranges of several restricted range birds overlap. Out of the identified 13 EBA's in China, two fall within the nominated area, which contains many of the most interesting and endangered of China's endemic birds.

2.1.10 Most important region of China for mammalian conservation

The most important region in China for mammal conservation consists of the band of forests on the eastern side of the Qinghai-Tibetan Plateau, extending through western Sichuan to south Shaanxi and southwest Hubei. This is the home of many of China's most precious and endangered species including giant panda, red panda, takin, musk deer, golden monkey and many others (MacKinnon et al, 1996). Within this zone the nominated area is the single site with the greatest representation of these important mammals. Cluster analysis by known distribution at county level or by biophysical sub-divisions (Xie Yan, 2001, 2002) confirms this importance and identifies the counties of Wenchuan, Kanding, Tianquan, Luding and Lixian as of particular importance.

Richness of fauna recorded for the nominated area is also very high with 365 birds, 109 mammals, 14 fishes, 22 amphibia, 32 reptiles and 1 700 insects.

2.1.11 Long lists of endangered and endemic species of almost all taxa

The nominated area boasts not only the great richness in numbers of species, but also the high levels of national and regional endemics as well as large numbers of species already labeled as threatened and in urgent need of protection. For instance, of the more than 1 000 plant genera recorded from the site more than 50 are endemic to China, representing c. 20% of all endemic Chinese genera.

In the nominated area, 86 species of animals and 67 species of plants are especially protected by

the country. Under the protection of Class I are 16 species of animals including giant panda, golden monkey, snow leopard, leopard, clouded leopard, white-lipped deer, takin, black stork, pallas's sea eagle, white-tailed sea eagle, golden eagle, bearded vulture, Chinese hazel grouse, pheasant grouse, Chinese monal and black-necked crane; and 8 species of plant including dove tree, ginkgo, *Microchlaena* (*Cystiathlyrium chinensis*), *Sorolepidium glacile* Christ, (*Taxus chinensis*), *Taxus chinensis* var. *mairei*, *Davidia involucrata* var. *vilmoriniana* (dode) wanger, and *Kingdonia uniflora*; under the protection of Class II are 62 animals such as red panda and 40 plants such as *Larix mastersiana*; and under the protection of class 3 are 8 animals and 19 plants, such as leopard cat and Qiongzhusa. These protected animals and plants account for 29% and 16% of protected species in China, respectively. In addition, 43 species of animals are under protection of CITES and 19 animals are listed in the Appendix I, including giant panda, golden monkey, snow leopard, leopard, clouded leopard, brown bear, black bear, spotted linsang, Asiatic golden cat, common otter, serow, white-tailed sea eagle, Chinese monal, black-necked crane, Elwe's eared pheasant, Reeve's pheasant and Chinese giant salamander; and 19 and 5 in Appendix II and III respectively, such as red panda and stone marten; 19 species are also under protection of IUCN, including 4 endangered as giant panda, snow leopard, Chinese monal, red panda, and 12 to be endangered such as golden monkey, and 3 rare species such as pallas's sea eagle.

Most species of the protected animals are endemic to China such as giant panda and *Hinopithecus roxellanae*, endemic to the Hengduan Mountain System such as *Ailurus fulgens*, and endemic to the Qinghai-Tibet Plateau, such as *Procapra picticaudata*. *Amphizoa davidi* grows only in the Jiabin Mountains of Baoxing County. In 1870 a specimen of a male worm was collected and was generally thought of as extinct. In 1995 its imago and larvae were found again at the original place, showing that the original state of ecological environment was preserved well at the habitat. Most species of the protected plants are also unique only growing in China. Especially, some plants are unique and only live in Sichuan, including dove tree, *Ginkgo biloba*, *Bretschneidera sinensis*, *Emmenopterys henryi*, *Qiongzhusa*, *Salix magnifica*, *Magnolia wilsonii* and so on. The dominant community of dove tree in the nominated area exceeds 2 000 km², which is the biggest growing area of protogenic dove tree in the world.

2.1.12 Important ecological service functions

Due to the location of the nominated area in the upper reaches of the Changjiang River, improved protection of the forest ecosystems is of enormous importance to China's economy. About one quarter of the entire population of China live downstream of the catchment area or are dependent on water and electricity diverted from the Changjiang River via the Three Gorges and Gezhouba dams. The lives of almost 300 million people are therefore affected by the success or failure of the catchment. Good protection means more reliable water supply, better supply of electricity, better flood control and better river communications. Poor protection means more frequent and severe floods, water shortages, siltation of canals and irrigation systems and loss of inland fisheries.

At a more local scale, the nomination of the area as a World Heritage Site will affect the levels of investment in eco-tourist infrastructure and protective management, providing important revenues to the local people whose support and collaboration are so vital to the programme's success.

2.1.13 Site of great biological history significance

The nominated area has been of great significance in the history of the study of biology for over 130 years. Highlights include the early explorations and collections of Pere Armand David in the late 19th

century, the further botanical explorations and collections by Wilson in the early years of the 20th century, the highly respected studies of the fauna by Chinese academics such as Hu Jinchu and flora by Wu Zhengyi, Fang Wenpei, extending into the pioneering research on giant panda ranging ecology and breeding biology initiated in 1981 by the unique and politically significant collaboration between international and Chinese scientists (Schaller et al., 1985) and continuing research into the 21st century.

Provincial research teams started work in the area during the 1960s. The famous field station of Wuyipeng in the home of the giant panda at an altitude of 2 400 m was established in 1979 and has been the site of continuous field studies ever since. This is one of the longest such studies of a mountain system of this type.

Wolong and Fengtonzhai nature reserves were among the first batch of nature reserves established in China in 1963 and apart from the Guangdong MAB reserve of Dinghushan (established in 1956), these areas have the longest history and greatest experience in conservation and protected area management in China.

2.1.14 Spectacular scenic area

The natural scenery of the nominated area is outstanding with steep forested valleys, clear rushing rivers, rocky crags, wide alpine meadows and the backdrop of the shy glacial peaks of Mt. Siguniang. There are eerie freshwater lakes and splendid examples of glacial landscapes. The entire scene is constantly changing with the season-icicles and snowy cushions in winter, carpets of flowers in the deciduous forests in spring, a blaze of alpine color in summer, stunning red leaves in fall and the elegant plumes of bamboo all year round. Strange mists swirl around the crags or settle in the valleys.

More than 20 special scenic areas have been specifically identified, with each possessing its own unique characters and features.

2.1.15 Largest and most successful captive breeding center of giant panda in the world

The Wolong Breeding Center at Hetaoping is the world's largest and most successful captive breeding center for giant panda. Here is found the largest collection of captive pandas and here has been the greatest number of successful captive births. 48 cubs were born there between 1986 and 2000. The unique feature of this center is that it is situated right inside the natural habitat of the species and has a large walled natural enclosure (2 ha) where animals can perform more natural life activities than in any other captive station.

2.1.16 Additional cultural interests of Qiang and Tibetan minorities and Han temples, Taoism and historical sites including unique Qing Dynasty Catholic Mission

The northeastern gateway to the nominated area is the municipal city of Dujiangyan, famous for its outstanding Taoist temples and famous irrigation works. These have separately, already been recognized as an outstanding cultural area and graced with the title of World Heritage Cultural Site.

Other examples of Han culture can be found in Baoxing and other early settlements in and around the nominated area. The Catholic mission station and church of Dengchigou in Baoxing county remains intact with its unique French/Qing style.

Qiang and Tibetan minorities preserve their own cultural values with distinctive house styles, dress, language, ethnobotanical knowledge, dances, religion and other traditions.

2.1.17 Most important genepool area for Chinese Traditional Medicine

The nominated area remains a major source and genepool for plants used in Traditional Chinese Medicine (TCM). Several hundred local species have been collected and used for medicine and many of these are now rare and endangered such as the orchid *Gastroidea elata*, alpine fritillaries and caterpillar fungus *Cordyceps sinensis*. Preservation of these species is essential for the conservation of these valuable natural resources, for the cultural importance of TCM and because of their potential in future pharmaceutical research.

2.1.18 Full documentation of biodiversity collections and reference materials

The level of historical and modern biodiversity documentation is unparalleled. Major collections of voucher specimens of fauna (225 birds, 56 mammals, 17 amphibia and reptiles, 700 insects) and flora (> 2170 species) are preserved in the museum of the Wolong National Nature Reserve. Type specimens are scattered among many museums and herbaria worldwide.

Living collections of plants exist, such as the rhododendron gardens in Dujiangyan and the bamboo collection in Wolong.

Records, reports and inventory data are preserved in reserve files, libraries, provincial agencies and institutes and universities.

The completeness of field documentation of an endangered species is virtually unequalled. In the 1974 ~ 77 surveys 3 000 people were involved in sweeping every valley of panda habitat for sign of pandas. In the 1985 ~ 88 surveys a joint international team of 35 persons covered the same territory systematically county by county, sampling all areas for signs of giant pandas and condition of bamboo. In both cases virtually every single wild panda in the world was noticed. Given the spacing of records of confirmed presence and the known range size of individual giant pandas, each confirmed location point can be more or less taken to represent minimum one individual panda.

Much of the data has been published in the form of more than 10 books and no less than 1 300 scientific papers and articles.

2.2 Comparative Analysis

2.2.1 Comparison of biodiversity richness with other global sites and European countries

Comparative statistics of the nominated area and some famous mountain World Heritage Sites (Table 2).

Table 2 Comparison of biodiversity richness with other global sites

Country	Name	Size (km ²)	Flowering plants	Birds	Mammals	Altitude range
USA	Yellowstone N.P.	8 992	1 050	290	58	1610~3462
USA	Yosemite N.P.	3 082	>1 400	230	74	671~3998
USA	Olympic N.P.	3 696	500	180	50	0~2 428
USA	Gt. Smoky Mt N.P.	2 090	1 500	>200	>50	259~2025
Nepal	Sagarmartha N.P.	2 330	c 2 000	152	28	2845~8848
Malaysia	Mt Kinabalu N.P.	753	5 000~6 000 (total flora)	326	112	152~4095
China	Nominated area	9 510	>4 000	>365	132	600~6250

The figures show that the biological richness of the nominated area is far higher than parallel temperate areas and comparable to biorich tropical zones. The nominated area is of comparable richness with Mt. Kinabalu which encompasses the richness of tropical lowlands and mountains on the recognized 'hotspot' of Borneo and is described on the UNEP WH website as 'believed to contain one of the richest and most diverse assemblages of plants in the world'.

The biological richness of the nominated area is greater than those of most European countries. The following table, for instance, presents the total numbers of flowering plants and other taxa for several large countries in Europe. The nominated area has a biodiversity richness equivalent to the whole of France.

Table 3 Comparison of biodiversity richness with some European countries

Country	Mammals	Breeding Birds	Reptiles	Amphibia	Butterflies	Vascular Plants
Switzerland	75	201	14	18	177	2 696
Austria	83	227	14	20	195	2 873
Denmark	43	185	5	14	68	1 200
France	93	267	32	32	240	4 630
Britain	50	219	8	7	59	1 623
Germany	76	273	12	20	176	3 203
Belgium	58	180	8	12	106	1 415
Nominated area	109	365	32	22	c.400	> 4 000

2.2.2 Comparison of vertebrate richness with other parts of China

The nominated area falls into one of the most species rich regions of China for mammals, birds and even amphibia. One-fourth terraneous vertebrates, one-fifth beasts and one third birds are living in the area. It shows comparable richness to the tropical zones of the country.

Table 4 shows the numbers of endemic birds (taken to be species with a global range of less than 5 000 km²) in each of 13 endemic bird areas in China. The nominated area contains large parts of both D12 Sichuan Central Mountains and D13 Sichuan Western Mountains. This gives it an equivalent rating as Taiwan Island. The only EBA with more species is the Eastern Himalayan Zone which is split spans across parts of 4 countries (E Nepal, N India, Bhutan and parts of China).

Table 4 Comparison of bird endemism with other areas in China

EBA number	EBA name	No. of restricted range spp.
D01	Taklimakan Desert	3
D06	East China	2
D07	South China	2
D08	Eastern Himalayas	21
D11	Qinghai Plateau	4
D12	Sichuan C. Mountains	9
D13	Sichuan W. Mountains	3
D14	China sub-tropical forest	5
D15	Yunnan Mountains	4
D20	Hanan Island	5
D23	Shanxi Mountains	2
D24	Southwest Mountains	6
D25	Taiwan Island	12

2.2.3 Comparison of the nominated area with other parts of giant panda distribution

The global natural habitats for giant panda remain only local regions at six ranges, including the Qionglai

Mountains, along the east edge upland of the Qinghai-Tibet Plateau to form discontinuous belt areas. The nominated area located in the Qionglai Mountains is in the center of wild giant panda distribution.

Based on the preliminary result from the recent national panda survey, the Qionglai Mountains remain the largest connected panda habitat, which represents greater level of protection and offers the best chances for long-term survival of panda population.

The nominated area has been the main source of giant panda for establishing the captive breeding population of the species and used for diplomatic and friendship gifts and loans. The record in the international *Studbook of Giant Panda* indicated that from 1936 to 1997, there had been 268 wild pandas captured, of which 119 were produced from the nominated area, accounting for 51% of 231, the total captured number (excluding 37 ones with unknown origin).

Table 5 Regional distribution of giant panda captured during 1936-1997 recorded in *Studbook of Giant Panda* (1997)

Origin	Number	%	Origin	Number	%
Baoxing , Sichuan	88	38	Meigu, Sichuan	2	<1
Pingwu, Sichuan	50	22	Taibai, Shaanxi	2	<1
Wenxian, Gansu	21	9	Dujiangyan , Sichuan	2	<1
Tianquan , Sichuan	14	6	Qionglai , Sichuan	1	<1
Nanping, Sichuan	9	4	Dayi , Sichuan	1	<1
Qingchuan, Sichuan	7	3	Maoxian, Sichuan	1	<1
Wenchuan , Sichuan	6	3	Songpan, Sichuan	1	<1
Fuping, Shaanxi	6	3	Mabian, Sichuan	1	<1
Wolong , Sichuan	4	2	Leibo, Sichuan	1	<1
Yuxi, Sichuan	4	2	Sichuan	29	
Lushan , Sichuan	3	1	Shaanxi	1	
Yangxian, Shaanxi	4	2	Unknown	7	
Ebian, Sichuan	3	1	Total	268	

Table 6 Natural distribution of giant panda captured during 1936-1997 recorded in *Studbook of Giant Panda* (1997)

Origin	Num	%	Remark
Qionglai Mountains	119	51	
East side of Siguniang Mountain	10	4	Sichuan: 6 in Wenchuan and 4 in Wolong
East-South sides of Jiajin Mts.	105	45	Sichuan: 88 in Baoxing , 14 in Tianquan and 3 in Lushan
East side of Daxue Mountain	4	2	Sichuan: 2 in Dujiangyan , 1 in Dayi and 1 in Qionglai
Minshan Mountains	89	39	
East side of main ridge	61	27	Sichuan: 50 in Pingwu, 9 in Nanping, 1 in Songpan and 1 in Maoxian
North side of Motianling	21	9	Gansu: 21 in Wenxian
South side of Motianling	7	3	Sichuan: 7 in Qingchuan
Qingling Mountains	12	5	Shaanxi: 6 in Fuping, 4 in Yangxian and 2 in Taibai
Dalang Mountains	7	3	Sichuan: 3 in Ebian, 2 in Meigu, 1 in Mabian and 1 in Leibo
Xiangling Mountains	4	2	Sichuan: 4 in Yuxi
Total	231	100	

Notes to Table 5 and 6:

- 1) The Baishuijiang River flows across Jiuzhaigou County of Sichuan Province and Wenxian County of Gansu Province. The statistical number of the Baishuijiang River is counted in that of Wenxian County;
- 2) 37 giant pandas of unknown origin are not counted in percentage statistically;
- 3) The regions in boldface in the table refer to the nominated place

Of the giant pandas as “State gifts” that the Chinese Government donated to America and other countries during 1957 to 1980, 78% were produced in the nominated area (69% from Baoxing County and 9% from Tianquan County).

There were 37 Chinese giant pandas exhibiting in 15 countries and Hong Kong during 1980 ~ 1999. 28 of these were captured in field including 14 from the nominated area, of which 11 from Baoxing, 2 from Tianquan, 1 from Lushan and 9 borrowed from the Wolong Giant Panda Research Center.

2.3 Authenticity and Integrity

The authenticity and integrity of the application is guaranteed by the very high level of documentation, filed records of research and management agencies, huge number of published papers, articles and books, large numbers of deposited voucher specimens in Chinese and overseas collections and high level of international participation in the collection and publication of survey and inventory findings. International scientists have worked side by side with Chinese counterparts on surveys and conservation activities since 1981. The entire flora of China is currently being reviewed through collaboration between Chinese and foreign botanists throughout the world. Royal Edinburgh Botanic Garden is collaborating on studies of rhododendrons.

Surveys on natural resources and especially on giant panda were organized by the Academy of Sciences, the Forest Department and the Sichuan Provincial Government in 1960s, 1970s and 1980s. In the late 1990s, the State Forestry Administration and WWF jointly organized the third national survey on giant panda.

Numbers of species quoted in this proposal can all be backed up by voucher specimens, published documents and point records held in the Chinese Species Information System – a large database, maintained by Institute of Zoology in Beijing. Species point distribution maps may be checked on the website www.chinabiodiversity.com

Figures for the extent, landform, land cover and other physical details presenting for the nominated area can be easily verified by reference to remote sensed images already in the public domain.

Since 1960s, nature reserves have been set up and scenic parks designated in the nominated area. Management plans for these areas were developed accordingly. For this purpose, species inventory and biodiversity baseline information in these nature reserves and scenic parks were collected. Since 1979, China has taken part in many research and conservation projects with international scientists and organizations. In June, 1979, China and the WWF reached an agreement to establish a Giant Panda Research and Protection Center. A continuing flow of new research findings, books and papers published and more success in giant panda captive breeding achieved along the time. Since 1980 there have been 10 books, 1 300 monographic papers and reports published on giant panda. In the museum of the Wolong Nature Reserve more than 1 000 animal specimens and more than 2 170 plant specimens are displayed.

The sincerity and determination of the Sichuan Government to safeguard and manage the nominated area in a manner compatible with the high objectives of the World Heritage Convention is in the consistently high budgetary allocations awarded to Wolong and other protected areas in the nominated area, in many new laws and regulations issued by the government over the past 15 years and in the severity of penalties applied to convicted law breakers (several giant panda poachers have been executed). All timber companies previously operating within the nominated area have been terminated. Many small factories closed and the mining in Baoxing County reduced to a very low scale which will be managed primarily for tourist reasons.

The nominated area contains 9 scenery regions and 7 nature reserves, which have similar physical geography environment, ecosystem and biotic population. They are linked together along the Qionglai Mountains to form an entire nature conservation zone. In this way, their ecological integrity and connectivity are preserved and the area can avoid long-term fragmentation problems to species protection. It is in favour of natural intercourse among animal population. Additionally, through unified planning and management in blocks, the ecologically damaged blocks can be restored.

2.4 Criteria for Inscription of the Nominated Area

The nominated area falls under all *criteria* of the *World Heritage Natural Heritage Criteria* (1994 revisions), especially criteria 4 and 2.

Criterion 4 *Contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.*

Evidence is presented that the nominated area contains outstanding biological richness, very high levels of endemism, very large numbers of monospecific genera which are of high scientific importance for studies of taxonomy and evolution and very large numbers of threatened and endangered species. Some species are of high economic significance such as the medicinal plants and national treasures, including giant panda, red panda, takin, golden monkey, rare pheasants and rare horticultural plants. The giant panda is the single most admired and valued animal on the planet. The nominated area constitutes the most important and significant habitats for its survival in the wild.

Criterion 2 *Be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals.*

The nominated area represents a fascinating example of a major species in adaptation from being a tropical animal to becoming adapted to the subalpine zone. Human pressures over centuries have been one of the selection processes driving this change.

Pleistocene fossils show prehistoric giant panda shared the same habitat as prehistoric terrestrial orang-utans. Both species faced pressure from spreading humanity, both have diverged away from man's habitats, in one case as an arboreal animal of remote tropical rainforests and in the other case as living in the extremes of the temperate subalpine zone. Historical distribution records of giant panda show it was formerly more widely distributed and lived at lower altitudes. The giant panda does not hibernate like the other bears that have a longer adaptation to the boreal zone.

Criterion 3 *Contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance.*

The nominated area certainly contains superb examples of several important ecosystems together with stunning scenery and important geological formations including present glaciers, forested mountains, charming mountain lakes, clear flowing rivers, rock pinnacles, elegant bamboo forests, lowland forests and combinations of natural and cultural elements. The site contains no exceptional concentrations of wildlife but it does contain amazing levels of diversity of both plant and animal life. The dazzling flowering of the alpine pastures through the summer is a spectacle in its own right.

Criterion 1 *Be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiological features.*

The nominated area represents a fascinating dynamic landscape shaped by glaciers and the tilting of lands between the Sichuan basin and still rising Qinghai-Tibetan Plateau. The site preserves relict elements of the Tertiary fauna and flora of the Tethys Sea region and is itself a classic Pleistocene Refuge revealing how extremely rich the temperate flora must have been before the ravages of Pleistocene climate oscillations decimated the flora of other northern regions.

Integrity Condition The nominated area is an important part of Sichuan giant panda habitat. It spans 7 nature reserves and 9 scenic parks in boundaries of 12 counties, 2 prefectures and 2 cities covering a total area of 951 000 ha. It comprises sine qua non of habitat factors for giant panda and accompanying rare and endangered species. So it meets integrity condition of the standards of natural heritage. Furthermore the Chinese Government and Sichuan Provincial Government have established a series of laws as well as concerned management plans to protect giant panda, dove trees and other endangered species and their habitats. They are able to follow the "Cultural and Natural Heritage Convention", and ensure the integrity of natural value and the effective protection of 1/3 of the total wild giant pandas. This nominated area applies for world natural heritage based on the right guidelines mentioned above.

3 DESCRIPTION OF THE NOMINATED AREA

3.1 Description of the Heritage Site

3.1.1 Natural environment

3.1.1.1 Geology

Geologically, the nominated area is located in the south-north active tectonic zone that divides Chinese mainland into two structural units, the south China sub-plate in the east and Qinghai-Tibet sub-plate in the west. As to regional structure the nominated area crosses the celebrated Jintang arc structural zone and Longmen Mountain structural zone. The principal stratum in the nominated area includes (Map. 1.5.4):

- **Presinian:** metamorphic and volcanoclastic rock.
- **Sinian:** acidic volcanic rock and dolomite rock with imbedded marble.
- **Ordovician:** quartzite, marble rock, and dolomite rock.
- **Silurian:** shale, limestone, and dolomite rock.
- **Devonian:** dolomite rock, limestone.
- **Arboniferous:** limestone and slate.
- **Permian:** limestone, coal measures, and basalt.
- **Triassic:** siltstone and slate, and limestone.
- **Jurassic and Cretaceous:** rotten rock, mudstone and conglomerate distributed in the Sichuan Basin to the east of the nominated area and in the fringe of scenery area of Mt. Qingcheng.
- **Eogene:** red glutenite and mudstone, only distributed in scenery area of Mt. Qingcheng.
- **Quaternary:** Diluvium distributed along valleys and drift sheet distributed in medium or height mountainous area.
- **Magmatic:** Diorite of late proterozoic, granite and ultrabasic rocks, which are generally

called as "Baoxing Conglomerate" with 630 million ~ 1.04 billion years old of isotopic age; Middle Mesozoic granite and syenite with isotopic age about 160 million years. The strata and principally magmatic rock strike northeast and dip steeply with intensive folds and faults.

3.1.1.2 Geomorphology

The nominated area is located in the southern section of the Qionglai Mountains, East of the Hengduan Mountain System, a transitional zone from the Qinghai-Tibetan Plateau to the Sichuan Basin. In this area, the highest peak in the north is Mt. Siguniang at 6250 m altitude, and in the south are Mt. Shilama and Mt. Daxuefeng of the Jiain Mountains at 5300 m and 5364 m, respectively. Landforms in the nominated area are mountains at different altitudes and of various relieves, with an altitude difference from 500 m to 4000 m or above, and dominated by mountains of moderate relief and altitude (Map 1.5.2, 3). Especially splendid are the landscapes of glaciers that developed in the high areas and along the divides in forms of U-shaped valleys, aretes, horns, tills, especially in cirques and parallel valleys. At least fourteen modern glaciers are also distributed in the ultra-high zones as Mt. Siguniang, Shilama, and Daxue. All but two gullies of 3.4 km and 2.2 km long in the scenery area of Bipenggou are cirques and hanging valleys. Razed terraces remain in divides of the tributaries, particularly at altitudes of 2500 m, 3000 ~ 3100 m, 3500 ~ 3600 m, 4000 ~ 4200 m and 5000 ~ 5200 m, where natural grass fields are often particularly favored. Among source areas of those tributaries, many are glaciated valleys with wide extension and bamboo cover, where this forms perfect habitat for giant pandas. Furthermore, middle sections of the main streams like the rivers of Pitiao and Zhenghe of Yuzixi, Donghe and Xihe of Baoxing, Laba and Baisha of Tianquan, are always deeply-cut valleys and the inner sides of which are often gentle slopes with bamboo forests, hence good habitat for giant panda.

The entire landscape is steep and deeply dissected. There is almost no place where a man can stand without slipping. The valleys fall as deep gorges, cut by the constant rushing of water and tall waterfalls tumble down from the valley lips to the river below. Such is the last retreat of the giant panda.

3.1.1.3 Hydrology

Draining from the nominated area are branches of two main water systems, the system of the Minjiang River and Dadu River. Converging into the main stream of the Minjiang River is the Qingyi River, which includes such tributaries as Tianquan River, Baoxing River, Lushan River, and tributaries of Wenjing River and Shoujiang River, and Pitiaohe (Pitiao River) and Zhenghe (Zheng River) of Yuzi River, and tributaries of Caopo and Zagunao River. And tributaries of Jintang River, and gullies of Haizigou and Shuangqiaogou of the Wori River are of the system of the Dadu River. Source areas of Tianquan River, the Labahe (Laba River) and Baishahe (Baisha River), source areas of Baoxing River, the Donghe (Dong River) and Xihe (Xi River), source areas of Lushan River, the Heishuihe (Heishui River) and Huangshuihe (Huangshui River), source areas of Yuzi River, the Pitiaohe and Zhenghe, are all together contributions to the principal habitats for giant panda. Streams flowing through the habitats fall down up to 1500 ~ 3400 m with gradient 8‰ ~ 38‰ on average. All rivers are perennial, in average discharge of 17 ~ 47 m³/s, receiving supplies from snow and ice melting and from groundwater.

3.1.1.4 Climate

Most of the nominated area falls in the subtropical zone, including the temperate zone, cool temperate zone, subfrigid zone, and frigid zone, forming the primitive surroundings and various scenic ecosystems.

The climate of the nature conservation zone belongs to mountain climate with subtropical monsoon. Data from the Qiaoqi Meteorological Station of 2060 m altitude show an 8.8°C annual mean temperature, -1.1°C mean temperature in January and 18.1°C in July; 837 mm of annual precipitation with 79% of this falling from May to September. In considering distinct vertical difference of climate in the nature conservation zone and based on related research data, temperature and precipitation change with elevation, it is estimated that the annual temperature and precipitation are 0.8 ~ 13°C and 800 ~ 1 500 mm, respectively in the principal habitats (altitude 1600 ~ 3500 m).

The climate at Wuyipeng camp at 2520 m a.s.l. in the center of the giant panda's altitudinal range is generally cold. Snow falls between late October and the following April. At higher altitudes it may still snow in May. 1981 snowfall at Wuyipeng was 573mm but fall varies from year to year.

Rainfall mostly falls between May and September during the peak of the SW monsoon. 1981 rainfall was 938 mm excluding snowfall. From November to the following March the average daily minimal temperature is as low as -12.5°C. In March, April, October and November the climate is transitional and changes a lot. From June to August is the summer period with average highest daily temperature 16 ~19°C.

These statistics alone cannot adequately describe the actual climate. The summer clouds come from the south and southeast, but get halted by the high peaks of the Qionglai Mts and settle in the valleys. In each summer month there are about 15 rainy days per month. Most of the rain falls at night. Even when it is not raining there is a damp fog. Humidity is 85% and dew hangs on the leaftips. There is little sunshine. Leaches roam the forest floor and conditions are perfect for the growth of the lush bamboo understorey. Even if the sun comes out the humidity rarely falls below 50%.

Temperatures change with altitude. A few kilometers down or up the valley, the climate is subtropical or permanent icefield. The Siguniang National Nature Reserve on the west side of the Qionglai Mountains lies in a rainshadow. Less rain and cloud reach those valleys in summer and the climate is much drier.

3.1.1.5 Soil

The actions of vegetation, microorganisms, climate, lithology and landform have created a variety of different soil formations. The vertical effect is most notable. Furthermore, the different parent soils do reinforce the physiochemical segregation. The soil types of the proposed location are classified into 6 types, vertically distributed as:

Elevation below 1800 m: yellow valley soil, distributed at the edge of southeast part of the zone.

Elevation between 1800 ~ 2500 m: mountain yellowish-brown soil.

Elevation between 2500 ~ 3300 m: mountain brown and dark brown soil.

Elevation between 3300 ~ 3800 m: subalpine float spodosol.

Elevation between 3800 ~ 4400 m: alpine meadow soil.

Elevation above 4400 m to modern proglacial zone: alpine tundra soil.

Soils covered with forests in various colors, yellow-brown, brown, dark brown, and float spodosol of subalpine are the principal agrotype for the growth of bamboo, the staple food for giant panda.

3.1.1.6 Land cover

Map 1.5.5 shows the land cover of the nominated area, and this can be compared with the satellite image on Map 1.5.8 and altitudinal zones on Map 1.5.3. These figures reveal the intact

natural land cover of the area. 53% of the area is natural forest [39% conifer zone (reddish shade on satellite photo), 14 % subtropical zone], 36% is alpine shrub and grassland above the treeline, 8% is bare rock and ice at very high altitude and only 3% of the area is agricultural lands used for traditional hill farming.

The maps indicate the good connectivity of habitat. All the alpine shrub/grassland zone is connected and most of the forest is continuously connected. This is important in preserving the ecological integrity of the site, allowing vertical seasonal migrations and preserving large outbreeding populations.

3.1.1.7 Natural evolution

The nominated area is located in the south-north active tectonic zone that divides Chinese mainland into two structural units, the south China sub-plate in the east and Qinghai-Tibet sub-plate in the west. It crosses the celebrated Jintang arc structural zone and Longmen Mountain structural zone. The stratigraphical records indicate that during the geological evolution, in the end of the Proterozoic Era 500 ~ 630 million years ago to the Cambrian Period of early Palaeozoic Era, the Jiajin Mountains had emerged as one part of the primitive mainland in China, the southwest edge of ancient China platform. During most of the Palaeozoic Era and the Triassic Period of early Mesozoic Era, i.e., 500 million to 200 million years ago, the region was swallowed by the ancient Tethys Sea. During that time, it had gone through many times of upswellings and resulted in discontinuous depositions of 10 000 m in depth. Under the effect of Indo-China Movement in late Triassic Period, the Tethys withdrew toward middle Asia, and the west of Sichuan, including the nominated area, rose as one part of ancient Asia. In the last 200 million years, this area entered the stage with the expanding of Asian continent, and then flattened by long terms of erosion. Till 3.4 million years ago, the Hengduan Movement resulted in the upthrust of the large area of the Qinghai-Tibet, and thus this area entered the new tectonic movement stage of the Qinghai-Tibetan Plateau. Simply speaking, the geology of the nominated area has gone through ancient geological evolution, from the primitive ocean period 1 010 million years ago, primitive China Mainland Period 1 040 to 500 million years ago, Tethys Period 500 to 200 million years ago, Asia Continent Formation and China Flattening Period 200 million to 3.4 million years ago, and to Mountain Formation Period 3.4 million years ago to the present time.

The base for mountains in this area is the flat land formed during the China Flattening Period as the rising of the Qinghai-Tibet Plateau and resulted from heavy corrosions on the transition zone at the front edge of the plateau. Also formed in the period were various mountains including Qionglai of the whole Hengduan Mountain systems. In terms of ecosystem, 3.4 million years ago, east edge of the Qinghai-Tibet Plateau was found with tropical or subtropical humid climate and peneplain environment; during the Qinghai-Tibet Plateau period, it was alternating between cold and hot climate. The mountain scenery changed from para-plain forest-prairie eventually to mountain forest-prairie, subalpine glacier-forest-meadow, and then to alpine glacier-forest-meadow.

3.1.2 Biodiversity

3.1.2.1 Plant resources

- **Rich diversity of species**

The flora is exceptionally rich. There are more than 4 000 species of higher plants in the nominated area, including bryophytes (46 families, 102 genera), pteridophytes (30 families, 70

genera), gymnosperms (9 families, 24 genera) and angiosperms (147 families; 794 genera). Among the total amount of angiosperms in China, the dicotyledon in the nominated area accounts for 62% of the total angiosperm species and the monocotyledon for 15%.

The figure presented for floral richness of the nominated area is a very 'conservative' estimate. The documented number of species in the small portion of Dujiangyan alone is 3 287 species. Over 2 000 species have been collected in the larger Wolong National Nature Reserve including many species not on the Dujiangyan list. The entire flora of Wolong has been estimated at 4 000 species (Schaller et al., 1983). Flora from the drier Mt. Siguniang area which is the other side of a major rainshadow and part of a different drainage system will undoubtedly add many more species to the total list, as will the more southerly forests of Luding. The total number of plants will be much higher than the lists for either Wolong or Dujiangyan alone. For instance Dujiangyan has 31 species of rhododendron and Wolong has 34, but the total number of rhododendrons known from the whole nominated area is 107 species. If other plant groups show comparable variability across the whole area the total flowering plant richness could be as high as 5 000 ~ 6 000 species.

Reasons for this great richness are the wide and complex connections with other major floristic regions, the wide range of different habitat types afforded by the large altitudinal range, sharp climatic gradation and variety of rock and soil types. Another reason for the high species richness is that trapped between the high Qinghai-Tibet Plateau to the west and the subtropical moist Sichuan Basin to the east, the valleys have served as a moisture trap and Pleistocene refuge.

• Complex relationships of flora

The flora in the nominated area is very complex, according to Prof. Wu Zhengyi's criteria, such distributions include world distribution, tropical distribution, extratropical distribution and special distributions to be found in the nominated area (Table 7).

Table 7 Flora distribution of Wolong Nature Reserve

Flora type	In China		In Wolong	
	Genera	%	Genera	%
1 World distribution	103	3.7	29	4.61
2 Pan tropical distribution	373	13.3	82	13.06
3 Tropical America and tropical Asia discontinuous distribution	89	3.2	19	3.03
4. Tropical distribution in ancient continent	163	5.8	16	2.55
5 Distribution from tropical Asia to Oceania	143	5.1	16	2.55
6 Distribution from tropical Asia to tropical Africa	151	5.4	15	2.4
7. Tropical Asia (India- Malaysia) distribution	543	19.4	39	6.21
8 North temperature zone distribution	296	10.6	186	29.62
9 East-Asia and North America discontinuous distribution	117	4.2	48	7.64
10 Distribution in temperature zone of ancient continent	157	5.6	34	5.41
11. Extratropical Asia distribution	63	2.2	25	3.98
12 Central Asia distribution	112	4.0		
13. East Asia (East Himalaya-Japan) distribution	298	10.5	83	13.21
14. Chinese special distribution	196	7.0	36	5.72
Total	2 804	100	628	100

• Vertical vegetational zones

The highest peak of the nominated area is Mt. Siguniang at 6250 m.a.s.l. The lowest point is in Dujiangyan at 600 m.a.s.l. In a short distance the elevation changed over 5500 m, which resulted in distinct vertical vegetation zones in this region. The zonation and composition of different zones vary at different locations but can be summarized as followings:

600 ~ 1800 m Subtropical mountain evergreen broad-leaved forest represented by *Castanopsis*, *Cinnamomum*, *Phoebe*, *Lindera*, *Juglans calthayensis* and Theaceae. The undergrowth is dominated by *Hydrangea* spp. and many shrubs. There are some *Phyllostachys* and *Fargesia robusta* bamboos but rarely dominant.

1800 ~ 2400 m Subtropical mountain evergreen broad-leaved forest and deciduous broad-leaved mixed forest presented by *Castanopsis platycantha*, *Lithocarpus cleislocarpus*, *Davidia* and *Betula insignis*. Dry areas support *Pinus* spp. The undergrowth is dominated by *Phyllostachys nidularia* and *Fargesia* bamboos and many shrubs. Open areas are colonised by *Rubus* spp and *Buddleia davidii*. Giant pandas sometimes come down into this zone.

2400 ~ 2800 m Warm extrotropical alpine coniferous and deciduous broad-leaved mixed forest. Common trees include *Tsuga dumosa*, *Tsuga chinensis*, *Larix masteriana*, *Acer* spp, *Tilia*, *Sorbus*, *Ribes*, *Betula* spp. The undergrowth is dominated by umbrella bamboo *Fargesia* and *Yushanai* spp. with *Rubus*. This is an important zone for giant panda from autumn to spring.

2800 ~ 3800 m Cool extrotropical subalpine coniferous forest. The dominant arbors are *Abies fabri*, *Picea asperata*, *Picea brachystyla* and *Abies faxoniana*. The undergrowth is dominated by hardy rhododendrons and arrow bamboo *Bashania fangiana*. This is an important feeding zone for giant panda in the summer.

3800 ~ 4400 m Subfrigid alpine scrub and meadows presented by rhododendrons, *Quercus spinosa*, *Sabina*, *Rosa*, *Potentilla*, *Fargesia*, *Mecanopsis*, *Corydalis*, *Primula*, Gramineae, Cyperceae, and Compositae.

4400 ~ 4500 m Frigid alpine screes and sparse vegetation represented by *Pedicularis*, *Rhodiola*, *Saussurea*, *Festuca*, *Gentiana* and *Polygonum*. In this belt there is only discontinuous or sparse vegetation of low grasses such as Compositae, Crassulaceae and Caryophyllaceae.

5000 m Above this height is the zone of permanent ice and snow.

• Diversified ecotypes

A large number of different ecotypes are recognized. For instance the Wolong vegetation could be divided into 5 groups, 15 types, 39 formation groups and 69 formations (Table 8).

Table 8 Diversified ecotypes in Wolong National Nature Reserve

Broad-Leaved Forest

Broad-Leaved Evergreen Forest

- Campher community
Cinnamomum longepaniculatum community
Cinnamomum wilsonii community
- *Phoebe* community
Phoebe neurantha community
Phoebe chinensis community
- *Machilus* community
Machilus microcarpa community
- *Neolitsea* community
Neolitsea wushanica community
- *Lithocarpus* community
Lithocarpus cleistocarpus and *Cyclobalanopsis glauca* var. *gracilis* community
- *Cyclobalanopsis* community
Cyclobalanopsis oxyodon community and *Cyclobalanopsis glauca* var. *gracilis* community

Mixed Forest of Evergreen and Deciduous Broad-Leaved Trees

- Mixed community of *Lithocarpus*, deciduous and broad-leaved trees
Lithocarpus hancei and *Platycarya strobilacea* community
- Mixed community of *Cyclobalanopsis*, deciduous and broad-leaved trees
Cyclobalanopsis glauca and *Betula luminifera* community
Cyclobalanopsis oxyodon, *Betula* spp. and *Acer* spp. community
- Mixed community of *Quercus engleriana*, thorn-leaved oak and deciduous broad-leaved trees
Quercus engleriana and *Carpinus* spp. community
Long-handle Beech and *Quercus engleriana* community
Acer laxiflorum and *Quercus spinosa* community

Deciduous Broad-Leaved Forest

- *Davidia involucrata* community
Davidia involucrata community
- *Tetracentron sinense* community
Tetracentron sinense community
- *Cercidiphyllum japonicum* community
Cercidiphyllum japonicum community
- *Pterocarya* community
Pterocarya insignis community
- *Betula* community
Betula platyphylla community
Betula albo-sinensis community
- *Populus* community
Populus lasiocarpa community
Populus purdomii community
- *Juglans cathayensis* community
Juglans cathayensis community

Bamboo Forest

- Warm bamboo grove
Phyllostachys nidularia community
Fargesia angustissima community
- Lukewarm bamboo grove
Fargesia rebusta community
Yushania brucepamcutala
Bashania fangiana

Coniferous Forest

Warm Coniferous Forest

- Warm pine community
Pinus armandi community
Pinus tabulaeformis community

Mixed Forest of Warm Acerose and Broad-Leaved Trees

- Mixed community of *Tsuga chinensis* and broad-leaved trees
Mixed community of *Tsuga chinensis*, *Acer* spp. and *Betula* spp. community

Cold and Temperate Coniferous Forest

- Evergreen coniferous community
- Spruce community
Picea brachytala community
- *Abies* community
Abies faxoniana community
Abies fabri community
Abies ernestii community
- Garden *Sabina* community
Sabina sabtuaria community
Deciduous coniferous community of cold hardness
- Larch community
Larix mastersiana community

Brushwood and Hassock

Very Warm Brushwood

- Evergreen broad-leaved brushwood
Lindera limprichtii brushwood

- *Quercus spinosa* and *Lindera tienchuanensis* brushwood
- Deciduous broad-leaved brushwood
- *Coriaria sinica* brushwood
- *Rubus setchuenensis* brushwood
- *Salix viriegata* brushwood

Warm Brushwood

- Evergreen broad-leaved brushwood
- *Quercus aquifolioides* brushwood
- *Rhododendron faberi* subsp. *pratense* brushwood
- Deciduous broad-leaved brushwood
- *Salix phaneva* brushwood
- *Myricaria germanica* brushwood
- *Hippophae rhamnoides* brushwood

Mountain Brushwood

- Evergreen broad-leaved brushwood
- *Rhododendron prgewalskii* brushwood
- *Rhododendron violaceum* brushwood
- Deciduous broad-leaved brushwood
- *Salix dissa* brushwood
- *Spiraea myrtilloides* and *Sorbus rehderiana* var. *cupreonitens* brushwood
- *Spiraea mongolica* brushwood
- *Potentilla glabra* brushwood
- Evergreen coniferous brushwood
- *Sabina pingu* var. *wilsonii* brushwood

Hassock

- Warm hassock
- *Pteridium revolutum* hassock
- *Polystichum bakerianum* and *Parathelypteris nipponica* hassock
- *Matteuccia struthiopteris* and *Matteuccia intermedia* hassock
- *Artemisia subdigitata* and *Cacalia davidii* hassock

Meadow

Subalpine Meadow

- Subalpine forb meadow
- *Pedicularis davidii* and *Iris dalavay* meadow
- *Ligularia duciformis* and *Cardamine macrophylla* meadow
- *Antirrhinum sylvestris* and *Chamaenerion angustifolium* meadow
- Subalpine grass meadow
- *Deyeuxia scabrescens* meadow
- *Elymus sibiricus* meadow

Alpine Meadow

- Alpine forb meadow
- *Polygonum viviparum* meadow
- *Polygonum sphaerostachyum* meadow
- Alpine grass meadow
- *Festuca ovina* meadow
- Alpine sedge meadow
- *Kobresia humilis* meadow

Swamp Meadow

- Alpine swamp meadow
- *Carex pachyrrhiza*, *C. fastigata* and *C. souliei* swamp meadow

Alpine Talus Vegetation

Alpine Flowstone Shale Vegetation

- *Saussurea velurea*, *Saxifraga* and *Rhodiola fastigiata*

• Important area for protection of rare and endangered species

About 67 species of state protected plants are found in the nominated area. The plants under Class I of state protection include dove tree (*Davidia involucrata*), Ginkgo (*Ginkgo biloba*), Chinese yew (*Taxus*

chinensis), South Chinese yew (*Taxus chinensis* var. *mairei*), Duyecao (*Kingdonia uniflora*), Microchlaena (*Cystoathyrium chinense* Ching), Sorolepidium (*Sorolepidium glabre*). The plants under Class II of state protection include Minjiang Cypress (*Cupressus chengiana*), Sichuan Redwood (*Larix mastersiana*), Youmaidaoshan (*Picea brachytyla* var. *complanata*), Ziyeqi (*Acer catalpifolium* Rehd), Lianxiang tree (*Cercidiphyllum japonicum*), tu-chung (*Eucommia ulmoides* Oliv.), Oil camphor-tree (*Cinnamomum longepaniculatum*), Camphortree (*Cinnamomum camphora*), Nanmu (*Phoebe zhennan*), Wild soybean (*Glycine soja* Sieb. et Zucc), Houpu (*Magnolia officinalis*), Yuanye Yulan (*Magnolia sinensis* (Rehd. et Wils) stopf), Xikang Yulan (*Magnolia wilsonii* (Finet et Gagnep.) Rehd), Shuiqingshu (*Tetracentron sinense*), Toon (*Toona ciliata*), Xingyecao (*Circaea agrestis*), Xiangguoshu (*Emmenopterys henryi* Oliv), Epaulette tree (*Pterostyrax psilophylla* Diels ex Perk.), Bashan Chinese torreyia (*Torreya fargesii*), Chinese caterpillar fungus (*Cordyceps sinensis*). The plants under Class III of state protection include Maidiao Yunshan (*Picea brachytyla*), Magnolia enangianata Cheng (*Magnolia sargentiana*), Lingchunmu (*Euptelea pleiospermum*), Jinqianqi (*Dipteronia sinensis*), Grandifoliate willow (*Salix magnifica* Hemsl), Common Dysosma Rhizome (*Dysosma versipellis*), Dawang Indian azalea (*Rhododendron rex*), Tuber of elevated gastrodia (*Gastrodia elata* Blume), Qiongzhu (*Qiongzhu*), Taoerqi (*Sinopodophyllum hexandrum*), etc. (Table 9).

Table 9 Plants listed under state protection

No	English name	Scientific name	CPWP(1999)	CREPP(1980)
1	Chinese cystoathyrium	<i>Cystoathyrium chinensis</i>	1	2
2	Ginkgo	<i>Ginkgo biloba</i>	1	2
3	Chinese yew	<i>Taxus chinensis</i>	1	
4	Marie yew	<i>Taxus chinensis</i> var. <i>mairei</i>	1	
5	Dove tree	<i>Davidia involucrata</i>	1	1
6	Vilmorin dove tree	<i>Davidia involucrata</i> var. <i>vilmoriniana</i>	1	2
7	Oneflower kingdonia	<i>Kingdonia uniflora</i>	1	2
8	Chinese bretschnidera	<i>Bretschneidera sinensis</i>	1	2
9	Palmate neocheiropteris	<i>Neocheiropteris palmatopedata</i>	2	
10	Chinese fern	<i>Sinopteris grevilleoides</i>	2	2
11	Scythian lamb	<i>Cibotium barometz</i>		2
12	Oliver plumyew	<i>Cephalotaxus oliveri</i>	2	2
13	Cheng cypress	<i>Cupressus chengiana</i>	2	2
14	Masters larch	<i>Larix mastersiana</i>	2	2
15	Graybark spruce	<i>Picea brachytyla</i> var. <i>complanata</i>	2	
16	Bigcone spruce	<i>Picea neoveitchii</i>	2	
17	Farges torreyia	<i>Torreya fargesii</i>	2	
18	Bracteate acanthochlamys	<i>Acanthochlamys bracteata</i>	2	
19	Catalpa maple	<i>Acer catalpifolium</i>	2	3
20	Katsuratree	<i>Cercidiphyllum japonicum</i>		2
21	Szechuan peony	<i>Paeonia szechuanica</i>	2	2
22	Eucommia	<i>Eucommia ulmoides</i>	2	2
23	Zhennan	<i>Phoebe zhennan</i>	2	3
24	Wild soybean	<i>Glycine soja</i>	2	3
25	Hosie ormosia	<i>Ormosia hosiei</i>	2	
26	Chinese tuliptree	<i>Liriodendron chinense</i>	2	2
27	Officinal magnolia	<i>Magnolia officinalis</i>	2	3
28	Magnolia	<i>Magnolia sinensis</i>	2	3
29	Wilson magnolia	<i>Magnolia wilsonii</i>	2	3
30	Wilsonii michelia	<i>Michelia wilsonii</i>	2	2
31	Tetracentron	<i>Tetracentron sinense</i>		2
32	Chinese toona	<i>Toona ciliata</i>	2	3
33	Field circaeaster	<i>Circaea agrestis</i>	2	2
34	Slender anisachne	<i>Anisachne gracilis</i>	2	
35	Short-awn wildryegrass	<i>Elymus brevicastratus</i>	2	
36	Awnless wildryegrass	<i>Elymus submuticus</i>	2	
37	Camphor tree campher wood	<i>Cinnamomum camphora</i>	2	
38	Langpaniculate cinnamom	<i>Cinnamomum longepaniculatum</i>	2	
39	Nanmu yunnan phoebe	<i>Machilus nanmu</i>	2	

40	Redflower meconopsis	<i>Meconopsis punicea</i>	2	
41	Common pomatosace	<i>Pomatosace filocula</i>	2	
42	Henry emmenopterys	<i>Emmenopterys henryi</i>	2	2
43	Chinese corktree	<i>Phellodendron chinense</i>	2	
44	Common rockycabbage	<i>Triaenophora rupestris</i>	2	
45	Tangut anisodus	<i>Anisodus tanguticus</i>	2	
46	Amur linden	<i>Tilia amurensis</i>	2	
47	Tong-chong-ha-cho	<i>Cordyceps sinensis</i>	2	
48	Matsutake mushroom	<i>Tricholoma matsutake</i>	2	
49	Chinese hazelnut	<i>Corylus chinensis</i>		3
50	Glabrousleaf epaulettetree	<i>Pterostyrax psilophyllus</i>		3
51	Silveryleaf cassia	<i>Cinnamomum mairei</i>		3
52	Tschonosk trillium	<i>Trillium tschonosku</i>		3
53	Pinnateleaf lilac	<i>Syringa pinnatifolia</i>		3
54	Mangseeded euptelea	<i>Euptelea pleiospermum</i>		3
55	Padus grayana	<i>Prunus grayana</i>		3
56	Chinese money maple	<i>Dipteronia sinensis</i>		3
57	Swollenknoded cane	<i>Qiongzhuca tumidiosa</i>		3
58	Chinese may-apple	<i>Sinopodophyllum emodi</i>		3
59	Chinese falsepistache	<i>Tapiscia sinensis</i>		3
60	Chinese goldthread	<i>Coptis chinensis</i>		3
61	Many-flowered may-apple	<i>Dysosma versipellis</i>		3
62	Tall gastrodia	<i>Gastrodia elata</i>		3
63	Sargent magnolia	<i>Magnolia sargentiana</i>		3
64	Sargent spruce	<i>Picea brachytyla</i>		3
65	Soft leather leaves rhododendron	<i>Rhododendron alutaceum</i>		3
66	King rhododendron	<i>Rhododendron rex</i>		3
67	Footcatkin willow	<i>Salix magnifica</i>		3

• **Abundance in endemic species and genera in addition to mono-species, rare-species families and genera**

The nominated area falls towards the northern end of the West Sichuan-Northwest Yunnan center, one of China's three main center of floral endemism, with a large quantity of plant genera and species. There are many gymnosperms, such as the genera of ginkgo China fir (*Cunninghamia*) and dawn redwood (*Metasequoia*); dicotyledon such as *Dipteronia*, *Clematoclethra*, *Notopterygium*, *Nannoglottis*, *Notoseris*, *Sinacalia*, *Sinojohnstonia*, *Dysosma*, *Bretschneidera*, dove tree (*Davidia*), *Berneuxia*, *Eucommia*, *Hanceola*, *Heterolamium*, *Kinostemon*, *Sinofranchetia*, *Camptotheca*, *Asteropyrum*, *Beesia*, *Kingdonia*, *Emmenopterys*, *Sargentodoxa* and *Triaenophora*, and monocotyledon, such as the bamboos *Bashania* and *Qiongzhuca*.

The total number of the endemic genera here amounts to over 50, accounting for 20% of the total endemic genera in China. This rare phenomenon shows that this area is ecologically quite favorable for the growth and evolution of wild plants.

Table 9 lists the plants for protection, most of which are endemic species of China. These special genera and species have originated from ancient time and are unique plants of systematical evolution. Emerged first in the Tertiary, Jurassic or even earlier periods, for example, are those primitive plants, including *Eucommia*, *Dysosma*, *Acer catalpifolium*, *Magnolia sinensis*, *Magnolia wilsonii*, *Michelia wilsonii* and *Rhododendron alutaceum*, and the plants of mono-species and rare species, including ginkgo, dove tree, *Dipteronia sinensis*, *Bretschneidera sinensis*, and *Cercidiphyllum japonicum*. The plants of ginkgo emerged in later Palaeozoic Era, boomed in the Jurassic Period, degenerated suddenly in the Cretaceous Period and now only one species and one genus exists on the earth. It occurs over a large area in Mt. Erlan in the nominated area. The plants of dove tree emerged in the Tertiary Period, with a wide distribution in the world in the middle Quaternary Period. But now there is only one mutation, one species and one genus, distributing over a large area within the nominated

area. The nominated area is the place with dense distribution of the China's endemic plants, and many survivors from evolution. The representatives are dove tree and ginkgo. Dove tree, *Bretschneidera sinensis* and *Cercidiphyllum japonicum* are the most important ancient tropical plants from the Tertiary Period.

In the nominated area location, there have been found about 76 rare-species genera, such as *Dipteronia*, *Euptelea* and *Kinostemon*; 36 mono-species genera, such as *Emmeopterys*, *Sinofranchetia* and *Moneses*; and 15 endemic mono-species genera, such as *Davidia involucrata*, *Tetracentron sinense* and *Cercidiphyllum japonicum*, accounting for 41.67% of the total endemic genera. In addition, there are also 22 endemic orchid species such as *Bletilla ochracea*, *Calanthe arcuata* and *Habenaria davidii*, accounting for 38.6% of the total endemic orchid species in the nominated area. The endemic species of Ericaceae (such as *Rhododendron balangense*, *R. wolongense* and *R. longesquamatum* var. *sessilifolium*) amounts to 23. Besides, there are 14 endemic species of gymnosperms, accounting for 70% of all the Gymnosperms in the proposed location. In addition to the above-mentioned genera, there are also many endangered plants that have not yet been included into the list of the protected plants, such as *Rhododendron*, *Primula*, *Gentiana*, *Fritillaria*, *Arethusa* and Liliaceae.

• Center of rhododendron diversity

The nominated area is a significant global diversity center for many plant groups, such as roses, peonies, magnolias, bamboos, primroses, maples and rhododendrons. About 100 species of *Rhododendron* are listed from the area (Table 10). This is more than those known from some whole countries (Nepal and Bhutan) in the Eastern Himalayan hotspot. The reason for the area becoming famous is its diversity of *Rhododendron*. Some of these species are now protected for they are threatened and some are endemic to the nominated area.

At the same time, 12 species of the subsect. *Fortunea*, which are the most ancient taxa in the genus *Rhododendron*, occur in the area accounting for 50% of the total of this subsect.

Table 10 List of rhododendrons of the Qionglai Mountains

(* indicates endemic to the nominated area)

<i>Rhododendron aganniphum</i> Balf f et Forrest
<i>Rhododendron agglutinatum</i> Balf f et Forrest
<i>Rhododendron alutaceum</i> Balf f. Et W. W. Smith
<i>Rhododendron ambiguum</i> Hemsl
<i>Rhododendron amesiae</i> Rehd et Wils
<i>Rhododendron anthopoginoides</i> subsp. <i>hoi</i> Fang
<i>Rhododendron anthosphaerum</i> Diels
<i>Rhododendron argyrophyllum</i> Franch
<i>Rhododendron argyrophyllum</i> var. <i>brevipedicellatum</i> * W. K. Hu
<i>Rhododendron asterocnoulum</i> Diels
<i>Rhododendron asterocnoulum</i> var. <i>brevipedicellatum</i> W. K. Hu
<i>Rhododendron augustinii</i> Hemsl
<i>Rhododendron bainbridgeanum</i> Tagg et Forrest
<i>Rhododendron balangense</i> Fang
<i>Rhododendron beesianum</i> Diels
<i>Rhododendron bellum</i> * H P Yang
<i>Rhododendron bracteatum</i> Rehd et Wils
<i>Rhododendron bureavii</i> Franch
<i>Rhododendron calophytum</i> Franch
<i>Rhododendron calophytum</i> var. <i>openshawianum</i> (Rehd et Wils) Chamb
<i>Rhododendron cephalanthum</i> Franch

Rhododendron concinnum Hemsl.
Rhododendron crinigerum Franch
Rhododendron davidu Franch
Rhododendron davidsonianum Rehd et Wils
Rhododendron decorum Franch
Rhododendron decorum Franch subsp *diaprepes* T. L. Ming
Rhododendron dendrocharis Franch
Rhododendron detonsum Balf f et Forrest
Rhododendron discolor Franch
Rhododendron faberi Hemsl
Rhododendron faberi subsp *prattu* (Franch) Chamb
Rhododendron floribundum Franch
Rhododendron galactinum Balf f ex Tagg
*Rhododendron guangxianense**
Rhododendron hanceanum Hemsl
Rhododendron heterochitum *H P. Yang
Rhododendron hippophaeoides Balf f et W W Sm
Rhododendron hunnewellianum Rehd. et Wils
Rhododendron intricatum Franch
Rhododendron lacteum Franch
Rhododendron longesquamatum Schneid.
Rhododendron longesquamatum var. *sessifolium*
Rhododendron longicalyx Fang f.
Rhododendron longipes Rehd et Wils
Rhododendron longistylum Rehd et Wils
Rhododendron lutescens Franch
Rhododendron maowenense Franch
Rhododendron micranthum Turcz
Rhododendron moupinense Franch
Rhododendron mucronatum G Don
Rhododendron nitidulum Rehd. et Wils
Rhododendron nivale subsp *boreale* Philipson et Philipson
Rhododendron ochraceum Rehd et Wils.
Rhododendron orbiculare Decaisne
Rhododendron oreodoxa Franch
Rhododendron oreodoxa Franch var *Fargesu* Cullen et Chamb
Rhododendron pachytrichum Franch
Rhododendron petrocharis Diels
Rhododendron phaeochrysum Balf. f. et W W. Sm
Rhododendron phaeochrysum var *agglutinatum* (Balf f et Frrest) Chamb.
Rhododendron phaeochrysum var. *levistratum* (Balf f et Frrest) Chamb
Rhododendron pingianum Fang
Rhododendron polylepis Franch
Rhododendron primuliflorum Bur et Franch
Rhododendron przewalskii Maxim
Rhododendron racemosum Franch
Rhododendron rex Levl
Rhododendron rubiginosum Franch
Rhododendron rufum Batal
Rhododendron rufescens Franch.
Rhododendron sargentianum Maxim
Rhododendron searsiae Rehd et Wils
Rhododendron siderophyllum Franch
Rhododendron sikangense Fang

Rhododendron simsii Planch
Rhododendron stamineum Franch.
Rhododendron strigillosum Franch.
Rhododendron strigillosum Franch. var. *monosematum* T. L. Ming
Rhododendron sutchuenense Franch
Rhododendron tatsienense Franch
Rhododendron telmateum Balf f et W. W. Sm
Rhododendron thayerianum Rehd. et Wils
Rhododendron trichanthum Rehd
Rhododendron trichostomum Franch
Rhododendron thymifolium Maxim
Rhododendron vernicosum Franch
Rhododendron violaceum Rehd et Wils
Rhododendron wasonii Hemsl. et Wils
Rhododendron wasonii var. *wenchuanense** L. C. Hu
Rhododendron watsonii Hemsl. et Wils
Rhododendron wilsonii Hemsl. et Wils
*Rhododendron wolongense** W. K. Hu
Rhododendron yunnanense Franch.
Rhododendron zheguense Ching et H. P. Yang

- **Important genepool area for traditional Chinese medicine**

The nominated area remains a major source and genepool of the plants used for traditional Chinese medicine. More than a hundred local species are collected and used for medicine, and many of them now become rare and endangered, such as orchid *Gastroidea elata*, alpine fritillaries, gentians and caterpillar fungus *Cordyceps agrestis*. Preservation of these species is essential for the conservation of these valuable natural resources because of the cultural importance of traditional Chinese medicine and their potential in future pharmaceutical research.

- **Major collecting locality of seeds that form the foundation of ‘English’ and western gardens**

The collecting expeditions of the famous British botanist E. Wilson were financed by a consortium of English horticulturalists. They were rewarded by getting a share of 30 tons of plant seeds brought back to England. Much of this collecting took place in the nominated area. E.H. Wilson’s book ‘A Naturalist in Western China’ provides a colourful account of his trips.

The resulting plants transformed the development of horticulture in Europe to such an extent that to this day a disproportionate number of species used in classical ‘English’ landscape gardens are Chinese species. These range from ornamental trees such as maples and flowering cherries to a wide array of ornamental shrubs such as rhododendrons, azaleas, magnolias, *Forsythia*, *Buddleia*, *Cotoneaster*, *Berberis*, ornamental bamboos, ferns and a great many ornamental flowers including lilies, irises peonies, slipper orchids, poppies, primroses, roses, asters and anemones. Wilson (1929) wrote a book entitled ‘China, Mother of Gardens’ shortly before he was killed in a car accident.

3.1.2.2 Animal Resources

- **High faunal diversity**

There are 542 species of vertebrates and 1 700 species of insects (still very incompletely studied) among the known wild animals in the nominated area. Among the vertebrates are 109

species of mammals in 25 families, 365 species of birds in 45 families, 32 species of reptiles in 9 families, 22 species of amphibians in 8 families, 14 species of fishes in 5 families.

The mammal list of the area accounts for 50% of the mammals in Sichuan and 20.5% in China, including the families of mole, shrew, false-vampire bat, horseshoe bat, evening bat, macaque, dog, bear, red panda, giant panda, weasel, civet, cat, pig, dog, musk deer, deer, bovids, squirrel, flying squirrel, rat, bamboo rat, porcupine, hares and pika.

Over 365 species of birds occur in the area. Almost 300 of these species are known or believed to breed there, though up to 70 migrate south during the winter. Others are altitudinal migrants and move down to lower altitudes through the winter. All major inland families are represented.

Reptiles in the area include families of tortoise (Emydidae), soft-shelled turtle (Trionychidae), *agamidae*, gecko (Gekkonidae), skink (Scincidae), lizard (Lacertidae), Anguidae, Colubridae, and vipers (Viperidae).

Amphibians in the area include the families of salamander (Hynobiidae), *Cryptotributaryidae*, *Pelobatidae*, toad (Bufonidae), rain frog (Hylidae), Ranidae, tree frog (Rhacophoridae) and *Mirohylidae*.

Fishes include carp (Cyprinidae), Cobitidae, Sisoridae, Syntributaryidae, and salmon (Salmonidae).

Among the insects, there are 3 species of mayfly (Ephemeroptera), 5 species of dragon fly (Odonata), one species of cockroach (Blattoptera), one species of mantis (Mantodea), one species of plecoptera, two species of walking stick (Phasmatodea), 17 species of Orthoptera, three species of Dermaptera, 23 species of Homptera, 52 species of Hemiptera, 181 species of elytrum (Coleoptera), one species of Megaloptera, 3 species of Neuroptera, four species of Trichoptera, 731 species of Lepidoptera, 33 species of Diptera and 27 species of Hymenoptera.

The butterfly fauna is particularly rich and from spring to autumn the forests and glades are a dance of fantastic forms. Many tropical swallowtails and bright Pierids live in the sub-tropical zone but come quite high up the valleys in summer. Huge amathusids flap slowly through the lowland forest understorey. Colourful emperors (*Apatura* spp.), and fritillaries live among the temperate woodlands and gorgeous Apollos and Blues (Lycaenidae) grace the alpine meadows.

• Faunal relationships

The nominated area is located in the China-Indian subrealm between the Oriental realm and the Palaearctic realm, and its fauna belongs to the subtropical forest type of the eastern margin of the Hengduan Mountain System, transiting to the subtropical broad-leaved forest type and coniferous forest type of western Sichuan mountains and also the alpine shrubbery and meadow type on the Qinghai-Tibet Plateau.

The fauna is thus a mixture of northern species of the Palaearctic realm, mostly distributing in the alpine, coniferous and temperate forest zones, with animals of the Oriental realm, mostly distributing in the subtropical evergreen broad-leaved zone, with regional endemics found at various levels in the transition zone.

For instance, the endemic representatives of mammals include giant panda and takin, the representatives in ancient continent-subtropical include leopard, bamboo rat and civet families, the representatives in world-around tropic-subtropical include the amphibian Japanese forest frog (*Rana japonica*) and the special representatives in metagea include jumping-mouse and pika families.

• Altitudinal zonation

The altitudinal or vertical zonality of animal species is conspicuous in the nominated area. Dominating in zones of elevation 1000 m ~ 2200 m with evergreen and deciduous broad-leaved mixed forest are tropic and subtropical animals of South China and Southeast Asia, such as *Polypedates megacephalus*, gem-faced Indian Civet (*Paguma larvata*), *Sphenomorphus indicus*, *Rhabdophis nuchalis*, *Garrulax canorus canorus*, gem-faced civet (*Paguma larvata*), large indian civet (*Veverra zibetha*), Sambar (*Muntiacus reevesi*), *Elaphodus cephalophus*, sambar (*Cervus unicolor*). Dominating in the range of 2200 m to 3600 m with conifer-broad-leaved-mixed forest and coniferous forest are animal types of Hengduan-Himalayan Mountain, such as Staurois loloensis, blood pheasant (*Ithaginis cruentus geoffroyi*), Temminck's tragopan (*Tragopan temminckii*), Elliot's laughing thrush (*Garrulax ellioti*), golden monkey, giant panda, red panda and Takin of China or Sichuan special species. Above shrubbery, meadow and vegetation in Liushatan region of 3600 m is dominated by mountain animals, such as *Lerwa lerwa*, *Tetraophasis obscurus*, Chinese monal, blue sheep (*Pseudois nayaur*), snow leopard (*uncia uncia*) and musk deer (*Moschus* spp.).

A major difference between the plants and the animals is that animals can walk or fly. Many species are altitudinal migrants using different altitudinal zones in different seasons. In winter the alpine zone is a frozen and inhospitable zone and few animals can be seen there. They descend into the forests and valleys to survive the winter. But in summer this zone is a mass of flowers, fast growing with plants and humming with insects. Blue sheep and takin graze the meadows, flocks of pink breasted snow finches, singing larks and carnivores follow herbivores and insectivores into mountains.

Giant panda itself shows modest changes in altitude feeding on the lower zones of its range in the winter and moving up into the rich arrow bamboo zone in summer. Fortunately for the panda, its food, the bamboo is evergreen. Green leaves are available all through the winter, the rich young shoots and stems can be eaten in the spring and summer.

The significance of the altitudinal migration of animals is that protected areas have to protect a very wide range of altitudes to ensure protection of all the species present. Luckily the nominated area contains extensive lowland areas down to as low as 580 m in which less hardy species can descend for the winter.

• Abundance of rare and endangered species

Among the known 86 species of animals under state protection, there are 16 species of animals belonging to class I of state protection, including giant panda, golden monkey, clouded leopard (*Neofelis nebulosa*), snow leopard (*Panthera uncia*), leopard (*Panthera pardus*), white-lipped deer, takin, bearded vulture (*Gypaetus barbatus*), Chinese hazel grouse (*Tetrastes sewerzowi*), pheasant grouse, Chinese monal, black-necked crane (*Grus nigricollis*), black stork (*Ciconia nigra*), Pallas's sea eagle, white-tailed sea eagle (*Haliaeetus a albicilla*) and golden eagle (*Aquila chrysaetos*). There are 62 species of animals belonging to Class II of state protection, including red panda, jackal (*Cuon alpinus*), Asiatic black bear (*Selenarctos thibetanus*), serow (*Capricornis sumatraensis*), argali sheep (*Ovis ammon*), and cinereous vulture (*Aegypius monachus*). There are 8 species of animals belonging to provincial level protection, such as leopard cat (*Felis bengalensis*) and red fox (*Vulpes vulpes*).

The protected rare butterflies are sub-tropical birdwings *Troides aecus* and *T. helena*, temperate forest *Taeniopalpus imperialis*, *Bhutanitis (Sinonitis) thaidana*, the endemics *Bhutanitis*

moupinensis and *Bhutanitis nigrilima*, and alpine Apollo butterflies *Parnassus jacquemontii*, *P. epaphus*, *P. tianschanicus*, *P. nomion*, *P. stubbendorfii*, *P. glacialis*, *P. orleans*, *P. szechenyii*, *P. cephalus*, *P. przewalskii*, *P. baileyi*, *Pacdestis*, *P. imperator*, *P. simio* and *P. andreji*.

The protected species occurring in the nomination area are given in Table 11.

Table 11 List of the protected wild animals in the nominated area

No.	Name	Scientific Name	Protection Class		
			China protection	CITES	IUCN
1	Golden monkey	<i>Rhinopithecus roxellana</i>	1	Annex I	VU
2	Giant panda	<i>Ailuropoda melanoleuca</i>	1	Annex I	EN
3	Snow leopard	<i>Panthera uncia</i>	1	Annex I	EN
4	Leopard	<i>Panthera pardus</i>	1	Annex I	
5	Clouded leopard	<i>Neofelis nebulosa</i>	1	Annex I	VU
6	White-lipped deer	<i>Cervus albirostris</i>	1		VU
7	Takin	<i>Budorcas taxicolor</i>	1	Annex II	R
8	Black stork	<i>Cicoma nigra</i>	1	Annex II	
9	Pallas's sea eagle	<i>Haliaeetus leucoryphus</i>	1	Annex II	R
10	White-tailed sea eagle	<i>Haliaeetus albicilla</i>	1	Annex I	VU
11	Golden eagle	<i>Aquila chrysaetos</i>	1	Annex II	
12	Bearded vulture	<i>Gypaetus barbatus</i>	1	Annex II	
13	Chinese hazel grouse	<i>Tetrastes sewerzowi</i>	1		
14	Pheasant grouse	<i>Tetraophasis obscurus</i>	1		
15	Chinese monal	<i>Lophophorus thuyssu</i>	1	Annex I	EN
16	Black-necked crane	<i>Grus nigricollis</i>	1	Annex I	VU
17	Rhesus macaque	<i>Macaca mulatta</i>	2	Annex II	
18	Chinese stump-tailed macaque	<i>Macaca thibetana</i>	2	Annex II	
19	Dhole	<i>Cuon alpinus</i>	2	Annex II	VU
20	Brown bear	<i>Ursus actos pruinosus</i>	2	Annex I	
21	Asiatic black bear	<i>Selenarctos thibetanus</i>	2	Annex I	VU
22	Red panda	<i>Ailurus fulgens</i>	2	Annex II	EN
23	Stone marten	<i>Martes foina</i>	2	Annex III	
24	Yellow-throated marten	<i>Martes flavigula</i>	2	Annex III	
25	Common otter	<i>Lutra lutra</i>	2	Annex I	
26	Large indian civet	<i>Viverra zibetha</i>	2	Annex III	
27	Indian civet	<i>Viverricula indica</i>	2	Annex III	
28	Spotted linsang	<i>Prionodon pardicolor</i>	2	Annex I	
29	Golden cat	<i>Felis temmincki</i>	2	Annex I	
30	Palla's cat	<i>Felis manul</i>	2	Annex II	
31	Lynx	<i>Lynx lynx</i>	2	Annex II	
32	Chinese forest musk deer	<i>Moschus berezovskii</i>	2	Annex II	
33	Roan musk deer	<i>Moschus sifanicus</i>	2	Annex II	
34	Red deer	<i>Cervus elaphus</i>	2		
35	Wapiti	<i>Cervus elaphus macneilli</i>	2		
36	Samber	<i>Cervus unicolor</i>	2		
37	Tibetan gazelle	<i>Procapra picticaudata</i>	2		
38	Serow	<i>Capricornis sumatraensis</i>	2	Annex I	VU
39	Goral	<i>Naemorhedus goral</i>	2	Annex I	VU
40	Argali sheep	<i>Ovis ammon</i>	2	Annex II	VU
41	Blue sheep	<i>Pseudois nayaaur</i>	2		
42	Mandarin duck	<i>Aix galericulata</i>	2		
43	Buteo	<i>Buteo buteo</i>	2		
44	Kite	<i>Milvus korschun</i>	2		
45	Sparrow hawk	<i>Accipiter gentilis</i>	2		
46	Goshawk	<i>Accipiter nisus</i>	2		
47	Pine grosbeak	<i>Accipiter virgatus</i>	2		
48	Cinereous vulture	<i>Aegypius monachus</i>	2	Annex II	VU
49	Greater spotted eagle	<i>Aquila clanga</i>	2	Annex II	
50	Brown-backed falcon	<i>Falco columbarius</i>	2		
51	Red falcon	<i>Falco tinnunculus</i>	2	Annex II	
52	Red-food falcon	<i>Falco vespertinus</i>	2		
53	Snow partridge	<i>Lerwa lerwa</i>	2		

54	Blood pheasant	<i>Ithaginis cruentus</i>	2		
55	Red-bellied tragopan	<i>Tragopan temminckii</i>	2		
56	Elwe's eared pheasant	<i>Crossoptilon harmani</i>	2	Annex I	
57	Tibetan eared pheasant	<i>Crossoptilon crossoptilon</i>	2	Annex I	VU
58	Blue eared pheasant	<i>Crossoptilon auritum</i>	2		
59	Koklos pheasant	<i>Pucrasia macrolopha</i>	2		
60	Golden pheasant	<i>Chrysolophus pictus</i>	2		
61	Chinese copper pheasant	<i>Chrysolophus amherstiae</i>	2		
62	Grey crane	<i>Grus grus</i>	2		
63	Wedge-tailed green pigeon	<i>Treron sphenura</i>	2		
64	Derbyan parakeet	<i>Psittacula derbiana</i>	2		
65	Collared scops owl	<i>Otus bakkamoena</i>	2		
66	Eagle owl	<i>Bubo bubo</i>	2	Annex II	
67	Forest eagle owl	<i>Bubo nipalensis</i>	2	Annex II	
68	Little owl	<i>Athene noctua</i>	2		
69	Tawny owl	<i>Strix aluco</i>	2		
70	Ural wood owl	<i>Strix uralensis</i>	2		
71	Barred owlet	<i>Glaucidium cuculoides</i>	2		
72	Collared scops owl	<i>Glaucidium brodiei</i>	2		
73	Chinese giant salamander	<i>Andrias davidianus</i>	2	Annex I	
74	Trout	<i>Hucho bleekeri</i>	2		
75	Carabus lafossei	<i>Carabus lafossei</i>	2		
76	Cheirotonus	<i>Cheirotonus gestroi</i>	2		
77	Apollo butterflies	<i>Bhutanitis thaidina dongchuanensis</i>	2		
78	Bhutanitis butterfly	<i>Parnassius apollo</i>	2		
79	Common red fox	<i>Vulpes vulpes</i>	3		
80	Alpine weasel	<i>Mustela altaica</i>	3	Annex III	
81	Leopard cat	<i>Felis bengalensis</i>	3	Annex I	
82	Tufted deer	<i>Elaphodus cephalophus</i>	3		
83	Red flying squirrel	<i>Petaurista petaurista</i>	3		
84	Owl	<i>Caprimulgus indicus jataka</i>	3		
85	Large hawk cuckoo	<i>Cuculus sparveroides</i>	3		
86	Swift	<i>Hirundapus caudacutus</i>	3		

Notes:

- 1) Animals of class-I and class-II protection are under state key protection, and animals of class-III protection are under Sichuan Provincial key protection
- 2) CITES: Convention on International Trade of Endangered Species, 1995
- 3) IUCN: International Union for Conservation of Nature and Natural Resources, 1994, EN endangered species, VU vulnerable species, R rare species

• High levels of endemism

Chinese and Sichuan endemic species in the nominated area include mammals such as giant panda, golden monkey, white-lipped deer and Chinese stump-tailed macaque, birds such as Chinese monal, orange-throated partridge (*Tetrophasis obscurus*), Chinese thrush (*Turdus mupinensis*) and Rufous-tailed babbler (*Chrysomma poecilotis*), amphibians such as *Oreolalax popei*, *Amolops mantzorum*, *Staurois mantzorum* and *Polypedates dugritei*, fishes such as *Schizopygopsis malcanthus*, *Baoxingensis*, *Schizothorax* (*Schizop.*) and trout (*Hache beekeri*), and half of the reptiles are endemic species such as *Japalura szechwanensis*, *Achalinus meiguensis*, *Leiopisma monticola* and *Pareas chinensis*.

Amphizoa davidi grows only in the Jiajin Mountains of Baoxing County. In 1870 a specimen of male worm was collected and it was generally thought as extinct. In 1995 its imago and larvae were found again at the original place, showing that the original state of ecological environment was preserved well at the habitat.

Analysis of the global distributions of birds with resident ranges undertaken by ICBP (now called Bird Life International) identified globally more than 400 EBA's or endemic bird areas

where the ranges of several restricted range birds overlap. 13 of these EBAs are in China and two fall within the nominated area. Between them these two EBAs contain many of the most interesting and endangered endemic birds of China.

- **Global centre of pheasant and other taxa diversity**

The nominated area is a special center of endemism for some bird taxa such as leaf warblers, laughingthrushes, rosefinches and pheasants. China is recognized as the global center of pheasant diversity with a total of 63 species. The nominated area contains a total of 15 or 16 different pheasant species; more than those known from any other single site.

Table 12 Pheasant species of the nominated area

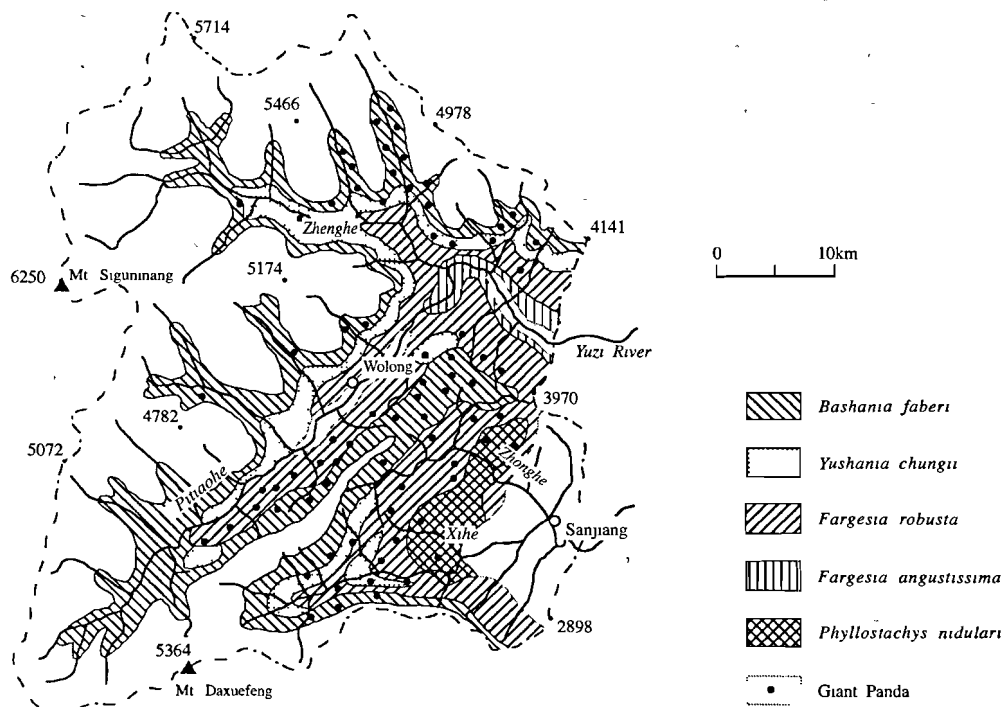
Snow partridge	<i>Lerwa lerwa</i>
Tibetan snowcock	<i>Tetraogallus tibetanus</i>
Orange-throated partridge	<i>Tetraophasis obscurus</i>
Tibetan partridge	<i>Perdix hodgsoniae</i> (marginal)
Chinese bamboo partridge	<i>Bambusicola thoracica</i>
Blood pheasant	<i>Ithaginis cruentatus</i>
Temminck's tragopan	<i>Tragopan temminckii</i>
Koklass pheasant	<i>Pucrasia macrolopha</i>
Chinese monal	<i>Lophophorus lhuysii</i>
Silver pheasant	<i>Lophura nyctymene</i>
White-eared pheasant	<i>Crossoptilon crossoptilon</i>
Common pheasant	<i>Phasianus colchicus</i>
Golden pheasant	<i>Chrysolophus pictus</i>
Lady amherst's pheasant	<i>Chrysolophus amherstiae</i>
Chinese grouse	<i>Tetrastes sewerzowi</i>
Japanese quail	<i>Coturnix japonicus</i>

3.1.3 Giant panda resources

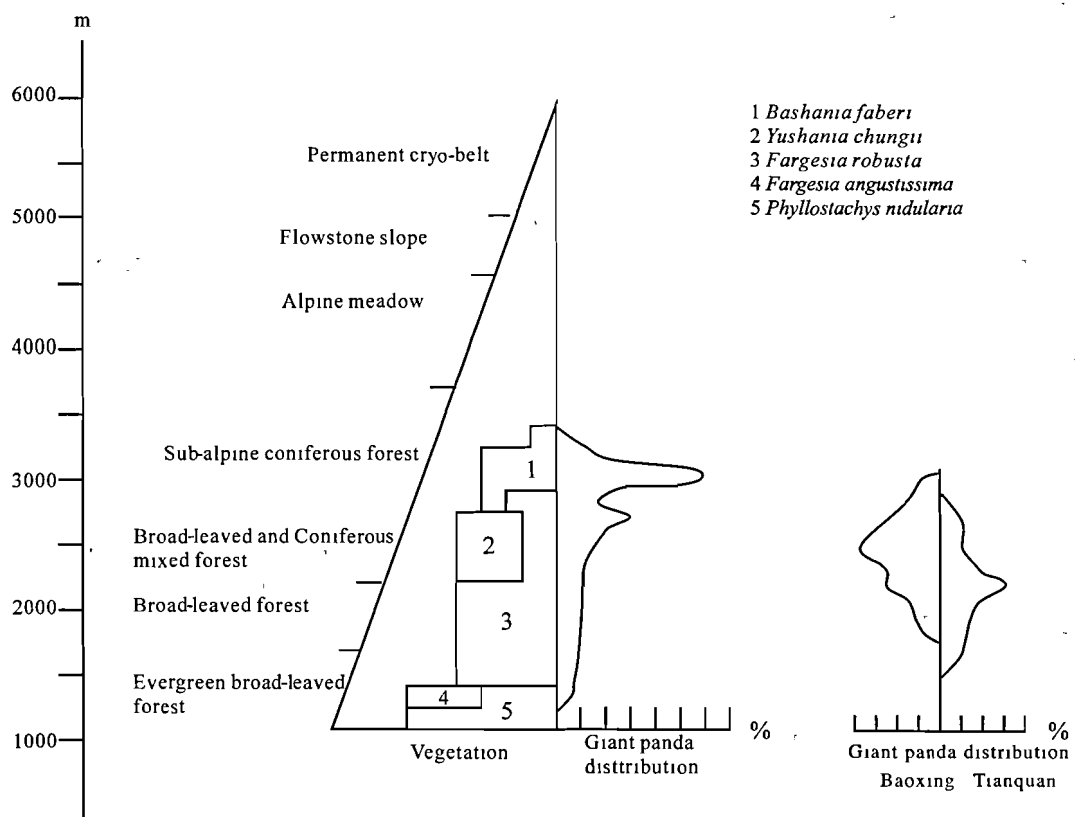
3.1.3.1 Distribution of bamboo for giant panda

The nominated area is of mixed bamboo forests on the mountains at the edges of Sichuan Basin, where grow many species and genera of bamboo, including *Bashania*, *B. fangiana*, *B. faberi*; *Chimonobambusa*, *Ch. pachystachys*, *Ch. quadrangularis*, *Ch. rivularis*, *Ch. szechanensis*; *Fargesia*, *F. angustissima*, *F. nitida*, *F. robusta*, *F. spathacea*; *Phyllostachys*, *Ph. heteroclada*, *Ph. nidularia*, *Ph. nigra*; *Qiongzhuea*, *Q. tumidinoda*; *Yushania*, *Y. chungii* and *Y. brevipaniculata*. Various bamboo types form the main parts of the shrub layer. And predominants in the evergreen broad-leaved forest and evergreen and deciduous mixed forest are *Ph. nidularia* and *F. robusta*. Main components in the coniferous and broad-leaved mixed forests include *B. faberi*, *F. robusta* and *Y. chungii*; and those in the subalpine coniferous forests, include *Y. chungii* and *B. faberi*.

Giant pandas mainly take various bamboos on the subalpine and medium mountains as their food. The tree canopy density is 0.6 ~ 0.75. It is very cool and humid in the forests. When bamboos are growing up, the coverage is about 60% in a large area. The gully, valley, terrace and eroded platform with slope less than 20° are the best places for giant panda to take food. The major bamboos for giant panda are distributed in the basin of the east and west part of the Baoxing River, Pitiaohe, Zhenghe, Labahe and Baishahe, Heshuihe and its tributary, Huangshuihe Stream, Zhonghe (Zhong River) and Xihe (Xi River) of Shoujiang River. The following figures indicate the relationship between the distribution of giant panda and that of bamboo.



Distribution map of giant panda and bamboo in the Wolong Nature Reserve
 (Adapted by Hu Jingchu and G. B. Schaller)



Vertical distribution of giant panda in the Qionglai Mountains (By Hu Jingchu, 1990)

3.1.3.2 Distribution of giant panda

Traces of giant panda, including direct sightings, dung, feeding signs and footprints in snow or mud, are frequently found in the area below 3600 m, and mainly in the evergreen-deciduous broad-leaved mixed forests, broad-leaved and coniferous mixed forests, and coniferous forests in the range between 1800 m and 3200 m. There are also some traces found in the evergreen broad-leaved forests below 1600 m.

Distribution of giant panda is known very precisely as a result from major field surveys involving hundreds of people between 1974 ~ 77, again from those in 1986 ~ 88 and in 2000. Map 1.5.7 shows their spatial distribution across the nominated area. The places with most traces of giant panda include Dengchigou, Dashuigou, and Guobayangou in the Fengtongzhai Nature Reserve, Mahuanggou and Pujigou of the Mt. Jiajin Provincial Park, north bank of the Zhenghe, south bank of the Pitiaohe and Zhonghe-Xihe Stream in the Wolong Nature Reserve, the Baishahe in the Mt. Erlang Provincial Park, Hexuangou and Lengshuigou of Labahe Nature Reserve, Huangshuihe, Tongchanghe and Dahe of Mt. Daxuefeng (Snow-capped Peak) Scenic Spot and Anzihe of the Mt. Jiguan - Jiulonggou Provincial Park.

3.1.3.3 Corridors for the giant panda across watersheds

Based on the analysis of the traces of giant panda, some important corridors for giant pandas exist on the watersheds of some tributaries of the Jiajin Mountain habitat, and can link the separate sub-populations living in different valleys:

- 1) Guobayangou (Fengtongzhai Nature Reserve)—upstream tributaries of the Huangshuihe (Daxuefeng Scenic Spot);
- 2) Dengchigou (Fengtongzhai Nature Reserve)—upstream tributaries of the Huangshuihe (Daxuefeng Scenic Spot);
- 3) Huoshiqi (Fengtongzhai Nature Reserve)—Dahe (Heishuihe Nature Reserve);
- 4) Ruobigou (Mt. Jiajin Provincial Park)—Dashuigou (Fengtongzhai Nature Reserve);
- 5) Ganyanggou (Mt. Jiajin Provincial Park)—upstream tributaries of the Baishahe (Mt. Erlang Provincial Park);
- 6) Meilichuan (Mt. Jiajin Provincial Park)—Baishahe (Mt. Erlang Provincial Park);
- 7) Upstream of the Tala River (Mt. Erlang Provincial Park)—upstream of the Labahe (Labahe Nature Reserve).

Also, corridors link other areas, such as the connection of Jiajin Mountain habitat and Jiguan Mountain—Qingcheng Mountain habitat, located between Huangshui Stream (Mt. Daxuefeng Scenic Spot) and Heishui River (Heishuihe Nature Reserve), as well as the connection of Jiguan-Qingcheng Mountain habitat and Wolong habitat is located on the watershed divide of the Anzihe of the Wenjingjiang River (Jiguan Mountain - Jiulong Gully Scenic Spot) and the Xihe Stream of the Shoujiang River (Wolong Nature Reserve). All these corridors are vital for the natural reproduction of wild giant pandas, to maintain outbreeding.

The center areas planned for the nominated area are the main places where traces of giant panda have been found, which includes all the vital corridors crossing watershed divides, and they are

also the places with golden monkey, takin and Chinese monal. Those places with many traces of giant panda and other rare animals are defined as protected areas; the places with scattered traces of giant panda and small number of wild animal are defined as buffer zone.

3.1.3.4 Main refuges of giant panda

The center of the Qionglai Mountains giant panda population is in Baoxing and Wenchuan Counties, surrounded by Tianquan, Lushan, Chongzhou and Dayi counties, as well as by Kangding, Luding, Dujiangyan, and Lixian counties. Individually, giant panda in the Jiajin Mountain and Wolong habitat account for 59% and 27% of the total in the nominated area, respectively. While those in the Jiajin Mountain Scenic Zone in Baoxing County - Fengtongzhai Nature Reserve and Wolong Nature reserve in Wenchuan County account for 34% and 24%, respectively.

3.1.4 Scenic resources

The nominated area is not only a masterpiece of natural scenery, famous for its biodiversity abundance of rare wild animals, forests, shrubs, meadows and year-round snow mountains and glacier landscapes, but also site with a lot of scenic spots of humanity culture, such as the stockade villages of Tibetan and Qiang ethnic groups, the catholic church constructed in Qing Dynasty with Chinese and Western styles and the Monument of the Long March of the Chinese Red Army. Among them, the most famous ones are listed below:

Table 13 Scenic and Touristic Resources

No.	Scenic Spot	Landscape Features	Present level of Development
1	Wolong National Nature Reserve Museum at Shawan	One of the best places for science and education, having numerous local species of 2170 plants, 225 birds, 56 beast, 700 insect, 6 fish, 17 amphibians and reptiles	Started
2	Yingchanggou in Wolong National Nature Reserve	High peaks embraced by clouds and mist, big trees and rushing water in valleys, with extra interest from travelling pandas	Started
3	Wolong Hetaoping Giant Panda Breeding Centre	Six labs and quarters for up to 55 pandas, an ideal place for panda study. Visitors can see pandas in pens and a large outdoor enclosure	Started
4	Shangjiang Scenic Spot of Wolong National Nature Reserve	Wonderful forest with dove trees and wild animals, such as Sambers	Started
5	Muerzhai Forest Park of Mt. Siguniang National Nature Reserve	Wonderful subalpine forest and alpine meadow	To be developed
6	Changpinggou Scenic Spot of Mt. Siguniang National Park	Along a path entering through the dense cypresses of thousands of years that form a huge umbrella, making people difficult to distinguish the sunrise from the sunset	Started
7	Shuangqiaogou Scenic Spot of Mt. Siguniang National Park	Wonderful subalpine forest by <i>Hippophae</i> and snow peaks	Started
8	Haizigou Scenic Spot in Mt Siguniang National Park	Located in the east of Rilong town, named after its consisting of lots of lakes, 19.2 km long and 126.48 km ² in area, with tranquil and clear water in which fishes swim and over which eagles soar in the blue sky.	To be developed
9	Red-leaf Scenic Spot of Miyalou Provincial Park	With National Road 317 running through, as the largest red-leaf spot in China at 2000 ~ 3400 m a s l, it extends 127 km and covers an area of 3 000 km ² with clean waters, green maintains and trees, a red corridor is formed among the trees in golden autumn	Started
10	Bipenggou Scenic Spot of Miyalao Provincial Park	45 km long, covering an area of 180 km ² and at 2000 ~ 5000 m a s l, adjacent to Mt Siguniang, Bipenggou is a scenic collection of plateau, swamps and valleys, featured by the well-known "Eight Wonders" ancient glaciers, lakes, springs, waterfalls, forests, peaks, red leaves and swamps. The resort covers varieties of red leaves and Rhododendron, with the intersections of glaciers, waterfalls and perilous peaks. In addition to its primitively ecological environments, its abundance of resources of natural landscapes and wildlife has made it an ideal resort for eco-tourism and scientific education in the 21st century.	Started

11	Caopo Provincial Nature Reserve	Scenery of ecosystem for giant panda, primitive forest and wild animals	To be developed
12	Fengtongzhai National Nature Reserve	Scenery of ecosystem for giant panda, primitive forest and wild animals, with dense distribution of giant panda and golden monkey	Started
13	Mt. Jiajin Scenic Spot of Mt. Jiajin Provincial Park	Scenery of ecosystem for giant panda, snowy mountain, Tibet villages and Tibet customs, commemorate places of the Chinese Red Army cross over the snow-capped mountain on foot	To be developed
14	Pujigou Scenic Spot of Mt. Jiajin Provincial Park	Scenery of ecosystem for giant panda, primitive forest, wild animals and snow-capped mountain	To be developed
15	Ganyanggou Scenic Spot of Mt. Jiajin Provincial Park	Scenery of ecosystem for giant panda, wild osmanthus, primitive forest, wild animals, gorges, with rare scenery of 600m ² of wild osmanthus forest	To be developed
16	Dengchigou Catholic Church of Mt. Jiajin Provincial Park	Constructed in Qing Dynasty in Baoxing County in 1839, covering an area of 1 560 m ² , with features of Chinese quadrangle and French style, by the French natural historian P. A David who then became the father of this church and found giant panda in 1869 at this place. The architecture is intact and the church is the place for catholics in Baoxing County to have their activities	To be developed
17	Labashe Provincial Nature Reserve	Scenery of ecosystem for giant panda, primitive forest wild animals, snow-capped mountain, with dense distribution of takin, deer and monkey. Good place to watch takin visiting salt licks in open area	Started
18	Baishahe Scenic Spot of Mt. Erlang Provincial Park	Attractive scenery of ecosystem for giant panda, primitive forest, wild animals and deep gorges	To be developed
19	Mt. Erlang and Mt. Hongling Scenic Spot of Mt. Erlang Provincial Park	Stunning scenery of ecosystem for giant panda, primitive forest, wild animals, snow-capped mountain, with rare scenery of dove trees of 200 000 m long and ginkgo of hundreds of acres	To be developed
20	Mt. Daxuefeng Scenic Spot of Mt. Lingjiu—Mt. Daxuefeng Provincial Park	Beautiful scenery of ecosystem for giant panda, primitive forest, wild animals, snow-capped mountain, glacier, with rare scenery of dense distribution of giant panda, deer and takin	To be developed
21	Mt. Qingcheng Scenic Spot of Mt. Qincheng—Dujiangyan National Park	Scenic and cultural site. Ecosystem for giant panda, primitive forest, wild animals, with vestiges of Chinese Daoism such as Tianshidong Temple. It is already listed as World Culture Heritage	Partly developed
22	Houshan Scenic Spot of Mt. Xilingxueshan National Park	Scenery of ecosystem for giant panda, primitive forest, wild animal, snow-capped mountains	To be developed
23	Mt. Jiguan-Jiulonggou Provincial Park	Scenery of ecosystem for giant panda, primitive forest, wild animals	Partly developed
24	Mt. Tiantai Provincial Park	Scenery of ecosystem for giant panda, landscapes and various bamboos	Partly developed
25	Jingtang-Kongyu Provincial Nature Reserve	Scenery of ecosystem for giant panda, primitive forest, wild animals, subalpine meadow, ancient path for transporting tea and salt to Tibetan and Commemorations for the Chinese Red Army's Long March	To be developed

3.2 History and Development

3.2.1 Historical records of giant panda

The records about giant panda in ancient China can be traced back to *Shijing*, *The Book of Songs*, composed in the Spring and Autumn Period (770 B.C.~ 476 B.C.), one reads, for example, in the folk songs “His lamb’s fur, with its cuffs of leopard-skin”. And in *Shangshu*, *The Book of History*, composed in the Epoch of Warring States (403 B.C.~221 B.C.), one reads lines as “Be like tigers and panthers, like bears and grisly bears”, where the animal involved in metaphors is actually what we now call the giant panda. Luji the famous litterateur in the period of the Three Kingdoms (220 A.D.~ 280 A.D.) once gave thorough explanations to the animal names appeared in *Shijing*, saying “the giant panda looks like a tiger or a bear, People living in the far northeast of China called it white bear”. Similar remarks are also found in the annotation to another classic *Liezi*, composed by Zhang Zhan in the Jin Dynasty (281 A.D. ~ 316 A.D.), that the so-called white leopard in the north was called tapir in the south, both referring to the giant panda as we call today.

A geographical book *Shanhailing (The Book of Mountains and Seas)* composed in the Epoch of Warring States and *The Historical Records* written in West Han Dynasty (91 A.D.) described that an animal like bear in white and black color appeared in Qionglai Mountains.

In *Annotation to Erya* composed by Xingbing in the Song Dynasty (960 A.D.~1279 A.D.), the giant panda was reported to live in Emei and Wawu mountains (in today's Sichuan Province). And according to the *History of Emei Mountain*, "the giant panda has been found in the forest above Mupi Temple, looking like dogs, obtuse in action, and never in dread of people." In the *History of Later Han* composed by Fanye in Southern Dynasty (420 A.D.~ 509 A.D.), "the giant panda lives in Ailaoshan Mountain".

The history of the giant panda can be traced also in many other historical books such as *Eryayi* composed by Luoyuan in the Song Dynasty, *Great Pharmacopoeia* by Li Shizhen in Ming Dynasty, *Miscellanea of Sichuan* edited by Cao Xuequan, and *Guizhouzhi* in the Ming Dynasty, and *Lizhouzhilin* in the Qing Dynasty.

All in all, the giant panda has records for a very long history in China, once found in such provinces as Sichuan, Guizhou, and Yunnan. It was mentioned in the *Shanglinfu* by Sima Xiangru in the Han Dynasty that Hanwudi the Emperor once had a breeding house built in Xianyang in Shaanxi Province. It was the world's earliest historical record about growing giant panda.

3.2.2 History of Conservation

It was in 1963 that the government took action to limit the damage to the environment and to set up reserves for the protection of Giant Panda. In that year Wolong and Fengtongzhai Giant Panda Reserves were established and Labahe was added in 1971. The timber operations in those areas terminated. The forests and bamboos recovered and the panda populations grew. The giant panda population in Wolong was estimated to be 147 in 1974.

It was the mass bamboo flowering events of the mid-1970s and mid-1980s that made authorities realize that the original reserves may not be enough to protect the giant panda. Wolong and Fengtongzhai were upgraded to national nature reserve level in 1975.

In 1979 the first team joined by international and Chinese scientists carried out field investigations from the tented camp of Wuyipeng in Wolong and undertook groundbreaking research into the ranging and ecology of giant pandas and the ecology of bamboos. The field camp was augmented by the Wolong Panda breeding center constructed at Hetaoping and opened in 1983.

In the year 1978, the Wuyipeng Giant Panda Research Station was set up here. By introducing the radio-tracking technology into the research work, a series of breakthrough achievements have been made. In 1983, the Giant Panda Protection and Research Center was established at Hetaoping. It has conducted deep studies on giant panda and has made great achievements up to the present. In the 15 years from 1986 to 2000, 32 births (46 cubs in total) were born here, in which 15 were singleton, 14 twins and 1 triplet.

Since the 1981, Chinese experts, together with foreign teams, have carried out continuous research into the giant panda.

Since 1979, China has taken part in giant panda research carried out by such international organizations as the WWF, IUCN and MAB.

In June, 1979, China and the WWF reached an agreement on the establishment of the Giant Panda Research and Protection Center.

In 1983, the Sino-foreign collaboration resulted in the publication of the book *The Giant Panda in Wolong*.

In August 1989, China and the WWF signed *The Program for the Protection and Management of the Chinese Giant Panda and Its Habitats*.

Recently the national and provincial authorities have taken a succession of new measures to improve protection, halt logging, tighten up law enforcement and declare new areas as nature reserves or scenic areas (see sections 3.3 and 3.4 below).

3.3 Recent Records Pertaining to the Nominated Heritage

The Overall Plan Design of Sichuan Labahe River Provincial Nature reserve, by Sichuan Research Institute of Forestry Reconnaissance & Design and Sichuan Administrative Station for the Investigation and Protection of Wildlife Resources, December 1994;

The Overall Plan for the Mt. Qingcheng-Dujiangyan National Park, by Sichuan Rural-Urban Planning & Design Institute, September 2000;

The Overall Plan for Mt. Xilinxue National Park, by Sichuan Rural-Urban Planning & Design Institute, August 1994;

The Overall Plan for Mt. Jiguan-Jiulonggou Provincial Park, by Sichuan Rural-Urban Planning & Design Institute, October 1996;

The Overall Plan for Mt. Tiantai Provincial Park, by Chengdu Planning & Design Institute, August 1989;

The Overall Plan for Miyaluo Provincial Park, by Sichuan Rural-Urban Planning & Design Institute, February 2002;

The Overall Plan for Mt. Lingjiu — Mt. Daxuefeng Provincial Park, by the People's Government of Lushan County, Sichuan Province, April 1998;

The Overall Plan of Jintang — Kongyu Provincial Nature reserve, by Forestry Bureau of Kangding County, Sichuan Province, May 1998;

The Overall Plan of Wolong National Nature reserve, by Sichuan Research Institute of Forestry Reconnaissance & Design and Sichuan Administrative Station for the Investigation & Protection of Wildlife Resources, June 1998;

The Overall Plan of Mt. Siguniang National Park, by Sichuan Rural-Urban Planning & Design Institute, September 1998;

The Overall Plan of Mt. Siguniang National Nature reserve, by Sichuan Research Institute of Environmental Protection and Chengdu Research Institute of Biology, Chinese Academy of Sciences, September 1998;

Investigation and Assessment Report on the Resources of Mt. Erlang Scenic Area, by the People's Government of Tianquan County, Sichuan Province, April, 1999;

Application Form of Sichuan Caopo Provincia Nature reserve, by the People's Government of Aba Autonomous Prefecture, Sichuan Province, May 2000;

The Overall Plan of Fengtongzhai National Nature reserve, by Sichuan Research Institute of Forestry Reconnaissance & Design and Sichuan Administrative Station for the Investigation and Protection of Wildlife Resources, June 2000;

The Overall Plan of Mt. Jiajin Provincial Park, by Sichuan Rural-Urban Planning & Design Institute, September 2000.

3.4 Status of Conservation

The nominated area covers 7 nature reserves and 9 scenic areas, including Aba Autonomous Prefecture, Ganzi Autonomous Prefecture, Ya'an City, and 12 counties of Chengdu City. Most of the places have set up administrative offices and completed their overall plans and fundamental constructions. Since 1993, the *National Conservation Programme on Giant Panda and Its Habitat* has been applied in the Wolong Nature Reserve and Fengtongzhai Nature Reserves. Since 1999, large national ecological programmes, the *National Natural Forest Protection Programme (NFPP)* and the *Programme on Conversion of Farmland into Forests and Grassland* have been executed in these areas. Recently, a National Programme on Wildlife Conservation and Nature Reserves was launched and a plan has been made for Sichuan by the Forestry Department accordingly.

Wolong National Nature Reserve in the nominated area, set up in Wenchuan County in 1963, 200 000 ha, mainly for the protection of golden monkeys and giant pandas. 100 wild pandas are living there. Tourist accommodation capacity in 2 000 amounted to 60 000 person-time.

Labaye Provincial Nature Reserve in the nominated area, set up in Tianquan County in 1963, 23 400 ha, protecting animals like takin and giant panda. 12 wild pandas are living there. Tourist flow in 2 000 amounted to 3 000 person-time.

Fengtongzhai National Nature Reserve in the nominated area, set up in Baoxing County in 1975, 39 000 ha, mainly protecting giant pandas. 40 wild pandas are living there. Tourist flow in 2 000 amounted to 6 000 person-time.

Mt. Qingcheng — Dujiangyan National Park in the nominated area, set up in Dujiangyan City in 1982, 15 000 ha, mainly protecting Taoist Heritages culture of Qingcheng Mountain, ecosystem and the ancient Dujiangyan Irrigation System. 6 or 8 pandas are living there. Its tourist flow in 2 000 amounted to 400 000 person-time.

Mt. Jiguan — Jiulonggou Provincial Park (including Anzi Provincial Nature Reserve) in the nominated area, with a tourist flow in 2 000 amounted to 100 000 person-time.

Mt. Tiantai Provincial Park in the buffer zone of the nominated area, set up in Qionglai City in 1989, 21 000 ha, mainly protecting the sightseeing ecosystem. 4 or 6 panda are living there. Its tourist flow in 2 000 amounted to 140 000 person-time.

Heishuihe Provincial Nature Reserve in the nominated area, managed by Lushan and Dayi Forestry Bureau and set up in Lushan and Dayi County in 1993, 31 800 ha, mainly protecting giant pandas. About 25 pandas are living there.

Mt. Siguniang National Park in the nominated area, set up in Xiaojin County in 1994, 45 000 ha, mainly protecting the sightseeing ecosystem. Giant pandas were once concentrated in the area. Its tourist flow in 2 000 amounted to 68 000 person-time.

Mt. Xilingxueshan National Park with the unexploited back mountain in the nominated area, set up in Dayi County in 1994, 48 300 ha. Its tourist flow in 2 000 amounted to 200 000 person-time.

Mt. Jiajin Provincial Park dominantly in the nominated area, managed by Construction, Environmental Protection & Travel Bureau of Baoxing County and set up in Baoxing County in 1995, 127 500 ha. About 100 pandas are living there.

Miyaluo Provincial Park (including Miyaluo Provincial Nature Reserve) with the Bipenggou and part of Red-leaf scenic areas in the nominated area, set up in Lixian County in 1995, 368 800 ha, protecting the sightseeing ecosystem. An administration of the scenic area was set up. 2 giant pandas were found in 2000.

Jintang — Kongyu Provincial Natureal Reserve dominantly in the nominated area, set up in Lushan County in 1995, 130 000 ha, protecting wild animals and ecosystem, managed by the Construction Bureau of the county. About 10 giant pandas are living there.

Mt. Siguniang National Nature Reserve partly in the mostly area, set up in Xiaojin County in 1996, 130 000 ha, protecting the ecosystem. Giant pandas were found there in 1970s.

Mt. Lingjiu — Mt. Daxuefeng Provincial Park partly in the nominated area, managed by Lushan Construction Bureau and set up in Lushan County in 1999, 30 000 ha, protecting the sightseeing ecosystem. 25 pandas are living in Mt. Daxuefeng area.

Mt. Erlang Provincial Park in the nominated area, managed by Construction, Environmental Protection & Travel Bureau of Tianquan County and set up in Tianquan County in 2000, 126 000 ha, protecting the sightseeing ecosystem. 23 pandas are living there.

Caopo Provincial Nature Reserve mostly in the nominated area, set up in Wenchuan County in 2000, 55 678 ha, protecting giant panda. About 10 giant pandas are living there.

3.5 Policies and Programs

Giant panda are protected by state laws and cherished by the public. In order to show the heritage of giant panda and carry out scientific education on protection, the State Government and Sichuan Provincial Government have approved to appropriate funds to establish scenic and historic areas and nature reserves. Exhibition rooms, open observation and experiment stations have been set up in the Wolong Nature Reserve, Labahe Nature Reserve, and Fengtongzhai Nature Reserve which were built in advance. Mass media and social organizations start the so-called “Giant Panda Culture” activities. Apart from news reports, a lot of educational films and TV programs have been made, exhibitions of photographs and traditional Chinese paintings have been organized, and popular science readings have been published. Most influential revelations include the films “*Wolong Nature Reserve*” and “*Fengtongzhai Nature Reserve*”, produced by Beijing Scientific Educational Films Studio in 1992 and won a prize in the “World Wildlife Film Festival” in Japan in August, 1993; “*The Mysterious World of Giant Panda*”, produced by China-Sichuan International TV Center and shown at the “‘93 Chengdu International Panda Festival”. Lianghekou Sculpture Mill and Marble Craftwork Factory of Baoxing County made stone sculptures of giant panda for the World Wildlife Fund among which large

sculptures are placed at the gate of the World Wildlife Fund and 15 small ones are donated by the Fund towards its sub-funds of member countries. In order to meet the strong requirement of foreign countries, 63 giant panda-time were exhibited in 15 countries and Hong Kong from 1980 to 1999.

Chinese Government has ranked science, culture, and education into the developing strategy of the country. After the nominated area enters *the Directory of World Heritages*, the exhibition plan for the heritages of giant panda will be implemented, including: 1) to build museums of giant panda on appropriate scales; 2) to set bilingual (Chinese and English) posters and signs at scenic areas; 3) to enlarge open fields for observation and experiment that can be used for exhibition purpose; 4) to publish monographs and popular science series on the giant panda heritages; 5) to go along with systematic popular science and culture education for the public.

Developing tourism is a key way of displaying heritage. And tourism in turn is constrained by both national and provincial laws to the specified capacity of tourist. Enforcing the constraint and improving travel quality are vital affairs confronted with heritages in various locations.

Since 1980, a giant panda conservation program has been carried out jointly by the Chinese Government and international organizations such as WWF and American zoos. In 1989, a WWF-MOF (Ministry of Forestry) Conservation Plan for the Giant Panda and Its Habitat was developed based on the second panda national survey. The plan was approved by the State Council in 1993 and was implement from then on. Recently, the third national panda survey was completed and an updated national panda conservation program is being developed.

4 MANAGEMENT

4.1 Ownership

The People's Republic of China

4.2 Legal Status

Article 9 of The Constitution of the People's Republic of China says "The state owns all the natural resources including mineral resources, streams, forests, mountains, grasslands, wastelands, beaches, etc."

Clause 2, Article 22, The Constitution of the People's Republic of China says "The State shall protect places of historical interest and scenic beauty, valuable cultural heritages, and other important historic and cultural heritage sites."

Article 2, Provisional Regulations of the State Council of the People's Republic of China on the Management of Scenic and Historic Areas says "All the areas shall be ranked as scenic and historic areas that have high value in appreciation, culture or science, have a comparative concentration of spectacular natural scenery and humanism views, together with a beautiful environment in a certain scale and scope, and are suitable for people's tourism, leisure, or conducting of cultural and scientific activities."

Article 2, Regulations of the People's Republic of China on Nature Reserves says "A certain area shall be legally marked out for special protection and management with regard to areas concentrated by representative natural ecological systems, rare, precious and endangered wildlife;

and lands, terrestrial water bodies or sea areas where special natural ruins are located.”

The legal status of scenic and historic areas and nature reserves within the nominated area is as follows:

Wolong Nature Reserve was approved for establishment by Sichuan Provincial Government of the People's Republic of China in 1963 and ratified to be a National Nature Reserve by the State Council in 1975;

Labahe Nature Reserve was approved for establishment by Sichuan Provincial Government of the People's Republic of China in 1963;

Fengtongzhai Nature Reserve was approved for establishment by the State Council of the People's Republic of China in 1975;

Mt. Qingcheng — Dujiangyan National Park was approved for establishment by the State Council of the People's Republic of China in 1982;

Mt. Jiguan — Jiulonggou Provincial Park was approved for establishment by Sichuan Provincial Government of the People's Republic of China in 1986;

Mt. Tiantai Provincial Park was approved for establishment by Sichuan Provincial Government of the People's Republic of China in 1989;

Heishuihe Nature Reserve was approved for establishment by Sichuan Provincial Government of the People's Republic of China in 1993;

Mt. Xilingxueshan National Park and Mt. Siguniang National Park were approved for establishment by the State Council of the People's Republic of China in 1994;

Mt. Jiabin Provincial Park was approved for establishment by Sichuan Provincial Government of the People's Republic of China in 1995;

Miyaluo Provincial Park was approved for establishment by Sichuan Provincial Government of the People's Republic of China in 1995;

Jintang — Kongyu Nature Reserve was approved for establishment by Sichuan Provincial Government of the People's Republic of China in 1995;

Mt. Siguniang Nature Reserve was approved for establishment by the State Council of the People's Republic of China in 1996;

Mt. Lingjiu — Mt. Daxuefeng Provincial Park was approved for establishment by Sichuan Provincial Government of the People's Republic of China in 1999;

Mt. Erlang Provincial Park was approved for establishment by Sichuan Provincial Government of the People's Republic of China in 2000;

Caopo Nature Reserve was approved for establishment by Sichuan Provincial Government of the People's Republic of China in 2001.

4.3 Measures of Protection and Implementation

4.3.1 Protection in accordance with the laws

The main laws and regulations for protection and management are as follows:

- *The Constitution of the People's Republic of China*
- *Law of the People's Republic of China on Wildlife Protection*
- *Environmental Protection Law of the People's Republic of China*
- *Forest Law of the People's Republic of China*
- *Cultural Heritages Protection Law of the People's Republic of China*
- *Regulations of the People's Republic of China on Nature Reserves*
- *Provisional Regulations on the Management of Scenic and Historic Areas of the State Council of the People's Republic of China*
- *Regulations on Wild Plant Protection of the People's Republic of China*
- *Regulations on the Management of Scenic and Historic Areas of Sichuan Province*
- *Regulations on the Management of Nature Reserves of Sichuan Province (Appendix 1)*

Regulations on the Protection of World Heritages of Sichuan Province is constituted in the light of UNESCO Convention for the Protection of World Cultural and Natural Heritage and laws of China concerned. It is the legal basis for direct management of all the world heritage properties in the province and its final enactment will undoubtedly become a very important measure for the protection of world heritage.

In accordance with the above-mentioned laws and regulations, bylaws regarding protection and management have been laid down by each of the protection areas.

4.3.2 Protection of the nominated area with the programming

In the light of the World Cultural and Natural Heritage Convention and relative laws and regulations of China, and on the basis of protecting the heritage worth, an integrated overall program is to be worked out for better protection of the world heritage in the nominated area and programs for all scenic areas, nature reserves either in effect or in compilation are to be revised accordingly.

In order to have a better protection for the relatively condensed areas at the downstreams of the Donghe Stream and the Xihe Stream in Baoxing County and at the upstream of the Wori River in Xiaojin County, and for the choppy places for the panda's activities outside the nominated area, a transitional zone will be established. This transitional zone is to be managed according to the *Sichuan Provincial Regulations on the Administration of Scenic and Historic Areas* and *Sichuan Regulations for the Protection of the World Heritage*. The establishment of the transitional zone will reserve more space for the growth of giant panda. The nominated world heritage is divided into core zone and buffer zone. Management regulations for each zone can be found in attached management plan.

A comprehensive management program will be put in practice. Details see the to attached management plan.

4.3.3 Overall management of environmental for the nominated area

Among the planned and ongoing conservation programs, important measure to be taken in management include:

- to close all the mines and polluting industries which are in conflict with heritage protection.
- to convert sloping cultivated lands to natural habitat for giant panda.
- to adjust the industrial structure in the nominated area to achieve effective protection and reasonable utilization of heritage resources.
- to conduct researches with regard to the needs of the local residents.

Most of the counties involved are in poverty. The implementation of a protection program will make the region suffer another heavy economic blow after the local financial revenue was greatly reduced due to the prohibition of natural forest felling. The purpose of the program is to raise necessary financial and technical assistance so as to relax the tension of local finance and to ascertain the smooth implementation of the protection program.

4.3.4 Establishment of unified administrative organizations for the proposed heritage site

The nominated area covers the area of 12 counties in two prefectures and two cities, including 7 reserves and 9 scenic parks that are currently management under Sichuan Forestry Department (SFD), Sichuan Environmental Protection Bureau (SEPB) and Sichuan Construction Department (SCD). Thus management of the world heritage will involve coordination of multi-agencies. Sichuan Provincial Government has established a multi-institutional steering committee to handle the world heritage application, an office is also set up in SCD. In order to guarantee effective and consistent management of such a large area, a formal management mechanism should be structured as follows:

- Based on the existing steering committee, establish a “Sichuan World Heritage Management Committee (SWHMC)”, which should be headed by a vice governor with top authority in the province. Its members will include representatives from SCD, SFD, EPB and other relevant departments such as the Provincial Planning Committee and Land and Resource Department, as well as governments of Chengdu City, Ya’an City, Aba Prefecture and Ganzi Prefecture.
- Set up a “Sichuan World Heritage Management Office (SWHMO), as an executive office of the above committee to be responsible to day to day coordination and communication. This office should be under SCD, consistent to the implementation focal point of World Heritage Convention in China.
- A parallel Scientific Committee is also important to ensure management decisions are based on scientific basis.

Terms of References of the committee and the executive office include several aspects:

- Relying on existing management system, build management consensus among involved agencies.
- Coordinate communications and management consensus among parties; develop new policies and legislations on management when necessary.
- Responsible for organizing monitoring and evaluation on management of the world heritage, making sure that the monitoring and evaluation are scientific, comprehensive and independent.
- Develop and update overall management plan for the world heritage, incorporating the monitoring results into such a plan.

The management unit of the world heritage is a nature reserve or a scenic park. Each unit remains in its original management structure, receives administrative support from local governments and technical support from its focal department. Thus each department will maintain its existing authority and responsibility. The main differences in management for the world heritage are increased coordination among institutions and enhanced monitoring:

4.3.5 Research and management training

4.3.5.1 Research

- Conduct researches on the ecological environment of giant panda, explore and work out technologies and measures to recover the habitat and to prevent and fight off ecological disasters (e.g. the wide area blooming of bamboo).
- Carry out a dynamic research and management plan for the ecological network of the world heritage sites. The objective is to construct a fundamental database and a dynamic monitoring network of sights through taking key problems and making use of “3S Technology” (i.e. system of remote sensing, system of global positioning, and system of geographical information) by means of multiscience unity and on the basis of a thorough field investigation of the realistic ecological state of affairs of all the world heritage sites; and to do a dynamic analysis to the biodiversity and a dynamic management to the heritage resources through data system, the dynamic monitoring network of sights, and the research network built by the comprehensive analysis centre.
- Conduct research on the breeding of giant panda and sending them back to nature. Make use of modern biological and physical engineering technologies to do a comparative study on the breeding and sending back to the nature in the habitats (China Giant Panda Protection and Research Center, Wolong) and the migrating place (Chengdu Giant Panda Breeding and Research Base, Chengdu). Besides, the development of the protection on the spot is going to be supported, complemented and promoted.
- Continue the monitoring of the distribution of giant panda, bamboo and other species including inventory of little studied groups, such as invertebrates and lower plants.

4.3.5.2 Management training

Establish a management training center for all the provincial world heritages and implement the management training plan for the protection of giant panda and natural & cultural heritage during 2003 ~ 2010.

4.4 Administrative Organizations

Ministry of Construction of the People's Republic of China

Address: 9# Sanlihe Road, Baiwanzhuang, Beijing, P. R. China Postal Code: 100835

State Bureau of Forestry of the People's Republic of China

Address: 18# Hepinglidong Street, Beijing, P.R. China Postal Code: 100714

State Environmental Protection Administration of the People's Republic of China

Address: 115# Xizhimenneinanzhao Street, Beijing, P.R. China Postal Code: 100035

Construction Bureau of Sichuan Province

Address: 36# Section 4, Renminnanlu Road, Chengdu, P.R. China Postal Code: 610041

Sichuan World Heritage Administrative Office

Address: 36# Section 4, Renminnanlu Road, Chengdu, P.R. China Postal Code: 610041

Forestry Bureau of Sichuan Province

Address: 15[#] Section 1, Renminbeilu Road, Chengdu, P.R. China Postal Code: 610081,

Environmental Protection Bureau of Sichuan Province

Address: 31[#] Xiyu Street, Chengdu, P.R. China Postal Code: 610012

4.5 Administration Status

A series of laws and regulations legislated by the State, Sichuan Province, and Aba Autonomous Prefecture, Ya'an City, Chengdu City, and Ganzi Autonomous Prefecture have been enforced in those scenic areas and nature reserves. The environmental awareness of local people has been improved. Wild vegetation and animal resources are now under better protection. Giant pandas that are found sick, hungry or injured have got immediately first-aid and medical treatment, and then duly released back to the nature. Therefore, there is some increase in the number of the wild giant pandas in comparison with that of the year 15 years ago. In the meantime, Dengchigou Catholic Church, the memorial cultural heritage, is well protected: it was ranked as a county-level protection unit for cultural heritage in 1988 and is now applying for a key state-level cultural protection unit.

Contact information

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Ya'an World Heritage Administration Committee Director: Sun Qian

Address: Construction Mansion, Linjiang Road, Ya'an City, Sichuan, P.R. China Postal Code: 625000

Chengdu World Heritage Administration Committee Director: Sun Ping

Address: Chengdu, P.R. China Postal Code: 610012

Ganzi World Heritage Administration Committee Director: Chen Jialin

Address: Kangding County, Sichuan, China Postal Code: 626000

Local World Heritage Administration Offices

Wolong National Nature Reserve Administration Director: Pu Guangjun

Address: Wolong, Wenchuan County, Sichuan, P.R. China Postal Code: 623006

Mt. Siguniang National Park Administration Director: Nima Mu

Address: Rilong, Xiaojin County, Sichuan, P.R. China Postal Code: 624204

Miyaluo Provincial Park Administration Director: Du Chaogang

Address: Zagunao, Li County, Sichuan, P.R. China Postal Code: 623100

Caopo Provincial Nature Reserve Administration Director: Gao Zhifu

Address: Weizhou, Wenchuan County, Sichuan, P.R. China Postal Code: 623004,

Fengtongzhai National Nature Reserve Administration Director: Cui Xuezhen

Address: Fengtongzhai, Yanjing, Baoxing County, Sichuan, P.R. China Postal Code: 625700

Mt. Jiajin Provincial Park Administration Director: Sun Delei
Address: Xinbaonan Street, Muping, Baoxing County, Sichuan, P.R. China Postal Code: 625700

Mt. Lingjiu - Mt. Daxuefeng Provincial Park Administration Director: You Xia
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Heishuihe Provincial Nature Reserve Administration Director: Fu Yuhai
Address: Modong, Lushan County, Sichuan, P.R. China Postal Code: 625600

Labuhe Provincial Nature Reserve Administration Director: Yang Mingquan
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Mt. Erlang Provincial Park Administration Director: Huang Yongxin
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Mt. Qingcheng National Park Administration Director: Liu Gang
Address: Qingcheng Mountain, Dujiangyan City, Sichuan, P.R. China Postal Code: 611844

Mt. Xilingxueshan National Park Administration Director: Zhang Mingyuan
Address: Dayi County, Sichuan, P.R. China Postal Code: 611330

Mt. Jiguan (Jiulonggou Provincial Park Administration Director: Song Maoquan
Address: Chongzhou City, Sichuan, P.R. China Postal Code: 611230

Mt. Tiantai Provincial Park Administration Director: Fu Guangwen
Address: Qionglai City, Sichuan, P.R. China Postal Code: 611530

Jintang (Kongyu Provincial Nature Reserve Administration Director: He Kangping
Address: Kangding County, Sichuan, P.R. China Postal Code: 626000

4.6 Approved Plans Related to the Proposed Heritage

The Overall Plan of Wolong National Nature Reserve, approved by the National Bureau of Forestry in October 1998;

The Overall Plan of Sichuan Fengtongzhai National Nature Reserve, approved by the State Bureau of Forestry in January 2001;

The Overall Plan of Mt. Siguniang National Nature Reserve, approved by the State Environmental Protection Administration, PRC in May 2000;

The Overall Plan and Design of Sichuan Labahe Nature Reserve, approved by the Forestry Administration of Sichuan Province in December 1995;

The Overall Plan of Mt. Xilingxueshan National Park, approved by the Ministry of Construction in December 1996;

The Overall Plan of Mt. Siguniang National Park, approved by the Ministry of Construction in December 2001;

The Overall Plan of Mt. Qingcheng—Dujiangyan National Park, approved by the Ministry of

Construction in August 2000;

The Overall Plan of Mt. Jiguan—Jiulonggou Provincial Park, approved by Sichuan Provincial Government in December 2001;

The Overall Plan of Mt. Tiantai Provincial Park, approved by Sichuan Provincial Government in 1990;

The Overall Plan of Miyaluo Provincial Park, approved by Sichuan Provincial Government in August 2001;

The Overall Plan of Mt. Jiajin Provincial Park, approved by Sichuan Provincial Government in March 2001.

4.7 Monetary Resources

- **Financial Sources and amount (1963 ~ 2000)**

Totally RMB 320 000 000 Yuan, including:

State appropriations: RMB 180 000 000 Yuan;

Appropriations from Sichuan Province, Aba Autonomous Prefecture, Ya'an City, Chengdu City, and Ganzi Autonomous Prefecture: RMB 55 000 000 Yuan;

Funds raised: RMB 85 000 000 Yuan.

- **Use of the fund**

Construction of infrastructure in scenic and historic areas and nature reserves;

Eco-environmental protection in scenic and historic areas and nature reserves;

Salvage of sick and injured giant pandas;

Maintenance of ancient buildings;

Research and dissemination;

Staff training.

4.8 Expertise and Training

The management or administration of scenic areas and nature reserves is under the support and guidance of the Ministry of Construction of the People's Republic of China, the State Bureau of Forestry (formerly the Ministry of Forestry), State Environmental Protection Administration, the Construction Bureau of Sichuan Province, the Forestry Department of Sichuan Province, Environmental Protection Bureau of Sichuan Province, the Bureau of Cultural Heritages of Sichuan Province, Chinese Academy of Sciences, and other departments and institutes. The professional knowledge of the managerial personnel mainly comes from:

Graduates from professional schools, colleges and universities;

The training of present jobholders at colleges and universities, the correspondence education, and self-study;

Professional trainings held by the State or Sichuan Province;

Joining in forums and academic exchange held by national or local research institutes.

4.9 Tourist Facilities and Recorded Tourist Flow

4.9.1 Tourist facilities

15 bus shuttles;
12 parking lots;
46 hostels and restaurants for organized tourists;
12 two-star (or above) hotels;
40 merchandizing shops
9 travel agencies;
36 standard sanitary lavatories;
20 information service stations;
164 tourist guides;
250 on-site safety and rescuing personnel;
2 reception and interpretation centers;
8 rescue centers;
13 on-site first-aid stations;
580 bilingual (Chinese and English) posters and signs;
253 bilingual (Chinese and English) destination boards;
268 signs for complaint claiming.

4.9.2 Recorded tourist flow

1997: 430 000 person-time (among them 400 000 to Qingcheng Mountain);
1998: 438 000 person-time (among them 380 000 to Qingcheng Mountain);
1999: 505 000 person-time (among them 400 000 to Qingcheng Mountain);
2000: 640 000 person-time (among them 400 000 to Qingcheng Mountain).

4.10 Management Plan and Objective of the Proposed Heritage

Goal (long-term):

The biodiversity, ecosystem and habitat of the giant panda will be effectively protected in the world heritage site; social and economic development of human population will be harmonized with the natural environment.

Objectives:

- The giant panda population and habitat well protected so that the “flagship” species will live and expand.
- Natural features of outstanding global significance, notably rare and endangered species, overall biodiversity, scenic values and geomorphic interests effectively protected in the world heritage.
- The Upper-Yangtze watershed and forest ecosystem well protected to provide adequate ecological services locally and to downstream.
- Rich cultural heritage protected and perpetuated.
- Local community development sustainable - environmental pressures from development reduced; ecotourism well managed and sustainably developed, negative impacts to environment from other livelihoods and threats (see section 2.2) are minimized.
- Increased public awareness and participation in conservation - making the world heritage a showcase for environmental education and communication.

A complete management plan is attached as appendix. The following is a brief summary.

Once the World Heritage application is submitted, implementation of the management plan will be launched, which includes the following aspects:

Zonation

The entire world heritage site will be divided into a conservation zone, 9 510 km², including include a core area, 5 370 km², and a protected area, 4 140 km², mainly considered the area covering all major panda habitat and special natural and ecological landscape of the Qionglai Mountains; and a buffer zone, 5 290 km², controlled area outside of the nominated area to ensure proper protection of the world heritage.

Management of different zones will follow different norms (see management plan).

An effective management mechanism put in place

In order to guarantee effective and consistent management of such a large area, a World Heritage Management Committee will be formed under the provincial government and a management office will be established under the Department of Construction as an executive office. The management will be responsible for building management consensus among involved agencies, coordinating communications, developing new policies and legislations on management when necessary and organizing monitoring and evaluation on the World Heritage, making sure that the results from monitoring and evaluation are integrated into the overall management plan updating.

Implementing conservation and management programs

Conservation and management programs include the followings:

- Expansion of nature reserves.
- Effective management of world heritage units and law enforcement.
- Implementation of conservation plans on the giant panda and other important endangered species.
- Restoration of panda habitat and re-establishing corridors.
- Eliminating or reducing environmental damage from mines and polluting industries.
- Population control in the world heritage.
- Community participation in management of the world heritage.
- Management planning and updating

Monitoring

Based on the existing monitoring activities by panda reserves, Academy of Science and the Sichuan Forestry Institute, a network will be built so information will be integrated and gaps filled in monitoring. Different aspects to be monitored are:

Data to collect in monitoring	Responsible agencies
Overall vegetation cover using satellite imagery time series	A research institution in Sichuan
Physical parameters climate, river flow, and sediment loads etc.	Trained staff from protected areas and relevant ecological observation stations
Condition of vegetation and especially bamboo by foot patrols and sample quadrates in respective management units	Staff of respective protected areas
Giant panda and other significant wildlife by foot patrol reports and periodic recensus	Staff of respective protected areas
Socio-economic conditions in local communities and trends of their livelihoods	Trained staff from protected areas and teams contracted by Sichuan WH Administration Office
Tourism development, numbers of visitors, revenues and impacts on scenic areas and environment	Trained staff from protected areas, county EPB offices and Dept. of Tourism
Pollution from residual industries in buffer zone	Provincial and county EPB offices and contracted research institutions
Progress on respective action programmes and governmental policies	Respective executing agencies for different programmes, contracted research institutions

Monitoring is useless without proper reporting. In addition to their normal reporting to their mother units, each management units within the WH site will be required to prepare periodic reports for submission to the Sichuan World Heritage Administration Office whose role will be to collate these reports and prepare an overall annual progress report on the whole WH site.

A completed monitoring flow is shown as following:

Research

Research would be most encouraged in areas that can help in the improvement of management and conservation of the area, notably:

- Establishment of GIS database for monitoring vegetational changes from remote sense data and integration with wildlife data reported during monitoring and census.
- Continued studies of ecology of wild giant pandas and other precious wildlife (pheasants, golden monkeys, red panda, takin etc.).
- Captive breeding and reintroduction trials of selected rare species.
- Ecology and flowering patterns of bamboo species.
- Continuing inventory of unsurveyed regions and lesser known taxa.
- Habitat restoration methodology.
- Taxonomic studies of special species groups - rhododendrons, lilies, pheasants etc..
- Artificial propagation and processing of medicinal plants.
- Socio-economic studies and surveys.

Captive Breeding Programmes

It is necessary to better breed and manage the existing captive panda population, no more wild pandas should be captured.

Public Awareness and environmental education

A comprehensive education programme will be developed aimed at three groups:

- Schools in local towns and villages.

- Local communities living in the conservation zone.
- Visitors and tourists.

Capacity building

Goals Uniformly insure the quality standards and methods of GIS management through propagating new conceptions, theories, information and technology concerning the world heritage; improve levels in profession and management, expand academic exchange between various countries in governing the world heritages.

Objects The program includes basic training and skill training, especially the application of GIS method in management matters. It is planned to establish a special provincial training course within an existing training center for the capacity building of world heritage staff at various levels, based on a training need assessment. A management training plan for the protection of giant panda and natural & cultural heritage will be implemented during 2003 ~ 2010.

Tourism management

An eco-tourism programme will be developed with the objectives of raising revenue for the local economy and creating education and awareness for the general public. The types of development and the levels of tourism will be strictly controlled within carrying capacity of the various scenic and cultural areas concerned and with a great care to minimize disturbance to wildlife, to protect the environment and to be sensitive to local culture. Construction of tourism facility will be strickly controlled, following the zoning of the world heritage.

An overall tourism management plan will be developed for the world heritage to regulate constructions of tourist facilities and to set up site-specific norms on tourism development in different zones within the world heritage.

Sustainable community development

Potential projects on community development in this area are:

- Alternative energy, such as biogas and micro-hydro power.
- Sustainable non-timber forest product (NTFP) collection and marketing.
- Community-based ecotourism development, especially homestay lodges, tour guide training and handicraft making.
- Training on advanced, environmental-friendly farming techniques.
- Valuable cash tree planting.
- Alternative livelihood skill training.

4.11 Staff

Up to now, there are 501 employees engaged in landscape planning, tourism management, and animal and plant management in the scenic areas and nature reserves. Among them, 190 are with junior technical titles, 182 with intermediate professional titles, and 40 with senior professional titles. More senior professionals will be employed and advanced training will be available for the staff.

5 FACTORS AFFECTING THE PROPOSED HERITAGE

5.1 Development and Environmental Pressure

5.1.1 Tourism development

Comparing with the 400 000 person-time of Qingcheng Mountain and Dujiangyan, the World Cultural Heritage site, tourists to other scenic spots in the nominated area are quite few. The flow of tourists is supposed to be enlarged to a large extent after its transition to one being listed in the *Directory of World Natural Heritages*.

Revenues from properly organized eco-tourism could be substantial and of great significance in this poor region of China. Earnings will help to justify the protection of such large areas of forest. Revenues should in particular be allowed to flow down to the local communities living around the protected areas and who have few alternative earning options other than exploitation of the natural resources.

With good management and qualified service, such as nature guides from reserves or local communities, viewing pandas and panda habitats has a potential to generate significant income for conservation and as an alternative livelihoods for local people after the logging ban.

Other activities such as mountaineering, bird-watching tours, specialist horticulture or butterfly tours and other forms of outdoor recreation have huge potentials for further development.

The fast growth of domestic tourism poses a real threat to the naturalness and tranquility of the nominated area. Lack of adequate controls could lead to the destruction of the very qualities that make the area so attractive to visitors as well as causing damage to vegetation and other common properties.

Tourism levels at Hetaoping center in the entrance area of the Wolong National Nature Reserve has already turned into an example that the control measures and tourist types are not so well compatible with the fast increasing of tourism.

For these reasons the management authorities have exerted considerable controls and issue suitable regulations to control the zoning, types of developments, seasons and numerical limits of tourist developments permitted in the area.

5.1.2 Poaching

Some of the local farmers living in and around the nominated area still indulge in illegal poaching to supplement incomes and provide kitchen food. Tufted deer, barking deer, black bear and even giant panda are accidentally injured and killed by indiscriminate snares.

The penalties for killing or trading in State Category Protection Wildlife are dramatically strengthened and the very severe penalties have been applied to several persons convicted of killing or selling parts of giant pandas. In 1989 a ring of the traders in such pelts was broken in Chengdu and many illegal pelts confiscated and destroyed.

5.1.3 Mining activities

Some mines of stone, multi-metals, coal and raw chemical materials are located in the core area

and the buffer zone of the nominated area. But their simple and crude equipment as well as backward technology result in serious destruction to forests and environment in some areas.

Three large-scale marble mines are located in Baoxing County. Mining activities cause noise and dust pollution as well as destroying vegetation cover and problems of disposal of waste materials.

Use of marble to make carved panda souvenirs could be promoted as a 'green' industry for local handicrafts, a useful source of revenue from the tourist industry and can help in promoting the image of the giant panda and its heritage park.

5.1.4 Pollution caused by metallurgical and chemical industries

The giant panda's living condition is threaten by the newly-established small-scale smelters and sulfuric acid plants at the entrance to the habitat, which, backward in technology and poor equipment, have polluted air, waters and soil to an evident degree.

5.1.5 Population growth

Population growth together with increasing need for living space add considerably to the pressure for land and resources. Minorities mainly of the Tibetan and Qiang populate the nominated area, including 2 560 inhabitants of 421 households in Wolong Nature Reserve in 1975, and 4 260 inhabitants of 904 households in 1995. Besides, there were 3 000 inhabitants in 1957 and 5 030 in 2000 in Qiaoqi village, Baoxing county located in the belly of the Jiajin Mountain range.

Although the government applies strict controls to population growth among the Han population, these regulations are relaxed in relation to minority groups and large families are the norm. Special education programmes to promote planned parenthood are needed in addition to incentives to persuade more people to move out of the protection areas and find economic employment in the buffer zones or adjacent townships.

5.1.6 Reclamation and Overgrazing

The population increase has resulted in the reclamation of wasteland from the valley bottom to the slopes, and thus reduced the giant panda's habitats and activity areas.

The nominated area has made great efforts towards rescuing giant pandas in danger, but there are many urgent problems to be solved with regard to the conservation of ecological condition. Given the underdeveloped economy in the nominated area, the local residents began to compete with giant pandas for living spaces, which turned the giant panda's habitats into "islands". Furthermore, the protection law for natural resources laid down by the State is in conflict with the local economic development to a certain extent. A government programme for returning steep farmland to tree cover can provide some funds to compensate losses but for real success the region requires a major investment of capital that membership of World Natural Heritage List will help to encourage.

The alpine meadows of the nominated area are used extensively for the grazing of yaks and cows. This is particularly the case in the higher zones of the Wolong National Nature Reserve and the grassland areas of Aba and Ganzi Tibetan Autonomous Prefectures. There have been cases of over-grazing and degradation of alpine pastures. Some domestic grazing is probably essential to maintain the original vegetation condition since formerly these areas were grazed by higher densities of natural ungulates such as blue sheep which are now rather rare. One major

task of the management of the heritage park will be to ensure that levels of grazing are stabilized within the natural capacity of these areas.

5.1.7 Logging and illegal cutting of wood

Forest resources are rich in the Qionglai Mountains, which have supplied woods for Chengdu Plain for a long time. But the forests in the east slope have already been felled, and the forests in sub-high mountains have been felled in the recent 40 years. As a result, forests in the main tributaries have been felled to different extents and the habitats of giant pandas have been cut apart. Thanks to the decision of a logging ban on natural forests by the Sichuan Provincial Government and the National Natural Forest Protection Programme initiated by the State Government in 1999, the situation had a fundamental improvement.

The human inhabitants of the nominated area use wood as their primary source of fuel and also cut wood, especially birch (*Betula*) trunks as substrate for growing edible fungi. Since the human population is growing fast this could become a serious problem in the future unless adequate controls and alternative energy resources are put in place quickly. These should include establishment of adequate wood plots in buffer zone areas to meet other legitimate wood needs.

5.1.8 Collection of medicinal plants

Collection of medicinal plants is a threat to the survival of some rare target species. In addition, the movements of collectors through the protected areas, especially if accompanied by dogs can constitute a serious disturbance to the shy giant panda, forcing them to abandon areas of suitable habitat.

Solution to this problem is complex and requires a multi-pronged approach including:

- Strict zoning of where collecting is permitted and of what species.
- Supervision that collecting follows the agreed regulations.
- Development of artificial rearing of medicinal plants in buffer zones and experimental zones of the nominated area.
- Cooperation with the traditional medicine factories about bans on the buying of endangered species and the identification of substitutes in traditional prescriptions.
- Extension work among communities engaged in collection of medicinal plants (and animals).
- Improving monitoring of the impacts of plant collecting on wild populations.

5.1.9 Planting of exotic species

Whilst the management authority both welcomes and encouraged efforts at reforestation of degraded areas within the nominated area, strict regulations and controls must be put in place to ensure that only appropriate local species are planted.

Use of exotic species, even from other parts of China, could cause threats to the native fauna and flora through the spread of alien invasive forms and species. Currently several non-native species of Larch (*Larix*), pines (*Pinus*), Pauwlonia and other trees, shrubs and flowers are being planted and this should be halted. Adequate nurseries for the rearing of local seed should be established to meet local reforestation needs.

The same rules should include prohibition of introduction of new bamboo species into the ecosystem. out of misguided hope this will help giant pandas.

5.1.10 Access for essential services

A road through the Wolong Nature Reserve to Aba Tibetan Autonomous Prefecture traverses the nominated area. This is a busy route for lorries and buses and does cause some disturbance to roadside vegetation and wildlife. Other roads lead into the nominated area for access to townships and farmlands or result from previous logging operations.

In addition, power lines, water channels and several hydropower plants exist within the nominated area. These features are regarded as essential services and suitable access for use and maintenance must be maintained. However, the heritage park management authorities should ensure that all such essential services are designed and managed in ways that cause the minimum of impact to the natural environment.

5.1.11 Capture of giant pandas from the wild

In addition to losses due to poaching, the panda population has suffered from excessive levels of capture and removal from the wild. Between 1950 and 1970 at least 70 wild pandas were captured for domestic and international zoos.

The people of Sichuan have always shown great love and care for the giant panda and Annex 4 lists many examples of spontaneous and often heroic actions taken to help and save pandas found to be in trouble. As a result nearly 47 wild pandas have over the past 20 years been rescued into captivity within the province. Some of these were quickly and properly returned to the wild but many have ended up in zoos or in special breeding centers for giant panda.

In many cases these rescues were genuine and essential to save the life of the animals in question but it is certain that the payment of financial incentives may have resulted in some healthy animals being caught unnecessarily. For this reason the government ceased the offer of financial rewards since 1988. In addition, zoos are also prohibited from offering financial 'thank yous' to suppliers of rescued animals. Furthermore, a new "rescuing policy" was issued by the State Forestry Administration in 1999 to stop random capture of wild pandas. The management agencies must continue to ensure that only animals in real need of help are taken into captivity and that animals are assigned to the most suitable facility for their own wellbeing.

There are enough giant pandas in captivity to maintain a healthy captive population. No new animals need to be caught for this purpose. The breeding of captive population should be raised in efficiency so as to be self-sufficient and the programme for releasing captive born pandas back into the wild to boost waning wild populations or achieve outbreeding between different populations should be pursued with greater vigor.

5.1.12 Weak management of existing nature reserves and scenic parks

Once a nature reserve or a scenic park established, poor management, influenced by lacking capacity and necessary financial support, often becomes a bottleneck to an effective protected area. Enhancing management will be a long term task for world heritage management.

5.2 Natural Disasters

The nominated area is located in the complex mountains and valleys with frequent natural calamities such as earthquakes, floods, debris flows, landslides, fires and withered bamboo blooms.

5.2.1 Earthquake

The nominated area is located in the north-south earthquake belt in China. Three earthquakes with magnitude over 6 have occurred in history, respectively with the epicenter in the north end of Labahe Reserve with a magnitude of 6.5 in Sept., 1927; the epicenter in the west part of the south end of Labahe Reserve with a magnitude of 6 in June 21, 1941; and the epicenter on southeast verge of Daxue Mountain Scenic Area with a magnitude of 6.25 in Feb. 24, 1970.

5.2.2 Floods

In the Jiajin Mountain Ranges, the rainfall is 150mm during 24 hours and 220mm during 72 hours, which results in 1.5 serious floods each year. Continuously heavy rain from July 27 to Aug. 4 in 1966 within the territory of Baoxing County destroyed all of the houses and cultivated land where in the Yanjing District Government was located.

5.2.3 Debris flow and landslide

The nominated area is located in the intermediate dangerous zone with debris flow and landslide, but the distribution of debris flow and landslide is different. The debris flow on July 8th, 1964 resulting from the heavy rain in Dengchigou of Baoxing County resulted in 29 deaths and 2 natural villages forced to remove. There has been over 10 debris flows with different destructive degrees within Siguniang Mountain Scenic Area in the past 40 years.

5.2.4 Forest fire hazard

With the implementation of the State Forest Conservation Stipulations, no large-area forest fire occurred in the past 30 years, while small fires took place occasionally which were caused by burning the grass on wasteland or burning the crop remains for fertiliser. Most of the nominated area is in a very humid zone where the chances of large-scale fire are very small but some western forests are in a rain-shadow and could become fire-prone in a dry year. In conclusion, fire prevention is one of the important tasks for the management of the proposed heritage site.

5.2.5 Bamboo blooming

As one of giant panda's staple food, arrow bamboo bloomed and then withered in the early 1980s, which resulted in a number of giant pandas having starved to death. The most serious ecological disaster in the past 50 years nearly covered the whole nominated area in 1983, when more than 60% arrow bamboo bloomed (up to 95% specifically in Wolong and Pujigou, northwest in Baoxing County) and almost all arrow bamboo in places at 2 300 ~ 3 500 m above sea level bloomed and then withered.

Much publicity has been given to these disastrous periodic mass flowering events of bamboo, which are followed by die off of the adult plants and consequent starvation for those animals including giant panda that depend on this staple food source.

Opinions as to how to deal with such problems in the future vary. Some Chinese scientists think that the severity of such events could be ameliorated by introducing secondary non-synchronized bamboo species into the ecosystem or even treating bamboo in ways that delay or prevent mass flowering. An alternative view promoted in the Ministry of Forestry/WWF *National Conservation management for the Giant Panda and its Habitat* suggests that synchronous mass

flowering is as essential part of the bamboo survival strategy and that any artificial efforts to frustrate nature's design could be disastrous for the health of the bamboo and therefore the giant panda. The authors of the plan argue that the giant panda is well equipped to cope with such natural events by emigration and that although some animals indeed starve, this weeding out of the weakest animals, combined with the out-breeding resulting from animals forced to emigrate to find new homes where the bamboo has not flowered are an essential mechanism to ensure the health and genetic vigor of the wild panda population. Some of the animals that are 'rescued' crossing agricultural village lands were probably not begging for food from man but merely trying to travel across valleys to explore the mountains on the other side.

The best strategy to minimize the damage to the wild panda population of future bamboo flowering episodes appears to be to ensure that adequate corridors and habitat connections remain to link giant panda sub-populations. For this reason the management plan for the heritage park places great emphasis on maintaining and re-establishing connectivity throughout the region and between the different protected areas and scenic sites of the nominated area.

5.3 Local Population

Within the core zone there are 1 020 inhabitants of 260 households. Within the buffer zone there are 20 300 inhabitants spreading 4 900 in Wolong Town and Gengda Town, Wenchuan County; and 500 in Rilong Town, Xiaojin County; 5 030 in Qiaoqi Town; 1 200 in Yongfu Town, Baoxing County; 650 in Taiping, Zhonglin and Dachuan Towns, Lushan County; 180 in Xiaohe and Lianglu Towns, Tianquan County; 700 in Tai'an and Qingcheng Towns of Dujiangyan City.

Programmes to assist the economic development of the local people in compatibility with the objectives of world heritage site must be sought. See sections 5.1.5 and 5.1.6 above.

6 MONITORING

6.1 Overview

6.1.1 Environmental monitoring

Regularly and irregularly environmental monitoring on surface water, air and pollution sources has been conducted to the nature reserves and scenic areas;

6.1.2 Dynamic survey on wildlife and community monitoring

Observation stations have been set up to monitor rare and precious animals such as giant panda as well as forest fire regularly. Trainings are given to the villagers so that they know how to conduct surveys and monitoring reports. This will play an important role in finding and rescuing sick, injured and hungry giant pandas in time;

6.1.3 Researches on living environment of giant panda and landscape ecology

Researches on living environment of giant panda and landscape ecology have been carried out through the joint cooperation of nature reserves, scenic areas, institutes and universities, among which the Wolong Nature Reserve has the highest level of research.

6.1.4 Population of giant panda

Since 1970s, three national giant panda surveys have been carried out by State Forestry Bureau (i.e. the former Ministry of Forestry), which have provided a general understanding of giant panda's distribution and ecological environment.

These data form an excellent baseline for future monitoring. It may be felt necessary to conduct further complete surveys in the future. Or it may be adequate to monitor representative sample areas of the whole population. Plans for future monitoring will require careful coordination of efforts by several different management agencies.

6.1.4 Tourist flow monitoring

Analyzing tourist dynamics, estimating influence of tourism on eco-environment, controlling tourist flow and decreasing landscape damages resulted from tourism.

6.2 Arrangement

The eco-monitoring network program of the proposed heritage involves: 1) setting up a dynamic monitoring network for giant pandas to perfect wild animal supervision and community monitoring; 2) setting up an observation network for observing key ecological factors of meteorology, hydrology, atmosphere, forest ecology, etc; 3) growing the cooperation with institutes and universities to make a thorough investigation on the heritage environmental background, observing the variety of animal and plant life and evaluating their dynamic variety based on the regular examinations; 4) establishing the landscape ecological system. The announcement, *Concerning Speeding up the Construction of World Heritage Monitoring Stations*, was jointly made known in July 2001 by Construction Bureau of Sichuan Province and Sichuan World Heritage Administration Office, which requires all of the world heritage management offices to conduct the monitoring on air, water, wildlife, vegetation, ancient architectures and ruins, and tourist flow.

The world heritage resources of Sichuan Province occupy an important position in China and even in the world. In order to scientifically protect and reserve the heritages, Construction Bureau of Sichuan Province, with a target of setting up a dynamic management system, has laid down a plan named *Research Project of Sichuan World Heritage Eco-Network* and launched the first stage of research. The present plan is composed of 4 parts: 1) research on the landscape background, tourist accommodation capacity and strategies to ecological degradation; 2) landscape eco-monitoring network construction; 3) database construction; 4) management training. The dynamic monitoring network set up within the giant pandas' habitats mentioned above is part of Sichuan dynamic monitoring network of world heritages.

6.3 Achievements

Since giant panda was rated as the State Class I protected animals in 1962, a series of Nature reserves have been established including Wolong, Labahe, Fengtongzhai, Jintang — Kongyu and Caopo Nature Reserves. In addition, sightseeing highlights with appropriate ecological environment for giant pandas have been founded such as Qingcheng Mountain-Dujiangyan Irrigation System, Jiguan Mountain-Jiulonggou, Tiantai Mountain, Xiling Snowy Mountain, Jiabin Mountain, Miyaluo, Lingjiu Mountain-Mt. Daxuefeng and Erlang Mountain. Based on the above reserves and sightseeing highlights, a large quantity of heritage resources and elementary

ecological environment data have been collected and great achievements have been gained in rescuing giant panda. According to some statistics, 48 injured, sick or hungry giant pandas have been saved in Ya'an City, Chengdu City and Ganzi Prefecture since 1982, with a recovery rate of 95% (Ref. Annex III). In addition, 28 were released back into the wild after recovery on the spot or in other proper places, while others were sent to Wolong Giant Panda Protection Center and Chengdu Research Base of Giant Panda Breeding.

The giant panda eco-observation station was established at Wuyipeng in the Wolong Nature Reserve in 1978.

The Wolong Nature Reserve was accepted as one protected area of "Man and Biosphere Program" in 1980 and in the meantime, *Cooperation Agreement on Protecting Giant Panda* was signed between the Ministry of Forestry and WWF. According to the agreement, the China International Research Center for Giant Panda Conservation was established in the Wolong Nature Reserve, and a series of researches were launched on giant pandas' behavioral ecology and the pen-breeding of giant pandas. Furthermore, important results have been achieved in breeding giant pandas and rescuing sick wild giant pandas.

The number of giant panda and the situation of their habitats have been known after three general surveys respectively made in 1970s, 1980s and recently under the joint effort of the Ministry of Forestry and WWF. In 1990s, the Ministry of Forestry and WWF implemented the project of *Protecting Giant Panda and Their Habitats* on the basis of the *Conservation and Management Program for Chinese Giant Panda and Their Habitats* jointly laid down by the two parties mentioned above. 13 established giant panda reserves have been perfected and improved, while 14 reserves are to be set up in order to enlarge the protected area, that play an important role in steadying the existing wild species.

7 DOCUMENTS AND PHOTOS

7.1 Planning of the Nominated Area

Refer to sec.3.3 and 3.4 for the executing plans of each heritage units ; and the *Overall Plan for Conservation* of the nominated area is referred to the annex file 4.

7.2 Bibliography

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7.3 Photos

7.3.1 Wild giant pandas and other endangered animals

1 ~ 40

7.3.2 Natural environment and landscape of giant panda's habitat

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7.3.3 Rescuing sick, hungry or injured giant pandas

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7.3.4 Cultural and historical attractions

70 ~ 73

Photographers

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Aba Autonomous Prefecture World Heritage Petition Office: 16 17 36 37 52 56 57 59 72

Chengdu World Heritage Petition Office: 23 24 25 32 34 38 39 40 47

Institute of Mountain Hazards and Environment, Chinese Academy of Sciences & Ministry of Water Conservancy: 2 15 18 21 22 64

Chen Feihu: 41 42 43 44 46 54

Yan Zhengchang: 6 8 19 60 65

Wang Guojun: 1 51 70 inside front cover 1 and 2

Chen Fubin: 50 55 62 71 73

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1 A giant panda in the Fengtongzhai National Nature Reserve, Baoxing County





2 A giant
panda in bamboo
forest in Wolong
National Nature
Reserve, Wenchuan
County

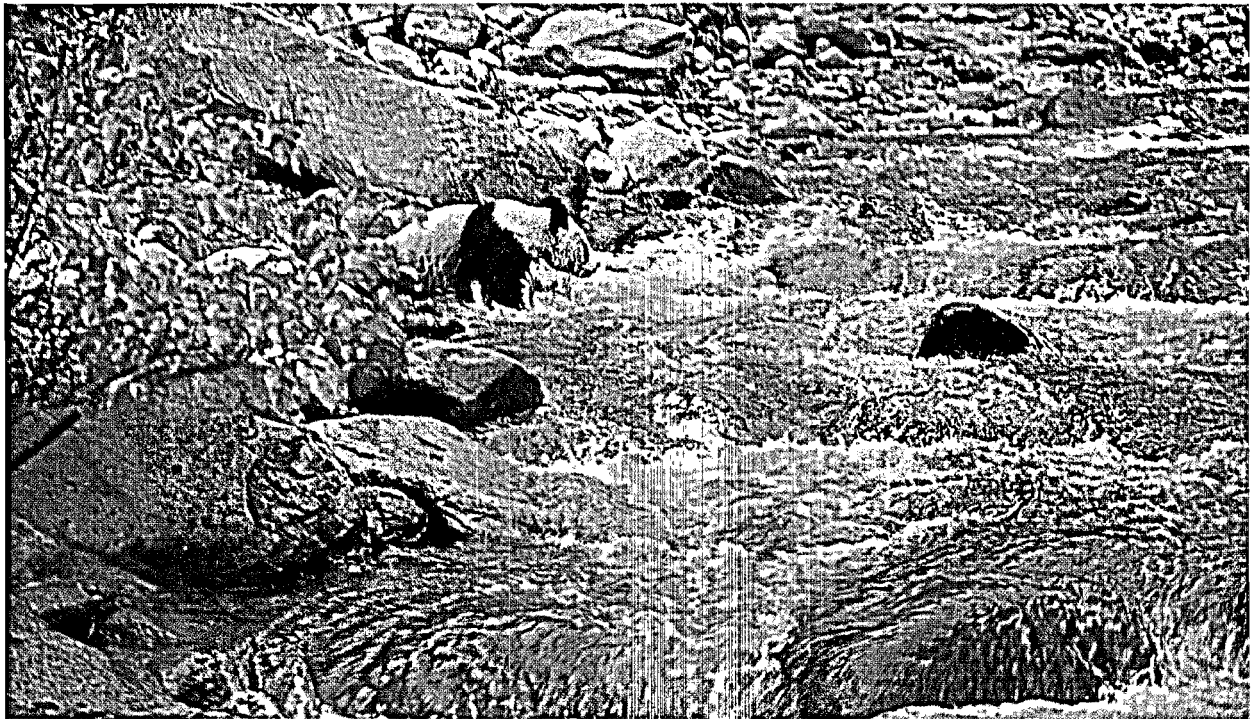
3 A giant panda looking for food on snowy slope in Heishuihe Provincial Nature Reserve, Lushan County



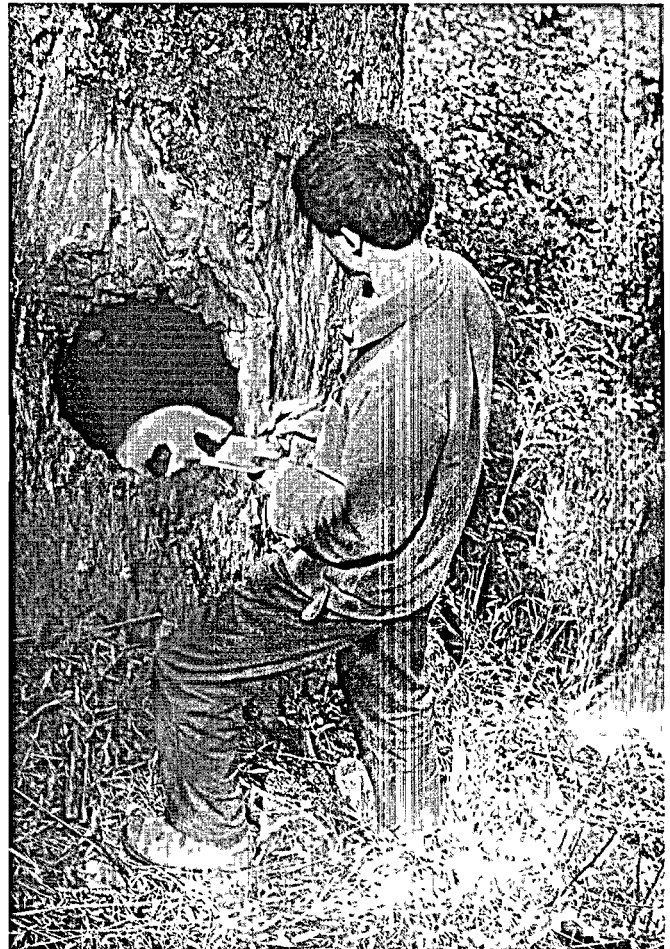
4 An old giant panda walking in bamboo forest in Heishuihe Provincial Nature Reserve, Lushan County

5 A frightened adult giant panda in Fengtongzhai National Natural Reserve, Baoxing County





6 A giant panda drinking by a brook in Mt.
Jiajin Provincial Park, Baoxing County



7 A giant panda giving birth in Mt.
Jiajin Provincial Park, Baoxing County



8 A giant panda in *Phyllostachys nidulria* forest in Fengtongzhai National Nature Reserve, Baoxing County



9 A giant panda passing through shrub in Mt. Jiajin Provincial Park, Baoxing County



10 A giant panda playing in bamboo thicket in Heishuihe Provincial Nature Reserve, Lushan County (March 3, 1985)



11-13 A giant panda passing through shrub in Mt. Jiajin Provincial Park, Baoxing County







14 A giant panda playing with a boy
near a marble mining in Mt. Jiajin Provin-
cial Park, Baoxing County



15 A giant panda climbing a tree in Wolong National Nature Reserve, Wenchuan County



16 A couple of giant pandas in Caopo Provincial Natural Reserve, Wenchuan County



17 A giant panda taking a rest in a tree in Caopo Provincial Nature Reserve, Wenchuan County





18 A giant panda in a coniferous forest in Wolong National Natural Reserve, Wenchuan County



19 A giant panda eating bamboo in the wild in Fengtongzhai National Natural Reserve, Baoxing County



20 A baby giant panda sleeping in a tree at night in Fengtongzhai National Natural Reserve, Baoxing County



21 A giant panda in bamboo thicket in Wolong National Nature Reserve, Baoxing County



22 A baby giant panda raised in Wolong National Nature Reserve, Wenchuan County

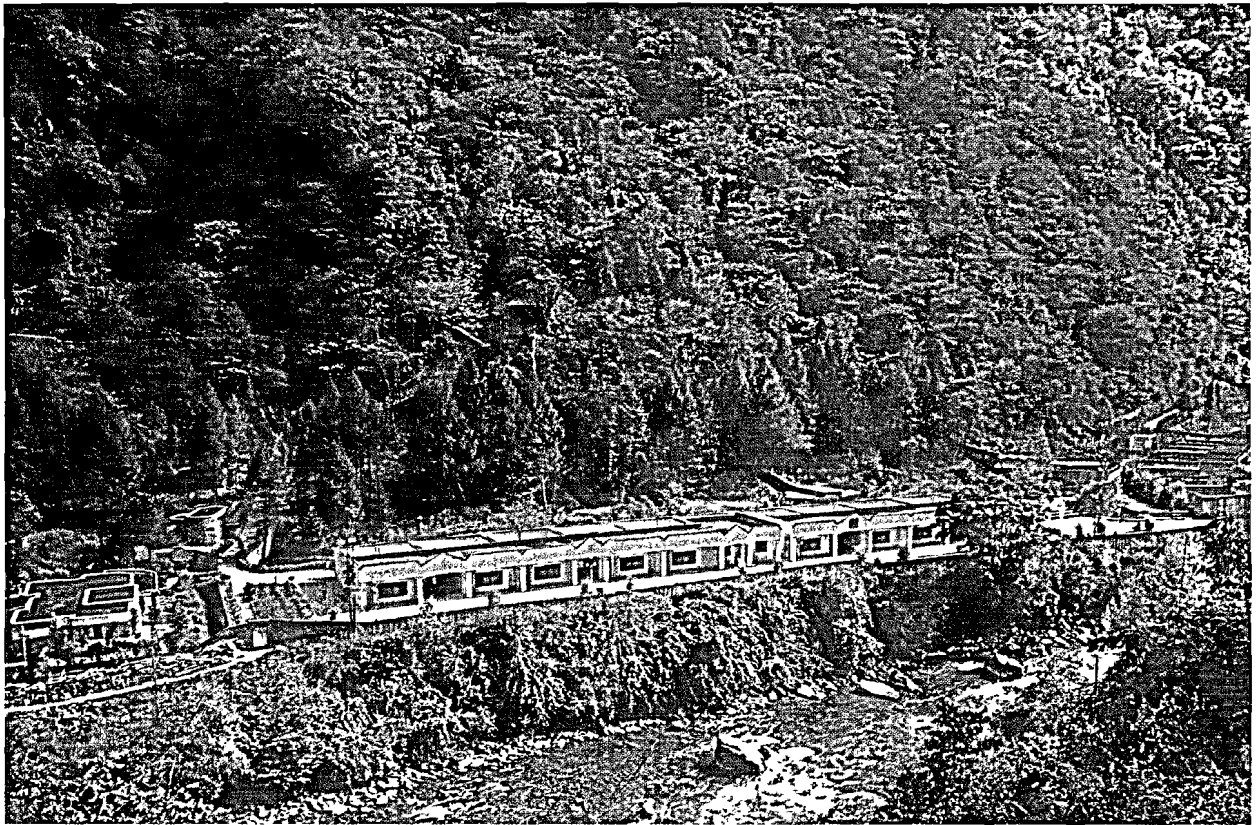


23 Two living fossils of giant panda and dove tree found together in Mt. Jiguan-Jiulonggou Provincial Park, Chongzhou City

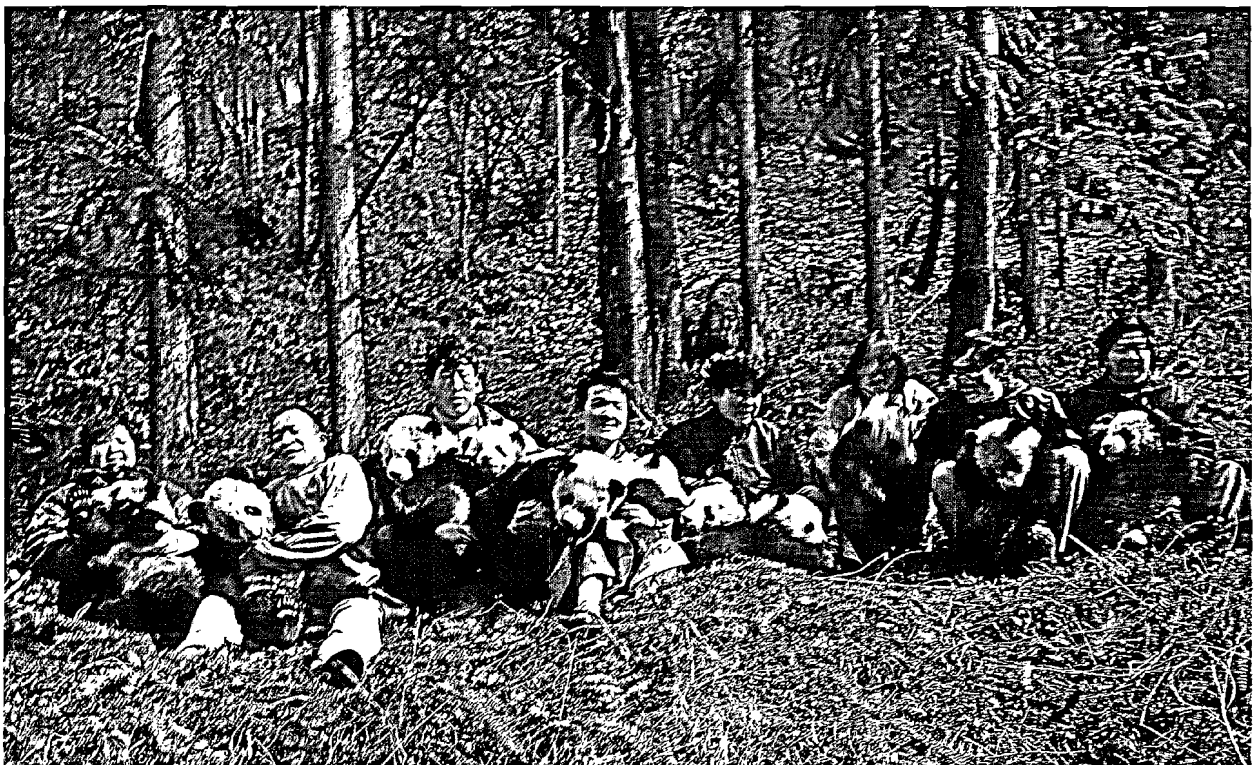
24 A giant panda seeking for food in Mt. Xilingxueshan National Park, Dayi County



25 A giant panda falling into a pit in Mt. Jiguan Jiulonggou Provincial Park, Chongzhou City



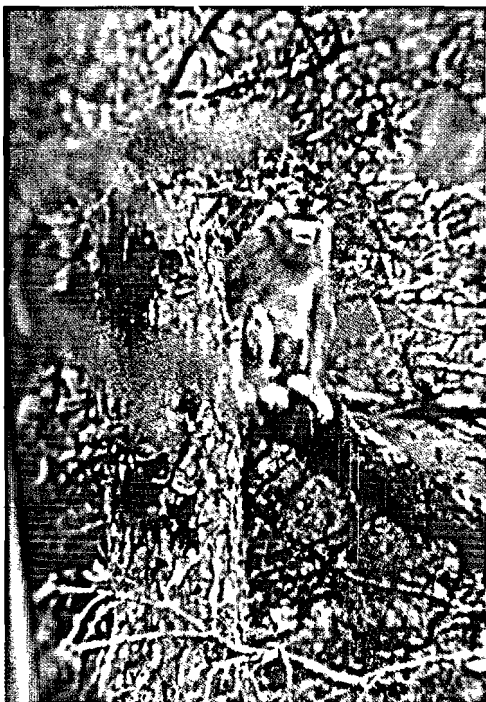
26 The breeding farm of Chinese Giant Panda Protection and Research Center, Wolong National Nature Reserve



27 Eleven pandas bred in the Chinese Giant Panda Protection and Research Center, Wolong



28 A golden Monkey (*Rhinopithecus roxellana*) in evergreen and deciduous broad-leaved mixed forest in Wolong National Nature Reserve, Wenchuan County



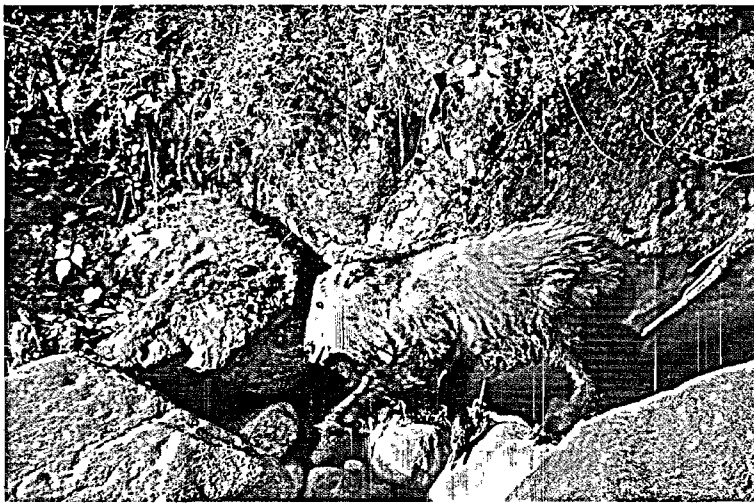
29 A golden monkey in forest in Mt. Jiajin Provincial Park, Baoxing County

30 Red pandas (*Ailurus fulgens*)
resting in broad-leaved forest in Mt. Jiajin
Provincial Park, Baoxing County



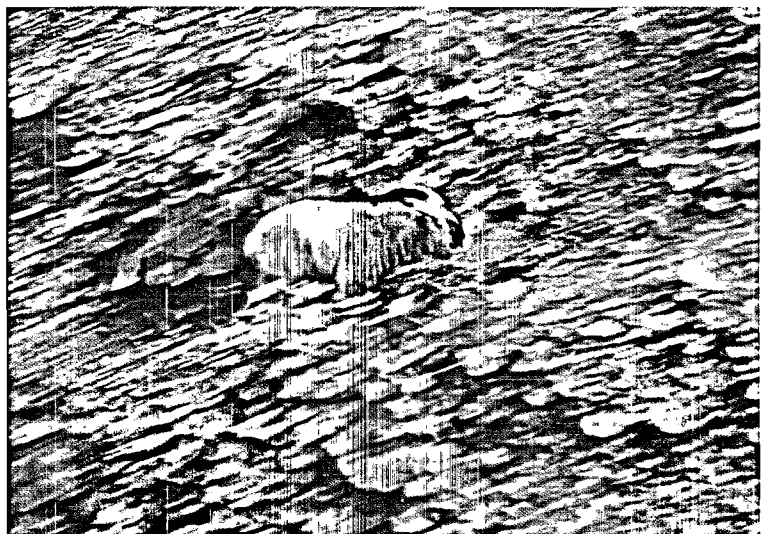
31 Red pandas resting in coniferous and broad-leaved mixed forest in Mt.
Jiajin Provincial Park, Baoxing County

32 Red pandas resting in coniferous and broad-leaved mixed forest in Fengtongzhai National Nature Reserve, Baoxing County



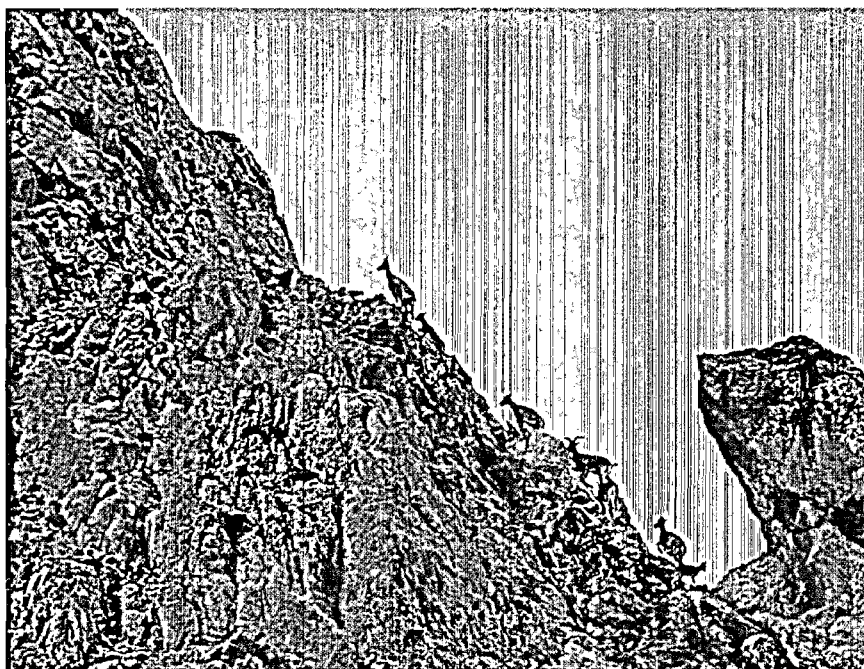
33 A running takin (*Budorcas taxicolor*) in Mt. Jiguan-Jiulonggou Provincial Park, Chongzhou City

34 A baby takin in Labahe Provincial Nature Reserve, Tianquan County





35 A baby sambar
(*Cervus unicolor*) in Labahe
Provincial Nature Reserve,
Tianquan County



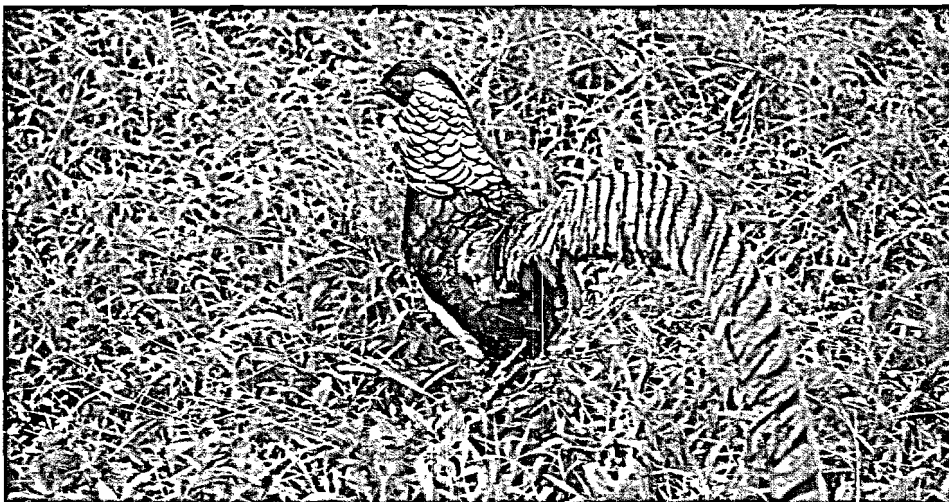
36 The gorals
(*Naemorhedus goral*) in
Mt. Siguniang National
Park, Xiaojin County

37 An eagle owl (*Bubo bubo*) in
Wolong National Nature Reserve,
Wenchuan County





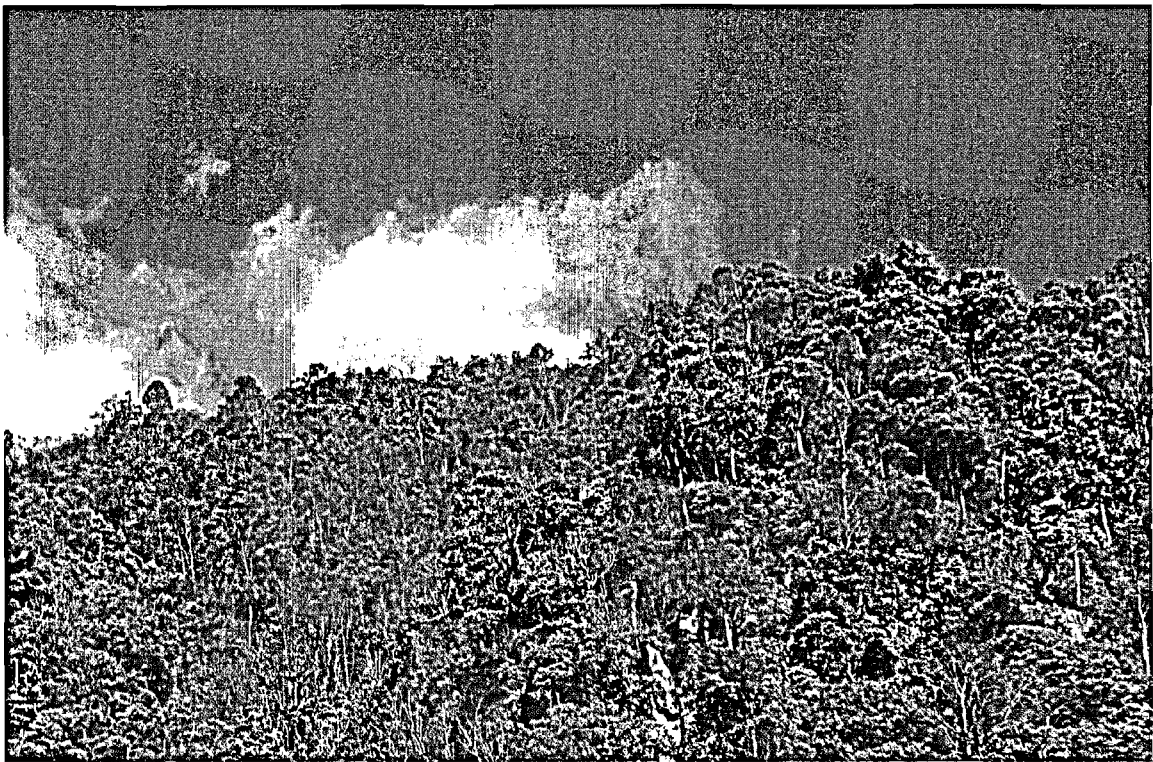
38 A chinese monal (*Lophophorus thuysii*) in Mt. Jiguan-Jiulonggou Provincial Park, Chongzhou



39 A chinese copper pheasant (*Chrysolophus amherstiae*) in Mt. Jiguan-Jiulonggou Provincial Park, Chongzhou



40 A blood pheasant (*Ithaginis cruentus*) in Mt. Jiguan-Jiulonggou Provincial Park, Chongzhou



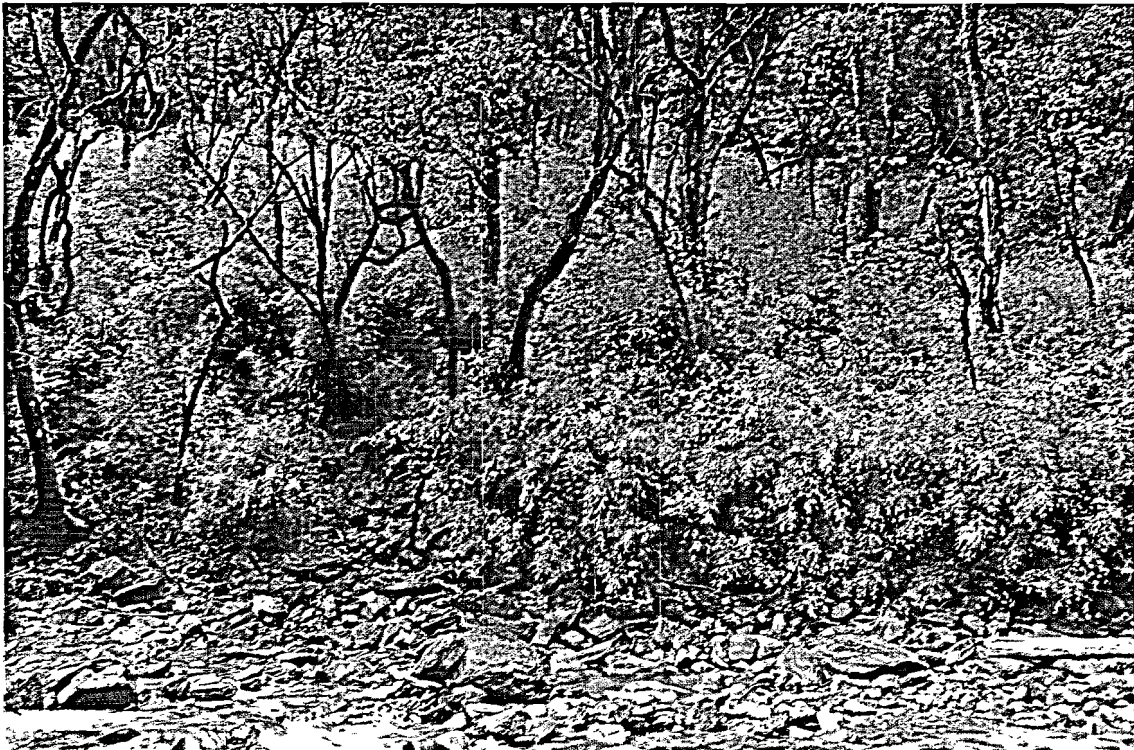
41 A view of mountain evergreen broad-leaved forest in Mt. Erlang
Provincial Park, Tianquan County



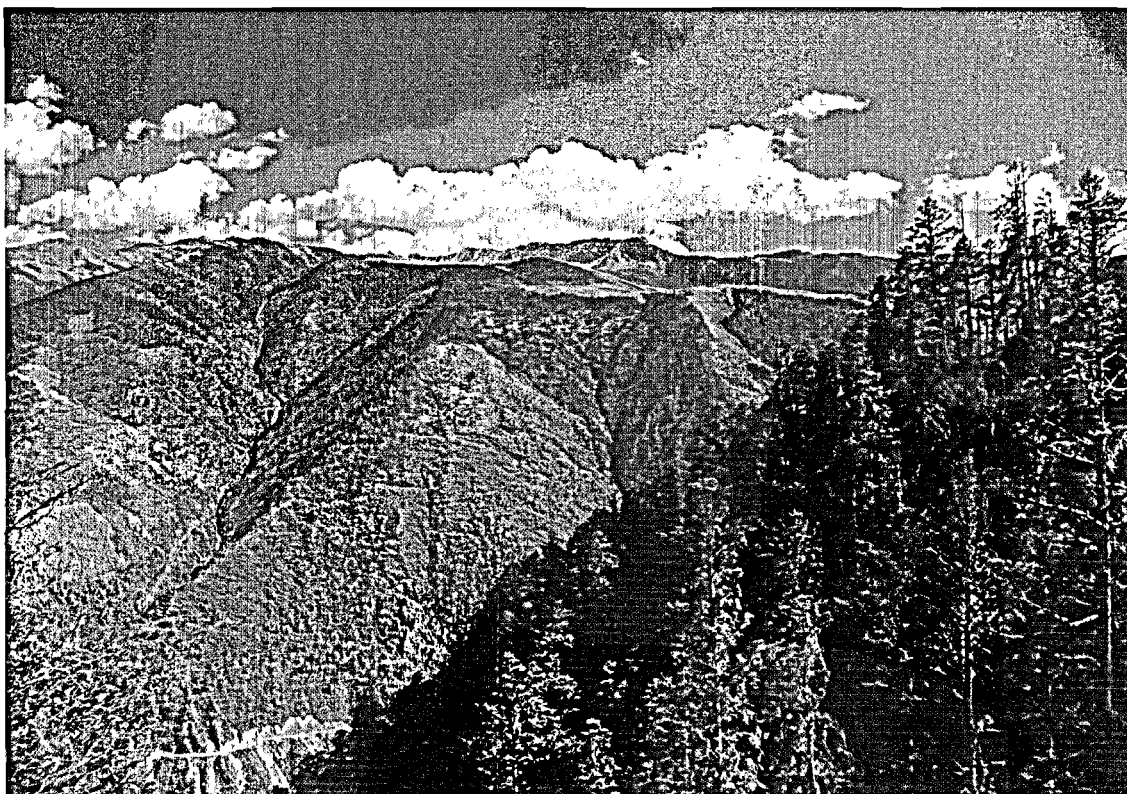
42 An early spring view of mountain evergreen broad-leaved forest in Mt.
Jiajin Provincial Park, Baoxing County



43 A view of mountain evergreen and deciduous broad-leaved mixed forest in Fengtongzhai National Nature Reserve, Baoxing County



44 A community landscape of giant panda's food bamboos under mountain evergreen and deciduous broad-leaved mixed forest, on the bank of the Huangshui River, Lushan County



45 A view of vegetation on subalpine area within giant panda's habitat in Mt. Jiaping Provincial Park, Baoxing County

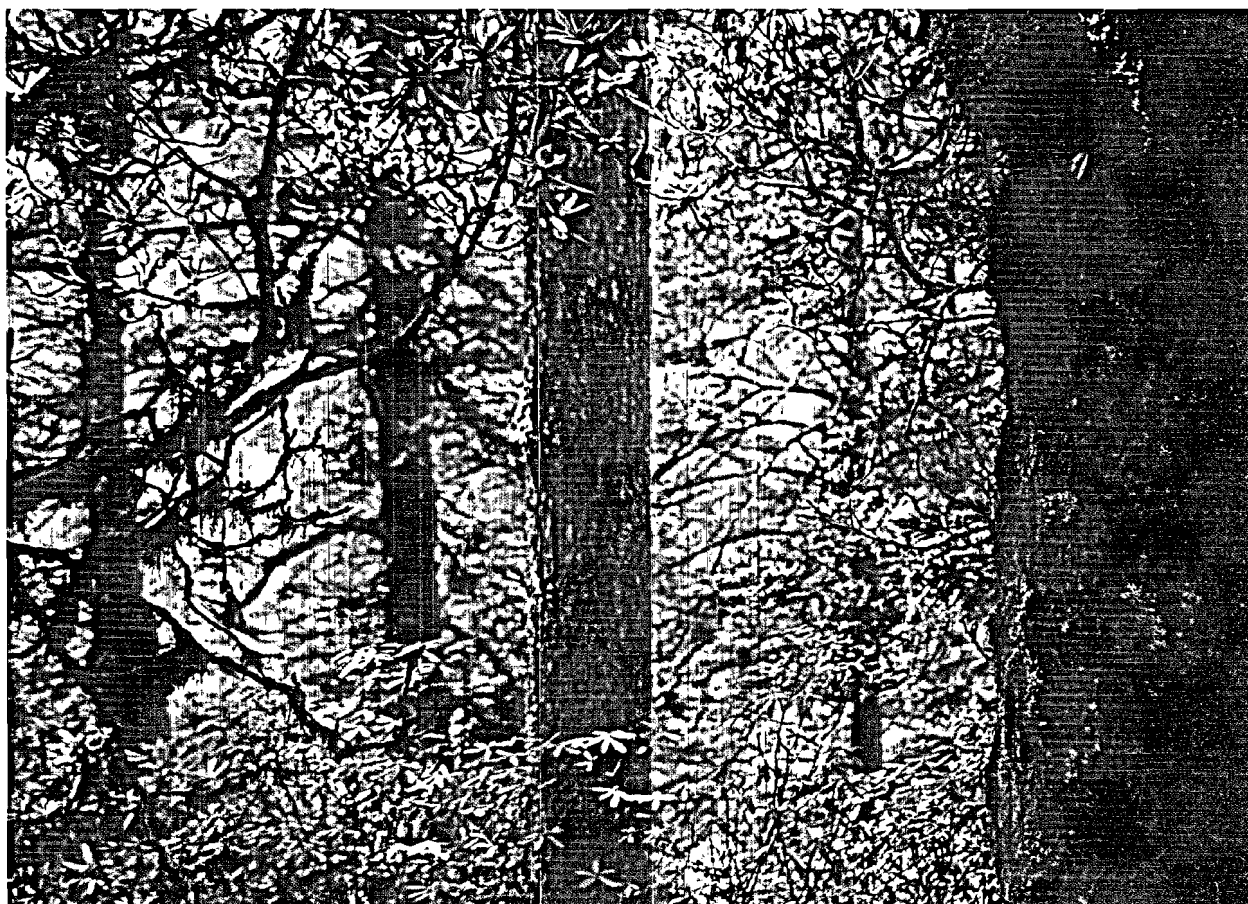


46 A community landscape of giant panda's food bamboos under subalpine mountain evergreen and deciduous broad-leaved mixed forest in Mt. Lingjiu-Mt. Daxuefeng Provincial Park, Lushan County

47 A halo found in the forest with bamboos in Mt. Xilingxueshan National Park, Dayi County



48 Firs and rhododendrons in subalpine coniferous forest in Mt. Lingjiu-Mt. Daxuefeng Provincial Park, Lushan County





49 Landscape of the natural vertical zonation on the south slope of Mt. Siguniang, Xiaojin County



50 Glacial landforms in the Jiajin Mountains, Mt. Jiajing Provincial Park, Baoxing County



51 Flowers of dove trees in Fengtongzhai National Nature Reserve, Baoxing County



52 Dove trees in Shanjiang Scenic Spot of Wolong National Nature Reserve, Wenchuan County



53 *Rhododendron concinnum* in Mt. Erlang Provincial Park, Tianquan County



54 *Rhododendron moupinense* in Mt. Jiajin Provincial Park, Baoxing County

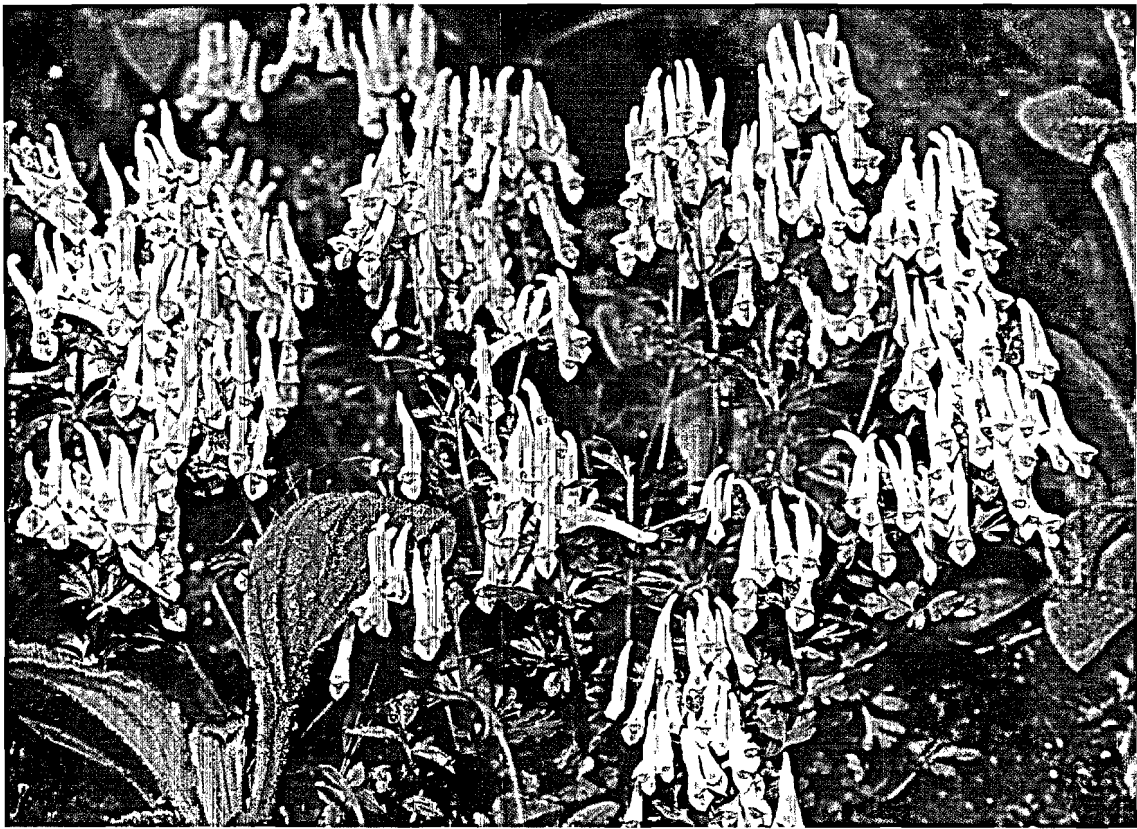
55 *Rhododendron lutescens* in Mt. Erlang Provincial Park, Tianquan County



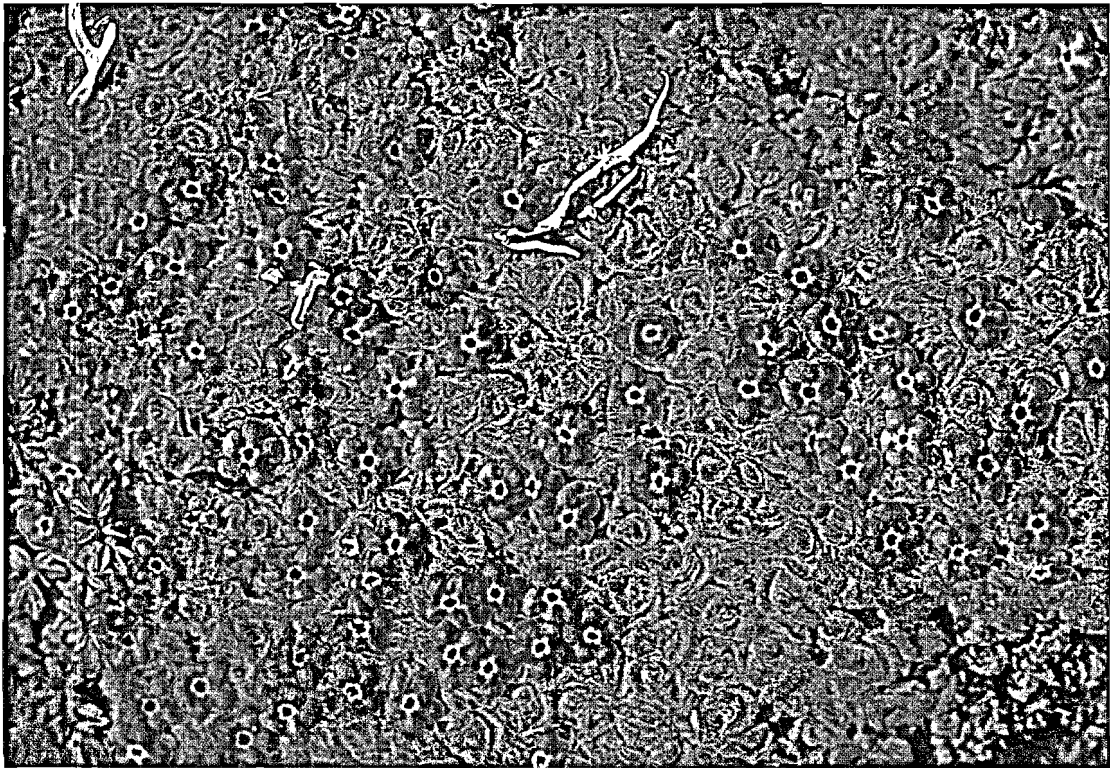
56 *Rhododendron asterochnoum* in Mt. Siguniang National Park, Xiaojin County

57 *Rhododendron balangnense* in Wolong National Nature Reserve, Wenchuan County

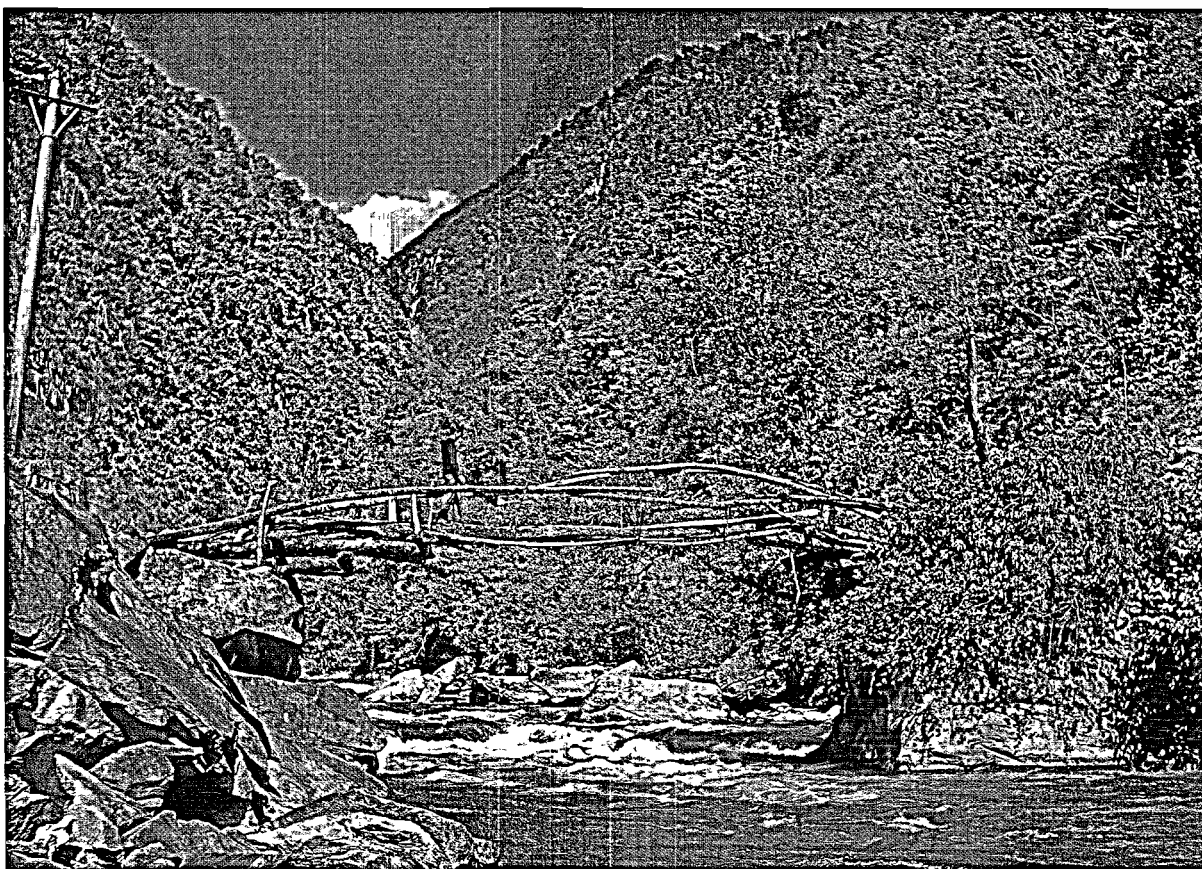




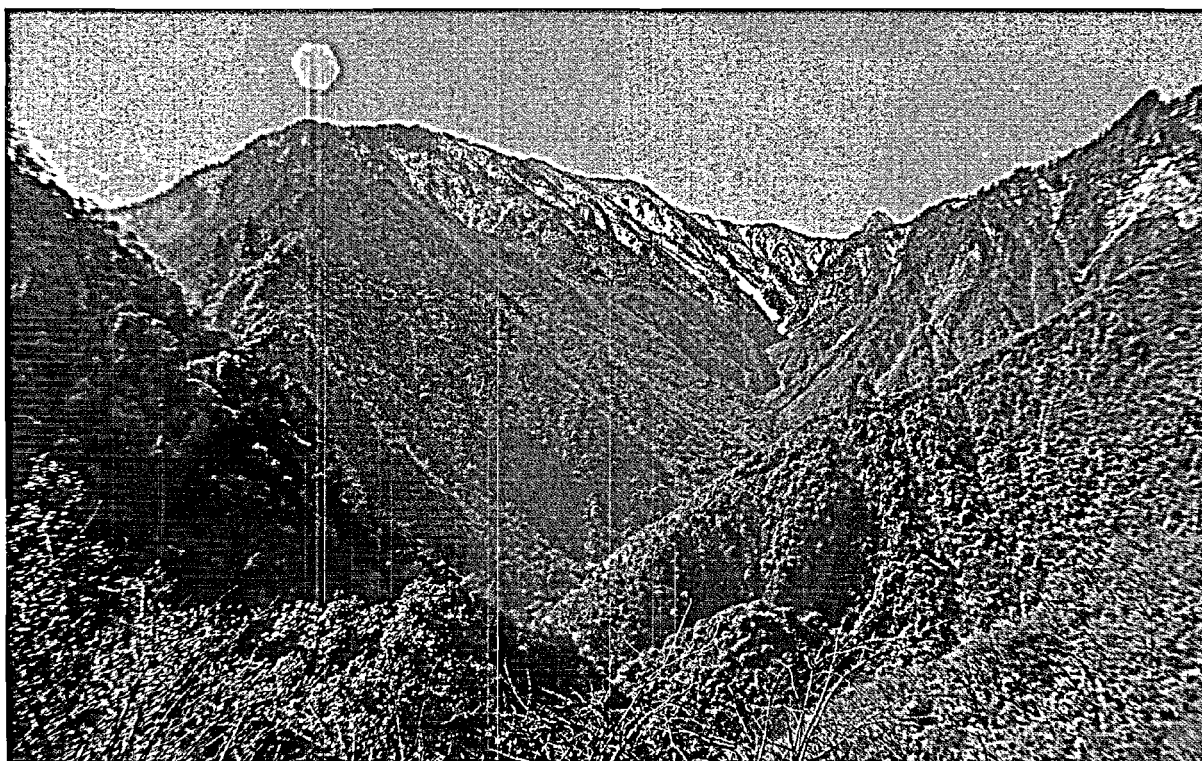
58 *Corydalis sigmoides* in Daxuefeng Scenic Spot of Mt. Lingjiu-
Daxuefeng Provincial Park, Lushan County



59 Primrose (*Androsace*) on alpine meadow, Mt. Siguniang National
Park, Xiaojing County



60 Geological landscape of East Baoxing River, Fengtongzhai National Nature Reserve



61 Landscape of Deshenggou in Baoxing County (main habitat for giant panda),
Mt. Jiaying Provincial Park



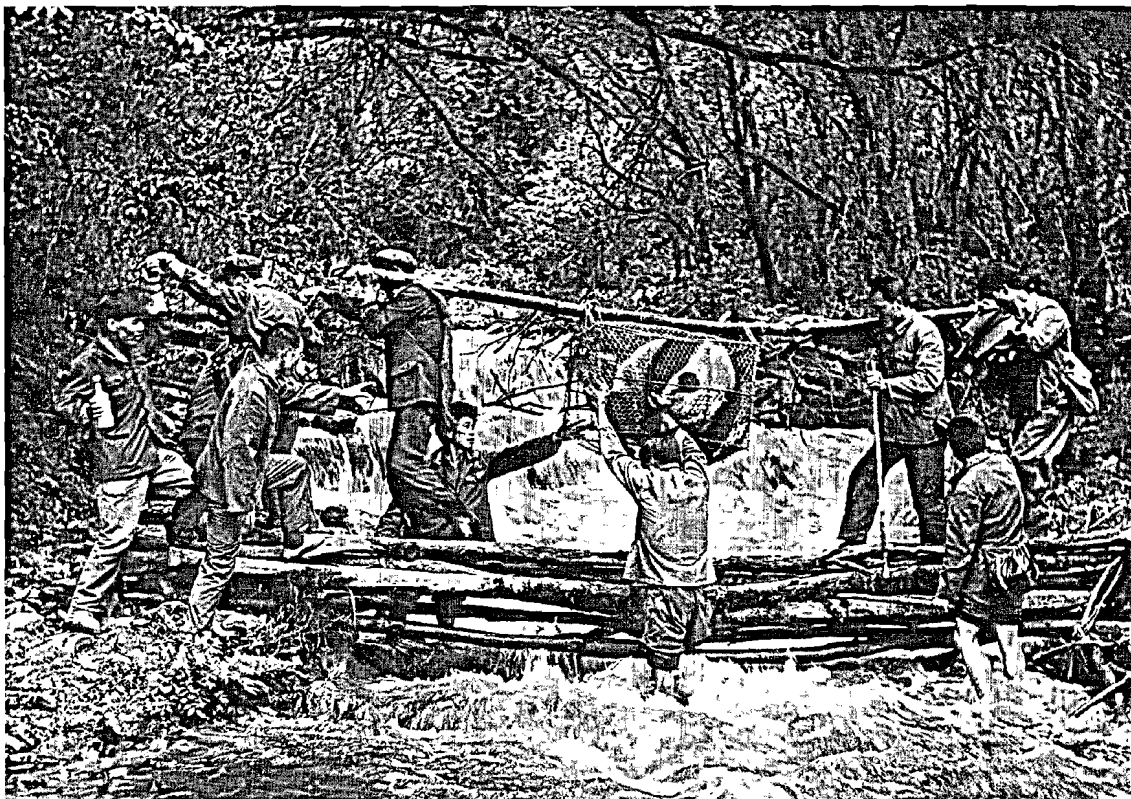
62 A view of wild sweet-scented osmanthus forest in Mt. Jiajin
Provincial Park, Baoxing County



63 Geological landscape of the Pitiao River, Wolong National Nature Reserve



64 Valley landscape of Yingxiongkou, Wolong National Nature Reserve



65 A giant panda transferred from Shisungou to Chujugou with more bamboos, Baoxing County (May 1984)



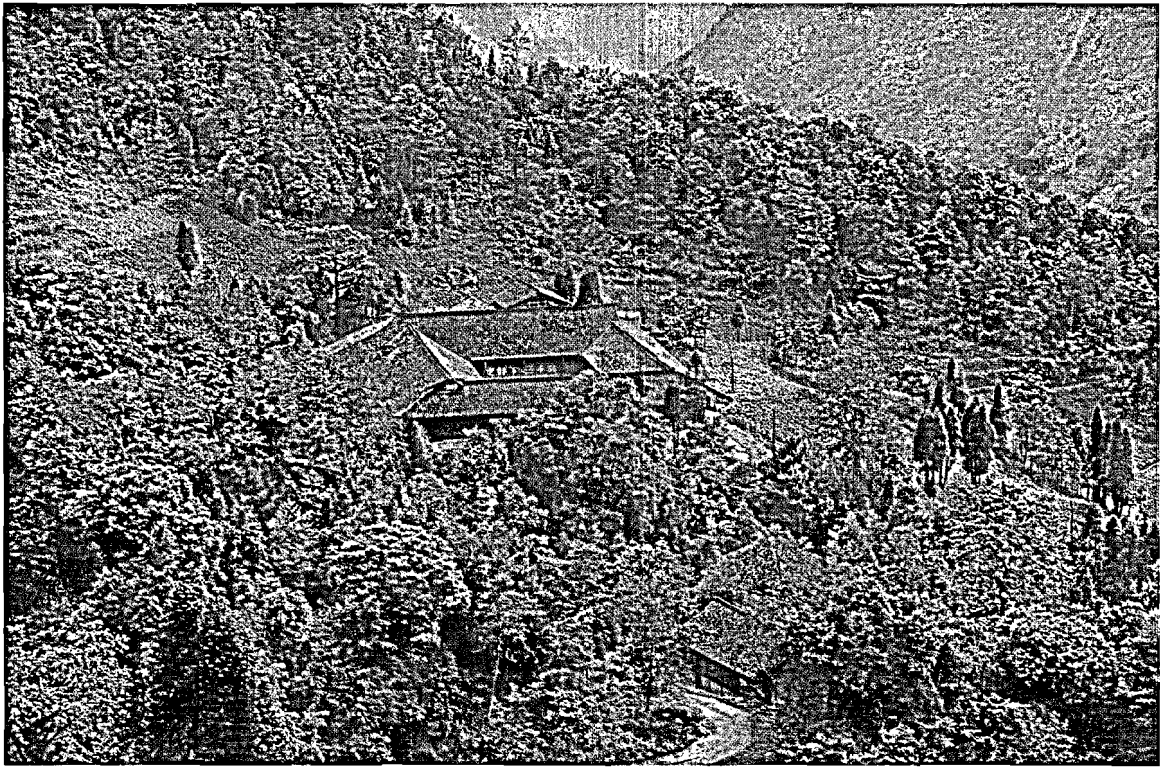
66 A rescued giant panda in Heishuihe Nature Reserve, Lushan County, (March 18, 1988)



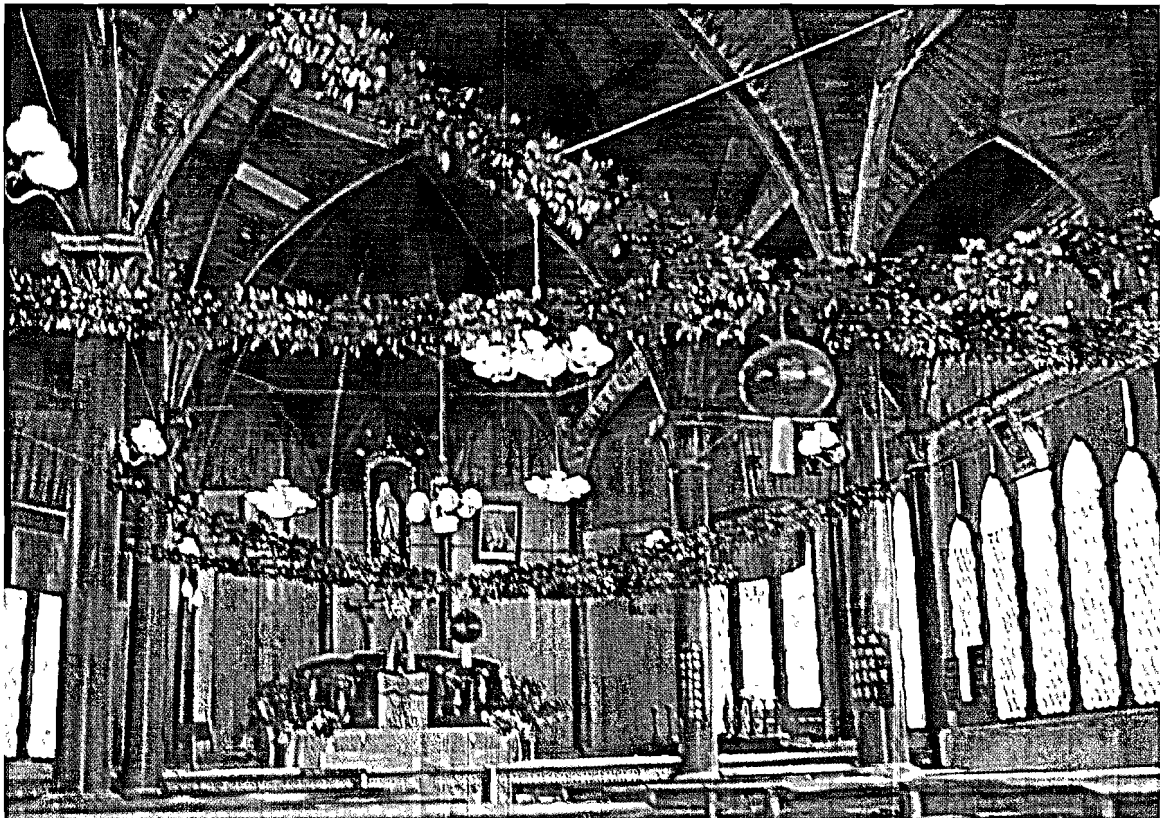
67,68 Rescuing sick giant pandas,
Baoping County

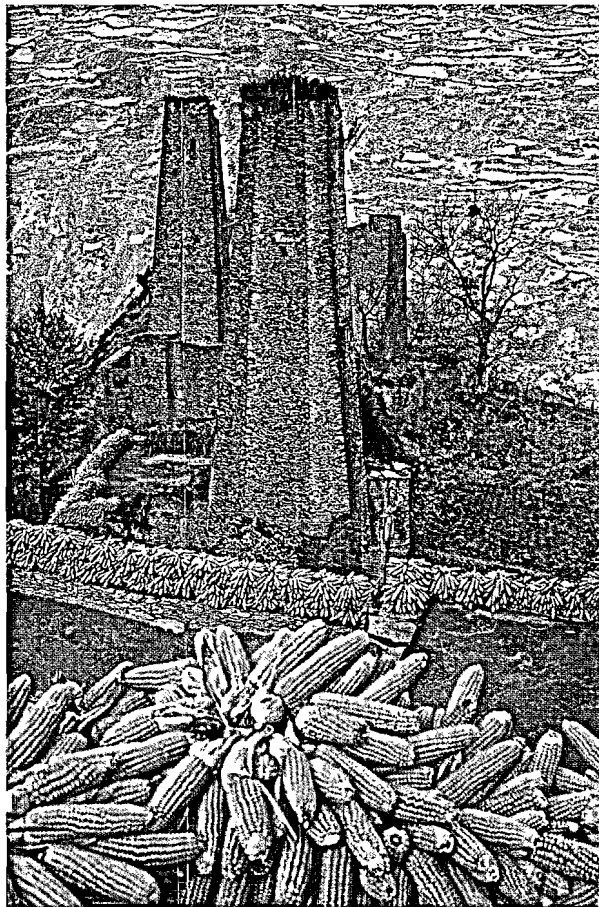


69 Baoping County Government and Sichuan Agricultural University rescuing an
injured giant panda (February 28, 2001)



70,71 A Cathòlic Church in Dengchigou, giant panda was discovered in 1869 by P. A. David in Dengchigou, Baoxing County



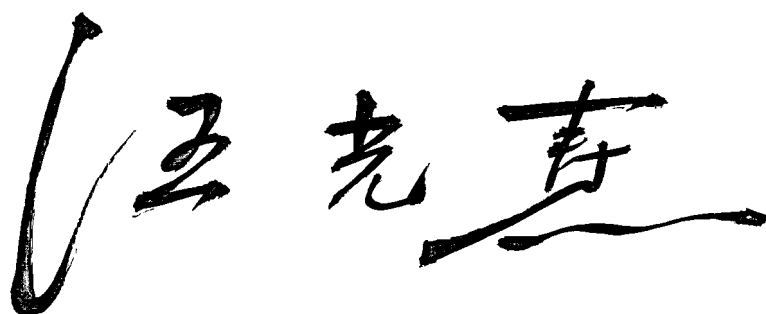


72 Houses of
the Qiang people
in Miyaluo Pro-
vincial Park,
Lixian County



73 Houses of the Tibetan people in Mt. Jiajin Provincial Park, Baoxing County

8 SIGNATURE BY A REPRESENTATIVE OF STATE ORGANIZATION

A large, bold, handwritten signature in Chinese calligraphy, reading '王光涛' (Wang Guangtao). The characters are fluid and expressive, with a prominent vertical stroke on the left.

(Wang Guangtao)

Minister

**Ministry of Construction of
the People's Republic of China**















ANNEX 1

LAWS AND REGULATIONS (EXTRACTS)

PROVISIONAL REGULATION ON THE MANAGEMENT OF SCENIC AND HISTORIC INTERESTS AREAS

(Promulgated by the State Council on June 7, 1985)

Article 1 These regulations are formulated in order to improve the quality of supervision, conservation, utilization and further exploitation of the scenic and historic areas.

Article 2 Places that fall into the following categories should be rated as the “scenic and historic interests areas”: places of tourist, cultural or scientific interest; places where views and sights, natural and/or artificial, are relatively concentrated; places where the environment is pleasing, and the area is sizeable and clearly market out; places where people may relax, may go for sight-seeing and may carry out cultural and scientific activities.

Article 4 The Ministry of Urban and Rural Construction and Environment Protection exercises nationwide supervision with regard to the scenic and historic interests areas. The departments of urban and rural construction and environment protection at all other levels exercise supervision in their respective areas with regard to the scenic and historic interests areas.

Article 6 Scenic and historic interests areas at all levels shall incorporate the following into their long-range plan:

- 1) The nature of the place to be defined;
- 2) Boundaries and buffer zones to be market out;
- 3) Scenes and other functional areas to be designated;
- 4) Measures to be determined for the conservation, utilization, and further exploitation of tourist resources;
- 5) Tourist accommodation capacity and management details to be determined;
- 6) Overall consideration be given to utilities, services and other public facilities;
- 7) Estimated expense and benefits;
- 8) Other matters that deserve planning.

Article 7 Under the leadership of the corresponding people’s government, the long-range plan concerning the scenic and historic interests area shall be formulated by the responsible official organ and related organs.

The long-range plan shall be open to advice and comments from all social sectors, from specialists, and from relevant official organs. The plan is subject to multi-facet comparison and argumentation.

When finalized by the authorized organ, the plan shall be submitted to the relevant official organs for review and approval, and reported to the relevant official organ at higher level to be filed on record.

Article 8 Under no circumstances shall land in the scenic and historic interests areas be annexed by any individual or organization.

Article 9 All scenic and historic interests areas shall take proper measures to protect their vegetation; to keep the place, mountainous or otherwise, afforested, and to keep the forest from fire and pests, so that the animal and plant life may live in their natural habitat.

Trees in a scenic and historic interests area or in the buffer zone, to whomever the ownership of them may belong, shall be incorporated into the long-range plan; and shall not logged. If some trees must be logged for purpose of replacement of thinning out, permission must be obtained in advance from the relevant official organ. Trees, ancient or famous, shall not be logged.

If plants must be collected in scenic and historic interests area either as sample or for medical or other purpose, permission must be obtained in advance from supervisory office, a limit must be set for the amount, and an area must be defined in which the collection may be done.

Article 10 In the scenic and historic interests areas, research and appraisalment of the major sights, historical relics, ancient and famous trees must be conducted, on the basis of which, protection measures shall be determined upon and properly implemented.

Article 11 In the light of the long-range plan, the supervisory office shall take the initiative to develop the tourist potential, to improve transportation, and to provide better service and better sightseeing conditions. But in so doing, the office shall see to it that the volume of tourists shall not exceed the carrying capacity determined in the long-range plan. Unlimited reception of tourists exceeding the accommodation capacity is not allowed.

PEOPLE'S REPUBLIC OF CHINA REGULATION ON THE MANAGEMENT OF NATURAL CONSERVATION AREAS

(Issued on October 9 1994 by the State Council of
the People's Republic of China as Decree 167)

Article 21 A natural conservation area at the national level is under the administration of the provincial and municipal governments where the area is located, or under the administration of relevant administrative departments from the State Council. A regional natural conservation area is under the administration of the county government or above.

Special management teams should be set up within the natural conservation areas by relevant administrative bodies. Special technical personnel should be assigned to these areas and be put in charge of the management.

Article 22 Main responsibilities of the management teams:

- 1) Implementation and enforcement of the country's relevant laws, regulations, and policies;
- 2) Formulation of various overall management systems;
- 3) Survey on natural resources, establishment of archives, environment monitoring, and protection of natural environment and resources;
- 4) Organization or coordination of scientific researches on natural conservation areas;
- 5) Popularization and education of natural conservation;

- 6) Organization of visiting tours to the natural conservation areas, without prejudice to the natural environment and resources;

Article 23 All monetary funds needed for the management of a conservation area should be allocated by the local government (above the county level) where the area is located. A natural conservation area will be properly subsidized by the State.

Article 26 In the natural conservation areas are prohibited, unless otherwise regulated by law, deforestation, animal husbandry, hunting, catching, gathering medicinal herbs, land cultivation, burning grass on waste land, mining, and quarrying.

Article 27 Entry into the core of the conservation area is not allowed. Those who need enter the core of the conservation area for the purpose of conducting scientific researches or scientific surveys must submit in advance to the local management office their application and schedule, which must be endorsed by relevant administrative departments of the provincial government. Entry into the core of a natural conservation area at the national level must be endorsed by relevant administrative department of State Council.

Article 28 Tourist and business operations in the buffer zone of the conservation area are prohibited. Those who need enter the buffer zone of the conservation area for the purpose of conducting scientific researches or teaching practice or collecting samples must submit in advance their application and schedule to the management office of the conservation area for endorsement.

Article 29 Plan to conduct tourist activities in the experimental zones of a natural conservation area at the national level must be prepared by the management office of the conservation area, examined by relevant administrative departments of the provincial and municipal governments, and endorsed by relevant administrative departments of the State Council. Plan to conduct tourist activities in the experimental zones of a regional natural conservation area must be prepared by the management office of the conservation area, and by relevant administrative departments of the provincial and municipal governments.

Conduction of tourist activities within a natural conservation area must strictly follow the endorsed plan. Groups or individuals entering the conservation area must conform to regulations concerning the management of the area.

No tourist projects in contradiction with the policy of a conservation area will be allowed.

Article 32 Construction of production facilities within the core or buffer zones of a natural conservation area is prohibited. Also prohibited is the construction of production facilities that may cause environmental pollution or damage the resources within the experimental zones of a natural conservation area. Emission of pollutants from the other constructions should not exceed pollutant emission standards established by the State or local authorities. Excessive emission of pollutants from facilities already constructed within the experimental zones must, according to relevant laws and regulations, be corrected and put under strict control without any delay.

Project to be carried out in the buffer zones of a natural conservation area should not be detrimental to the environmental quality of the conservation area. Damage already done to the environment should be immediately corrected according to the laws and regulations.

Article 33 Accidental environmental pollution or damage, or the possibility of environmental pollution or damage, must be put under the strictest control. People who may be harmed by the pollution or damage must be alerted in a timely fashion. For future investigation, report on the pollution or damage must be filed to the local authorities in charge of environmental protection and natural resources conservation.

REGULATIONS ON THE MANAGEMENT OF SCENIC AND HISTORIC INTERESTS AREAS OF SICHUAN

(Endorsed on May 28 1998 by the 9th Session of the Standing Committee of the 8th People's
Congress of Sichuan Province)

Chapter 3 ProtectionArticle

Article 13 Establishment of development zones and holiday villas is prohibited within the boundaries and the buffer zones of the scenic and historic interests areas, nor rental nor transferal of the resources of the scenic and historic interests area.

Article 14 In coordination with relevant official organs, those in charge of the management of the scenic and historic interests areas should coordinate with proper administrative authorities in the investigation and documentation of ancient architectures, ancient gardens, historical sites and sights, ancient and famous trees within the scenic and historic interests areas. Records and files should be well kept, and marks and signs planted for rigorous protection.

Article 15 Priority should be attached to afforestation and prevention from fire, debris flows, landslides, and other mountainous disasters. No efforts should be spared in the proper conservation of vegetation growth conditions and animal living environment.

Article 16 Within the boundaries and buffer zones of the scenic and historic interests areas, wood and trees should be incorporated into the promulgated regulations, and should not be wantonly slashed. If some trees must be felled, review and examination by the management office of the area should be conducted, and proper license should be obtained from the official forest administration at or above the county level.

The scenic and historic interests area of bamboo forests needing felling or thinning out may do so under the condition that natural landscape is not damaged. Such felling must be reviewed and approved by those in charge of the management of the area and endorsement must be obtained from the official forest administrative authorities at or above the county level.

Article 17 If plants must be collected in the scenic and historic interests area either as samples or for medical purpose or as forest byproducts, permission should be obtained in accordance with the relevant

State regulations and from the those in charge of the management of the scenic and historic interests area. And an area should be defined in which the collection may be done, and a limit set up for such collection.

Article 18 Neither unit nor individual is permitted to conduct mineral and stone quarrying, enclosing the lake for field, reclaiming wasteland, and other similar activities that might change the landform, or damage the environment and the landscape.

Article 19 Tourist and inhabitants in the scenic and historic interests area have the obligation to protect the resources of the scenic and historic interests area and various public facilities, should consciously maintain the public sanitation and public orders, and should conform to the relevant regulations concerning the scenic and historic interests areas.

Article 20 The following activities are prohibited within the scenic and historic interests area:

- 1) Graffiti on views, sights, and public facilities;
- 2) Littering onto waters and ground;
- 3) Poaching and harming wild animals;
- 4) Climbing the tree, snapping bamboo, destroying flower and grass;
- 5) Smoking and making a fire within the fire-off area;
- 6) Damages or vandalism to the resources of the scenic and historic interest area.

Article 21 Rivers and lakes, streams and brooks within the scenic and historic interests area should be conserved and harnessed in the light of the long-range plan of the scenic and historic interests area. Neither unit nor individual is allowed to change or alter without permission the current status and looks, nor to discharge polluted waters, dump rubbish and other solid wastes.

Article 22 Fire prevention should be organized and related facilities upgraded within the boundaries and buffer zones of the scenic and historic interests area.

Article 23 Without permission from the relevant quarantine office, animals and plants are prohibited to enter the scenic and historic interests area.

Article 24 Factories and other similar manufacturing facilities that are likely to pollute and damage the ecological environment are not permitted to be constructed within the boundaries and the buffer zones of the scenic and historic interests area.

Warehouses storing inflammable, explosive and toxic materials are prohibited to built within the boundaries of the scenic and historic interests area.

Chapter 4 Planning Article

Article 25 Plans shall be prepared before setting up the scenic and historic interests area.

Such preparation and its feasibility assessment shall extensively collect advice and comments from the relevant official organs, specialists and general public.

Article 26 Such preparation shall conform to the following regulations:

- 1) Implement the laws and regulations stipulated by the state concerning conservation and utilization of the resources of the scenic and historic interests area, balance between the long-range and short-range and short-range considerations, and that between the part and the whole.
- 2) Keep intact the natural and cultural landscapes and symptomatic features, maintain the ecological balance, harmonize the construction of the facilities with the scenic environment.
- 3) Adapt the national and local economic development ability into the consideration of the development scope, progress, criteria and related quotas for the scenic and historic interests area.
- 4) Scientifically assess the features and importance of the resources of the scenic and historic interests area, give prominence to the outstanding characters of the scenic and historic interests area so as to avoid the artificiality and urbanization of the natural landscape.

Article 27 Planning of the scenic and historic interests area is classified into the General Plan and the Detailed Plan.

The general plan includes: nature and features of the scenic and historic interests area, its boundaries and buffer zones, functions, and landscape subdivisions, tourist threshold carrying capacity, tourist routes, and various specialized outlines.

The detailed plan includes: nature and features of the scenic and historic interests area, conservation of sites and sights, development plan, tourist utilities, tourist services and related service facilities, layouts of other infrastructure, architectures for major sites and sights.

Article 30 Planning of the scenic and historic interests area finalized and approved through all stipulated procedures shall be implemented likewise. Permission is not given for any unauthorized alternation and change by any unit or individual.

Chapter 5 Construction

Article 31 Construction in the scenic and historic interests area shall conform to the approved plan. The layout, height, size, style and features shall be harmonized with the surrounding landscape and environment.

Article 32 Construction activities shall conform to the plan of the scenic and historic interests area. In respect of selecting the site for the construction project and building farmhouses, the project contractor shall be required to obtain the review and approval from the official organ in charge of management of the scenic and historic interests area. The project contractor shall go through relevant procedures before construction starts.

Article 34 Construction of hotels, restaurants, and similar facilities is not allowed at the site of key views and sights within the scenic and historic interests area.

Article 35 Effective measures should be taken to ensure unpolluted construction at the scenic and historic interests area in order to conserve vegetation, water resources, and landform. As a means enforced restoration of the damaged vegetation, thorough cleaning shall be carried out upon completion of the project construction.

**REGULATION ON THE PROTECTION
OF WORLD PROVINCE HERITAGE OF SICHUAN**

(Issued on January 18, 2002 by the 24th Session of the Standing Committee of
the 9th People's Congress of Sichuan Province)

Article 1 For better protection of world cultural and natural heritage within Sichuan province, this regulation has been formulated in accordance with relevant laws and regulations.

Article 2 The World Heritage defined in this regulation refers to such natural and cultural properties that have been inscribed in the list of World Heritage by the UNESCO.

Activities concerning the protection of World Heritage within the territory of Sichuan Province must be in conformation with this regulation.

Article 3 According to the overall plan, protection is divided into the core zone, the protection zone, and the peripherals buffer zone.

Article 4 The principle of effective protection and scientific management has been adopted. Utilization and exploitation of natural resources should be reasonable and in line with the protection.

Article 5 The construction and cultural administrative departments of the provincial government will be in charge of the management of the World Heritage within the whole province.

The construction and cultural administrative departments of the municipal or county government will be in charge of the management of the World Heritage within the territory under its jurisdiction.

Article 6 Administrative offices higher than the county level should be established. They should be put in charge of the protection, utilization, construction, and management of the World Heritage. All organizations within the protection area should be under the leadership of the administrative offices.

The main responsibilities of the world heritage management are:

- 1) Propaganda and Implementation of relevant laws and regulations;
- 2) Implementation of the overall plan and various detailed plans for the purpose of effectively protecting and utilizing natural and cultural resources;
- 3) Formulation and implementation of protective measures and management systems;
- 4) Investigation, appraisal, and registration of World Heritage resources;
- 5) Coordination of protective measures taken by relevant organizations;
- 6) Management of the business community and residents within the boundaries of the protected world heritage;
- 7) Construction and management of infrastructure and other public facilities within the boundaries of the protected world heritage, and improvement of the service quality;
- 8) Other matters concerning the protection of world heritage;
- 9) Execution of administrative penalty on commission of authorities.

Article 7 Formulation of the overall plan to protect of world heritage should be organized by the people's government above the county level and should be submitted to the proper authorities for endorsement. Once endorsed the overall plan should not be changed or modified by any group or individual without the written permission from the proper authorities.

Article 8 Within the area where the world heritage is located, construction that may pollute the environment, damage the ecological system, or cause the lose of water and land, is prohibited. Activities that may damage the world heritage resources are prohibited.

Article 9 Construction projects within the area where the world heritage is located should be under strictest control. Construction projects required by the overall plan should be examined by the world heritage management office and be submitted to the proper authorities for endorsement.

Any construction or facility within the protection area that dose not conform to the overall plan should be demolished or renovated.

Article 10 Resettlement of inhabitants in central area of the World Heritage, when exceeds the limit set by the overall plan, should be carried out in an orderly fashion. Resettlement plan should be drafted by local government (county level and above) and put into practice after its approval.

Article 11 Under no circumstance should any group or individual sell the world heritage.

Article 12 No animal or plant species not included in the world heritage list should be introduced into the area where world heritage is protected. Animal or plant species already introduced into the area should be disposed of or removed out.

Article 13 Vehicles or boats used as transportation means within the protection area should only be powered by clean fuels like electricity, gas, or solar energy.

Emission of wastewater or exhausts must meet the emission standard. Garbage should be treated in a nontoxic manner.

Article 14 Accommodation capacity should be designed in accordance with the overall plan. The number of travelers should be restricted in order to protect the ecosystem. Specific plan should be drafted by those who are in charge of the management of the world heritage, examined by the local government, and submitted to and finalized by the people's government at a superior level.

Article 15 A protective and monitor system should be formed by relevant departments of the provincial, municipal, and county government. Monitoring should be carried out in a fixed time and appraisal reports should be filed to the provincial government.

Article 16 Management and technical personnel performing the protection of world heritage must be properly trained and qualified.

Article 17 Restoration and renovation of historical relics and antiquities must be endorsed by the provincial cultural administration.

Article 18 In case that the world heritage is located within an area which is under jurisdiction of different administrative bodies, resources should be shared, joint efforts should be exerted to carry out the protection and to make development;

Article 19 A special monetary fund should be established by various local governments and investment into such a fund should be gradually increased.

The special monetary fund is raised through various channels such as government subsidy, public donation, international aid, and admission ticket. This special fund should be used for special purposes and should not be used for any other purpose.

Article 20 For natural views and cultural sits, standard marks and signs should be established.

Article 21 Groups or individuals who enter a protection area must pay close attention to the protection of the world heritage resources and various facilities, must observe various regulations, and must keep the public order and public hygiene.

Article 22 Any action that is in violation of the rules set by article10 and 11 of this regulation will be instructed by the management office to stop. Those have done such actions will be fined:

- 1) Illegal construction in the core zone of the World Heritage will be fined with 100-500 Yuan/m²;
- 2) Construction without proper approval within the protection zone will be fined with 50-300 Yuan;
- 3) Construction without proper approval within the buffer zone will be fined with 30-100 Yuan. Unauthorized approval by administrative offices to make constructions within the world heritage protection area will be deemed invalid. Those who are directly responsible for such misconduct will be given disciplinary sanction.

Article 23 Those who have caused serious damage to the world heritage as a result from any action in violation of the rules set by this regulation will be fined with 50,000 Yuan and above.

Public official and management personnel who have caused damage as a result from derelict and abusive actions will be given disciplinary sanction.

Article 24 Any action constituting a crime will be investigated in accordance with the law by the judicial authority;

Article 25 Construction, management and protection concerning the Dujiangyan Irrigation System should be executed under the rules of the *Regulation of Management of Dujiangyan Irrigation System of Sichuan Province*.

Article 26 This regulation comes into force from April 1, 2002.

ANNEX 2

TYPE SPECIES OF VERTEBRATS AND HIGHER PLANTS IN THE JIAJIN MOUNTAINS, BAOXING, TIANQUAN & LUSHAN COUNTIES

Type species and subspecies of animals

1. *Uropsilus soricipes* Milne-Edwards (1872)
2. *Talpa longirostris* Milne-Edwards (1870)
3. *Sorex cylindricauda* Milne-Edwards (1871)
4. *Blarinella quadrata* Milne-Edwards (1872)
5. *Crociodura attenuata* Milne-Edwards (1872)
6. *Anourosorex squamipes* Milne-Edwards (1872)
7. *Nectogale elegans* Milne-Edwards (1872)
8. *Rhinolophus pearsoni* Horsfield (1851)
9. *Murina aurata* Milne-Edwards (1872)
10. *Murina leucogaster* Milne-Edwards (1872)
11. *Myotis mystacinus moupinensis* Milne-Edwards (1872)
12. *Macaca thibetana* Milne-Edwards (1870)
13. *Rhinopithecus roxellanae* (1872)
14. *Selenarctos thibetanus mupinensis* Heude (1901)
15. *Ailuropoda melanoleuca* David (1869)
16. *Mustela sibirica moupinensis* Milne-Edwards (1874)
17. *Felis temmincki tristis* Milne-Edwards (1872)
18. *Sus scrofa moupinensis* Milne-Edwards (1871)
19. *Elaphodus cephalophus* Milne-Edwards (1871)
20. *Budorcas taxicolor tibetana* Milne-Edwards (1874)
21. *Capricornis sumatraensis milneedwardsi* David (1869)
22. *Naemorhedus goral griseus* Milne-Edwards (1871)
23. *Tamias swinhoei* Milne-Edwards (1874)
24. *Dremomys pernyi* Milne-Edwards (1867)
25. *Sciurotamias davidianus consobrinus* Milne-Edwards (1868)
26. *Petaurista alborufus* Milne-Edwards (1870)
27. *Petaurista xanthotis* Milne-Edwards (1872)
28. *Apodemus chevrieri* Milne-Edwards (1868)
29. *Rattus flavipectus* Milne-Edwards (1871)
30. *Niviventer confucianus* Milne-Edwards (1871)
31. *Eothenomys melanogaster* Milne-Edwards (1871)
32. *Ochotona thibetana* Milne-Edwards (1871)

Type species and subspecies of birds

33. *Tetraophasis obscurus obscurus* J. Verreaux (1869)

34. *Ithaginis cruentus geoffroyi* J. Verreaux (1867)
35. *Lophopholus thuysii* Geoffroy St. Hilaire (1866)
36. *Strix uralensis davidi* Sharpe (1875)
37. *Strix aluco nivicola* Blyth (1758)
38. *Picoides tridactylus funebris* Verreaux (1870)
39. *Turdus rubrocanus gouldii* Verreaux (1870)
40. *Turdus mupinensis* Laubmann (1920)
41. *Spelaeornis troglodytoides troglodytoides* Verreaux (1920)
42. *Moupinia poecilotis* Verreaux (1870)
43. *Babax lanceolatus* Verreaux (1870)
44. *Lanceolatus lanceolatus* Verreaux (1870)
45. *Garrulax davidi concolor* Stresemann (1923)
46. *Garrulax lunulatus* Verreaux (1870)
47. *Garrulax ocellatus artemisiae* David (1871)
48. *Garrulax maximus* Verreaux (1870)
49. *Garrulax ellioti* Verreaux (1870)
50. *Garrulax affinis blythii* Verreaux (1870)
51. *Garrulax formosus* Verreaux (1869)
52. *Minla ignotincta jerdoni* Verreaux (1871)
53. *Alcippe chrysotis swinhoii* Verreaux (1870)
54. *Alcippe striaticollis* Verreaux (1870)
55. *Alcippe ruficapilla* Verreaux (1870)
56. *Alcippe cinereiceps cinereiceps* Verreaux (1870)
57. *Alcippe morrisomia davidi* Styan (1871)
58. *Yuhina diademata* Verreaux (1876)
59. *Paradoxornis flavirostris guttaticollis* David (1871)
60. *Paradoxornis paradoxus* Verreaux (1870)
61. *Paradoxornis webbianus alphonsianus* Verreaux (1870)
62. *Paradoxornis nipalensis verreauxi* Sharpe (1883)
63. *Cettia(robustipes) acanthizoides* Verreaux (1870)
64. *Fortipes davidiana* Verreaux (1870)
65. *Phylloscopus subaffinis* Ogilvie-Grant (1900)
66. *Aegithalos iouschistos obscuratus* Mayr (1940)
67. *Loxia curvirostra himalayensis* Blyth (1844)
68. *Aegithalos fuliginosus* Verreaux (1869)
69. *Carpodacus rhodopeplus verreauxii* David et Oustalet (1877)
70. *Carpodacus edwardsii* Verreaux (1870)
71. *Carpodacus vinaceus* Verreaux (1870)
72. *Carpodacus trifasciatus* Verreaux (1870)
73. *Prunella strophciata* Blyth (1843)
74. *Sitta europaea sinensis* Verreaux (1870)
75. *Leucoschistus Swinhoe* (1871)

Type species and subspecies of amphibians and fish

76. *Oreolalax popei* Liu (1947)
77. *Polypedates dugritei* David (1871)
78. *Amolops mantzorum* David (1871)
79. *Batrachuperus pinchonii* David (1871)
80. *Euchilogenis davidi* Sauvage (1874)
81. *Schizopygopsis malacanthus baoxingensis* Ding et Ye (1990)
82. *Schizothorax* (*Schizop.*) *davidi* Sauv (1880)

Type species and subspecies of higher plants

1. *Aleuritopteris cremea* Ching
2. *Aleuritopteris orgentea* var. *geraniifolia* Ching et S. K. Wu
3. *Onychium moupinense* Ching
4. *Allantodia baoxingense* Ching
5. *Allantodia costulalisorum* Ching
6. *Cystoathyrium chinensis* Ching
7. *Cystopteris moupinensis* Fanch.
8. *Cyrtomidictyum moupingense* Ching et Shing
9. *Polystichum moupinense* Bedd
10. *Polystichum huae* H. S. Kung and L. B. Zhang
11. *Lepidogrammitis intermedia* Ching
12. *Lepidogrammitis sichuanense* Ching et Shing
13. *Biondia pilosa* Tsiang et P. T. Li
14. *Populus davidiana* Dode var. *tomentella* (Schneid.) Nakai
15. *Salix moupinensis* Franch.
16. *Aristolochia moupinensis* Franch.
17. *Cyathula ficinalis* Kuan
18. *Berberis asmyana* Schneid
19. *Berberis atrocarpa* Schneid. var. *Subintegra* Ahrendt
20. *Epimedium davidii* Franch.
21. *Epimedium ecalcaratum* G. Y. Zhong
22. *Aconitum Franch. etii* var. *geniculatum* W. T. Wang et Hsiao
23. *Anemone hupehensis* f. *alba* W. T. Wang
24. *Anemone hupehensis* var. *simplicifolia* W. T. Wang
25. *Anemone patula* var. *minor* W. T. Wang
26. *Anemone saniculiformis* C. Y. Wu
27. *Clematis gracilifolia* var. *macrantha* W. T. Wang et M. C. Chang
28. *Delphinium pseudo-tongolense* W. T. Wang, *Delphinium saxatile* W. T. Wang
29. *Delphinium smithianum* Hand-Mazz
30. *Acer pehpeiense* Fang
31. *Lindera tienchuanensis* Fang et H. S. Kung

32. *Litsea moupinensis* H. Lec.
33. *Corydalis calycosa* H. Chuang
34. *Corydalis concinna* C. Y. Wu et H. Chuang
35. *Corydalis curviflora* var. *alteocristata* C. Y. Wu et H. Chuang
36. *Corydalis gemmipara* H. Chuang
37. *Corydalis linearis* C. Y. Wu
38. *Corydalis sigmoides* C. Y. Wu et H. Chuang
39. *Cardamine flexuosoides* W. T. Wang
40. *Draba moupinensis* Franch.
41. *Cardamine multiflora* T. Y. Cheo et R. C. Fang
42. *Sedum Paoshingensis* S.H Fu
43. *Sedum nothodugueyi* K. T. Fu
44. *Cotoneaster moupinensis* Franch.
45. *Parnassia labiata* Jien
46. *Ribes moupinense* Franch.
47. *Ribes tianquanense* S. H. Yu et J. M. Xu
48. *Ajuga ciliata* var. *hirta* C. Y. Wu et C. Chen
49. *Ajuga ciliata* var. *ovatisepala* C. Y. Wu et C. Chen
50. *Rubus angustibracteatus* Yu et Lu
51. *Rubus flosculosus* var. *etomentosus* Yu et Lu
52. *Rubus ourosepalus* Card
53. *Rubus pseudopileatus* var. *glabratus* Yu et Lu
54. *Rubus pubifolius* var. *glabriusculus* Yu et Lu
55. *Rosa saturata* var. *glandulosa* Yu et Lu
56. *Rubus subtibetanus* var. *glandulosus* Huang
57. *Geranium moupinense* Franch.
58. *Geranium wilfordii* var. *glandulosum* Z. M. Tan
59. *Zanthoxylum bungeanum* var. *pubescens* Huang
60. *Euonymus moupinensis* Loes. et Rehd
61. *Magnolia sinensis* Stapf
62. *Acer sutchuenense* Franch. subsp. *tienchuanse* (Fang et Song)
63. *Davidia involucrata* Baill.
64. *Clematoclethra loniceroides* C. F. Liang et Y. C. Chen
65. *Acanthopanax baoxinensis* X. P. Fang et C. K. Hsieh
66. *Cornus poliophylla* var. *praelonga* Fang et W. K. Hu
67. *Cornus scabrida* Franch.
68. *Cornus walteri* var. *confertiflora* Fang et W. K. Hu
69. *Rhododendron bellum* H. P. Yang
70. *Rhododendron decorum* Franch.
71. *Rhododendron floribundum* Franch.
72. *Rhododendron heteroclitum* H. P. Yang
73. *Rhododendron intricatum* Franch.
74. *Rhododendron moupinense* Franch.

75. *Rhododendron nitidulum* Rehd. et Wils.
76. *Rhododendron thayerianum* Rehd. et Wils.
77. *Vaccinium moupinense* Franch.
78. *Lysimachia baoxingensis* (Chen et C. M. Hu)
79. *Lysimachia pterantha* var. *baoxinensis* Chen et C. M. Hu
80. *Primula davidii* Franch.
81. *Primula heucherifolia* Fanch.
82. *Primula moupinensis* Franch.
83. *Gentiana baoxingensis* T. N. Ho
84. *Gentiana filisepala* T. N. Ho
85. *Gentiana hirsuta* Ma et E. W. Ma ex T. N. He
86. *Ceropegia paohsingensis* Fsiang et P. Tli
87. *Marsdenia officinalis* Tsiang et P. T. Li
88. *Microula involcriformis* W. T. Wang
89. *Sinojohnstonia moupinensis*
90. *Keiskea siechuanensis* C. Y. Wu
91. *Microtoena moupinensis* Franch.
92. *Phlomis paohsingensis* C. Y. Wu
93. *Salvia alatipetiolata* Sun
94. *Salvia baohsingensis* C. Y. Wu
95. *Pedicularis moupinensis* Fanch.
96. *Pedicularis triangularidens* Tsong
97. *Gleadovia moupinense* Hu
98. *Lonicera acuminata* var. *depilata* Hsu et H. J. Wang
99. *Notoseris gracilipes* Shin
100. *Saussurea laniceps* Hand.-Mazz.
101. *Calamagrostis moupinensis* Franch.
102. *Carex magnoutriculata* Tang et Wang
103. *Carex moupinensis* Franch.
104. *Carex ovatispiculata* Wang et Y. L. Chang
105. *Aletris capitata* Wang et Tang
106. *Fritillaria sichuanica* S. C. Chen
107. *Lilium duchartrei* Franch.
108. *Paris bashanensis* Wang et Tang
109. *Amitostigma dolichocentrum* Tang
110. *Orchis sichuanica* K. Y. Lang

ANNEX 3

THE RECORDS ON RESCUING GIANT PANDAS SINCE 1982 IN BAOXING, LUSHAN, TIANQUAN, DAYI, CHONGZHOU, LUDING, AND QIONGLAI

In Baoxing County:

1. Mid-June 1983, Yun Haichen and his brother, when picking wild vegetables in the mountain, saw a panda (20 kg of weight) suffering hunger at Qinsuixi, Chengguan Town, and they convoyed it to the Fengtongzhai National Nature Reserve.
2. On February 12, 1984, at Yongfu Village, the villager Li Xingyu and others convoyed a sick and hungry panda (5 years old, female) to the Fengtongzhai National Nature Reserve for emergency treatment, and then transferred her to the Wolong Panda Conservation Center for recovery.
3. On March 20, 1984 at Rauzi Village, a pupil, Ang Kabing saw a seriously sick panda in a cornfield and reported to the Village Administration. But the panda finally died after emergency treatment at the Fengtongzhai National Nature Reserve. It died of gastric bleeding as anatomized and diagnosed later by Sichuan University.
4. In May 1984 at Yongfu Village, the Forestry Bureau transferred an adult panda from Shisun Valley to Chujugou where bamboo was abundant.
5. On May 30, 1984, a starveling male adult panda was moved out from Kuaile Valley, Yanjing Town to Chuju Valley with bamboo forest.
6. On June 18, 1984 at Kuaile Village, Yanjing Town, villagers convoyed a young male panda, then named it "Xiaole" (10 month old), to the Fengtongzhai National Nature Reserve.
7. On July 13, 1984, a female old panda died at Hunshui Village, Longdong Town. It was taken to Sichuan University and was found having suffered from necrosis of both hepar and bilis.
8. On February 28, 1985 at Chunjiancao, Yanjing Town, villagers found a sick male adult panda and sent it to Chengdu Zoo. It was then recovered there and called "Chunchun".
9. On February 28, 1985, villagers found a sick female panda (about 5 years old) in Mt. Yuanjia, Longdong Town and sent her to the Chengdu Zoo. It was then called "Yuanyuan".
10. On May 9, 1985, the Fengtongzhai National Nature Reserve adopted an adult female panda from Luoyingyan, Jingtang Town, Kangding County. It was named "Zaxi" and then sent to the forest area in the Conservation Zone.

11. On May 30, 1985, a patrol group found a hungry female adult panda at Mt. Jiandao, Yongfu Town. The County Government organized to build road and bridges, and transferred her to Xucun Valley with dense bamboo growth.

12. On October 23, 1985 at Kuaile Valley, Yanjing Town, a female panda, 6-year old, frightened by felling, was entrapped and then sent back to nature.

13. On March 11, 1986 at Xiangxing Village, Longdong Town, a sick panda was rescued at the Fengtongzhai National Nature Reserve and then sent to Chengdu Zoo for treatment, named "Dongdong".

14. On March 29, 1986 in Houshan, Zhongba Town, a 4-year-old female panda was found straggling down the mountain for food and was adopted in the Fengtongzhai National Nature Reserve, named "Houshan", finally it was released back to the mountain.

15. On April 7, 1986 in Mt. Daping, Xinxing Town, a young panda went down the hill for food, and was convoyed to the Fengtongzhai National Nature Reserve, named "Xinxing".

16. On March 1, 2001 in Yongfu Town, Baoxing, an herb farmer saw a young sick panda (7 kg) in bamboo thicket and convoyed it to the Fengtongzhai National Nature Reserve for emergency treatment. It was then transferred to the Wolong Panda Conservation and Research Center for further treatment in April 2001.

17. On March 26, 2001 at Guobayan, road workers saw a wounded panda lying on the road (over one year old, about 25 kg), but soon it was frightened and escaped because of a truck running by. Then 20 policemen were organized from the Fengtongzhai National Nature Reserve to search for it through the whole night. It was finally found in a tree next day, and sent to the County hospital for treatment. In the following days, its back leg again suffered pathological changes. It had an operation given by Prof. Peng Guangneng and Prof. Liu Changsong from Sichuan Agricultural University. Some days later it was completely recovered.

18. On May 10, 2001 in Raozi Town, villagers met a young sick panda (about 10 kg) and sent it to the Fengtongzhai Nature Reserve for treatment. The panda was recovered one week later.

In Lushan County:

19. In September 1982, at Xinming Village, Zhonglin Town, a villager Gao Yilun saw a hungry panda eating his goat. The panda was fed by the farmer and recovered. It was soon returned to nature.

20. In December 1983, at Dahe Village, Taiping Town, a hungry panda went into the observation station for food. It was fed and recovered, and then it was returned to nature.

21. In July 1984, at Dahe Village, Taiping Town, a forest guard Zhao Encheng found a sick baby panda (about 800 g) during his patrol. The forestry Bureau organized to rescue and cure it, and then sent it to Chengdu Zoo for further treatment.

22. In July 1984, a panda went into Kuaile Primary School, Dachuan Town, and was fed carefully and recovered, and then it was returned to nature.

23. In July 1984, a hungry and sick panda (about 30 kg) was rescued at Heituxi, Dahe Village, Taiping Town and was transferred to Chengdu Zoo for further treatment.

24. In June 1987 at Dashuijing, Xinming Village, Zhonglin Town, the patrol team of Forestry Bureau of the county found a corpse of a panda died naturally.

25. In March 1988 at Dahe Village, Taiping Town, Lushan County, a sick young panda (about 60 kg) was found. The Forestry Bureau organized to rescue and cure it. Then, it was sent to the Chengdu Research Base of Giant Panda Breeding for further treatment.

26. In January 11, 1991 in a state run nursery, Jinghua Village, Modong Town, villagers found a sick and hungry panda. It was rescued and recovered ten days later. Then it was returned to nature.

27. In April 1994, at Gaoze Village, Shenlong Town, an adult sick panda was rescued and recovered. Soon it was returned into a forest.

28. In February 1995, in Zhongba Town, a sick and hungry panda was found, and then recovered, and returned to nature after twenty days.

29. In May 1995, at Mupingzi, Dahe Village, Taiping Town, panda was found died naturally and was made a specimen by the Forestry Bureau of the County.

30. In October 24, 1999 at Gaojiaping, Zhonglin Town, a villager Fang Guoquan saw a young panda hungry and sick. It was rescued by the Forestry Bureau of the County, and then was sent to Wolong Panda Conservation and Research Center for further treatment.

31. In December 2000, two pandas went into Xichuan, Shuangshi Town for food. They were fed, and then returned to nature.

In Tianquan County:

32. In April 10, 1984 at Longmen Village, Xiaohe Town, a wounded panda was saved by villagers and conveyed to the County Hospital for emergency treatment. Then it was transferred to Chengdu Zoo for cure and recovery, and to Wolong Panda Conservation and Research Center. One year later, it flew to Toronto of Canada for exhibition for one hundred days.

33. In April 19, 1984 at the lower reaches of the Labahe, forestry workers rescued a sick panda. It was then transferred to Chengdu Zoo for treatment and recovery, and finally sent to the Wolong Panda Conservation and Research Center.

34. In June 18, 1986, a died panda floated on the Lizipinghe at Xiaorenyan Village. It was anatomized in Sichuan Agricultural University and found died of too many ascarids.

35. In 1985, villagers found a sick and hungry panda in Xinchang Town. The County Government organized to rescue it. After recovered, it was sent back to nature.

36. In 1988, a wounded young panda (about 7.5 kg) was rescued and named Chunchun at Xiaorenyan Village. It was sent to the Breeding & Rescue Center of Rare Wild Animal of Sichuan Province and unfortunately it died half a month later.

37. In November 1995 in Laochang Village, a sick panda was rescued and then convoyed to Chengdu Research Base of Giant Panda Breeding for further treatment.

38. In March 1997 at Xiaorenyan Village, a sick panda was rescued and convoyed to the Breeding & Rescue Center of Rare Wild Animal of Sichuan Province for treatment.

39. In 1998, villagers found a sick panda in Xiaohe Town. After properly treated and recovered. The Forestry Bureau of the County sent it back to nature in the Labahe Nature Reserve.

40. In March 8, 2001, a panda was looking for food in bamboo thicket in Qinshi Town. Villagers observed and protected it carefully at a distance until it went away deep into the bamboo thickets.

41. In March 17, 2001, at Yanmenxi, Qinshi Town, a forest guard Yang Jingmin saw a panda wandering down to hillslope.

42. In March 22, 2001, a villager Gou Yaoquan saw a panda about 100kg wandering out of forest, and he observed and protected it at a distance until it disappeared twenty minutes later.

In Dayi County:

43. In June 21, 1984, at Yuanyangci, Xining Town, a patrol team of Panda Survey Station saw a young panda (about 20 kg) sitting on a tree for sunshine.

44. In 1986, a patrol team met pandas for four times (or pandas), including two young pandas (or times) at Shuangyanwo, Shuanghe Town.

45. In 1987, a patrol team met pandas 15 times (or 15 pandas), including young pandas for 8 times. On March 20 at Yunhua Village, Xiling Town, the team observed three pandas in heat.

46. In May 27, 1988, a team found a highly decomposed body of a panda and was found died naturally after examined by the legal medical expert of Public Security Office.

47. In March 26, 1989, a patrol team accidentally met a pair of panda mating in bamboo thicket at Shandashan, Xiling Town.

48. In April 1990, a villager Huang Zhongxuan found two pandas went down the hill eating bamboo at Xiaohe Village, Xiling Town. The Forestry Bureau organized the local people to protect them in distance until they returned to the hill. In November, a panda wandered near coal mine of Wushan Village. The Village Administration made arrangement to observe and protect the panda in distance until it returned to its habitat.

49. In March 13, 1991, a patrol party found a died panda at Yuanyangci, Yunhua Village of Xiling Town. It was anatomized and confirming it died naturally. The body was made specimen displayed in the Forestry Bureau of the County.

50. In April 14, 1993, villagers found a panda wandering at Lijia Valley, Danfeng Town. The Forestry Bureau organized and convoyed it to Xiling Town, and then it returned to nature.

51. Later in November 1998, at Gaodian Village of Xiling Town, a hungry panda entered a villager Xiao Yucheng's home. It was rescued by the Forestry Bureau and returned to nature four days later.

52. In May 17, 2000, a herb farmer Zhang Jinrong saw two pandas eating fresh bamboo at Mt. Hongling, Gaodian Village, Xiling Town.

53. In February 19, 2001, villagers found a panda wondering in Jinxing Town. The County Government coordinated with Forestry Bureau, Security Office and T.V. Station to search for the panda in the villages and towns nearby for four days until they confirmed that the panda had gone back to deep into mountains.

In Chongzhou City:

54. In March 27, 1986, staff of the Forestry Bureau saw a young panda climbing and playing on a tree at Yanfeng Village.

55. In May 18, 1991, villagers found an old panda died at Mt. Liuding in Shanlang Town. It was identified died naturally. The body was made an specimen displayed in the Forestry Bureau of the County.

56. At night of November 28, 1992, villagers found a seriously sick adult panda at Liuli Village. The City Government organized to convoy it to Chengdu Zoo for emergency treatment. The panda died several days later because of wrong treatment.

57. In April 1993, a panda went out for food in Heping Village and lost its way. The City Forestry Bureau arranged hundreds villagers to help it return to its habitat.

58. In September 1998, a person of City Forestry Bureau saw an adult panda wandering at Kuanheba, Yaifeng Village, Goujia Town.

59. In August 2000, a person of City Forestry Bureau saw a young panda play on a dove tree in the upper reaches of the Anzihe.

60. In February 12, 2001, the villager found a sick panda at Yaifeng Village, Goujia Town. It was rescued by the government and then was sent to Wolong Panda Conservation & Research Center for further treatment.

In Luding County:

61. In April 1990, villagers of Lanan Town met a panda. It was fed and returned to its habitat.

62. In October 1, 1995, at bank of the Dadu River in Chuni Town, villagers rescued a panda from the river. It was then named "Lulu". The Forestry Bureau arranged to convoy the panda to Breeding & Rescue Center of Rare Wild Animal of Sichuan for healthy check.

63. In April 1998, at bank of the Dadu River in Anleba, villagers rescued a panda from the river. It was named Lumin. The Forestry Bureau arranged to convoy the panda to Breeding & Rescue Center of Rare Wild Animal of Sichuan Province for healthy check and feeding.

In Qionglai City:

64. In July 1999, villagers found a panda at the top of hill at Changle Village, Lanbao Town; and in March 2000, a villager Zhou Jiaguo found a panda on the same hill again. The Forestry Bureau and the Town Administration spread propaganda among the local people and made proper arrangement to protect pandas.

65. In July 28, 2000, villagers of Changhong Village met a 50 kg panda when they were collecting herbs at Caodie Stream. On September 23, tourist Caohu saw two pandas, one was getting sunshine and eating bamboo; the other was eating bamboo and rolling around. Since the investigation showed that pandas and large area of bamboo existed at Xiangcaodie Stream area, the Administration of Mt. Tiantai Provincial Park decided to set up a project of tourism and provide 20 million Yuan (RMB) to enhance the ecological conservation in the area.

四川大熊猫栖息地—卧龙·四姑娘山·夹金山脉
世界自然遗产保护规划

THE WORLD HERITAGE
SICHUAN GIANT PANDA SANCTUARY
—WOLONG, MT. SIGUNIANG AND JIAJIN MOUNTAINS
Overall Management Plan

四川省人民政府

The People's Government of Sichuan Province

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四川省人民政府

2002年11月

四川大熊猫栖息地—卧龙·四姑娘山·夹金山脉

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特别说明

四川省人民政府于 2003 年 1 月 3 日以“川府函（2003）2 号”文批准了《四川大熊猫栖息地—卧龙·四姑娘山·夹金山脉世界自然遗产保护规划》。

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1. 提名世界自然遗产地的重要性

1.1 提名地位置

提名的世界自然遗产地，四川大熊猫栖息地—卧龙·四姑娘山·夹金山脉（简称四川卧龙—夹金山脉大熊猫栖息地），位于中国四川省成都平原与青藏高原之间的邛崃山脉。它涉及四川省阿坝藏族羌族自治州、雅安市、成都市和甘孜藏族自治州的12个县市，覆盖该地区现有的7个自然保护区和9个风景名胜区。提名地的具体位置介于如下地理坐标之间：东经 $102^{\circ} 08' 45'' \sim 103^{\circ} 23' 45''$ ；北纬 $29^{\circ} 53' 47'' \sim 31^{\circ} 21' 49''$ 。提名地面积为 $951\,000\text{ hm}^2$ ，其中核心区 $537\,000\text{ hm}^2$ ，保护区 $414\,000\text{ hm}^2$ 。此外，还指定了提名地外围保护区，面积 $529\,000\text{ hm}^2$ 。

1.2 提名地独特的生物学特征

1.2.1 拥有大熊猫这一全球濒危物种保护的“旗舰物种”

大熊猫 (*Ailuropoda melanoleuca*) 是第三纪古热带森林动物的残遗种，具有典型食肉类动物的消化道组织结构，却以植物性食物为主，属高度特化的食肉目草食动物，独科单种，分类学上的地位特殊；大熊猫动物群的形成经历了第三纪热带环境、第四纪热带—亚热带环境和现代山地亚热带—亚高山寒温带环境的演化，是地球发展最新阶段—第四纪的地质—生物过程的突出例证，在哺乳动物分类与进化以及古环境变迁研究上，具有十分重要的科学价值。目前大熊猫仅产于中国四川省西部、甘肃省东南部和陕西省南部的局部区域，分布范围狭窄，被列为国家一级重点保护动物。同时，濒危野生动植物物种国际贸易组织 (CITES) 禁止大熊猫及其产品的国际贸易，世界自然保护联盟 (IUCN) 将大熊猫列为濒危物种。世界自然基金会 (WWF) 成立时 (1961 年)，选定大熊猫为会徽，视之为国际野生动物保护的旗帜和全球自然保护的象征。

大熊猫的容貌奇异，举止天真，魅力神奇，深受各国人民尤其儿童的爱戴。无论中国政府的“国礼”，还是应邀出国展览，无不受到“国宾”式的礼遇。大熊猫是世界动物的“宠儿”。作为濒临灭绝的大型哺乳动物的大熊猫，不仅是中国的“国宝”，也是全世界人民共同的珍贵自然遗产。保护大熊猫遗产的关键是保护与保持大熊猫栖息地。因此，大熊猫栖息地的保护状况，受到国际社会的广泛关注。大熊猫栖息地保护，在全球环境与生物多样性保护上具有特殊意义。

20 世纪 80 年代中期由中国林业部与 WWF 联合进行的全国第二次大熊猫调查的结果显示，在全国有大熊猫分布的 34 个县级政区中，四川省计 28 个县，占全国大熊猫分布县总数的 82%；在全国大熊猫栖息地 $13\,900\text{ km}^2$ 的总面积中，四川省计 $11\,680\text{ km}^2$ ，占 84%。全国大熊猫种群 $1\,112 \pm 240$ 只中，陕西省有 109 ± 23 只，甘肃省有 96 ± 21 只，而四川省有 907 ± 196 只。四川省的大熊猫占全国大熊猫种群数量的 82%。所以，四川省是全球大熊猫栖息地与大熊猫种群分布的主体。

提名地具有以下特点：

• 大熊猫栖息地中具有最大种群、最广范围和最具完整代表性的残存部分

现存之大熊猫，自北而南分布于秦岭山脉、岷山山脉、邛崃山脉、相岭山脉、大雪山脉与大凉山脉。提名地包含了目前世界上还残存野生大熊猫的六大山脉中最重要的大熊猫栖息地，拥有数量最多的连续野生种群，是最大面积的大熊猫栖息地，以及适合大熊猫栖息的最大面积的潜在生境。与其他山脉相比，其破碎化程度较小，从海拔区带和竹子种类来讲，具有更多样的大熊猫栖息地类型，而且也比其他山脉保护得更好。胡锦涛教授认为，本区大熊猫的遗传多样性优于岷山山脉种群。

提名地覆盖邛崃山脉南段的主体，包括邛崃山脉主峰（四姑娘山）东坡的卧龙栖息地与北坡的毕棚沟栖息地、邛崃山脉南延主脉夹金山脉东—东南坡的夹金山脉栖息地与西坡的金汤河栖息地，邛崃山脉东南支脉大雪峰（西岭雪山）—青城山（赵公山）栖息地，以及联接各栖息地的高海拔分水岭地带。卧龙栖息地跨越岷江支流鱼子溪、荦江、草坡河的源区，夹金山脉栖息地跨越岷江干支流青衣江的支流宝兴河、天全河与芦山河的源区，毕棚沟栖息地属于岷江支流杂谷脑河下游右岸支沟的源区，金汤河栖息地属于大渡河支流金汤河的源区。大雪峰—青城山栖息地主体属于岷江支流文井江的源区。卧龙栖息地与夹金山脉栖息地是提名地大熊猫种群的主要分布区。整个提名地，处在横断山系东部的大渡河与岷江两大干流之间，构成南北长180千米、东西宽40~70千米的片状区域。目前提名地的大熊猫种群，约占全国野生大熊猫种群的三分之一。

提名地还是一大批珍稀野生动物的集中分布区。据调查估计，区内保有金丝猴（*Rhinopithecus roxellana*）约2 000只，扭角羚（*Budorcas taxicolor*）约1 800只，小熊猫（*Ailurus fulgens*）约200只，绿尾虹雉（*Lophopholus thuyssii*）约150只。因此，提名地不仅是大熊猫的重要栖息地，也是金丝猴、扭角羚、小熊猫、绿尾虹雉等稀有濒危动物的重要栖息地。

• 现有大熊猫圈养种群的主要种源

中国和海外动物园以及繁殖中心的大熊猫大部分来自这个山脉。据统计，自1955年起，先后从提名地调出野生活体大熊猫148只，包括夹金山脉栖息地的137只（其中：宝兴县118只，天全县14只，芦山县4只，大邑县1只）与卧龙栖息地11只（其中：汶川县9只，崇州市2只），供给北京、上海、天津、重庆与成都等22个国内的大型动物园和繁殖中心展出与研究，并通过国家礼品赠送、动物园之间展品交换和借展形式，向26国的50个国家动物园提供了展出与繁殖研究的活体。1957~1980年，从提名地选用的野生大熊猫18只（其中：宝兴县16只，天全县2只），由中国政府作为“国礼”赠予前苏联、朝鲜、美国、日本、法国、英国、前西德与墨西哥。此外，在同一时期，还从提名地调出金丝猴212只、扭角羚281只、绿尾虹雉50只、小熊猫41只，其它珍稀动物600只，供国内外展出与研究。因此，提名地为保护大熊猫的国际合作、社会教育与科学研究作出了特殊贡献。

• 大熊猫和珙桐的模式标本产地以及科学探险和科学发现的独特地点

大熊猫第一次为科学界认识是在1869年。当年法国传教士戴维（Peré A. David）在宝兴县邓池沟捕捉了4只大熊猫，制成标本以后，在法国自然历史博物馆展出，并在博物馆通讯上发表了报告。戴维也是第一个于1871年采集到美丽的珙桐标本。为纪念戴维，H.E.Baillon用戴维的名字，将珙桐定名为 *Davidia involucrata*。

提名地已经被证实为生物学探索的一个“宝库”。除发现大熊猫和珙桐这样极其重要的物种外，戴维还发现了65种鸟类新种，以及大量植物、哺乳类和昆虫新种。其中很多是在提名地发现的。随后的探险不断地发现大量植物、两栖类和其它生物的新种。在提名地发现的物种种数（地模种）分别是：哺乳类32种、鸟类43种、鱼类和两栖类7种以及高等植物110种（统计不完全）。保护如此重要的模式标本产地具有极其重要的生物学意义。

1.2.2 许多孑遗种与“活化石”物种的故乡

大熊猫和珙桐是自然演化长河中各自种群里最具代表性的物种，被称作“活化石”。“活化石”大熊猫又以古老的箭竹为食，以古老的冷杉、云杉为主的森林植被为栖息地，是多种物种协同进化的最佳例证。同时提名地也是随着青藏高原的隆起、海洋消失以及湿润的古地中海周围的广大森林干死后，在中国中部地区残留下来的大量活化石物种的故乡之一。

提名地是50~60个单型属（其中都江堰就有43个单型属）第三纪遗留下来的活化石的原产地，包括古老的独叶草（*Kingdonia uniflora*）、金钱槭（*Dipteronia sinensis*）、伯乐树（*Bretschneidera sinensis*）、连香树（*Cercidiphyllum japonicum*）、水青树（*Tetracentron sinensis*）等，甚至还有起源于三叠纪的“活化石”大卫两栖甲（*Amphizoa davidi*）。另外，银杏（*Ginkgo biloba*）可能被引入这个地区已经几个世纪了，水杉（*Metasequoia glyptostroboides*）也被大面积种植。

1.2.3 除热带地区以外全球有记录的植物物种最丰富的地区之一

提名地的植物种数超过5000种，其中有花植物超过4000种。该数值与法国的总植物物种数值相当。这里是温带，事实上是除热带雨林以外有记载植物物种最丰富的地区之一，是保护国际（Conservation International）认定的全球生物多样性热点地区之一，也是WWF确定的“全球200”生态区域之一。

这里植物物种丰富的原因是由于面积大、海拔范围宽和生态类型完整，以及该地区特殊的植物地理位置。而且该地区也是更新世冰期的生物避难所。在更新世由于气候干冷和湿热环境的不断变化，导致大多数物种的死亡，但是由于西部高原的屏障作用使这个地区气候即使在更新世最干旱的时期依然保持湿润。这种缓和作用如此剧烈，即使世界温度发生变化，植物也可以很容易地通过改变位置来适应剧烈变化的环境条件（WWF/MOF, 1989）。

提名地植物多样性的特点还有：

- 植物区系成分十分复杂

以卧龙为例，根据中国科学院吴征镒院士提出的划分标准，世界分布、热带分布、温带分布、特有分布等类型均有存在。

卧龙自然保护区的植物区系成分

区系类型	全 国		卧 龙	
	属数	%	属数	%
1. 世界分布	103	3.7	29	4.61
2. 泛热带分布	373	13.3	82	13.06
3. 热带美洲和热带亚洲间断分布	89	3.2	19	3.03
4. 旧大陆热带分布	163	5.8	16	2.55
5. 热带亚洲至热带大洋洲分布	143	5.1	16	2.55
6. 热带亚洲至热带非洲分布	151	5.4	15	2.4
7. 热带亚洲（印度—马来西亚）分布	543	19.4	39	6.21
8. 北温带分布	296	10.6	186	29.62
9. 东亚和北美洲间断分布	117	4.2	48	7.64
10. 旧大陆温带分布	157	5.6	34	5.41
11. 温带亚洲分布	63	2.2	25	3.98
12. 中亚分布	112	4.0	-	-
13. 东亚（东喜马拉雅—日本）分布	298	10.5	83	13.21
14. 中国特有分布	196	7.0	36	5.72
合 计	2 804	100	628	100

• 多样性生态类型

提名地有大量各种不同的生态系统类型。以植物生态类型为例，仅卧龙就有5个植被型组、15个植被型、39个群系组和69个群系。

• 典型垂直自然带谱

提名地区最高峰四姑娘山海拔6250米，最低点都江堰（提名地边缘的外侧）海拔582米。在如此短的距离里高差达5668米。这导致了显著的垂直带谱，可以划分为7个生物垂直带。依次为：

- 600 ~ 1800 m 亚热带山地常绿阔叶林带
- 1800 ~ 2400 m 亚热带山地常绿阔叶与落叶阔叶混交林带
- 2400 ~ 2800 m 暖温带山地针阔混交林带。这是从秋季到春季大熊猫的重要活动地带。
- 2800 ~ 3800 m 寒温带亚高山针叶林带。这是夏季大熊猫重要的取食区域。
- 3800 ~ 4400 m 亚寒带高山灌丛草甸带
- 5000 m 以上 极高山永久冰雪带

• 具有世界上最丰富和繁茂的高山植物区系之一

植物学家(Wilson, 1916; Baron, 1987)认为提名地可能是世界上高山植物物种最丰富和最繁茂的范例。每个遗产地单元发现的不同物种的数量和种类的丰富程度令人惊异。在卧龙自然保护区的巴朗山，几平方米的范围内就可以发现数十种有花植物种类。四川夏季不同寻常的湿润云团使得气候与世界上其他高山地区形成了鲜明对比，那些高山地区干旱、光照强烈的夏季很典型。提名地为“华西雨屏”的中心位置，其潮湿的气候更有助于保护植物的多样性，使其成为更新世冰期的避难所，并有利于物种的特化。

• 濒危物种的重要保护区

提名地已发现国家重点保护植物67种。如下表所列：

提名地国家重点保护野生植物

序号	中 名	拉 丁 名	国家重点保护野生植物名录(1999)	中国珍稀濒危保护植物名录(1980)
1	光叶蕨	<i>Cystoathyrium chinensis</i>	1	2
2	银杏	<i>Ginkgo biloba</i>	1	2
3	红豆杉	<i>Taxus chinensis</i>	1	
4	南方红豆杉	<i>Taxus chinensis</i> var. <i>mairei</i>	1	
5	珙桐	<i>Davidia involucrata</i>	1	1
6	光叶珙桐	<i>Davidia involucrata</i> var. <i>vilmoriniana</i>	1	2
7	独叶草	<i>Kingdonia uniflora</i>	1	2
8	伯乐树	<i>Bretschneidera sinensis</i>	1	2
9	扇蕨	<i>Neocheiropteris palmatopedata</i>	2	
10	中国蕨	<i>Sinopteris grevilleoides</i>	2	2
11	金毛狗	<i>Cibotium barometz</i>		2
12	莛子三尖杉	<i>Cephalotaxus oliveri</i>	2	2
13	岷江柏木	<i>Cupressus chengiana</i>	2	2
14	四川红杉	<i>Larix mastersiana</i>	2	2
15	油麦吊云杉	<i>Picea brachytyla</i> var. <i>complanata</i>	2	
16	大果青扦	<i>Picea neoveitchii</i>	2	
17	巴山榧树	<i>Torreya fargesii</i>	2	
18	芒苞草	<i>Acanthochlamys bracteata</i>	2	
19	梓叶槭	<i>Acer catalpifolium</i>	2	3
20	连香树	<i>Cercidiphyllum japonicum</i>	2	2
21	四川牡丹	<i>Paeonia szechuanica</i>		2
22	杜仲	<i>Eucommia ulmoides</i>		2
23	楠木	<i>Phoebe zhennan</i>	2	3
24	野大豆	<i>Glycine soja</i>	2	3
25	红豆树	<i>Ormosia hosiei</i>	2	
26	鹅掌楸	<i>Liriodendron chinense</i>	2	2
27	厚朴	<i>Magnolia officinalis</i>	2	3
28	园叶玉兰	<i>Magnolia sinensis</i>	2	3
29	西康玉兰	<i>Magnolia wilsonii</i>	2	3
30	峨眉含笑	<i>Michelia wilsonii</i>	2	2
31	水青树	<i>Tetracentron sinense</i>	2	2
32	红椿	<i>Toona ciliata</i>	2	3
33	星叶草	<i>Circaeaster agrestis</i>		2
34	异颖草	<i>Anisachne gracilis</i>	2	
35	短芒披碱草	<i>Elymus brevicastratus</i>	2	
36	无芒披碱草	<i>Elymus submuticus</i>	2	
37	樟树	<i>Cinnamomum camphora</i>	2	
38	油樟	<i>Cinnamomum longepaniculatum</i>	2	
39	润楠	<i>Machilus nanmu</i>	2	
40	红花绿绒蒿	<i>Meconopsis punicea</i>	2	
41	羽叶点地梅	<i>Pomatosace filocula</i>	2	
42	香果树	<i>Emmenopterys henryi</i>	2	2
43	川黄檗	<i>Phellodendron chinense</i>	2	
44	崖白菜	<i>Triebenophora rupestris</i>	2	
45	山莨菪	<i>Anisodus tanguticus</i>	2	
46	紫椴	<i>Tilia amurensis</i>	2	
47	虫草	<i>Cordyceps sinensis</i>	2	
48	松口磨(松茸)	<i>Tricholoma matsutake</i>	2	
49	榉榛	<i>Corylus chinensis</i>		3
50	白辛树	<i>Pterostyrax psilophyllus</i>		3
51	银叶桂	<i>Cinnamomum mairei</i>		3
52	延龄草	<i>Trillium tschonoskii</i>		3
53	羽叶丁香	<i>Syringa pinnatifolia</i>		3

续表

序号	中 名	拉 丁 名	国家重点保护野生植物名录(1999)	中国珍稀濒危保护植物名录(1980)
54	领春木	<i>Euptelea pleiospermum</i>		3
55	灰叶稠李	<i>Prunus grayana</i>		3
56	金钱槭	<i>Dipteronia sinensis</i>		3
57	箬竹	<i>Qiongzhusa tumidinosa</i>		3
58	桃儿七	<i>Sinopodophyllum emodi</i>		3
59	银鹊树	<i>Tapiscia sinensis</i>		3
60	黄连	<i>Coptis chinensis</i>		3
61	八角莲	<i>Dysosma versipellis</i>		3
62	天麻	<i>Gastrodia elata</i>		3
63	凹叶木兰	<i>Magnolia sargentiana</i>		3
64	麦吊云杉	<i>Picea brachytyla</i>		3
65	棕背杜鹃	<i>Rhododendron alutaceum</i>		3
66	大王杜鹃	<i>Rhododendron rex</i>		3
67	大叶柳	<i>Salix magnifica</i>		3

• 除单种和稀有种的科属外，还有丰富的特有种属

提名地属于中国植物区系中三大特有种群中心之一的川西—滇西北中心的北段，特有属、种的数目较多。裸子植物的银杏属 (*Ginkgo*) 与杉木属 (*Cunninghamia*)，双子叶植物的金钱槭属 (*Dipteronia*)、藤山柳属 (*Clematoclethra*)、羌活属 (*Notopterygium*)、毛冠菊属 (*Nannoglottis*)、紫菊属 (*Notoseris*)、华蟹甲草属 (*Sinacalia*)、车前紫草属 (*Sinojohnstonia*)、八角莲属 (*Dysosma*)、伯乐树属 (*Bretschneidera*)、珙桐属 (*Davidia*)、岩匙属 (*Berneuxia*)、杜仲属 (*Eucommia*)、四轮香属 (*Hanceola*)、异野芝麻属 (*Heterolamium*)、动蕊花属 (*Kinostemon*)、串果藤属 (*Sinofranchetia*)、喜树属 (*Camptotheca*)、星果树属 (*Asteropyrum*)、铁破锣属 (*Beesia*)、独叶草属 (*Kingdonia*)、香果树属 (*Emmenopterys*)、大血藤属 (*Sargentodoxa*)、四福花 (*Trtradoxia*) 与崖白菜属 (*Triaenophora*) 等，单子叶植物的巴山竹属 (*Bashania*) 与箬竹属 (*Qiongzhusa*) 等，分布广泛。本地特有属数超过 50 属以上，约占全国特有属的 20%。这种罕见的现象说明，本区生态非常有利于野生植物的生长和繁衍。

所列保护植物的多数是中国特有种。这些特有属、种的大多数起源古老，是系统进化中的独特植物。例如，原始类型的有独叶草属、杜仲属、八角莲属与梓叶槭、园叶玉兰、西康玉兰、峨眉含笑 (*Michelia wilsonii*)、棕背杜鹃 (*Rhododendron fitolacteam*) 等；单型、寡型的有银杏属、珙桐属、金钱槭属、伯乐属、连香树属等，发生于第三纪甚至侏罗纪或更早的地质时期。银杏类始现于晚古生代，中生代的侏罗纪发展最盛，白垩纪晚期突然衰退，现仅存 1 属 1 种，在提名地的二郎山有较大面积的分布，也可能是很久以前引入的。珙桐类始现于第三纪，在第四纪中期曾广布于世界各地，现仅存 1 属 1 种 1 变种，在提名地有大面积的自然分布。提名地是以珙桐、银杏为代表的中国特有孑遗种的集中分布区，象珙桐、伯乐树、连香树、香果树等还是第三纪古热带植物区系的重要组成部分。

提名地已发现 76 个稀有种属，如金钱槭、领春木 (*Euptelea*) 和动蕊花；36 个单种属，如香果树 (*Emmeopterys*)、串果藤和独丽花 (*Moneses*)；15 个特有单种属，如珙桐、水青树，占总特有种属数的 41.67%。另外，还有 22 个特有兰科种，如黄花白芨 (*Bletilla ochracea*)、短距虾脊兰 (*Calanthe arcuata*) 和长矩玉凤花 (*Habenaria davidii*)，占提名地兰科种属的 38.6%；杜鹃特有种 6 种。此外，还有 14 个特有裸子植物种属。

• 杜鹃多样性中心

区内有 95 种杜鹃, 比以杜鹃多样性闻名的东喜马拉雅地区的尼泊尔和不丹的种类总和还要多, 是中国和全球的杜鹃多样性中心之一。其中包括被《中国植物红皮书》列为渐危种的国家 3 级重点保护的棕背杜鹃与大王杜鹃 (*Rh. rex*) 以及提名地特有种卧龙杜鹃 (*Rh. wolongnesis*) 等 6 种。杜鹃花属中最原始的类群云锦杜鹃 (*Rh. fortunei*) 亚组有 12 种分布于本区, 占该亚种的 50%。

• 中国中部具有从永久性冰川到亚热带常绿森林连续分布的两个地点之一

中国中部地区有两个完整的垂直自然带谱, 从永久性冰川, 再通过高山植物、亚高山植物、山地混交林, 再往下为亚热带常绿阔叶林。一个为提名地, 另一个是四川西部的贡嘎山。

• 中医药的重要基因库之一

提名地是中国传统药用植物的重要来源和基因库。已知的当地药用植物有几百种, 其中许多是稀有濒危物种, 如天麻、贝母、龙胆和虫草。由于它们潜在的药用研究价值, 这些物种的保护对于这类重要自然资源的保护以及中医药文化都有着重要的意义。

• 西方园林的主要种子基地

英国著名植物学家威尔逊在英国园艺家协会的资助下曾将 30 吨植物种子带回英国, 多数产自提名地。他的《一个博物学家在中国西部》精彩地描述了他的经历。那些植物极大改变了欧洲的园艺发展, 实际上今天许多所谓经典的“英式”景观园林的植物是来自中国的。其中包括很多装饰灌木, 如杜鹃、木兰、连翘 (*Forsythia*)、碎鱼草 (*Buddleia*)、栒子 (*Cotoneaster*)、小檗 (*Berberis*)、竹子, 蕨类和大量花卉, 如百合、红牡丹、兰花、樱花、樱粟、杜鹃、紫苑和银莲花。1929 年, 威尔逊在车祸逝世前不久写了一本题名《中国, 园林之母》的书。

1.2.4 丰富的野生动物多样性和动物保护的优先地区

提名地区已知的野生动物, 有脊椎动物 542 种和昆虫 1 700 种。在脊椎动物中, 有兽类猴科、熊科、小熊猫科、大熊猫科等 25 科 109 种 (或亚种), 占四川兽类的 50% 和全国兽类的 20.5%; 鸟类鹰科、隼科、雉科、鹤科等 45 科 365 种 (或亚种), 占四川鸟类的 68%; 爬行类蛇蜥科、游蛇科等 9 科 32 种 (或亚种); 两栖类小鲵科、树蛙科等 8 科 22 种 (或亚种) 和鱼类鮡科、鲑科等 5 科 14 种。提名地是中国野生脊椎动物的集中分布区。在昆虫中, 有蜉蝣目 3 种、蜻蜓目 5 种、蜚蠊目 1 种、螳螂目 1 种、襀翅目 1 种、竹节目 2 种、直翅目 17 种、革翅目 3 种、同翅目 23 种、半翅目 52 种、鞘翅目 181 种、广翅目 1 种、脉翅目 3 种、毛翅目 4 种、翅鳞目 731 种、双翅目 33 种、和膜翅目 27 种。

• 区系成分

在动物区系上, 提名地处于东洋界与古北界交汇的中印亚界, 属横断山系东缘山地亚热带森林动物群向川西山原针叶林、灌丛草甸青藏高原动物群过渡。以兽类为例, 东洋界代表性科有特有科—大熊猫科、旧大陆热带—亚热带特有科—竹鼠与灵猫科、环球热带—亚热带的菊头蝠科等, 全北界代表性科有特有科—林跳鼠科、鼠兔科等。

• 垂直分带

提名地动物种群的垂直分带比较明显, 海拔 1000 ~ 2200 m 的常绿阔叶林、常绿阔叶与落叶阔叶混交林以南中国和东南亚热带—亚热带动物为主, 代表种如斑腿泛树蛙 (*Polypedates*

megacephalus)、水鹿 (*Muntiacus reevesi*) 等; 海拔 2200 ~ 3600 m 的针阔叶混交林与针叶林, 以横断山-喜马拉雅山动物为主, 代表种以血雉 (*Ithaginis cruentus geoffroyi*)、金丝猴 (*Rhinopithecus roxellana*)、大熊猫 (*Ailuropoda melanoleuca*)、小熊猫 (*Ailurus fulgens*) 等中国或四川特有种为多; 海拔 3600 m 以上的灌丛草甸与流石滩植被, 以山原动物为主, 代表种有雪鹑 (*Lerwa lerwa major*)、绿尾虹雉 (*Lophophorus thuyssii*)、岩羊 (*Pseudois nayaur*) 等。

• 濒危物种

已发现的 86 种重点保护野生动物中, 属于国家一级保护的有大熊猫、绿尾虹雉、金带喙凤蝶 (*Teinopapus imperialis*) 等 16 种; 属于国家二级保护的有小熊猫、秃鹫 (*Aegypius monachus*)、三尾褐凤蝶 (*Bhutanitis*) 和阿波罗绢蝶 (*Parnassius apollo*) 等 62 种; 四川省重点保护动物赤狐 (*Vulpes vulpes*) 等 8 种。因此, 提名地是中国稀濒野生脊椎动物和蝶类的集中分布区。

• 特有种

提名地的中国、四川特有种, 兽类有大熊猫、金丝猴、白唇鹿 (*Cervus albirostris*) 等, 鸟类有绿尾虹雉、宝兴歌鸲 (*Turdus mupinensis*)、宝兴鹇雀 (*Moupinis poecilotis*) 等, 两栖类有宝兴齿蟾 (*Oreolalax popei*)、四川湍蛙 (*Staurois mantzorum*)、宝兴泛树蛙 (*Polypedates dugritei*) 等, 鱼类有宝兴裸裂尻鱼 (*Schizopygopsis malacanthus baoxingensis*)、重口裂腹鱼 (*Schizothorax davidi*)、川陕哲罗鲑 (*Hache beekeri*) 等, 爬行类的半数为特有种, 有四川龙蜥 (*Japalura szechwanensis*)、美姑脊蛇 (*Achalinus meiguensis*) 等; 昆虫类大卫两栖甲是提名地特有种。

提名地重点保护野生动物

序 号	中 名	拉 丁 名	保护等级		
			中国保护	CITES	IUCN
1	金丝猴	<i>Rhinopithecus roxellana</i>	1	附录 I	VU
2	大熊猫	<i>Ailuropoda melanoleuca</i>	1	附录 I	EN
3	雪豹	<i>Panthera uncia</i>	1	附录 I	EN
4	豹	<i>Panthera pardus</i>	1	附录 I	
5	云豹	<i>Neofelis nebulosa</i>	1	附录 I	VU
6	白唇鹿	<i>Cervus albirostris</i>	1		VU
7	扭角羚	<i>Budorcas taxicolor</i>	1	附录 II	R
8	黑鹳	<i>Ciconia nigra</i>	1	附录 II	
9	玉带海雕	<i>Haliaeetus leucoryphus</i>	1	附录 II	R
10	白尾海雕	<i>Haliaeetus albicilla</i>	1	附录 I	VU
11	金雕	<i>Aquila chrysaetos</i>	1	附录 II	
12	胡兀鹫	<i>Gypaetus barbatus</i>	1	附录 II	
13	斑尾榛鸡	<i>Tetrastes sewerzowi</i>	1		
14	雉鹑	<i>Tetraophasis obscurus</i>	1		
15	绿尾虹雉	<i>Lophophorus thuyssii</i>	1	附录 I	EN
16	黑颈鹤	<i>Grus nigricollis</i>	1	附录 I	VU
17	猕猴	<i>Macaca mulatta</i>	2	附录 II	
18	藏酋猴	<i>Macaca thibetana</i>	2	附录 II	
19	豺	<i>Cuon alpinus</i>	2	附录 II	VU
20	马熊	<i>Ursus actos pruinosus</i>	2	附录 I	
21	黑熊	<i>Selenarctos thibetanus</i>	2	附录 I	VU
22	小熊猫	<i>Ailurus fulgens</i>	2	附录 II	EN
23	石貂	<i>Martes foina</i>	2	附录 III	

续表

序 号	中 名	拉 丁 名	保护级别		
			中国保护	CITES	IUCN
24	黄喉貂	<i>Martes flavigula</i>	2	附录III	
25	水獭	<i>Lutra lutra</i>	2	附录 I	
26	大灵猫	<i>Viverra zibetha</i>	2	附录III	
27	小灵猫	<i>Viverricula indica</i>	2	附录III	
28	斑灵狸	<i>Prionodon pardicolor</i>	2	附录 I	
29	金猫	<i>Felis temmincki</i>	2	附录 I	
30	兔狲	<i>Felis manul</i>	2	附录 II	
31	猞猁	<i>Lynx lynx</i>	2	附录 II	
32	林麝	<i>Moschus berezovskii</i>	2	附录 II	
33	马麝	<i>Moschus sifanicus</i>	2	附录 II	
34	马鹿	<i>Cervus elaphus</i>	2		
35	白臀鹿	<i>Cervus elaphus macneilli</i>	2		
36	水鹿	<i>Cervus unicolor</i>	2		
37	藏原羚	<i>Procapra picticaudata</i>	2		
38	鬣羚	<i>Capricornis sumatraensis</i>	2	附录 I	VU
39	斑羚	<i>Naemorhedus goral</i>	2	附录 I	VU
40	盘羊	<i>Ovis ammon</i>	2	附录 II	VU
41	岩羊	<i>Pseudois nayaur</i>	2		
42	鸳鸯	<i>Aix galericulata</i>	2		
43	普通鵟	<i>Buteo buteo</i>	2		
44	鸢	<i>Milvus korschun</i>	2		
45	苍鹰	<i>Accipiter gentilis</i>	2		
46	雀鹰	<i>Accipiter nisus</i>	2		
47	松雀鹰	<i>Accipiter virgatus</i>	2		
48	秃鹫	<i>Aegypius monachus</i>	2	附录 II	VU
49	乌鹫	<i>Aquila clanga</i>	2	附录 II	
50	灰背隼	<i>Falco columbarius</i>	2		
51	红隼	<i>Falco tinnunculus</i>	2	附录 II	
52	红脚隼	<i>Falco vespertinus</i>	2		
53	雪鹀	<i>Lerwa lerwa</i>	2		
54	血雉	<i>Ithaginis cruentus</i>	2		
55	红腹角雉	<i>Tragopan temminckii</i>	2		
56	藏马鸡	<i>Crossoptilon harmani</i>	2	附录 I	
57	白马鸡	<i>Crossoptilon crossoptilon</i>	2	附录 I	VU
58	蓝马鸡	<i>Crossoptilon auritum</i>	2		
59	勺鸡	<i>Pucrasia macrolopha</i>	2		
60	红腹锦鸡	<i>Chrysolophus pictus</i>	2		
61	白腹锦鸡	<i>Chrysolophus amherstiae</i>	2		
62	灰鹤	<i>Grus grus</i>	2		
63	楔尾绿鸠	<i>Treron sphenura</i>	2		
64	大胖胸鹦鹉	<i>Psittacula derbiana</i>	2		
65	领角鸮	<i>Otus bakkamoena</i>	2		
66	鸱鸺	<i>Bubo bubo</i>	2	附录 II	
67	林鸱鸺	<i>Bubo nipalensis</i>	2	附录 II	
68	纵纹腹小鸮	<i>Athene noctua</i>	2		
69	灰林鸮	<i>Strix aluco</i>	2		
70	长尾林鸮	<i>Strix uralensis</i>	2		
71	斑头鸺鹠	<i>Glaucidium cuculoides</i>	2		
72	领鸺鹠	<i>Glaucidium brodiei</i>	2		
73	大鲵	<i>Andrias davidianus</i>	2	附录 I	
74	川陕哲罗鲑	<i>Hucho bleekeri</i>	2		
75	拉步甲	<i>Carabus lafossei</i>	2		
76	彩臂金龟	<i>Cheirotonus gestroi</i>	2		

续表

序号	中 名	拉 丁 名	保护级别		
			中国保护	CITES	IUCN
77	三尾褐凤蝶	<i>Bhutanitis thaidina dongchuanensis</i>	2		
78	阿波罗绢蝶	<i>Parnassius apollo</i>	2		R
79	赤狐	<i>Vulpes vulpes</i>	3		
80	香鼬	<i>Mustela altaica</i>	3	附录III	
81	豹猫	<i>Felis bengalensis</i>	3	附录 I	
82	毛冠鹿	<i>Elaphodus cephalophus</i>	3		
83	大鼯鼠	<i>Petaurista petaurista</i>	3		
84	普通夜鹰	<i>Caprimulgus indicus jataka</i>	3		
85	鹰鹃	<i>Cuculus sparveroides</i>	3		
86	白喉针尾雨燕	<i>Hirundapus caudacutus</i>	3		

注：中国保护 1 级、2 级为国家重点保护，3 级为四川省重点保护。

CITES 濒危物种国际贸易公约组织 1995 年。

IUCN 国际自然与自然资源保护同盟 1994 年：EN 濒危种；VU 渐危种；R 稀有种。

• 某些特有鸟类如雉类的分布中心

ICBP（现称鸟类国际）通过对留鸟的全球分布分析，确定了 30 个特有鸟区（EBA），也就是若干鸟区相互重叠的地区。中国有 13 个特有鸟区，其中 2 个在提名地内，包含了大多数濒危的中国特有鸟。

提名地是某些特有鸟类的分布中心，如柳莺（*Phylloscopus*）、噪鹛（*Garrulax*）、朱雀（*Corpodacus*）和雉类。中国是公认的全球雉类多样性中心，有 63 个种。提名地包含了 16 个种，比已知的任何其他单独的地区都多。

• 中国最重要的哺乳类保护地区

对于哺乳类的保护，中国最重要的地区从青藏高原东缘森林带，通过四川西部到陕西南部 and 湖北西南部地区。这是中国许多珍贵和濒危动物的故乡，包括大熊猫、小熊猫、扭角羚、林麝、金丝猴和许多其它物种（MacKinnon et al, 1994）。在这个地带中，提名地是这些重要哺乳类最具代表性的地点。用已知的县级物种分布或生物地理区划聚类分析（Xie Yan, 2001, 2002）也证实了该地的重要性，并指出了汶川、宝兴、康定、天全、泸定、理县等县的重要性所在。

1.2.5 重要的生态服务功能

由于提名地位于长江上游，这些地区森林生态系统的改善对中国的经济有极其重要的作用。大约四分之一的中国人口居住在长江下游流域，或者依赖于流经三峡的水和产生的电力。因而大约 3 亿人民的生活受到流域成功或失败的影响。良好的保护意味着更可靠的水源、更好的电能供给、更好的防洪和更好的水利交通。保护不好则意味着更频繁、更严重的洪灾、水源短缺、水渠和灌溉系统淤积断流，以及内陆渔业的损失等。

在更具体的地方范围内，位于世界遗产区域内的山地将得到更大强度的生态旅游基础设施和保护管理投资，而且将增加当地老百姓的收入。他们的支持和合作对规划的成功与否十分重要。

1.3 具有 40 年开创性研究和保护活动的历史

20 世纪 60 年代，四川省人民政府即开始这个地区的大熊猫研究。位于海拔 2400 米的著名

的大熊猫研究站五一棚建立于1979年。从那时起,这里就一直进行研究,是对大熊猫持续研究时间最长的山地系统研究站之一。

研究包括运用无线电遥感技术开展的大熊猫、小熊猫和黑熊的破碎地带研究,长期对亚高山竹子的监测,森林砍伐后森林连续性和恢复的补充研究,以及对其它植物和动物的研究。

核桃坪中国保护大熊猫研究中心开展的大熊猫繁育实验研究进一步补充了五一棚的研究工作。该中心建立于1983年,其研究工作建立在远程感知和GIS技术支持的基础上。

卧龙和喇叭河自然保护区成立于1963年,是中国首批成立的自然保护区。除广东鼎湖山人与生物圈保护区(建立于1956年)外,在中国,提名地具有最长的保护活动历史和最丰富的保护区管理经验。

1.4 世界上最大和最成功的大熊猫圈养繁殖中心

卧龙核桃坪中国保护大熊猫研究中心是世界上最大和最成功的大熊猫圈养繁殖中心。这里有最大的圈养大熊猫种群数量,有最大的成功圈养出生数量。该中心的突出特点是它座落在该物种的自然栖息地,有很大的自然封闭区(2 hm²),动物可以进行比其他任何圈养站更自然的生命活动。

1.5 引人入胜的风景名胜区

提名地的自然风光有着森林覆盖的陡峭山谷、清澈的急流、多岩石的峭壁、广阔的高山草甸和四姑娘山的高耸冰川顶峰。还有奇异的淡水湖、壮丽的冰川风光。风景随季节而不断变化—冬季的冰柱和覆雪的地面,春季遍野的鲜花,夏季丰富的高山色彩,秋季绚丽的红叶以及全年繁茂的竹子。变幻的云雾环绕在峭壁或山谷。

已经确定了20多个风景区,其中每一个都有其独特的特点:

卧龙自然保护区银厂沟 云雾环抱山峰,幽谷深处古木参天,水流湍急。大熊猫为景区带来了更多情趣;

卧龙核桃坪中国保护大熊猫研究中心 设6个实验室,圈养48只大熊猫,是研究大熊猫的理想场所。游客可以看到圈养和户外活动的大熊猫;

卧龙自然保护区三江景区 以珙桐森林和水鹿等野生动物出没的亚高山湖泊景观著名,森林茂盛,景色奇秀;

四姑娘山风景名胜区长坪沟景区 千年古柏遮天蔽日,山风吹过,暗香涌动;落叶松林秋色金辉;

四姑娘山风景名胜区双桥沟景区 奇异的亚高山沙棘森林与群峰峭崖的组合,冰雪覆盖的群峰;

四姑娘山风景名胜区海子沟景区 冰蚀湖—亚高山草甸,湖上鱼与鹰上下翱翔,湖滨繁花似锦,四姑娘山主峰;

米亚罗风景区红叶景区 长127km,面积300 000 hm²,海拔1700~3400 m,317国道横贯其间。金秋10月,万山红遍,是国内最大的红叶景区;

米亚罗风景区毕棚沟景区 大熊猫生境、原始森林—野生动物、冰川雪山景观,融

已经单独被认为是著名的文化遗址,已被列入世界文化遗产地。宝兴和芦山还有其他的汉文化遗址,在提名地及其周围有早期居住人类地,也发现了2000多年前的汉代文化遗址。位于宝兴邓池沟的法式天主教堂完整地保存了独特的中西融合的文化形式。羌和藏民族以独特的建筑、服饰、语言、舞蹈、宗教和其他文化传统保存了其文化价值。

提名地的东北入口是都江堰市,以庙宇和水利工程著称。青城山是著名的道教胜地。这里

1.6 具有藏、羌民族文化、汉族寺庙、道教和清代天主教的历史遗迹

高山草原、湖泊与峡谷风光于一体;
草坡自然保护区 大熊猫生境、原始森林-野生动物景观,水色清秀,瀑布众多;
蜂桶寨自然保护区 大熊猫生境、原始森林-野生动物景观,大熊猫与金丝猴密度较高,四季景色秀丽,建有大熊猫等十余种珍稀动物的圈养场;
夹金山风景名胜区分夹金山景区 大熊猫生境、雪山、藏寨与藏族风情、红军长征徒步翻越大雪山纪念地景观;
夹金山风景名胜区分扑鸡沟景区 大熊猫生境、原始森林-野生动物、雪山景观,春夏秋冬景色俱佳;
夹金山风景名胜区分赶羊沟景区 大熊猫生境、野桂花原始森林-野生动物、峡谷景观,野桂花林面积约600 hm²,极其罕见。
夹金山风景名胜区分邓池沟清代天主教堂 建于1839年,建筑面积1560 m²,中式四合院布局,法式教堂装饰,因法国自然史学家P.A.戴维担任神甫期间,于1869年发现大熊猫而闻名于世。整个建筑保存完好,是宝兴县天主教的活动场所。
喇叭河自然保护区 大熊猫生境、原始森林-野生动物、雪山景观,扭角羚群、鹿群、猴群密度较高,可以直接观赏动物的野外活动;
二郎山风景名胜区分白沙河景区 大熊猫生境、原始森林-野生动物景观,融峡谷与品种繁多的杜鹃群丛于一体;
二郎山风景名胜区分二郎山景区 大熊猫生境、原始森林-野生动物、雪山景观,长20千米的珙桐优势森林长廊与数百公顷的银杏优势森林十分罕见;
灵鹫山-大雪峰风景名胜区分大雪峰景区 大熊猫生境、原始森林-野生动物、雪山冰川景观,大熊猫、鹿群、扭角羚群密度较高,杜鹃花与冬景极佳;
青城山-都江堰风景名胜区分青城山景区 大熊猫生境、原始森林-野生动物景观,天师洞等道教文化遗迹已列为世界文化遗产;
西岭雪山风景名胜区分后山景区 大熊猫生境、原始森林-野生动物景观,雪山景观,以森林“佛光”、红叶秋景与雪景闻名;
鸡冠山-九龙沟风景名胜区分鸡冠山景区 大熊猫生境、原始森林-野生动物景观,有罕见的溪谷瀑布群、奇异的峰崖、雄旷的亚高山草甸;
天台山风景名胜区分 大熊猫生境、丹霞地貌景观,竹林茂盛,景色秀丽;
金汤-孔玉自然保护区 大熊猫生境、原始森林-野生动物、亚高山草甸景观,有古代川藏茶马古道和红军长征遗迹。

2. 遗产地保护现状及面临的问题

2.1 保护现状

提名地中的卧龙和喇叭河自然保护区建于六十年代。之后区内又陆续建立了5个自然保护区(另2个自然保护区位于风景名胜区内)和9个风景名胜区,依照相应的保护管理条例,如“中华人民共和国自然保护区管理条例”和国务院“风景名胜区管理暂行条例”等进行管理。20世纪80年代中期以来,国家和四川省都颁布了野生动物保护法规,对稀濒野生动物实行了保护,并在许多县实施了禁猎。

1979年以来,四川省开展了广泛的国际合作,在提名地开展有关大熊猫和其他野生动植物的研究以及保护项目,其中历时最长的是与WWF进行的有关大熊猫研究和保护的合作,在全面调查基础上编制了《中国大熊猫及栖息地保护计划》(1989),并进一步发展成为《中国保护大熊猫及其栖息地工程》,于1993年经国务院批准实施。

自1999年全国天然林保护工程实施以来,四川全省实施了天然林禁伐,消除了对栖息地最主要的威胁。2000年以来,按照国家的战略要求,四川省又实施了退耕还林工程。天然林保护和退耕还林两项工程为恢复遭到破坏的大熊猫栖息地和生物多样性提供了极大的可能性。自2001年起,国家林业局开始实施全国野生动物保护和自然保护区工程,加大了对提名地内大熊猫、金丝猴等主要濒危物种的保护力度和资金投入,并将进一步扩大自然保护区的范围,提高现有保护区的有效性。现将提名地中各自然保护区和风景名胜区的情况简略介绍如下:

卧龙自然保护区 1963年建于汶川县境,主要保护大熊猫与金丝猴,为国家级自然保护区,设保护区管理局,已完成总体规划与主要基础设施建设,面积200 000 hm²,全部进入提名地。现有野生大熊猫约100只,是《中国大熊猫及其栖息地管理计划》与《中国保护大熊猫及其栖息地工程》项目的重点实验区。2000年旅游流量6万人次。

喇叭河自然保护区 1963年建于天全县境,主要保护扭角羚与大熊猫,为省级自然保护区,设保护区管理处,已完成总体规划和部分建设,面积23 400 hm²,全部进入提名地。现有大熊猫约12只,实施了《天然林保护工程》和《退耕还林工程》。2000年旅游流量0.3万人次。

蜂桶寨自然保护区 1975年建于宝兴县境,主要保护大熊猫,为国家级自然保护区,设保护区管理局,已完成总体规划和部分建设,面积39 000 hm²,全部进入提名地。现有大熊猫约40只,实施了《中国大熊猫及其栖息地管理计划》与《中国保护大熊猫及其栖息地工程》。2000年旅游流量0.6万人次。

青城山-都江堰风景名胜区 1982年建于都江堰市境,保护青城山道教文化遗存与景观生态系统、都江堰古代水利工程,为国家重点风景名胜区,设风景区管理局,已完成总体规划与建设,面积15 000 hm²。其青城山景区现有大熊猫约6~8只,进入提名地,实施了《天然林保护工程》和《退耕还林工程》。2000年旅游流量40万人次。

鸡冠山-九龙沟风景名胜区 1986年建于崇州市境,为省级风景名胜区(含鞍子河省级自然保护区),设风景区管理局,已完成总体规划与部分建设,面积39 400 hm²,大部分进入提名地。现有大熊猫约15只,实施了《天然林保护工程》和《退耕还林工程》。2000年旅游流量8万人次。

天台山风景名胜区 1989年建于邛崃市境,保护景观生态系统,为省级风景名胜区,设风景区管理局,已完成总体规划与部分建设,面积21 000 hm²,全部进入提名地外围保护区。现有大熊猫4~6只,实施了《天然林保护工程》和《退耕还林工程》。

黑水河自然保护区 1993年建于芦山与大邑县境,主要保护大熊猫,为省级自然保护区,由两县林业局共同管理,尚未规划与建设,面积31 800 hm²,全部进入提名地。现有大熊猫约25只,实施了《天然林保护工程》和《退耕还林工程》。

四姑娘山风景名胜区 1994年建于小金县境,保护景观生态系统,为国家重点风景名胜区,设风景区管理局,已完成总体规划和部分建设,面积45 000 hm²,全部进入提名地。70年代有大熊猫分布,是雪豹、绿尾虹雉等的集中分布区,实施了《天然林保护工程》和《退耕还林工程》。2000年旅游流量6.4万人次。

西岭雪山风景名胜区 1994年建于大邑县境,为国家重点风景名胜区,设风景区管理局,已完成总体规划与基本建设,面积48 300 hm²。尚未开发的后山景区进入提名地。现有大熊猫约20只,实施了《天然林保护工程》和《退耕还林工程》。

夹金山风景名胜区 1995年建于宝兴县境内,保护大熊猫景观生态系统,为省级风景名胜区,由县建设环保旅游局管理,已完成总体规划,尚未建设,面积127 500 hm²,绝大部分进入提名地。现有大熊猫约100只,实施了《天然林保护工程》和《退耕还林工程》。

米亚罗风景名胜区 1995年建于理县境,保护景观生态系统,为省级风景名胜区(含米亚罗省级自然保护区),设风景区管理局,已完成总体规划与部分建设,面积368 800 hm²。2000年在毕棚沟景区发现大熊猫2只,毕棚沟景区与红叶景区的部分进入提名地,实施了《天然林保护工程》和《退耕还林工程》。

金汤-孔玉自然保护区 1995年建于康定县境,保护野生动物与生态系统,为省级自然保护区,由县林业局管理,已完成总体规划,尚未建设,面积120 000 hm²,大部进入提名地。现有大熊猫约10只,实施了《天然林保护工程》和《退耕还林工程》。

四姑娘山自然保护区 1996年建于小金县境,保护生态系统,为国家级自然保护区,设保护区管理局,已完成总体规划与部分建设,面积130 000 hm²,部分进入提名地。70年代有大熊猫分布,是雪豹、绿尾虹雉等的分布区,实施了《天然林保护工程》和《退耕还林工程》。

灵鹫山-大雪峰风景名胜区 1999年建于芦山县境内,保护景观生态系统,为省级风景名胜区,由县建设局管理,尚未规划与建设,面积30 000 hm²。其大雪峰景区有大熊猫约25只,进入提名地,实施了《天然林保护工程》和《退耕还林工程》。

二郎山风景名胜区 2000年建于天全县境内,保护景观生态系统,为省级风景名胜区,由县建设环保旅游局管理,尚未规划与建设,面积126 000 hm²,核心景区进入提名地。现有大熊猫约23只,实施了《天然林保护工程》和《退耕还林工程》。

草坡自然保护区 2000年建于汶川县境,保护大熊猫,为省级自然保护区,设保护区管理局,尚未规划与建设,面积55 678 hm²,大部分进入提名地。现有大熊猫约10只,实施了《天然林保护工程》和《退耕还林工程》。

2.2 社会经济简况

提名地所涉及的阿坝藏族羌族自治州、雅安市、成都市和甘孜州族自治州的 12 个县, 2000 年的总人口为 313 万人。提名地处在各县辖区的边缘区域, 是藏族、羌族、回族、彝族等少数民族的聚居区。提名地范围内 2000 年人口为 211320 人, 在核心区有居民 260 户、1 020 人, 保护区有居民 20 300 人。主要包括汶川县卧龙乡全乡与耿达乡的一部分 4 900 人, 小金县日隆乡的一部分 500 人, 宝兴县硃砂乡全乡 5 030 人与永富乡的大部分 1 200 人, 芦山县的太平、中林、大川镇(乡)的一部分 650 人, 天全县的小河乡、两路乡的一部分 180 人, 都江堰市的泰安乡、青城山镇的一部分 700 人。

提名地人口中少数民族约占 60%。

提名地区目前的人均国内生产总值和农村居民纯收入水平(四川省统计局, 2001)如下:

	2000 年人均国内生产总值 (人均 GDP)	2000 年农村居民人均纯收入
成都市	13 020 元	2 926 元
雅安市	4 949 元	1 909 元
阿坝州	4 288 元	1 191 元
甘孜州	2 797 元	733 元

上面的数据是包含城市和工业在内的大区域的平均值, 处在政区边缘的提名地的实际经济水平则要低得多。以上数据表明, 提名地内群众的生活仍然非常贫困尤其是地处偏远的阿坝州和甘孜州。

2.3 面临的环境压力和威胁

2.3.1 旅游发展

目前, 除青城山景区的前山世界文化遗产景区达到 40 万人次/年的客流量和卧龙自然保护区的 6 万人次/年外, 提名地内其它风景区和自然保护区的游客量很小。预计提名地被正式列入世界自然遗产名录后, 旅游流量会有较大的增长。在天然林保护工程实施停伐后, 许多地方的财政和社区群众收入明显下降, 寻找替代经济来源的压力很大。地方政府和群众往往对发展旅游寄予很大的期望。但是已经开发旅游的一些地方普遍出现了游客人数猛增, 旅馆、道路等设施的建设无序或对环境带来直接的破坏, 游客带来的垃圾和污水管理不善等一系列问题对环境 and 野生动物直接的负面影响。卧龙自然保护区核桃坪旅馆餐馆等设施的建设曾经出现缺乏规划的问题, 巴郎山植被遭游人踩踏、摘采等。目前卧龙正在大力整顿区内旅游的管理, 对设施建设进行规范。旅游的规范管理将是遗产地保护管理的一项主要任务。

2.3.2 偷猎

提名地内和周边生活的一些当地农民有时偷猎, 设置陷阱捕捉经济价值高的动物如麝, 但是这些陷阱也常常杀死毛冠鹿、麂, 偶尔也误伤黑熊和大熊猫。杀死大熊猫的人总是把兽皮藏

起来，寻找收购珍品的买主。进行这种皮货贸易的案件仍有发生，但在90年代以后大大下降。对捕杀或贸易国家保护野生动物的判刑是极其严格的，猎杀大熊猫和贩卖大熊猫皮的罪犯常常被判处重刑。

然而消灭偷猎现象除了严格的法律，还需要制定规划来捣毁陷阱，加强森林巡护，增加和地方社区的交流，引导他们开展对环境影响较小的生产生活活动。

2.3.3 采矿活动

提名地及外围保护区有一些采石场、多种金属矿场、煤矿和化工原料矿场。这些矿场设备简陋，技术粗糙，给一些地区的森林植被和环境带来了严重破坏。宝兴县有3个较大规模的大理石采石场，采矿活动产生了水、噪音和灰尘污染，以及破坏植被层和废物遗弃等问题。

2.3.4 冶炼化工污染

近年在大熊猫栖息地入口处附近兴建了多处冶炼厂、硫酸厂，工艺落后，规模虽小而对大气、水体与土壤的污染明显，对大熊猫的生存环境构成威胁。

2.3.5 人口增长

提名地是中国少数民族聚居区，居民以藏族、羌族为主。卧龙保护区1975年有421户2560人，而1995年则增长到904户4260人。处在夹金山脉腹地的宝兴县硃砂乡，1957年为3000人，2000年增长到5030人。人口的增长使当地居民对自然资源的需求也随之增加。

2.3.6 垦荒与过度放牧

由于人口的增长，农耕从谷地向谷坡发展，一些大熊猫栖息地的边缘地带渐被开垦，栖息地内的农耕地与牧场形成的天窗亦日渐扩大，导致大熊猫活动的下限海拔上升和活动范围进一步缩小。此外，提名地的高山草甸广泛用于放牧。在卧龙自然保护区的高山草甸上尤其明显。一些地区一直存在过度放牧和高山草场退化现象。一定量家养动物的放牧可能对维持天然植被状况是必须的。遗产管理的主要任务是要确保放牧水平稳定在这些区域的自然承载能力范围内。

2.3.7 森林采伐

邛崃山脉的森林资源丰富，是成都平原木材的长期供应地。其东坡山麓地带的森林早已采伐殆尽，最近40年的采伐推进到亚高山地带。主要支流都经过一定程度采伐，导致大熊猫栖息地被分割。森林砍伐曾经是提名地内对栖息地的最主要威胁，这种状况直至1999年四川省人民政府决定全面停止天然林砍伐和国家实施天然林保护工程，才得以根本扭转。

2.3.8 药用植物的采集

采集药用植物对某些珍稀物种的生存是一种威胁。此外，采集者在保护区内的活动，特别是在带有猎狗的情况下，会对害羞的大熊猫和幼仔造成极为严重的干扰，迫使它们放弃适宜的生态环境。

2.3.9 引种外来植物

主管部门提倡并鼓励在提名地内的退化地区植树造林,但同时必须严格控制和规范以确保所种物种是合适的本地物种。少数地区引种非本地物种,包括日本落叶松、松树 (*Pinus*)、柳杉 (*Gyptomeria*) 以及其他一些树种、灌木和花卉植物。应该在提名地内停止外来种引种,以避免外来物种(包括国内其他地区的物种)可能通过外来入侵种扩散的形式给本地动植物区系带来威胁。为了满足种植的需要,建立足够的乡土种子苗圃是十分必要的。

2.3.10 基础设施的建设

从卧龙自然保护区到阿坝藏族自治州和成都的公路横穿提名地。这是一条比较繁忙的客货运输线,给路边植物和野生动物带来了一定影响。为了降低影响程度,将在每年大熊猫发情交配期的3月~6月,实行夜间(每天17时~次日7时)关闭公路。

提名地内还有输电线路、水渠和多个水电站。这些可以作为基础设施,适当地使用和维护。遗产主管部门应该确保所有在遗产地内建设必要基础设施的设计和管理尽可能少地影响自然环境,任何不必要的、对环境有较大影响的设施必须禁止建设或予以拆除。

2.3.11 关于捕捉大熊猫

四川人民对大熊猫非常热爱和关心。申报世界遗产文本的附件3列举了提名地区在过去20年中救助大熊猫的情况。被救助的47只大熊猫中(不包括经监护自行归隐的25只),有25只在恢复健康后被放归自然,21只留卧龙中国大熊猫保护中心、成都大熊猫繁育研究基地或转移到国内外的一些动物园,1只重病患者抢救无效死亡(另有7只在野外发现的尸体,经验尸属自然死亡)。尽管多数适时和适地地送回野外,但圈养的数量仍占被救助数量的近半数的比例。结果既减少自然状况下的种群数量,也给圈养地增加了压力。

在许多情况下这些救助行为是必要的,但也存在不了解大熊猫的生活习性而误捉,和极少数为奖赏而捕捉健康大熊猫的情况。为了避免这种情况的发生,林业部于1988年停止了奖励资金,并于1989年专门发布了有关抢救大熊猫的严格规定。目前圈养的大熊猫数量已经足够维持健康的圈养种群。不应该为这个目的再继续从野外捕捉大熊猫。圈养种群应该采取有效的繁殖措施,保证种群的自我维持,并积极实施圈养繁殖的大熊猫放归到野外的项目。

2.3.12 保护区管理的能力不足

尽管国家和主管部门在建立自然保护区和风景区上做出了极大的努力,但大多数保护区仍存在资金缺乏、能力不足的问题,因而影响了管理的有效性。作为自然遗产地最基本的单元,提高自然保护区和风景名胜区管理的有效性也是遗产地管理的主要任务之一。

提名地区的经济很不发达,上述为改变贫困状况而出现的与大熊猫争地、争夺生存空间的结果,导致大熊猫种群栖息地的岛屿化,国家制订的自然资源保护法律,在一定程度上受到地方经济发展的冲击。国家的退耕还林和天然林保护计划可以提供一定的经费补偿,但是,真正解决问题还需要大量的资金投入,被列入世界自然遗产可以帮助鼓励和吸引资金的投入。

2.4 自然灾害

提名地处在高山峡谷区域,环境条件复杂,自然灾害比较频繁。地震、洪水、泥石流与滑坡、森林火灾以及箭竹开花枯死是主要灾害。

2.4.1 地震

提名地处在我国西部南北地震带上,属强震活动区。历史上发生过3次6级以上地震:1927年9月的6.5级地震,震中位于喇叭河自然保护区的北端;1941年6月21日6.0级地震,震中位于喇叭河自然保护区南端西侧;1970年2月24日6.25级地震,震中位于大雪峰景区东南缘。

2.4.2 洪水

夹金山脉地区24小时降水可达150 mm、72小时降水可达220 mm,形成大洪水的机率为年均1.5次。1966年7月27日至8月4日,宝兴县境内普降暴雨,大洪水摧毁盐井区政府所在地的全部房屋与耕地。

2.4.3 泥石流与滑坡

提名地属泥石流、滑坡的中度危险区,但分布很不均衡。1964年7月8日宝兴县邓池沟暴雨引发泥石流,造成29人死亡,两个自然村被迫搬迁;四姑娘山地区在最近的40年中曾发生不同程度破坏性的泥石流10余次。

2.4.4 森林火灾

随着国家森林保护法规的贯彻,最近30年中未发生大面积森林火灾,但山区农民垦荒烧地与烧灰积肥所引发的小范围森林火险时有发生。严防森林火灾仍是遗产管理的一项重要工作。

2.4.5 主食竹开花枯死

冷箭竹是大熊猫的主食竹之一。80年代初发生的大面积冷箭竹开花枯死曾造成一批大熊猫饿死。据调查,1983年提名地冷箭竹开花面积达60%以上,在重灾区的卧龙与宝兴县西北部的扑鸡沟一带达95%,海拔2300~3500 m除小块面积未开花外,几乎全部开花结实并枯死。这一事件曾引起了媒体的广泛报道。尽管竹子开花是竹子正常生理周期的一部分,且大多数大熊猫栖息地生长着两种或以上的竹子,如生长在卧龙的冷箭竹和缺苞箭竹,然而由于大熊猫栖息地已经出现了破碎化,竹子开花有可能在孤立的小片栖息地给大熊猫带来灾难。因此,减少竹子开花对野生大熊猫种群产生不利影响的最佳对策是确保栖息地的连接和通道,防止孤立小种群的形成。因此,保护大熊猫栖息地的完整,重建栖息地片段间的连接是遗产地管理的一项核心工作。

3. 遗产地保护管理对策

本规划力求做到各主要责任相关者的参与。以下政府机构和部门参与了本规划的制订过程：省建设厅、省林业厅、省计委、省环保局、省国土资源厅、省旅游局、雅安市政府、成都市政府、阿坝州政府、甘孜州政府、提名地各自然保护区和风景区及所涉及的县政府等。这些部门都分别签署了有关的确认文件。

3.1 保护管理的目标

3.1.1 总目标(长远目标)

使自然遗产地中以大熊猫为代表的生物多样性和自然生态系统得到有效保护,使区内人民生活和社会经济发展与自然和谐。

3.1.2 具体目标

- 大熊猫种群和栖息地的有效保护,使这个“旗舰物种”在遗产地长久地生存、繁衍并发展;
- 遗产地内具有全球重要性的稀有濒危物种和生物多样性以及景观和地貌特征的有效保护;
- 长江上游水源涵养地和森林生态系统的有效保护;
- 区内丰富多样的文化遗产的保护和发扬;
- 遗产地内社区的可持续发展—减少发展活动对环境的压力,开展管理良好的、可持续的生态旅游和其他于环境无害的生计活动;
- 公众保护意识的提高和对保护行动的参与—使遗产地成为一个教育和宣传的基地。

3.2 保护管理的体制

3.2.1 对遗产地实行功能区划管理

• 功能区划的原则

为了保证遗产地管理的可行性和有效性,依照《四川省世界遗产保护条例》的规定对所提名的遗产地进行了功能区划,以便分区、有针对性地进行管理。所划分的区域有如下类型:遗产地分为核心区(Core Zone)和保护区(Buffer Zone);遗产地周边又限定了外围保护区(Transitional Zone)。

在划定边界时考虑了以下原则:

- 1) 遗产地的边界主要考虑覆盖邛崃山脉大熊猫分布区和重要、特殊的自然生态景观。
- 2) 遗产地核心区是：
 - 大熊猫的集中分布区；
 - 保存较完整的现有大熊猫栖息地；
 - 生物多样性的集中分布区和重要物种的模式标本产地；
 - 保留相对完好的原生生态系统和自然景观；
 - 人类活动稀疏，居民人口密度小于 0.2 人 /km²；
 - 尽可能地包括自然保护区和风景名胜区的核心区。
- 3) 遗产地保护区是核心区以外的遗产地部分，人口密度小于 4.9 人 /km²。
- 4) 遗产地外围保护区是为了确保遗产地的保护而需要控制的区域。

如此划定的面积为：

世界遗产提名地面积 9 510 km²，其中核心区 5 370 km²，保护区 4 140 km²。

世界遗产提名地外围保护区面积 5 290 km²。

提名地及其外围保护区面积的政区分布如下表：

提名世界自然遗产地的政区分布

政 区		世界遗产提名地 (hm ²)	核心区 (hm ²)	保护区 (hm ²)	外围保护区 (hm ²)
阿坝州	汶川县 (含卧龙特区)	233 000 (200 000)	189 000 (172 000)	44 000 (28 000)	53 000
	小金县	98 000	7 000	91 000	154 000
	理 县	82 000	4 000	78 000	46 000
	小 计	413 000	200 000	213 000	253 000
雅安市	宝兴县	232 000	178 000	54 000	74 000
	天全县	97 000	63 000	34 000	29 000
	芦山县	58 000	40 000	18 000	40 000
	小 计	387 000	281 000	106 000	143 000
成都市	都江堰市	16 000	4 000	12 000	9 000
	崇州市	20 000	11 000	9 000	17 000
	大邑县	15 000	10 000	5 000	25 000
	邛崃县	0	0	0	21 000
	小 计	51 000	25 000	26 000	72 000
甘孜州	康定县	93 000	31 000	62 000	53 000
	泸定县	7 000	0	7 000	8 000
	小 计	100 000	31 000	69 000	61 000
合 计		951 000	537 000	414 000	529 000

提名世界自然遗产保护区的遗产地单元分布

政区	遗产地单元	世界遗产提名地 (hm ²)			外围保护区 (hm ²)
		小计	核心区	保护区	
阿坝藏族羌族自治州	卧龙国家级自然保护区	200 000	172 000	28 000	-
	四姑娘山 (国家级) 风景名胜区	45 000	7 000	38 000	-
	四姑娘山国家级自然保护区	53 000	-	53 000	154 000
	米亚罗 (省级) 风景名胜区 (毕棚沟景区, 红叶景区)	82 000	4 000	78 000	46 000
	草坡省级自然保护区	33 000	17 000	16 000	53 000
雅安市	蜂桶寨国家级自然保护区	54 000	34 000	20 000	-
	夹金山 (省级) 风景名胜区	178 000	144 000	34 000	74 000
	喇叭河省级自然保护区	24 000	20 000	4 000	-
	二郎山 (省级) 风景名胜区	73 000	43 000	30 000	29 000
	黑水河省级自然保护区	37 000	26 000	11 000	-
	灵鹫山—大雪峰 (省级) 风景名胜区	21 000	14 000	7 000	40 000
成都市	青城山—都江堰 (国家级) 风景名胜区	16 000	4 000	12 000	9 000
	鸡冠山—九龙沟 (省级) 风景名胜区	20 000	11 000	9 000	17 000
	西岭雪山 (国家级) 风景名胜区	15 000	10 000	5 000	25 000
	天台山 (省级) 风景名胜区	-	-	-	21 000
甘孜藏族自治州	金汤—孔玉省级自然保护区	93 000	31 000	62 000	53 000
	岚安 (拟建省级) 风景名胜区	7 000	-	7 000	8 000
合 计		951 000	537 000	414 000	529 000

提名世界自然遗产保护区在各县的百分比

序号	各县总面积与人口			核心区		提名地		外围保护区		提名地+外围保护区	
	县别	km ²	万人	Km ²	%	km ²	%	km ²	%	km ²	%
1	宝兴	3 114	5.5	1 780	57	2 320	75	740	23	3 060	98
2	汶川	4 083	11.0	1 890	46	2 330	57	530	13	2 860	70
3	芦山	1 193	12.3	400	34	580	49	400	34	980	82
4	天全	2 390	14.3	630	26	970	41	290	12	1 260	53
5	崇州	1 090	64.6	110	10	200	18	170	16	370	34
6	大邑	1 338	49.6	100	7	150	11	250	19	400	30
7	都江堰	1 208	59.4	40	3	160	13	90	7	250	21
8	康定	11 423	10.8	310	3	930	8	530	5	1 460	13
9	理县	4 313	4.4	40	1	820	19	460	11	1 280	30
10	小金	5 583	7.7	70	1	980	18	1 540	28	2 520	45
11	泸定	2 165	7.7	-	-	70	3	80	4	150	7
12	邛崃	1 378	64.0	-	-	-	-	210	15	210	15

• 功能区管理的准则

遗产地的功能区划及其保护和管理遵循下列法规：

《四川省世界遗产保护条例》(四川省第九届人民代表大会常务委员会第 27 次会议通过, 2002 年 1 月 18 日公布, 2002 年 4 月 1 日起施行)。

《中华人民共和国自然保护区条例》(中华人民共和国国务院令第 167 号, 1994 年 10 月 9 日公布, 1994 年 12 月 1 日起施行);

《四川省自然保护区管理条例》(四川省第九届人民代表大会常务委员会第 11 次会议通过, 1999 年 10 月 14 日公布, 2000 年 1 月 1 日起施行);

《风景名胜区管理暂行条例》(1985 年 6 月 17 日国务院发布);

《四川省风景名胜区管理条例》(四川省人民代表大会常务委员会第 9 次会议通过, 1994 年

5月28日公布施行)；

《中华人民共和国国家标准：风景名胜区规划规范》(GB 50298-1999，国家质量技术监督局、中华人民共和国建设部1999年11月10日联合发布，2000年1月1日起施行)。

各功能区的管理还应遵循下列原则：

核心区 不允许任何目的的砍伐、狩猎、烧山、采集、居所开发、采矿和工业生产活动；不允许新建公路、大中型水利工程等基础设施和扩建已有基础设施；不允许大众旅游进入核心区；放牧只允许在指定范围的高山草甸上，以起到维护高山草甸的作用；科学研究应限制在非破坏性的采集、观察和监测上。在废弃的耕地上应注重栖息地的恢复；已有的矿区和污染性工业应关闭；对区内的居民提供优惠的条件以鼓励其自愿向区外移民。

保护区 因有人类的居住而允许有限制的人为活动。在此区域内农业不应再扩张，所有坡度大于25°的农业用地应采取人工促进自然更新的做法尽快恢复栖息地，重建大熊猫种群的通道；道路和其他基础设施的建设应严格控制，如必需修建时应进行严格的、科学的环境评估和监测；可开展旅游，但必须将游客的数量控制在环境容量以内，并及时监测旅游对环境的影响；区内居民对自然资源的依赖应通过寻找替代来源的方式逐渐减少；已有的矿区和污染性工业应逐渐关闭。

外围保护区 位于提名地之外，但大多数地区仍位于现有保护区和风景区之内，其主题依然是保护。在此区内不应允许打猎、烧山等活动；对森林资源的利用必须建立可持续的机制；坡度25°以上的耕地应按照现行政策的要求退耕还林；不允许新建对环境有害的工业和矿区，已有的要逐步关闭；大中型基础设施建设必须进行严格的环境评估；开展旅游时应对游客人数进行监控，最大限度地减少他们对环境的负面影响。

3.2.2 管理机制

提名地地涵盖2州2市12县的地域，包括由林业、环保和建设部门主管的16个遗产地单元，遗产地的管理涉及多部门的协调和统一。四川省政府为此成立了一个跨部门和机构的世界遗产申报领导小组，并在省建设厅下设工作办公室。为了确保遗产地的有效管理，需要进一步理顺和明确遗产地管理的机制。

1)在世界遗产申报领导小组的基础上成立由主管副省长牵头的“四川省世界遗产管理委员会”，成员包括省建设厅、文化厅、林业厅、环保局等相关部门、以及遗产地所在地的州或市政府的代表，具有足够的行政权威性。

2)四川省世界遗产管理办公室是该委员会的执行机构，挂在省建设厅。

3)该委员会还将设立一个多学科的专家委员会，以确保管理的科学性。

4)遗产管理委员会和办公室的职责主要有以下几方面：

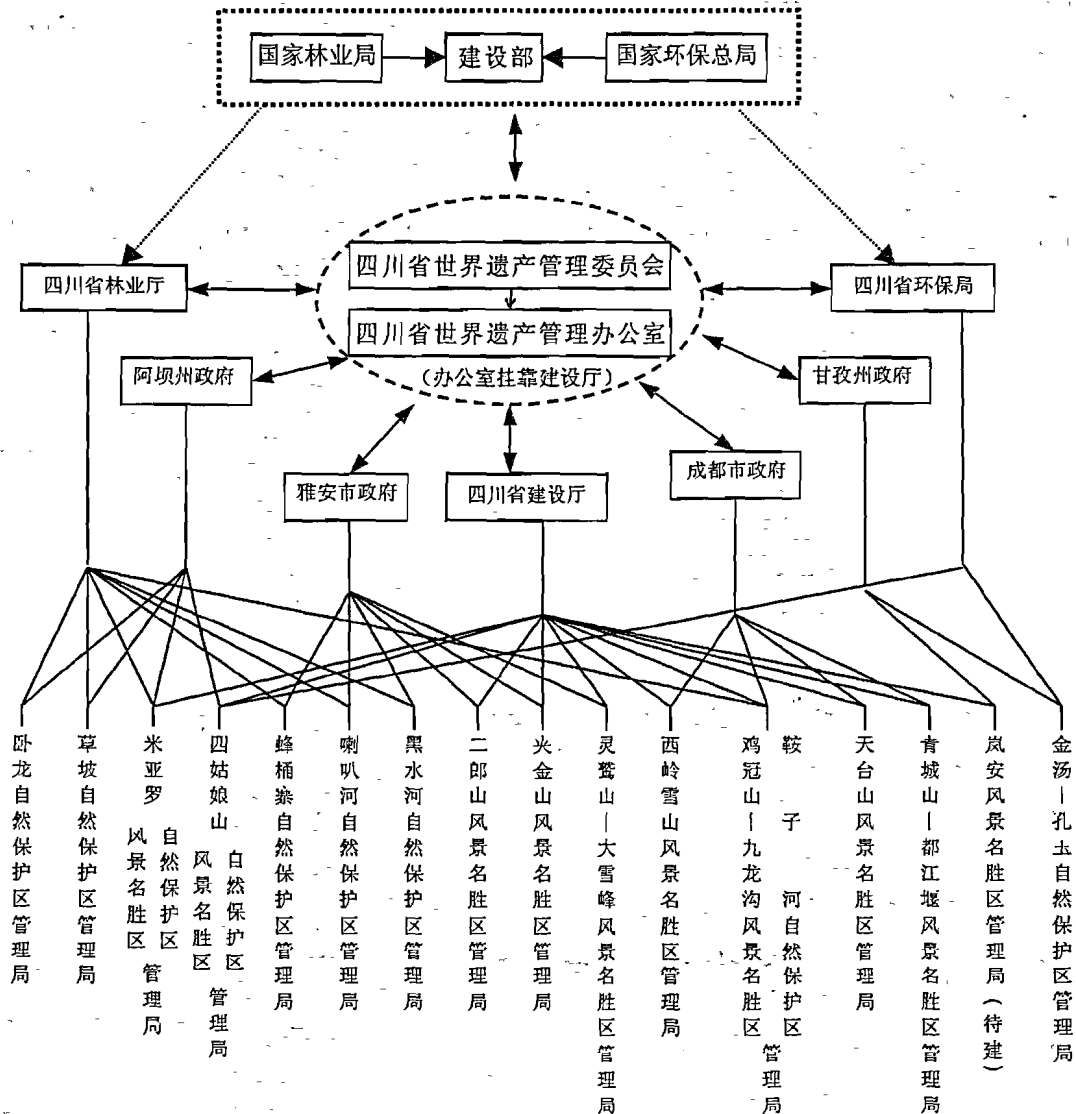
- 依靠现有管理体系，对遗产地的管理提出综合和统一的要求，建立机制，保证部门间定期的交流和协作，并协调遗产地保护与经济社会发展部门之间协商，出台必要的政策、管理原则和法规；

- 负责协调对遗产地持续的监测和定期评估。监测和评估应保证综合性、独立性和科学性；

- 组织编制和实施遗产地保护规划。

5) 遗产地管理的单元是自然保护区和风景名胜区。各保护区依照现有的管理体制，在行业上服从其主管部门的管理，在社会行政事务上服从所在地州、市和县人民政府的领导，因此，各主管部门在管理上的责任和权限不变。世界遗产地建立后各部门在操作上与以往的主要不同，体现在按照世界遗产地管理的要求增强跨部门的协作和对遗产地的保护监测。

6) 世界自然遗产管理的机制图解如下：



3.3 遗产地保护管理项目活动

以下列出的项目内容一些在计划中，一些已进行，由各主管部门负责。我们的目的是把遗产地内开展的项目协调起来，使之向共同的目标努力，以获得最大的效益，避免重复。

3.3.1 管理项目

保护区扩建 结合省政府批准的“四川省野生动植物保护及自然保护区建设工程”，扩大提名地中自然保护区的面积。有的风景名胜区也要按照世界遗产保护的要求，扩大保护范围。

遗产地单元的有效管理和保护 结合各自然保护区和风景区已有的保护管理框架和总体规划，在遗产地单元内按照遗产地的要求确定和调整具体的保护目标和措施，加强执法，制订各遗产地单元的管理计划并进行实施。

实施大熊猫等重点濒危动植物的保护计划 这是四川省野生动植物保护及自然保护区建设工程的一部分，由省林业厅牵头，已列入国家计划。

恢复栖息地，保护和重建大熊猫走廊 结合现有的国家政策，如天然林保护工程和退耕还林工程，把25°以上的坡耕地按照大熊猫栖息地的要素恢复其生境，在栖息地的关键连接地带加大保护力度，或者重新建立栖息地的连接。

特别要注意维护大熊猫分布区里脆弱的瓶颈或通道的畅通。通过卫星遥感图片和野外调查，特别是最近的第三次大熊猫调查，这些通道已经被识别。这些通道不仅为不同山谷地带孤立的大熊猫亚种群之间建立了联系，更为重要的是维持大熊猫整个种群之间的完整性。当成年雄性大熊猫不能在出生地获得统治地位时可以转移到近邻种群以获得更开阔的雄性领地。同时，这些通道对减少由于竹子大面积开花造成的损失也是极为重要的。大熊猫通过安全通道，进入近邻山谷，那里的竹子可能种类不同，而且更为丰富。特别要注意维持和保护通道的植被和竹子的覆盖率以便为大熊猫从一个地点转移到另一个地点提供条件。在由于砍伐或农业活动造成的通道被蚕食的地方，应采取积极的栖息地保护措施，包括种植郁闭度高的树种和适宜的竹子种类以形成下层林木。要尽可能恢复遗产地和外围缓冲地带的自然植被，退耕所有核心区内的坡耕地，并将废弃的农田恢复为自然植被，恢复被砍伐的林地，根除可能立足于当地自然植被的外来的入侵物种。要采取积极的行动保护栖息地，避免由于自然或人为因素而导致泥石流和滑坡。

治理和减少遗产地内的采矿和工业污染 核心区的矿区与污染型企业要立即关闭；在保护区内的此类企业也要逐渐关闭。在外围保护区，要求对矿区与工业进行严格的监测，对于其中对环境造成危害的企业将分期关闭或整治。被采矿破坏的栖息地要依情况进行恢复。具体实施办法在本规划的准备阶段已由四川省世界遗产管理办公室同当地政府协商。

严格控制遗产地内的人口 介绍健康教育与计划生育的工具，对于居住在核心区内的居民，将建立鼓励机制，倡导自发的搬迁。

遗产管理的社区参与 位于遗产地内部及其外围保护带的社区要把社区发展计划与世界遗产地管理的标准相结合；在此，本规划的制定已将社区考虑进来，为达到社区发展与遗产地管理的和谐统一提供指导。

管理计划的制定和修订 一旦申请通过世界遗产委员会的批准，所有参与的单位都会被邀请来审阅目前的规划书；如有需要，还要做工作，使各单位与此总体规划的内容达到一致。此后，对于规划的进一步修改、添加其他附属的地区、或是在现划定的遗产地范围内规划的修订，都要以参与式的方式进行，并由四川省世界遗产管理委员会批准。每五年作为一个周期，要对遗产地的管理办法进行总体修订，从而保证管理的标准、规定与法律保证以及其它的支持体系可以重新被评估并依情况进行调整。通过监测收集的信息在管理计划及其更新中将有所体现。四川省世界遗产管理办公室将作为组织者，邀请所有遗产管理单元的管理层，也包括政府单位与非政府组织，以参与式的方式对总体规划修订中的问题及策略进行讨论。

3.3.2 监测

目前在该地区的大熊猫保护区中，一个监测系统已经设计完毕并开始投入使用。中国科学院与四川林业科学研究院也设立了监测站用于监测各种生态学指标。本规划将目前的监测系统扩大，在每家研究单位间建立一个网络，用于整合收集的信息，并从地理位置上与技术上补充现有的监测系统没有覆盖的空缺。补充监测将由遗产地内各单元的工作人员进行，事先要对他们进行适当的培训。世界遗产专家委员会的科学家与工作人员将为这些培训提供技术上的支持。每个遗产地单元都要建立数字化的数据库。省世界遗产办公室负责协调每个单元的监测计划与活动情况；一个研究单位将被指定负责从每个单元收集信息并综合分析动向。另外，还要建立一个基于 GIS 基础上的管理系统。

监测项目有几个组成部分。注意其中很多项在开始时获取准确可靠的基础调查数据是至关重要的。

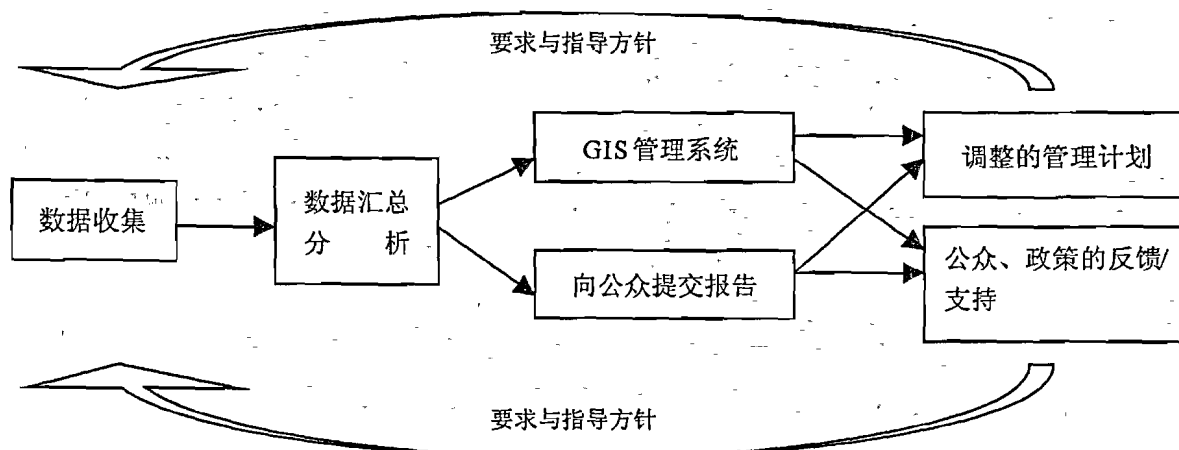
下表总结了要监测的不同目标（包括基础数据收集），并根据各监测目标的情况推荐了负责监测的单位：

遗产地保护监测内容简表

监测收集的信息	负责单位
通过不同时期的卫星图片分析整体植被覆盖情况	四川的一家研究机构
物理参数：气象、水文与大气沉淀物载量	通过培训的保护区工作人员与相关的生态观测站
在各管理单元内通过步行调查与样方测量了解到的植被，尤其是竹子的状况	各保护区的工作人员
步行调查与阶段性重查所报告的大熊猫与其它重要野生动物的情况	各保护区的工作人员
当地社区的社会经济状况以及他们的生活趋势	通过培训的保护区工作人员与四川遗产管理办公室签约的调查人员
旅游业发展、游客的数量、旅游的收入以及旅游对遗产地环境的影响	通过培训的保护区工作人员、县环保局与旅游局
外围保护地带中剩余的工业污染	省级与各县的环保局与签约的研究单位
现行项目的进展情况与政府政策上的变化	负责各项项目实施的单位与签约的研究单位

只进行监测而没有适当的报告是无意义的。各遗产地管理单元除了要向各自的主管单位按常规程序报告之外，还要求定期向四川省世界遗产管理办公室提交报告。遗产办负责将这些报告汇总，每年提交整个遗产地的年度进展报告。

一个完整的监测框架图示意如下：



3.3.3 研究

研究计划包含了几个方面和很多子项目。研究应该由不同部门、研究机构和大学承担，还应包括国际合作者以及国际合作项目。

研究计划应建立在已经取得的大量研究成果和正在进行的研究基础之上，特别是卧龙和都江堰正在进行的研究以及四川及外省的研究机构、大学和组织长期关注的课题和研究成果。

应鼓励那些能够帮助改善遗产地管理和保护的研究，特别是以下方面：

- 通过遥感数据以及野外监测和调查的数据建立 GIS 数据库，监测植被变化情况；
- 继续研究大熊猫以及其它珍稀野生生物的生态学（如雉、金丝猴、小熊猫、扭角羚等）；
- 对所选择的物种进行圈养繁殖和放归实验；
- 竹种的生态学和开花模式；
- 继续对没有调查的地区和了解较少的生物类群进行研究；
- 栖息地恢复的方法；
- 特殊类群，杜鹃花、百合花和雉的分类方法研究；
- 各遗产地单元的环境本底研究；
- 遗产地景观生态网络动态管理研究；
- 药用植物的人工培植和加工；
- 社会经济研究和调查。

所有研究的申请按照现行的管理体制向主管部门或者科研管理部门提交。管理机构与研究人员间应就每一项研究签订明确的协议，写明研究的性质、研究结果的知识产权归属、标本副本的存放、书写报告和出版的规定以及引用文献的要求等。合作双方所需提供的条件也要具体说明，如协助解决住房、交通工具、翻译、地图或其它数据和所需的资料等。各管理单元可以根据提供协助的情况收费。所有的外籍研究人员必须由国内相应单位的同行陪伴，涉及费用由外籍研究者承担。

3.3.4 保护意识的宣传和教育

一个综合性的宣传教育项目将针对以下三组人群展开：

- 当地村镇的学校；
- 保护区内的社区；
- 参观者和游客。

通过与各自管理单元的合作，建立一系列信息与资料处理中心。现有的博物馆、对外开放的繁育中心和教育中心要进行改进。此外，还要制作地图、展览、印发小册子和其他有关材料。

在当地学校中要开设专门课程，针对学龄儿童讲授维护江河流域功能的重要性、防火和介绍当地格外丰富的生物多样性情况。这些课程要培养儿童对当地自然与传统的热爱和自豪，同时也用实例证明，通过精心的保护和发展生态旅游能够增加当地的经济收益。学校要组织学生远足，让孩子们感受在他们身边的美丽的风景和野生生物。

通过远程服务将有关恢复森林、控制侵蚀、垃圾处理、流域保护、生物多样性的重要性等一些特别的宣传材料送达保护区内偏远的村庄和家庭。此外，还要通过有教育意义的张贴物和积极采取措施来发展更多可持续的和新的生活方式来加强宣传的力度，让这些生活方式在保护、

监测、研究、旅游和其它积极措施中得到体现。

3.3.5 管理培训

目标与任务 通过传播世界遗产新理论、新信息、新技术与新方法，统一保护监测与GIS管理的质量标准和方法，更新知识，提高科学技术水平，发展国内与国际的世界遗产管理学术交流，培训高素质遗产管理技术骨干。

基本内容

- 基础知识 遗产资源管理基础，UNESCO《保护世界文化与自然遗产公约》、《四川省世界遗产保护条例》以及国家和地方相关法规，世界遗产概要。
- 管理技能 GIS应用，保护监测质量标准与方法，世界遗产定期监测报告编制方法。
- 国内外世界遗产管理学术交流。

组织要点

- 四川省世界遗产管理办公室组建全省世界遗产培训中心。
- 组织专家编写教材与授课，邀请世界遗产中心(UNESCO)和相关国际组织的专家讲学。
- 鼓励遗产管理人员参加国家高层次进修和高学历深造。
- 在2003~2010年的四川省世界遗产管理培训计划期间，全部管理人员都经过1~2次培训，总人数800~1200人次。

3.3.6 旅游管理和生态旅游的发展

生态旅游在世界上发展很快，在中国也是如此。除国际游客的人数持续增长之外，中国国内生活水平的提高也导致国内游客数量的快速上升。要发展的生态旅游项目的目标是提高当地经济的收入水平，同时进行教育、提高公众的意识。

生态旅游的级别与发展的类型，必须严格控制在各景区和相关文化区域的环境容量之内，并尽可能减少对野生动物的干扰，保护自然环境，尊重当地文化。大力支持由当地社区发展的小规模、低影响的旅游企业，以确保旅游收入的大部分留在当地，并能进一步加强对遗产地的保护。

为了确保这些原则得以贯彻，世界遗产地的旅游发展所必需的开发建设规划都必须得到四川省世界遗产管理办公室的审查和四川省世界遗产管理委员会的批准。在前文列出了一个正在准备发展的或已经在进行旅游管理的风景区的名单。今后这个名单可能还会增加，以应对不断增长的对旅游景点的需求，并把旅游带来的压力分散到更多景区。

例如，在宝兴到蜂桶寨的主干道附近的邓池沟，建立一个特别的博物馆，以纪念和展示戴维传教士杰出的标本收集工作。原名穆坪的宝兴县，是世界上生物模式标本最大的产地之一。1862~1875年在穆坪天主教堂行使神职期间，戴维不仅向世界第一次描绘了大熊猫，还第一次收集了其它哺乳动物标本、鸟类标本(其中65个新种)和其它几百个动植物的模式标本。这些模式标本种很多都被精彩地刻在宝兴路边的大理石板上。这样一个博物馆将引起进入宝兴县境内游客的极大兴趣，对当地政府和人民也是一种骄傲和鼓舞。这个博物馆也能揭示这样一个生物多样性遗产地的国际地位与全球意义。

遗产地要制定一个总体的旅游管理计划，用于控制旅游设施的发展，并建立对遗产地内不

同的功能区旅游发展的标准。

3.3.7 社区可持续发展

当地已经很贫困的社区在农耕与放牧方面受到进一步限制后，贫困将更为加剧，而通过积极地支持一个致力于不以破坏为代价，提倡可持续的生活方式与工业的项目，这种状况有望得到很大程度上的改善。有必要为此做一个评估，找出适当的对象组与可行的方法，发展对环境有益的生活方式。这显然是一个长期的工作。一个有用的方式是让社会发展机构与自然保护区与保护组织共同工作与探讨。

这个地区可能的社区发展项目有：

- 替代能源，如沼气和小型水电站；
- 可持续性的非木材林产品 (NTFP) 的采集与市场营销；
- 建立在社区基础上的生态旅游，尤其是家庭旅馆、导游的培训与手工艺品的制作；
- 先进的、对环境有益的农业技术的培训；
- 贵重经济林木的种植；
- 可持续性生活方式技能的培训。

发展这些新的生活方式必须与社区参与保护工作相联系，这一点很重要。

4. 投资概算

由于遗产地由多个不同的部门管理，每个部门有各自的预算和管理计划，一些部门的计划只有一部分在遗产地的范围内，因此很难给出现在和未来的资金投入情况以及未来不同的资金来源。比如中国最近已经实施的西部大开发战略，将对西部地区实行投资倾斜，以帮助西部地区的经济发展。这些资金将用来改善交通、通讯、能源等基础设施和旅游设施，转变生活方式，保护森林和植树造林。

另外，由国家林业局与四川省林业厅实施的退耕还林还草工程与野生动植物保护及自然保护区建设工程为大熊猫栖息地的恢复、自然保护区的扩大与新建、法律的执行、保护区的管理、以及大熊猫与其它野生动物的研究提供了数额可观的支持。

500多个政府工作人员的工资已经由省政府或县政府财政来支付。政府对于旅游业和其他产业的投资增长也很快。毫无疑问，一旦大熊猫的长期租借款到位，将全部用于重新投资保护大熊猫，四川省人民政府也将提高投资力度。这样的收入会保护遗产地做出实质性的贡献。

下表概述了作为世界遗产地 2003 ~ 2010 年的预算。本预算以 2000 年物价为基准计算，费用将随着物价上涨而增加。

提名地 (2003 ~ 2010) 管理项目投资概算简表

单位: 万元 (人民币)

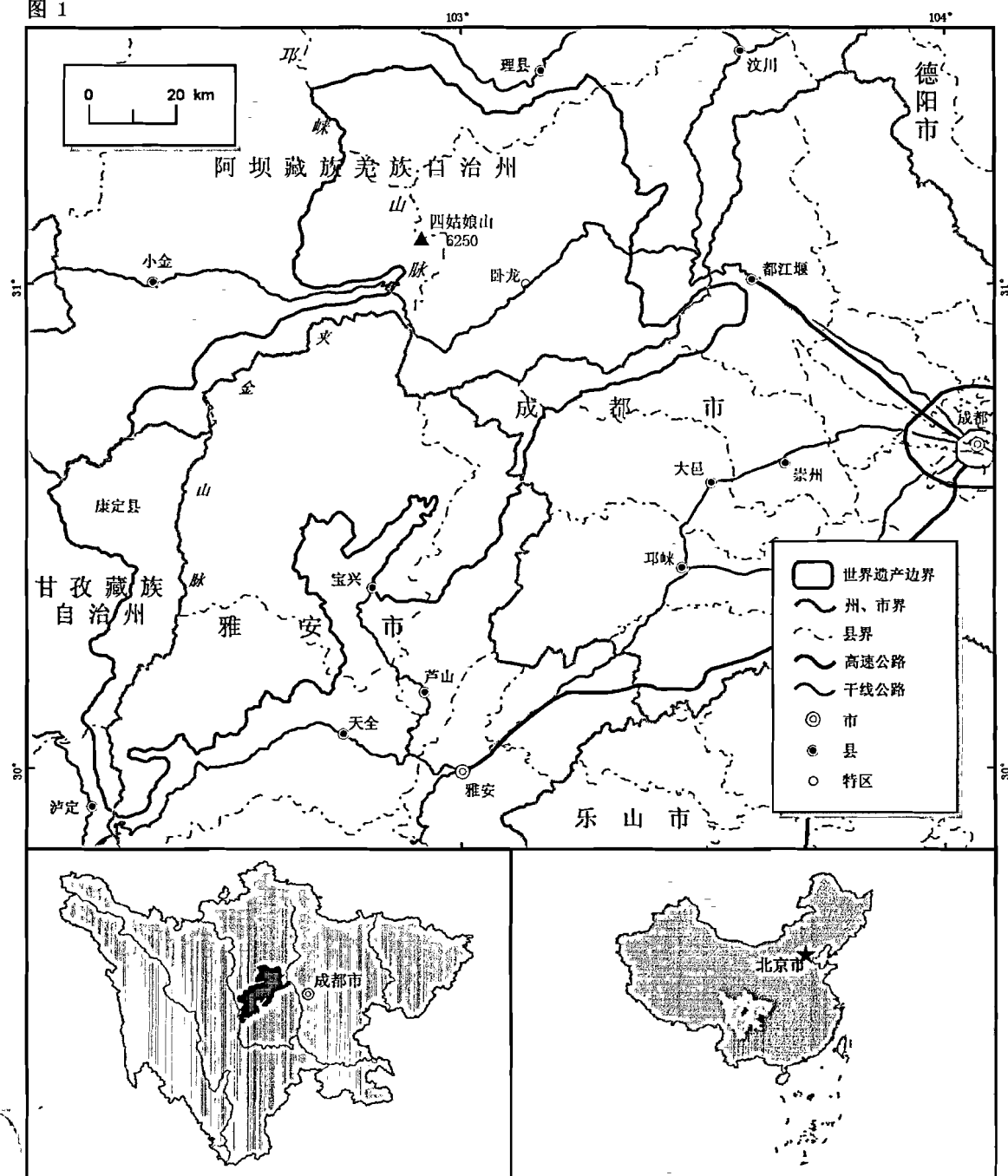
项 目	预 算	资金来源
管理项目	40 400	包括政府财政报表中已批准的管理计划以及现行的政府项目, 如天保工程、退耕还林以及野生动物保护与保护区建设工程
执 法	800	包含在政府常规预算中
根治与减少采矿与工业污染对环境的破坏	39 000	国家、四川省和当地政府
建立大熊猫通道	58 000	正在实施的全国项目, 如天保、退耕还林以及增补的大熊猫保护行动计划
管理规划	300	省遗产办与各保护区协调
监 测	2 900	各保护区日常开支, 四川省遗产办争取更多的资金渠道
研 究	5 800	很多国家级、省级项目加上寻求国际合作
教育/宣传	3 000	省与当地政府
发展生态旅游	37 300	一部分靠当地政府投资, 大部分靠商业投资
培 训	3 000	寻求国际资金
社区发展	5 100	一部分资金来源于政府投资, 一部分寻求国际组织资助
总 计	195 600	各种来源

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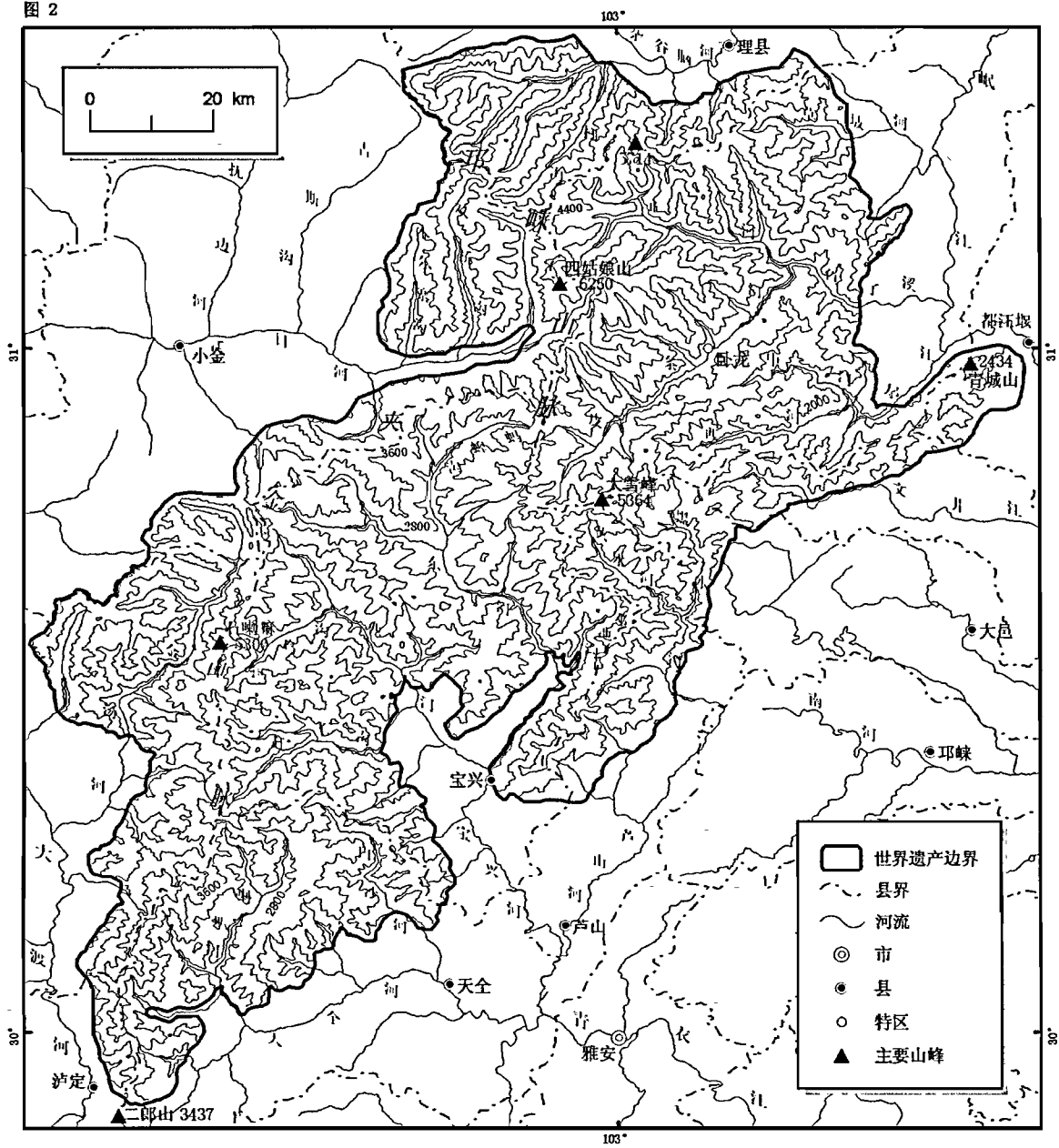
四川卧龙—夹金山脉大熊猫栖息地位置图

图 1



四川卧龙—夹金山脉大熊猫栖息地地形图

图 2



四川卧龙—夹金山脉大熊猫栖息地植被图

图 3

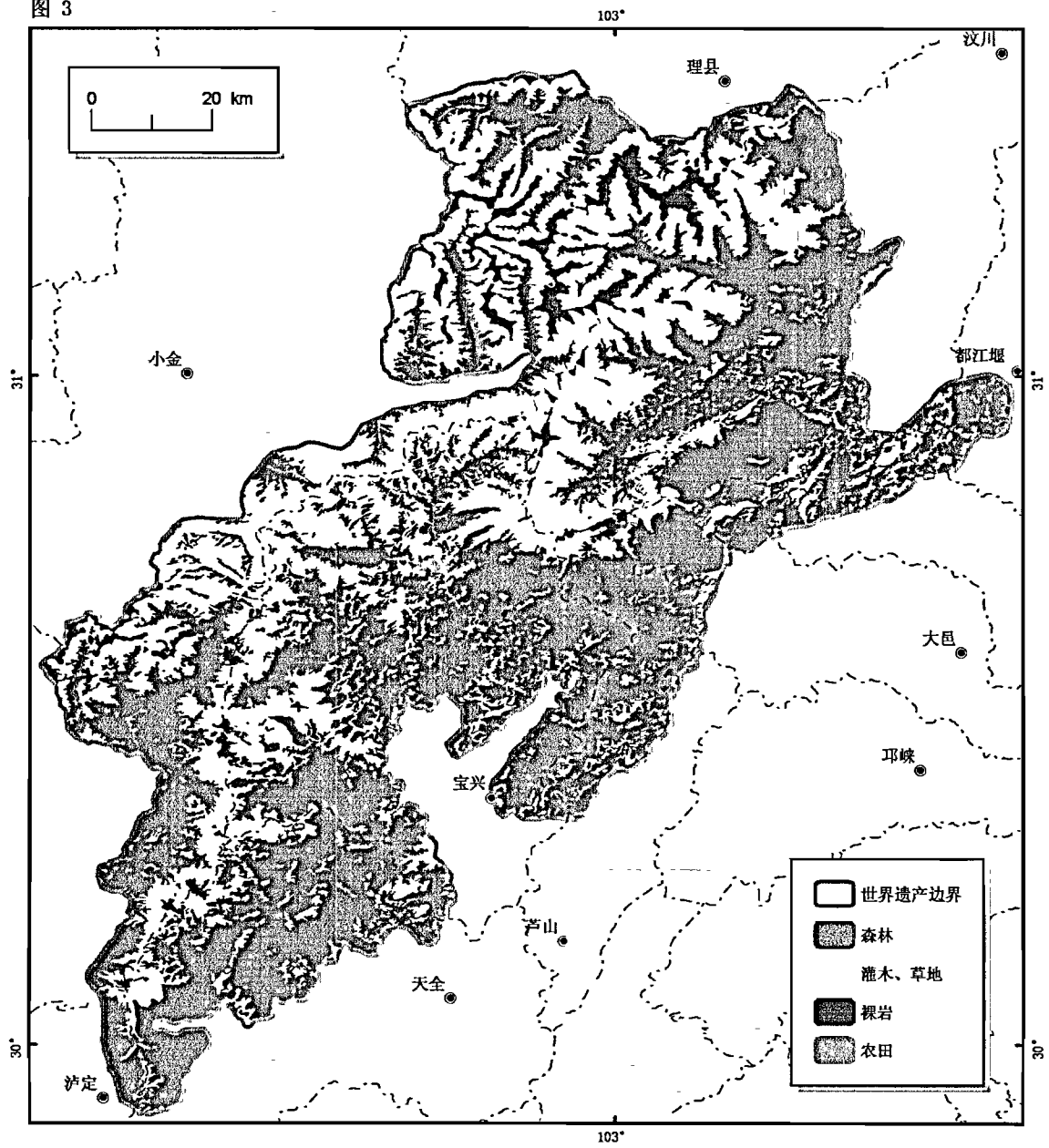
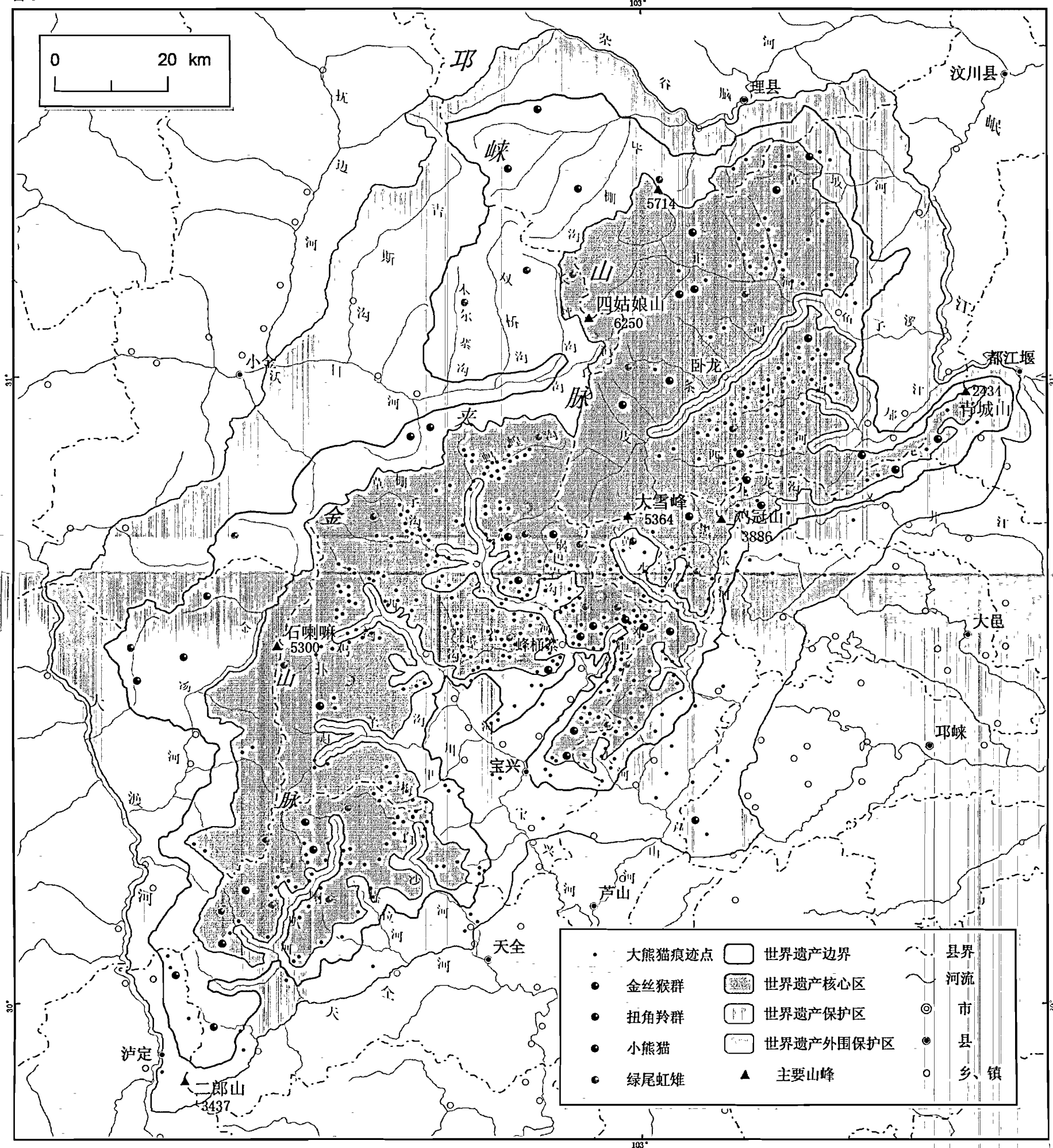
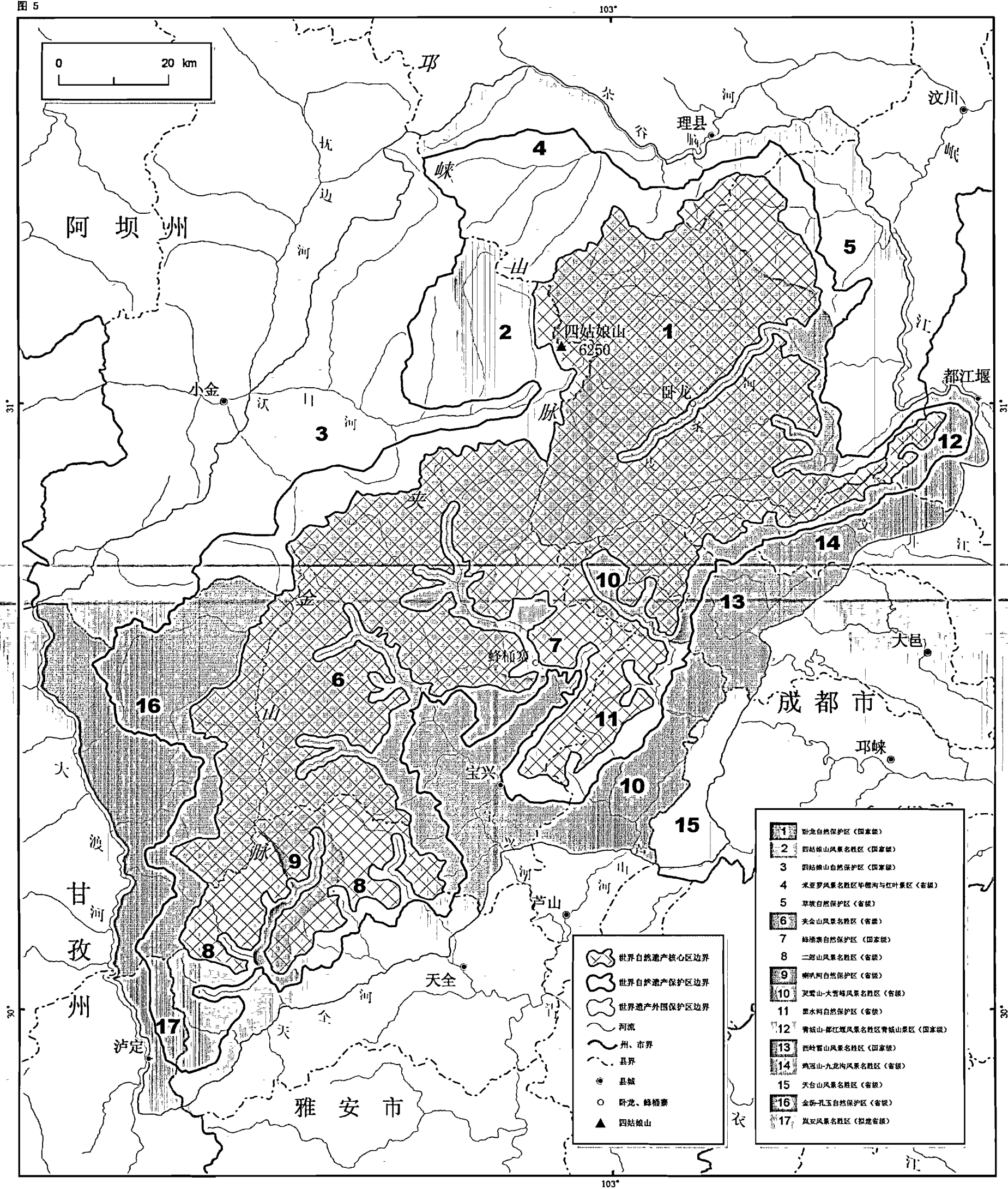


图 4



四川卧龙—夹金山脉大熊猫栖息地 世界自然遗产保护分区规划图

图 5



**THE WORLD HERITAGE
SICHUAN GIANT PANDA SANCTUARY
—WOLONG, MT. SIGUNIANG AND JIAJIN MOUNTAINS
Overall Management Plan**

The People's Government of Sichuan Province

November 2002

THE WORLD HERITAGE
SICHUAN GIANT PANDA SANCTUARY
—WOLONG, MT. SIGUNIANG AND JIAJIN MOUNTAINS
Overall Management Plan

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1.2 Unique biological features	(1)
1.3 Site of great biological history significance	(12)
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Attached Maps:

Map 1 Location Map of the Nominated Area

Map 2 Topographical Map of the Nominated Area

Map 3 Vegetation Map of the Nominated Area

Map 4 Map of the Nominated Area for the Overall Plan

Map 5 Map for Planned Protection in the Nominated Area

1 Significance of the Nominated World Heritage

1.1 Introduction

The nominated area is located in the Qionglai Mountains between the Chengdu Plain and the Qinghai-Tibetan Plateau, and includes seven nature reserves and nine scenic parks in four prefectures or cities, Aba, Ganzi, Ya'an and Chengdu. Its geographic location is between the following coordinates: E 102° 08'45"~103° 23'45"; N 29° 53'47"~31° 21'49". The nominated world heritage covers an area of 951 000 ha, including a core zone of 537 000 ha and a buffer zone of 414 000 ha. In addition, an area of 529 000 ha outside of the world heritage is designated as transitional zone.

1.2 Unique biological features

1.2.1 Giant panda as the "flagship species" of the world conservation

Giant panda (*Ailuropoda melanoleuca*) is a relict species remained from the paleo-tropic forests of the Tertiary Era. Having an alimentary canal structure typically similar to the other carnivores, it has evolved into a unique specialized herbivore of the carnivorous order, feeding almost entirely on bamboo in the wild. Of the unique single species and family, giant panda is highly significant in taxonomy.

Giant panda has evolved from the environments of the Tertiary paleo-tropics, through the Quaternary tropic-subtropic, to the environments of alpine subtropic and cool temperate in modern times, exemplifying convincingly the geo-biological process in the latest stage in the development of the earth. It is of extremely high scientific value for studying mammal classification and evolution as well as ancient environment transition.

Giant panda today only lives in a very narrow belt in China including western Sichuan, southwestern Gansu and southern Shaanxi. Having been inscribed as a Class I Protected Animal by the Chinese Government, giant panda has also found its position in the lists of endangered animals under protection of the organization of CITES (Convention on International Trade of Endangered Species) and IUCN (the International Union for the Conservation of Nature and Nature Resource). Furthermore, the WWF (known as World Wildlife Fund in US), when it was founded in 1961, chose the giant panda as the emblem, symbolizing world wildlife protection and natural conservation. Giant panda is not only the "National Treasure" of China, but also the natural heritage of the world. The striking black and white pattern and cuddly shape of the giant panda have endeared it to humanity so that it is the best recognized and most loved of all the earth's wild animals. The key factor to preserve giant panda shall be stressed as the protection of its habitat, to which objective increasing attention has been paid all over the world.

According to the study in 1980s, giant pandas are distributed in 34 counties in China, and out of which 28 counties are located in Sichuan. Of the 13 900 km² of area of the giant panda habitats, 11 680 km², 84% of the total is in Sichuan. The joint investigation conducted by the Ministry of Forest, PRC and WWF showed that the number of giant panda is $1\,112 \pm 240$ in China, including 907 ± 196 in Sichuan, 109 ± 23 in Shanxi, and 96 ± 21 in Gansu. Sharing 82% of the total population, Sichuan is necessarily to be the mainframe of giant panda habitat and population.

The nominated area and its giant panda population are characterized by the following features:

The largest, most extensive and most completely representative remaining portion of the habitat of the Giant Panda out of the six mountain systems still containing wild pandas

It has the largest connected area of occupied panda habitat in Sichuan, the largest area of suitable 'potential' habitat for giant panda, is less fragmented than other mountain ranges, has a wider range of panda habitat sub-types in terms of altitudinal zones and bamboo species, is better protected than other mountain ranges, has less human pressure and higher reported density of pandas. According to the preliminary result from the third general survey on giant pandas in China, there are more than 400 giant pandas living in the nominated area, which takes 40% of the total giant panda population and 35% of the total habitat in Sichuan.

A major source for the pandas in zoos and breeding centers

Since 1955 there had been, 148 giant pandas taken into 22 major domestic zoos or breeding centers. In addition, giant pandas from the nominated area have supplied over 50 zoos in 26 counties in the world, some as "state gifts". In the meantime, there have been 212 golden monkeys, 281 takins, 50 Chinese monal, 41 red pandas and 600 other rare and precious animals taken from the nominated area for exhibition or research both at home and abroad. So the nominated area has made a special contribution to the international cooperation, public education, and scientific research.

Site of the original discovery of giant panda, dove tree, and unprecedented numbers of type specimens from scientific exploration

Giant panda made its first appearance to the scientific world in 1869 when Pere Armand David, a French missionary and naturalist then in China, collected 4 giant pandas in Dengchigou of Baoxing County. He made the giant pandas as specimens and showed them at the Paris Museum of Natural History in the same year, and gave a report in the museum bulletin. David was also the first to collect the famous and beautiful dove tree in 1871. This was eventually named in his honour as *Davidia involucrata* by H.E.Baillon. In addition, the nominated area has proved a 'goldmine' in terms of biological discovery. Pere Armand David also discovered 65 birds new to science and also large numbers of new plants, mammals and insects in 19th century. Many of these were discovered within the nominated area. Subsequent explorations have continued to yield an amazing list of new plants, amphibia and other creatures. Protection of such an important type-collecting locality is of enormous biological importance. There are many type species discovered in the nominated area, including

32 mammals, 43 birds, 7 fish and amphibia and 110 higher plants.

1.2.2 Home of many relict species and 'living fossils'

Both of single species representatives of their lines with long evolutionary histories, living in an ancient forest with many other primitive plants and animals, giant panda and dove tree in the nominated area are often referred to as 'living fossils'. The nominated area is also home to great many more living fossils trapped in Central China as the great forests around the humid Tethys dried out as the sea disappeared with the rising of the Qinghai-Tibetan Plateau.

Of 50~60 monotypic genera (43 in Dujiangyan alone) or living fossils from the Tertiary period known from the area include the ancient tree *Duyecao* or *Kingdonia uniflora*, *Dipteronia sinensis*, *Bretschneidera sinensis*, *Cercidiphyllum japonicum*, *Tetracentron sinensis* and even a 'living fossil' beetle *Amphizoa davidi* originated from the Triassic Era. In addition the ginkgo tree *Ginkgo biloba* has been planted through the area for some centuries and recently the dawn redwood *Metasequoia glyptostroboides* has been extensively introduced around the site.

1.2.3 Globally richest documented botanical site outside of the tropical region

The total flora of the nominated area is estimated to be in excess of 5 000 species of which more than 4 000 are flowering plants. This number is comparable to the entire flora of France! It is the richest botanical site documented in the temperate region or indeed anywhere outside of the tropical rain forests. The nominated area falls into top 25 Biodiversity Hotspots selected by CI (Conservation International) and "Global 200" ecoregions defined by WWF.

Richness is conspicuous for the large size, wide altitudinal range and ecological completeness of the site combined with its special phyto-geo-graphical location and the fact that the site is a classical refuge where the decimating action of repeated oscillations from dry cold and hot wet climates during the Pleistocene could be survived by the rich flora because the high plateau wall to the west created a moisture trap that remained humid even in the driest periods and the relief is so steep that changes in world temperature could be easily accommodated by tiny lateral shifts in location by plants through that turbulent era (WWF/MOF, 1989).

Special attention has been drawn to the nominated area because it also has:

Long lists of endangered and endemic species of almost all taxa

Not only is the nomination area characterized by great richness in numbers of species, but also these contain high levels of national and regional endemics, as well as large numbers of species already labeled as threatened and in urgent need of protection. For instance, of the more than 1000 plant genera recorded from the site more than 50 are endemic to China representing c. 20% of all

endemic Chinese genera. At the species level 60 ~ 70 % of plants are endemic to China. Tables in the proposal and annexes list important endemic and endangered species for plants, birds, and mammals and endangered fish, amphibians and insects.

Diversity for rhododendrons and other plant groups, major source of seeds that form the foundation of 'English' and Western gardens

The nominated area is also a significant global diversity center for many plant groups such as roses, peonies, magnolias, maples, primroses, bamboos and rhododendrons. More than 100 species of rhododendron are listed for the area. This is more than known from some whole countries (Nepal, Bhutan) in the Eastern Himalayan Hotspot, a place per se is famous for its diversity of rhododendrons. Since 19th century, western explorers and collectors had travelled extensively in the Qionglai Mountains. Famous British botanist E. Wilson, alone, had shipped 30 tons of plant seeds to England. The resulting plants transformed the development of horticulture in Europe to such an extent that to this day a disproportionate number of species used in classical 'English' landscape gardens are Chinese species. Edinburgh Royal Botanic Garden in UK has introduced more than 50 species of Rhododendron from this site.

Most important genepool area for Chinese traditional medicine

The nominated area remains a major source and genepool for plants used for traditional Chinese medicine (TCM). Several hundred local species have been collected and used for medicine and many of these are now rare and endangered such as the orchid *Gastroidea elata*, alpine fritillaries and caterpillar fungus *Cordyceps sinensis*. Preservation of these species is essential for the conservation of these valuable natural resources, for the cultural importance of TCM and because of their potential in future pharmaceutical research.

Richest and lushest alpine flora in the world

Alpine botanists (Wilson, 1916; Baron, 1987) recognized the alpine flora of the nominated area as being probably the richest and lushest example of its type in the world. The number of different species found per unit area and the luxuriance of forms are astonishing. On the Balangshan, several dozen species of flowers can be identified within a few square metres. The unusual wet cloudy Sichuan summer weather is in complete contrast to almost all other alpine zones, where dry, exposed summers are typical. This nominated area lies within the Western China rain trap and the added moisture has helped to protect the floral richness as a Pleistocene refuge and to create endemism.

A complete continuum from permanent ice to evergreen subtropical forests

Only two sites in Central China offer a protected spectrum of natural vegetation zones from permanent icefields, through alpine, subalpine, temperate mixed forests and down to subtropical evergreen broad-leaved forests. One is the nominated area and the second is the Mt. Gongga Glacier Reserve in southwestern Sichuan. The latter area lacks giant panda.

Vertical vegetation zones

The highest peak of the nominated area is the Mt. Siguniang at 6250 m.a.s.l. The lowest point is in Dujiangyan at 600 m.a.s.l. The zonation and composition of different zones vary at different locations but can be summarized as followings:

600 ~ 1800 m: Subtropical montane evergreen broad-leaved forest.

1800 ~ 2400 m: Subtropical montane evergreen and deciduous broad-leaved mixed forest.

2400 ~ 2800 m: Warm extrotropical alpine coniferous and deciduous broad-leaved mixed forest.

2800 ~ 3800 m: Cool extrotropical subalpine coniferous forest.

3800 ~ 4400 m: Subfrigid alpine scrub and meadows.

4400 ~ 4500 m: Frigid alpine scree and sparse vegetation.

Above 5000 m: Permanent ice and snow.

Diversified ecotypes

A large number of different ecotypes are recognized. For instance the Wolong vegetation could be divided into 5 groups, 15 types, 39 formation groups and 69 formations.

Important area for protection of rare and endangered species

About 67 species of state protection plants are found in the nominated area. The plants under Class I of state protection include 8 species such as dove tree, (*Davidia involucrate*). The plants under Class II of state protection include 40 species such as Minjiang cypress (*Cupressus chengiana*). The plants under Class III of state protection include 19 species such as sargent spruce (*Picea brachytyla*).

Plants listed under state protection in the nominated area

No	English name	Scientific name	CPWP(1999)	CREPP(1980)
1	Chinese cystoathyrium	<i>Cystoathyrium chinensis</i>	1	2
2	Ginkgo	<i>Ginkgo biloba</i>	1	2
3	Chinese yew	<i>Taxus chinensis</i>	1	
4	Marie yew	<i>Taxus chinensis</i> var. <i>mairei</i>	1	
5	Dove tree	<i>Davidia involucrata</i>	1	1
6	Vilmorin dove tree	<i>Davidia involucrata</i> var. <i>vilmoriniana</i>	1	2
7	Oneflower kingdonia	<i>Kingdonia uniflora</i>	1	2
8	Chinese bretschnidera	<i>Bretschneidera sinensis</i>	1	2
9	Palmate neocheiropteris	<i>Neocheiropteris palmatopedata</i>	2	
10	Chinese fern	<i>Sinopteris grevilleoides</i>	2	2
11	Scythian lamb	<i>Cibotium barometz</i>		2
12	Oliver plumyew	<i>Cephalotaxus oliveri</i>	2	2
13	Cheng cypress	<i>Cupressus chengiana</i>	2	2
14	Masters larch	<i>Larix mastersiana</i>	2	2
15	Graybark spruce	<i>Picea brachytyla</i> var. <i>complanata</i>	2	
16	Bigcone spruce	<i>Picea neoveitchii</i>	2	
17	Farges torreyia	<i>Torreya fargesii</i>	2	
18	Bracteate acanthochlamys	<i>Acanthochlamys bracteata</i>	2	
19	Catalpa maple	<i>Acer catalpifolium</i>	2	3

20	Katsuratree	<i>Cercidiphyllum japonicum</i>		2
21	Szechuan peony	<i>Paeonia szechuanica</i>	2	2
22	Eucommia	<i>Eucommia ulmoides</i>	2	2
23	Zhennan	<i>Phoebe zhennan</i>	2	3
24	Wild soybean	<i>Glycine soja</i>	2	3
25	Hosie ormosia	<i>Ormosia hosiei</i>	2	
26	Chinese tuliptree	<i>Liriodendron chinense</i>	2	2
27	Officinal magnolia	<i>Magnolia officinalis</i>	2	3
28	Magnolia	<i>Magnolia sinensis</i>	2	3
29	Wilson magnolia	<i>Magnolia wilsonii</i>	2	3
30	Wilsonii michelia	<i>Michelia wilsonii</i>	2	2
31	Tetracentron	<i>Tetracentron sinense</i>		2
32	Chinese toona	<i>Toona ciliata</i>	2	3
33	Field circaeaster	<i>Circaeaster agrestis</i>	2	2
34	Slender anisachne	<i>Anisachne gracilis</i>	2	
35	Short-awn wildryegrass	<i>Elymus brevioristatus</i>	2	
36	Awnless wildryegrass	<i>Elymus submuticus</i>	2	
37	Camphor tree campher wood	<i>Cinnamomum camphora</i>	2	
38	Langpaniculate cinnamom	<i>Cinnamomum longepaniculatum</i>	2	
39	Nanmu yunnan phoebe	<i>Machilus nanmu</i>	2	
40	Redflower meconopsis	<i>Meconopsis punicea</i>	2	
41	Common pomatosace	<i>Pomatosace filocula</i>	2	
42	Henry emmenopterys	<i>Emmenopterys henryi</i>	2	2
43	Chinese corktree	<i>Phellodendron chinense</i>	2	
44	Common rockcabbage	<i>Trienophora rupestris</i>	2	
45	Tangut anisodus	<i>Anisodus tanguticus</i>	2	
46	Amur linden	<i>Tilia amurensis</i>	2	
47	Tong-chong-ha-cho	<i>Cordyceps sinensis</i>	2	
48	Matsutake mushroom	<i>Tricholoma matsutake</i>	2	
49	Chinese hazelnut	<i>Corylus chinensis</i>		3
50	Glabrousleaf epaulettetree	<i>Pterostyrax psilophyllus</i>		3
51	Silveryleaf cassia	<i>Cinnamomum mairei</i>		3
52	Tschonosk trillium	<i>Trillium tschonoskii</i>		3
53	Pinnateleaf lilac	<i>Syringa pinnatifolia</i>		3
54	Mangseeded euptelea	<i>Euptelea pleiospermum</i>		3
55	Padus grayana	<i>Prunus grayana</i>		3
56	Chinese money maple	<i>Dipteronia sinensis</i>		3
57	Swollenodded cane	<i>Qiongzhuea tumidinosa</i>		3
58	Chinese may-apple	<i>Sinopodophyllum emodi</i>		3
59	Chinese falsepistache	<i>Tapiscia sinensis</i>		3
60	Chinese goldthread	<i>Coptis chinensis</i>		3
61	Many-flowered may-apple	<i>Dysosma versipellis</i>		3
62	Tall gastrodia	<i>Gastrodia elata</i>		3
63	Sargent magnolia	<i>Magnolia sargentiana</i>		3
64	Sargent spruce	<i>Picea brachytyla</i>		3
65	Soft leather leaves rhododendron	<i>Rhododendron alutaceum</i>		3
66	King rhododendron	<i>Rhododendron rex</i>		3
67	Footcatkin willow	<i>Salix magnifica</i>		3

Abundance in endemic species and genera in addition to mono-species, rare-species families and genera

The nominated area falls towards the northern end of the West Sichuan-Northwest Yunnan Center, one of China's three main centers of floral endemism, with a large quantity of plant genera and species. There are many gymnosperms, such as the genera of ginkgo (*Ginkgo biloba*) Chinese fir (*Cunninghamia*) and the dawn redwood (*Metasequoia*); dicotyledons, such as *Dipteronia*, *Clematoclethra*, *Notopterygium*, *Nannoglottis*, *Notoseris*, *Sinacalia*, *Sinojohnstonia*, *Dysosma*, *Bretschneidera*, dove tree (*Davidia*), *Berneuxia*, *Eucommia*, *Hanceola*, *Heterolamium*, *Kinostemon*, *Sinofranchetia*, *Camptotheca*, *Asteropyrum*, *Beesia*, *Kingdonia*, *Emmenopterys*, *Sargentodoxa* and *Triaenophora*, and monocotyledons, such as the bamboos *Bashania* and *Qiongzhusa*. The total number of the endemic genera here amounts to over 50, accounting for 20% of the total endemic genera in China. This rare phenomenon shows that this area is ecologically quite favorable for the growth and evolution of wild plants.

The above table lists the plants for protection, most of which are endemic species of China. These endemic genera and species originated from ancient time, and are unique plants of system evolution. Emerged first in the Tertiary, Jurassic or even earlier periods, for example, are those primitive plants, including *Eucommia*, *Dysosma*, *Acer catalpifolium*, *Magnolia sinensis*, *Magnolia wilsonii*, *Michelia wilsonii*, *Rhododendron alutaceum*, and the plants of mono-species and rare species, including ginkgo, dove tree, *Dipteronia sinensis*, *Bretschneidera sinensis*, and *Cercidiphyllum japonicum*. Plants of *Ginkgo biloba* emerged in later Palaeozoic, boomed in the Jurassic Period and degenerated suddenly in the Cretaceous Period, of which only one species and one genus exist now. It is distributed over a large area in the Mt. Erlang in the nominated area. Plants of *Davidia* emerged in the Tertiary, and there were a great number all over the world in the middle of the Quaternary, but now there is only one mutation, one species and one genus, distributed over a large area in the nominated area. The nominated area is the place with dense distribution of the China's endemic plants, a few survivors from evolution. The representatives are dove tree and ginkgo. Dove tree, *Bretschneidera sinensis*, and *Cercidiphyllum japonicum* are the most important components of the ancient tropical plants from the Tertiary Period.

In the nominated area, about 76 rare-species genera have been found, such as *Dipteronia*, *Euptelea* and *Kinostemon*; 36 mono-species genera such as *Emmeopterys*, *Sinofranchetia* and *Moneses*; and 15 endemic mono-species genera such as *Davidia involucrata*, *Tetracentron sinense* and *Cercidiphyllum japonicum*, accounting for 41.67% of the total endemic genera.

1.2.4 Important area for conservation of wild fauna

The nominated area is located in the China-Indian subtropical system, at the intersection of the palaearctic region, which transits towards the Hengduan Mountain system to the Oriental region to the south. The fauna can be classified as belonging to the subtropical forest of the east marginal

mountains, and includes animal groups of the subtropical broad-leaved forests, coniferous forests of western Sichuan mountains and also the animals in the alpine shrubbery and meadow on the Qinghai-Tibet Plateau. The fauna is thus a mixture of northern species of the Palaearctic realm, mostly distributed in the alpine and coniferous and temperate forest zones, with animals of the Oriental realm, mostly distributed in the subtropical evergreen broad-leaved zone, with regional endemics found at various levels in the transition zone.

There are 542 species of vertebrates and 1 700 species of insects (still very incompletely studied) among the known wild animals in the nominated area. Among the vertebrates there are 109 species of mammals in 25 families, accounting for 50% of the mammals in Sichuan and 20.5% in China; 365 species of birds in 45 families, accounting for 68% of the birds in Sichuan; 32 species of reptiles in 9 families, 22 species of amphibians in 8 families, 14 species of fishes in 5 families.

The wild fauna, influenced by landscape and vegetation, has the following important features:

Altitudinal zonation

The altitudinal or vertical zonality of animal species is conspicuous in the nominated area. Dominating in zones of elevation 1 000 m ~ 2 200 m with evergreen and deciduous broad-leaved mixed forest are tropic and subtropical animals of South China and Southeast Asia, such as Japanese forest frog, *Polypedates megacephalus*, gem-faced Indian Civet (*Paguma larvata*), (*Sphenomorphus*), *Rhabdophis nuchalis*, *Hwamei* (*Garrulax canorus canorus*), gem-faced civet (*Paguma larvata*), large Indian civet (*Veverra zibetha ashtoni*), *Muntiacus reevesi*, *Elaphodus cephalophus* and sambar (*Cervus unicolor*). Dominating in the range of 2200 m ~ 3600 m with coniferous-broad-leaved-mixed forest and coniferous forest are animal types of the Hengduan-Himalayan Mountain, such as *Staurois loloensis*, blood pheasant (*Ithaginis cruentus geoffroyi*), Temminck's tragopan (*Tragopan temminckii*), Elliot's laughing thrush (*Garrulax ellioti*), golden monkey, giant panda, red panda and Takin of China or Sichuan endemic species. Above flowstone slope 3600 m is dominated by mountain animals, such as *Lerwa lerwa*, *Tetraophasis obscurus*, Chinese monal, blue sheep (*Pseudois nayaur*), snow leopard (*uncia uncia*) and musk deer (*Moschus* spp.). The giant panda itself shows modest changes in altitude feeding on the lower zones of its range in the winter and moving up into the rich arrow bamboo zone in summer. Fortunately for the panda, its food, the bamboo is evergreen. Green leaves are available all through the winter and richer young shoots and stems can be eaten in the spring and summer.

Abundance of endangered species

Among the known 86 species of animals under state protection, there are 16 species of animals belonging to class I of state protection, 62 species of animals belonging to Class II of state protection, and 8 species of animals belonging to provincial level protection. Rare protected butterflies are sub-tropical birdwings *Troides aecus* and *T. helena*, Temperate forest *Taeniopalpus imperialis*, *Bhutanitis* (*Sinonitis*) *thaidana*, the endemics *Bhutanitis moupinensis* and *Bhutanitis nigrilima*, and alpine Apollo butterflies *Parnassus jacquemontii*, *P. epaphus*, *P. tianschanicus*, *P. nomion*, *P.*

stubbendorffii, *P. glacialis*, *P. orleans*, *P. szechenyii*, *P. cephalus*, *P. przewalskii*, *P. baileyi*, *P. acdestis*, *P. imperator*, *P. simio* and *P. andreji*. The list of protected species occurring in the nomination area is given in the table below.

List of special protected wild animals in the nominated area

No.	Name	Scientific Name	Protection Class		
			China protection	CITES	IUCN
1	Golden monkey	<i>Rhinopithecus roxellana</i>	1	Annex I	VU
2	Giant panda	<i>Ailuropoda melanoleuca</i>	1	Annex I	EN
3	Snow leopard	<i>Panthera uncia</i>	1	Annex I	EN
4	Leopard	<i>Panthera pardus</i>	1	Annex I	
5	Clouded leopard	<i>Neofelis nebulosa</i>	1	Annex I	VU
6	White-lipped deer	<i>Cervus albirostris</i>	1		VU
7	Takin	<i>Budorcas taxicolor</i>	1	Annex II	R
8	Black stork	<i>Ciconia nigra</i>	1	Annex II	
9	Pallas's sea eagle	<i>Haliaeetus leucoryphus</i>	1	Annex II	R
10	White-tailed sea eagle	<i>Haliaeetus albicilla</i>	1	Annex I	VU
11	Golden eagle	<i>Aquila chrysaetos</i>	1	Annex II	
12	Bearded vulture	<i>Gypaetus barbatus</i>	1	Annex II	
13	Chinese hazel grouse	<i>Tetrastes sewerzowi</i>	1		
14	Pheasant grouse	<i>Tetraophasis obscurus</i>	1		
15	Chinese monal	<i>Lophophorus thuyssii</i>	1	Annex I	EN
16	Black-necked crane	<i>Grus nigricollis</i>	1	Annex I	VU
17	Rhesus macaque	<i>Macaca mulatta</i>	2	Annex II	
18	Chinese stump-tailed macaque	<i>Macaca thibetana</i>	2	Annex II	
19	Dhole	<i>Cuon alpinus</i>	2	Annex II	VU
20	Brown bear	<i>Ursus actos pruinosus</i>	2	Annex I	
21	Asiatic black bear	<i>Selenarctos thibetanus</i>	2	Annex I	VU
22	Red panda	<i>Ailurus fulgens</i>	2	Annex II	EN
23	Stone marten	<i>Martes foina</i>	2	Annex III	
24	Yellow-throated marten	<i>Martes flavigula</i>	2	Annex III	
25	Common otter	<i>Lutra lutra</i>	2	Annex I	
26	Large indian civet	<i>Viverra zibetha</i>	2	Annex III	
27	Indian civet	<i>Viverricula indica</i>	2	Annex III	
28	Spotted linsang	<i>Prionodon pardicolor</i>	2	Annex I	
29	Golden cat	<i>Felis temmincki</i>	2	Annex I	
30	Palla's cat	<i>Felis manul</i>	2	Annex II	
31	Lynx	<i>Lynx lynx</i>	2	Annex II	
32	Chinese forest musk deer	<i>Moschus berezovskii</i>	2	Annex II	
33	Roan musk deer	<i>Moschus sifanicus</i>	2	Annex II	
34	Red deer	<i>Cervus elaphus</i>	2		
35	Wapiti	<i>Cervus elaphus macneilli</i>	2		
36	Samber	<i>Cervus unicolor</i>	2		
37	Tibetan gazelle	<i>Procapra picticaudata</i>	2		
38	Serow	<i>Capricornis sumatraensis</i>	2	Annex I	VU
39	Goral	<i>Naemorhedus goral</i>	2	Annex I	VU
40	Argali sheep	<i>Ovis ammon</i>	2	Annex II	VU
41	Blue sheep	<i>Pseudois nayaur</i>	2		
42	Mandarin duck	<i>Aix galericulata</i>	2		

43	Buteo	<i>Buteo buteo</i>	2		
44	Kite	<i>Milvus korschun</i>	2		
45	Sparrow hawk	<i>Accipiter gentilis</i>	2		
46	Goshawk	<i>Accipiter nisus</i>	2		
47	Pine grosbeak	<i>Accipiter virgatus</i>	2		
48	Cinereous vulture	<i>Aegypius monachus</i>	2	Annex II	V U
49	Greater spotted eagle	<i>Aquila clanga</i>	2	Annex II	
50	Brown-backed falcon	<i>Falco columbarius</i>	2		
51	Red falcon	<i>Falco tinnunculus</i>	2	Annex II	
52	Red-foot falcon	<i>Falco vespertinus</i>	2		
53	Snow partridge	<i>Lerwa lerwa</i>	2		
54	Blood pheasant	<i>Ithaginis cruentus</i>	2		
55	Red-bellied tragopan	<i>Tragopan temminckii</i>	2		
56	Elwe's eared pheasant	<i>Crossoptilon harmani</i>	2	Annex I	
57	Tibetan eared pheasant	<i>Crossoptilon crossoptilon</i>	2	Annex I	V U
58	Blue eared pheasant	<i>Crossoptilon auritum</i>	2		
59	Koklos pheasant	<i>Pucrasia macrolopha</i>	2		
60	Golden pheasant	<i>Chrysolophus pictus</i>	2		
61	Chinese copper pheasant	<i>Chrysolophus amherstiae</i>	2		
62	Grey crane	<i>Grus grus</i>	2		
63	Wedge-tailed green pigeon	<i>Treron sphenura</i>	2		
64	Derbyan parakeet	<i>Psittacula derbiana</i>	2		
65	Collared scops owl	<i>Otus bakkamoena</i>	2		
66	Eagle owl	<i>Bubo bubo</i>	2	Annex II	
67	Forest eagle owl	<i>Bubo nipalensis</i>	2	Annex II	
68	Little owl	<i>Athene noctua</i>	2		
69	Tawny owl	<i>Strix aluco</i>	2		
70	Ural wood owl	<i>Strix uralensis</i>	2		
71	Barred owl	<i>Glaucidium cuculoides</i>	2		
72	Collared scops owl	<i>Glaucidium brodiei</i>	2		
73	Chinese giant salamander	<i>Andrias davidianus</i>	2	Annex I	
74	Trout	<i>Hucho bleekeri</i>	2		
75	Carabus lafossei	<i>Carabus lafossei</i>	2		
76	Cheirotonus	<i>Cheirotonus gestroi</i>	2		
77	Apollo butterflies	<i>Bhutanitis thaidina dongchuanensis</i>	2		
78	Bhutanitis butterfly	<i>Parnassius apollo</i>	2		
79	Common red fox	<i>Vulpes vulpes</i>	3		
80	Alpine weasel	<i>Mustela altaica</i>	3	Annex III	
81	Leopard cat	<i>Felis bengalensis</i>	3	Annex I	
82	Tufted deer	<i>Elaphodus cephalophus</i>	3		
83	Red flying squirrel	<i>Petaurista petaurista</i>	3		
84	Owl	<i>Caprimulgus indicus jataka</i>	3		
85	Large hawk cuckoo	<i>Cuculus sparveroides</i>	3		
86	Swift	<i>Hirundapus caudacutus</i>	3		

Notes:

- 1) According to the state protection of China. The animals of class-I and class-II are under state key protection, and animals of class-III protection in Sichuan are under provincial key protection.
- 2) CITES: Convention on International Trade of Endangered Species, 1995.
- 3) IUCN: International Union for Conservation of Nature and Natural Resources, 1994, EN endangered species, VU vulnerable species, R rare species

High levels of endemism

Chinese and Sichuan endemic species in the nominated area include mammals such as giant panda, golden monkey, takin, white-lipped deer and Chinese stump-tailed macaque, birds such as Chinese monal, Orange-throated partridge (*Tetrophasis obscurus*), Chinese Thrush (*Turdus mupinensis*) and Rufous-tailed babbler (*Chrysomma poecilotis*), amphibians such as *Oreolalax popei*, *Amolops mantzorum*, *Staurois mantzorum* and *Polypedates dugritei*, fishes such as *Schizopygopsis malcanthus*, *Baoxinggensis*, *Schizothorax* (*Schizop.*) and trout (*Hache beekeri*), and half of the reptiles are endemic species such as *Japalura szechwanensis*, *Achalinus meiguensis*, *Leiolopisma monticola*, and *Pareas chinensis*. *Amphizoa davidi* grows only in the Jiabin Mountains of Baoxing County. In 1870 a specimen of male worm was collected which was generally thought of as extinct. In 1995 its imago and larvae were found again at the original place, showing that the original state of ecological environment was preserved well at the habitat.

Analysis of the global distributions of birds with restricted ranges undertaken by ICBP (now called BirdLife International) identified globally more than 400 EBA's or endemic bird areas where the ranges of several restricted range birds overlap. 13 of these EBAs are in China and 2 fall within the nominated area, which contain many of the most interesting and endangered endemic birds of China.

Global center of pheasants and important site for China's endemic birds

The nominated area is a special center of endemism for some bird taxa such as leaf warblers, laughingthrushes, rosefinches and pheasants. China is recognized as the global center of pheasant diversity with a total of 63 species. The nominated area contains a total of 15-16 different pheasant species; more than those known from any other single site.

Pheasant species of the nominated area

Snow partridge	<i>Lerwa lerwa</i>
Tibetan snowcock	<i>Tetraogallus tibetanus</i>
Orange-throated partridge	<i>Tetraophasis obscurus</i>
Tibetan partridge	<i>Perdix hodgsoniae</i> (marginal)
Chinese bamboo partridge	<i>Bambusicola thoracica</i>
Blood pheasant	<i>Ithaginis cruentatus</i>
Temminck's tragopan	<i>Tragopan temminckii</i>
Koklass pheasant	<i>Pucrasia macrolopha</i>
Chinese monal	<i>Lophophorus lhuysii</i>
Silver pheasant	<i>Lophura nyctymene</i>
White-eared pheasant	<i>Crossoptilon crossoptilon</i>
Common pheasant	<i>Phasianus colchicus</i>
Golden pheasant	<i>Chrysolophus pictus</i>
Lady amherst's pheasant	<i>Chrysolophus amherstiae</i>
Chinese grouse	<i>Tetrastes sewerzowi</i>
Japanese quail	<i>Coturnix japonicus</i>

Most important region of China for mammalian conservation

The most important region in China for mammal conservation consists of the band of forests on the eastern side of the Qinghai-Tibetan Plateau, extending through western Sichuan to southern Shaanxi and southwestern Hubei. This is the home of many of China's most precious and endangered species including giant panda, red panda, takin, musk deer, golden monkey and many others (MacKinnon et al, 1996). Within this zone the nominated area is the single site with the greatest representation of these important mammals. Cluster analysis by known distribution at county level or by biophysical sub-divisions (Xie Yan, 2001, 2002) confirms this importance and identifies the counties of Wenchuan, Kanding, Tianquan, Luding and Lixian as of particular importance.

1.2.5 Important ecological service functions

Based on the satellite image analysis, 53% of the area is natural forest [39% conifer zone (reddish shade on satellite photo), 14% subtropical zone], 36% is alpine shrub and grassland above the treeline, 8% is bare rock and ice at very high altitude and only 3% of the area is agricultural lands used for traditional hill farming. All the alpine shrub/grassland zone is connected and most of the forest is continuously connected. This is important in preserving the ecological integrity of the site, allowing vertical seasonal migrations and preserving large outbreeding populations.

Due to the location of the nominated area in the upper reaches of the Yangtze River, improved protection of the forest ecosystems is of enormous importance to China's economy. About one quarter of the entire population of China live downstream of the catchment area or are dependent on water and electricity diverted from the Yangtze River via the Three Gorges and Gezhouba dams. The lives of almost 300 million people are therefore affected by the success or failure of the catchment. Good protection means more reliable water supply, better supply of electricity, better flood control and better river communications. Poor protection means more frequent and severe floods, water shortages, siltation of canals and irrigation systems and loss of inland fisheries.

At a more local scale, the nomination of the area as a world heritage site will affect the levels of investment in eco-tourist infrastructure and protective management, providing important revenues to the local people whose support and collaboration are so vital to the programme's success.

1.3 Site of great biological history significance

The nominated area has been of great significance in the history of the study of biology for over 130 years. Highlights include the early explorations and collections of Pere Armand David in the late 19th century, the further botanical explorations and collections by Wilson in the early years of the 20th century, the highly respected studies of the fauna by Chinese academics such as Hu Jinchu and flora by Wu Zhengyi, Fang Wenpei, extending into the pioneering research on giant panda ranging ecology and breeding biology initiated in 1981 by the unique and politically significant collabora-

tion between international and Chinese scientists (Schaller et al., 1985) and continuing research into the 21st century.

Provincial research teams started work in the area during the 1960s. The famous field station of Wuyipeng in the home of the giant panda at an altitude of 2 400m was established in 1979 and has been the site of continuous field studies ever since. This is one of the longest such studies of a mountain system of this type.

Wolong and Labahe nature reserves were among the first batch of nature reserves established in China in 1963 and apart from the Guangdong MAB reserve of Dinghushan (established in 1956), these areas have the longest history and greatest experience in conservation and protected area management in China.

1.4 Largest and most successful captive breeding center of giant panda in the world

The Wolong Breeding Center at Hetaoping is the world's largest and most successful captive breeding center for giant panda. Here is found the largest collection of captive pandas and here has been the greatest number of successful captive births. 48 cubs were born there between 1986 and 2000. The unique feature of this center is that it is situated right inside the natural habitat of the species and has a large walled natural enclosure (2 ha) where animals can perform more natural life activities than in any other captive station.

1.5 Spectacular scenic area

The natural scenery of the nominated area is outstanding with steep forested valleys, clear rushing rivers, rocky crags, wide alpine meadows and the backdrop of the shy glacial peaks of Mt. Siguniang. There are eerie freshwater lakes and splendid examples of glacial landscapes. The entire scene is constantly changing with the season-icicles and snowy cushions in winter, carpets of flowers in the deciduous forests in spring, a blaze of alpine color in summer, stunning red leaves in fall and the elegant plumes of bamboo all year round. Strange mists swirl around the crags or settle in the valleys.

More than 20 special scenic areas have been specifically identified, with each possessing its own unique characters and features. Among them, the most famous ones are listed below:

Scenic and Touristic Resources in the nominated area

No.	Scenic Spot	Landscape Features	Present level of Development
1	Wolong National Nature Reserve Museum at Shawan	One of the best places for science and education, having numerous local species of 2 170 plants, 225 birds, 56 beast, 700 insect, 6 fish, 17 amphibians and reptiles.	Started
2	Yingchanggou in Wolong National Nature Reserve	High peaks embraced by clouds and mist, big trees and rushing water in valleys, with extra interest from travelling pandas.	Started
3	Wolong Hetaoping Giant Panda Breeding Centre	Six labs and quarters for up to 55 pandas, an ideal place for panda study. Visitors can see pandas in pens and a large outdoor enclosure.	Started
4	Shangjiang Scenic Spot of Wolong National Nature Reserve	Wonderful forest with dove trees and wild animals, such as Sambers	Started
5	Muerzhai Forest Park of Mt. Siguniang National Nature Reserve	Wonderful subalpine forest and alpine meadow	To be developed
6	Changpinggou Scenic Spot of Mt. Siguniang National Park	Along a path entering through the dense cypresses of thousands of years that form a huge umbrella, making people difficult to distinguish the sunrise from the sunset	Started
7	Shuangqiaogou Scenic Spot of Mt. Siguniang National Park	Wonderful subalpine forest by <i>Hippophae</i> and snow peaks	Started
8	Haizigou Scenic Spot in Mt Siguniang National Park	Located in the east of Rilong town, named after its consisting of lots of lakes, 19.2 km long and 126.48 km ² in area, with tranquil and clear water in which fishes swim and over which eagles soar in the blue sky.	To be developed
9	Red-leaf Scenic Spot of Miyalou Provincial Park	With National Road 317 running through, as the largest red-leaf spot in China at 2000 ~ 3400 m a.s.l., it extends 127 km and covers an area of 3 000 km ² with clean waters, green maintains and trees, a red corridor is formed among the trees in golden autumn.	Started
10	Bipenggou Scenic Spot of Miyalao Provincial Park	45 km long, covering an area of 180 km ² and at 2000 ~ 5000 m a.s.l., adjacent to Mt. Siguniang, Bipenggou is a scenic collection of plateau, swamps and valleys, featured by the well-known "Eight Wonders": ancient glaciers, lakes, springs, waterfalls, forests, peaks, red leaves and swamps. The resort covers varieties of red leaves and Rhododendron, with the intersections of glaciers, waterfalls and perilous peaks. In addition to its primitively ecological environments, its abundance of resources of natural landscapes and wildlife has made it an ideal resort for eco-tourism and scientific education in the 21st century.	Started
11	Caopo Provincial Nature Reserve	Scenery of ecosystem for giant panda, primitive forest and wild animals.	To be developed
12	Fengtongzhai National Nature Reserve	Scenery of ecosystem for giant panda, primitive forest and wild animals, with dense distribution of giant panda and golden monkey.	Started
13	Mt. Jiajin Scenic Spot of Mt. Jiajin Provincial Park	Scenery of ecosystem for giant panda, snowy mountain, Tibet villages and Tibet customs, commemorate places of the Chinese Red Army cross over the snow-capped mountain on foot.	To be developed
14	Pujigou Scenic Spot of Mt. Jiajin Provincial Park	Scenery of ecosystem for giant panda, primitive forest, wild animals and snow-capped mountain.	To be developed
15	Ganyanggou Scenic Spot of Mt. Jiajin Provincial Park	Scenery of ecosystem for giant panda, wild osmanthus, primitive forest, wild animals, gorges, with rare scenery of 600m ² of wild osmanthus forest	To be developed
16	Dengchigou Catholic Church of Mt. Jiajin Provincial Park	Constructed in Qing Dynasty in Baoxing County in 1839, Covering an area of 1 560 m ² , with features of Chinese quadrangle and French style, by the French natural historian P. A. David who then became the father of this church and found giant panda in 1869 at this place. The architecture is intact and the church is the place for catholics in Baoxing County to have their activities.	To be developed
17	Labashe Provincial Nature Reserve	Scenery of ecosystem for giant panda, primitive forest wild animals, snow-capped mountain, with dense distribution of takin, deer and monkey. Good place to watch takin visiting salt licks in open area.	Started
18	Baishahe Scenic Spot of Mt. Erlang Provincial Park	Attractive scenery of ecosystem for giant panda, primitive forest, wild animals and deep gorges.	To be developed
19	Mt. Erlang and Mt. Hongling Scenic Spot of Mt. Erlang Provincial Park	Stunning scenery of ecosystem for giant panda, primitive forest, wild animals, snow-capped mountain, with rare scenery of dove trees of 200 000 m long and ginkgo of hundreds of acres.	To be developed

20	Mt. Daxuefeng Scenic Spot of Mt. Lingjiu—Mt. Daxuefeng Provincial Park	Beautiful scenery of ecosystem for giant panda, primitive forest, wild animals, snow-capped mountain, glacier, with rare scenery of dense distribution of giant panda, deer and takin.	To be developed
21	Mt. Qingcheng Scenic Spot of Mt. Qincheng—Dujiangyuan National Park	Scenic and cultural site. Ecosystem for giant panda, primitive forest, wild animals, with vestiges of Chinese Daoism such as Tianshidong Temple. It is already listed as World Culture Heritage	Partly developed
22	Houshan Scenic Spot of Mt. Xilingxueshan National Park	Scenery of ecosystem for giant panda, primitive forest, wild animal, snow-capped mountains.	To be developed
23	Mt. Jiguan-Jiulonggou Provincial Park	Scenery of ecosystem for giant panda, primitive forest, wild animals	Partly developed
24	Mt. Tiantai Provincial Park	Scenery of ecosystem for giant panda, landscapes and various bamboos.	Partly developed
25	Jingtang-Kongyu Provincial Nature Reserve	Scenery of ecosystem for giant panda, primitive forest, wild animals, subalpine meadow, ancient path for transporting tea and salt to Tibetan and Commemorations for the Chinese Red Army's Long March	To be developed

1.6 Additional cultural interests of the Qiang and Tibetan minorities and Han temples, Taoism and historical sites including the unique Qing Dynasty Catholic Mission

The northeastern gateway to the nominated area is the municipal city of Dujiangyuan, famous for its outstanding Taoist temples and famous irrigation works. These have separately, already been recognized as an outstanding cultural area and graced with the title of World Heritage Cultural Site.

Other examples of Han culture can be found in Baoxing and other early settlements in and around the nominated area. The Catholic mission station and church of Dengchigou in Baoxing county remains intact with its unique French/Qing style.

Qiang and Tibetan minorities preserve their own cultural values with distinctive house styles, dress, language, ethnobotanical knowledge, dances, religion, and other traditions.

2 Conservation Status and Pressures Facing the World Heritage

2.1 Conservation status

Wolong and Labahe Reserves were established in 1960's, among the ones first set up in China. Another 7 reserves and 9 scenic parks were also set up later. The legislation applied in nature reserves is the "Management Regulations on Nature Reserves" and in scenic parks the "Management Regulations on Scenic and Historical Parks (Areas)". Since 1980's, both the State Council and Sichuan Province issued Wildlife Protection Law or Regulation. Many counties in the region applied hunting ban.

Since 1979, international collaborations have been initiated in the nominated area, especially on giant panda. Among them the longest one is the collaborative project on giant panda conservation with WWF. Based on such project, a National Conservation Program on Giant Panda and Its Habitat was formed in 1989 and later approved by the State Council in 1993.

In 1999, the National Natural Forest Protection Program (NFPP) was launched with a logging ban, eliminating the major threats to habitat degradation and fragmentation. In year 2000, the Program on Conversion of Slopping Cultivated Land to Forest and Grassland (also known as "Grain to Green") was also initiated. Both Programs presented great potential of restoring damaged panda habitat and recovering biodiversity in a landscape scale. Since 2001 a National Program on Endangered Wildlife and Nature Reserves" has been applied, greatly increased the investment in protecting selected species such as giant panda and golden monkey, as well as in establishing new reserves and expanding existing ones. The following provides a brief description of all 7 nature reserves and 9 scenic parks in the nominated area:

- **Wolong National Nature Reserve** in the nominated area, set up in Wenchuan County in 1963, 200 000 ha, mainly for the protection of golden monkey and giant panda. 100 wild pandas are living there. Tourist accommodation capacity in 2 000 amounted to 60 000 person-time.
- **Labahe Provincial Nature Reserve** in the nominated area, set up in Tianquan County in 1963, 23 400 ha, protecting animals like takin and giant panda. 12 wild pandas are living there. Tourist flow in 2 000 amounted to 3 000 person-time.
- **Fengtongzhai National Nature Reserve** in the nominated area, set up in Baoxing County in 1975, 39 000 ha, mainly protecting giant pandas. 40 wild pandas are living there. Tourist flow in 2 000 amounted to 6 000 person-time.
- **Mt. Qingcheng - Dujiangyan National Park** in the nominated area, set up in Dujiangyan City in 1982, 15 000 ha, mainly protecting Taoist heritage culture of the Qingcheng Mountain, ecosystem and the ancient Dujiangyan Irrigation System. 6 or 8 pandas are living there. Its tourist flow in 2 000 amounted to 400 000 person-time.
- **Mt. Jiguan - Jiulonggou Provincial Park** (including Anzi Provincial Nature Reserve) in the nominated area, with a tourist flow in 2 000 amounted to 100 000 person-time.
- **Mt. Tiantai Provincial Park** in the buffer zone of the nominated area, set up in Qionglai City in 1989, 21 000 ha, mainly protecting the sightseeing ecosystem. 4 or 6 panda are living there. Its tourist flow in 2 000 amounted to 140 000 person-time.
- **Heishuihe Provincial Nature Reserve** in the nominated area, managed by Lushan and Dayi Forestry Bureau and set up in Lushan and Dayi County in 1993, 31 800 ha, mainly protecting giant pandas. About 25 pandas are living there.
- **Mt. Siguniang National Park** in the nominated area, set up in Xiaojin County in 1994, 45 000 ha, mainly protecting the sightseeing ecosystem. Giant pandas were once concentrated in the area.

Its tourist flow in 2 000 amounted to 64 000 person-time.

- **Mt. Xilingxueshan National Park** with the unexploited back mountain in the nominated area, set up in Dayi County in 1994, 48 300ha. Its tourist flow in 2 000 amounted to 200 000 person-time.
- **Mt. Jiabin Provincial Park** - dominantly in the nominated area, managed by Construction, Environmental Protection & Travel Bureau of Baoxing County and set up in Baoxing County in 1995, 127 500 ha. About 100 pandas are living there.
- **Miyaluo Provincial Park** (including Miyaluo Provincial Nature Reserve) with the Bipenggou and part of red-leaf scenic areas in the nominated area, set up in Lixian County in 1995, 368 800 ha, protecting the sightseeing ecosystem. An administration of the scenic area was set up. 2 giant pandas were found in 2000.
- **Jintang - Kongyu Provincial Natureal Reserve** dominantly in the nominated area, set up in Lushan County in 1995, 130 000 ha, protecting wild animals and ecosystem, managed by the Construction Bureau of the county. About 10 giant pandas are living there.
- **Mt. Siguniang National Nature Reserve** partly in the mostly area, set up in Xiaojin County in 1996, 130 000 ha, protecting the ecosystem. Giant pandas were found there in 1970s.
- **Mt. Lingjiu - Mt. Daxuefeng Provincial Park** partly in the nominated area, managed by Lushan Construction Bureau and set up in Lushan County in 1999, 30 000 ha, protecting the sightseeing ecosystem. 25 pandas are living in the Mt. Daxuefeng area.
- **Mt. Erlang Provincial Park** in the nominated area, managed by Construction, Environmental Protection & Travel Bureau of Tianquan County and set up in Tianquan County in 2000, 126 000 ha, protecting the sightseeing ecosystem. 23 pandas are living there.
- **Caopo Provincial Nature Reserve** mostly in the nominated area, set up in Wenchuan County in 2000, 55 678 ha, protecting giant panda. About 10 giant pandas are living there.

2.2 Socio-economic status

There are 21 320 people living inside the nominated area, among which 1 020 inhabitats of 260 households are in the core zone and 20 300 in buffer zone, mainly 4 900 in Wolong and Gengda Town in the Wolong Nature Reserve; and 500 in Rilong Town, Xiaojin County; 5 030 in Qiaoqi Town; 1200 in Yongfu Township, Baoxing County; 650 in Taiping, Zhonglin and Dachuan Towns, Lushan County; 180 in Xiaohe and Lianglu Towns, Tianquan

County; 700 in Tai'an, Qingcheng Mountain and Yutang Towns, and Dujiangyan City. About 60% of the population is from minority groups. Net income of these people are listed in the following table (Sichuan Statistics Bureau, 2001):

	GDP per capita in 2000 (RMB: Yuan)	Net income of rural population in 2000 (RMB: Yuan)
Chengdu City	13 020	2 926
Ya'an City	4 949	1 909
Aba Prefecture	4 288	1 191
Ganzi Prefecture	2 797	733

The above figures indicate that the nominated area is a rather poor area, especially in remote locations in Aba and Ganzi.

2.3 Pressures/Threats

2.3.1 Tourism development

Except the 400 000 visitors to Qingcheng – Dujiangyan and 60 000 visitors to Wolong, tourists to other sites in the nominated area are limited. The flow of tourists is supposed to be enlarged to a large extent after its transition to one being listed in the Directory of World Natural Heritages.

After the launch of logging ban, many counties in this region depending on logging for cash income lost its revenue, so did communities in the region. Under such a pressure, both communities and local governments often raised high expectations to developing tourism. Revenue from properly organized eco-tourism has a great potential and could be a significant alternative livelihood in this poor region of China. Earnings will help to justify the protection of such large areas of forest. Revenues should in particular be allowed to flow down to the local communities living around the protected areas and who have few alternative earning options other than exploitation of the natural resources. Tourism development in this area should focus on ecotourism, which is characterized by minimized environmental impact from tourists, income directly benefiting conservation by providing alternative income to local communities and direct funding to protected areas. This usually requires sensible planning, good visitor management and qualified service, such as nature guides from reserves or local communities, viewing pandas and panda habitats. However, current development of tourism has caused environmental pressure by uncontrolled tourist flow into natural areas, disordered construction of hotels and roads, and ill-managed garbage and wastewater etc., which have had negative impact to wildlife and environment. This problem had occurred in Wolong where hotels and restaurants built in Hetaoping without proper plan, easier access to the pass on Balangshan created by road upgrade has led to trampling of rich alpine vegetation and plants being picked by tourists. Currently, Wolong is improving its tourist management and regulating facility

construction. Tourism management will be one of the major tasks for the management of this world heritage region.

2.3.2 Poaching

Some of the local farmers living in and around the nominated area still sometimes engaged in illegal poaching to supplement incomes. Animals with high economic value such as musk deer are often the target, but other animals, tufted deer, barking deer, black bear and even giant panda are accidentally injured and killed by indiscriminate snares. Cases on panda killing still occurs but greatly decreased since 1990's, due to severe penalties for killing or trading giant pandas and other State Category Protection Wildlife. However, in addition to strict law, what are also needed to eliminate poaching are patrols to prevent poachers, and assistance to local communities so their livelihoods could be less environmentally damaging.

2.3.3 Mining

Some mines of stone, multi-metals, coal and raw chemical materials are located in the conservation zone and the transitional zone of the nominated area. Their simple and crude equipment as well as backward technology result in serious destruction to forests and environment in some areas.

Three large-scale marble mines are located in Baoxing County. Mining activities cause noise and dust pollution as well as destroying vegetation cover and problems of disposal of waste materials. But a well managed and small scaled marble workshop to make carved panda souvenirs could be promoted as a 'green' industry for local handicrafts, a useful source of revenue from the tourist industry and can help in promoting the image of the giant panda and the its heritage park.

2.3.4 Pollution caused by metallurgical and chemical industries

The giant panda's living condition is threaten by the newly-established small-scale smelters and sulfuric acid plants at the entrance to the habitat, which, backward in technology and poor equipment, have polluted air, waters and soil to an evident degree.

2.3.5 Population growth

Population growth together with increasing need for living space add considerable pressure to land and resources. Populations in the nominated area are mainly from ethnic groups such as Tibetan and Qiang. There were 2 560 inhabitants of 421 households in the Wolong Nature Reserve in 1975, and 4 260 inhabitants of 904 households in 1995. Similarly, there were 3 000 inhabitants in Qiaoqi village, Baoxing county in 1957, which increased to 5 030 in 2000.

The government controls over population growth are relaxed in relation to minority groups so large families are normal in the nominated area. Special education programmes to promote population control are needed in addition to incentives to persuade more people to move out of the protected areas and find economic employment in the transitional zones or adjacent towns.

2.3.6 Agricultural incursions and overgrazing

The population increase has resulted in the clearing of natural vegetation to expand agriculture from the valley bottom to the steep slopes, and thus reduced the giant panda's habitats and activity areas. The alpine meadows of the nominated area are used extensively for the grazing of yaks and cows. This is particularly the case in the higher zones of the Wolong National Nature Reserve and the grassland areas of Aba and Ganzi Tibetan Autonomous Prefectures. There have been cases of over-grazing and degradation of alpine pastures. Some domestic grazing is probably essential to maintain the original vegetation condition since formerly these areas were grazed by higher densities of natural ungulates such as blue sheep and white-lipped deer which are now rather rare. One major task of the management of the Heritage Park will be to ensure that levels of grazing are stabilized within the natural capacity of these areas.

2.3.7 Logging and illegal cutting of wood

Forest resources are rich in the Qionglai Mountains, which have supplied woods for Chengdu Plain for a long time. But the forests on the east slope have already been cleared, and the forests in sub-high mountains have been felled in the recent 40 years. As a result, forests in the main tributaries have been felled to different extents and the habitats of giant panda have been cut apart. Thanks to the decision of the logging ban on natural forests by the Sichuan Provincial Government and the National Natural Forest Protection Programme, initiated by the State Government in 1999, the situation has had a fundamental improvement.

The human inhabitats of the nominated area use wood as their primary source of fuel and also cut wood, especially birch (*Betula*) trunks as substrate for growing edible fungi. Since the human population is growing fast this could become a serious problem in the future unless adequate controls and alternative energy resources are put in place quickly. These should include establishment of adequate wood plots in transitional zone areas to meet other legitimate wood needs.

2.3.8 Collection of medicinal plants

Collection of medicinal plants is a threat to the survival of some rare target species. In addition, the movements of collectors through the protected areas, especially if accompanied by dogs can constitute a serious disturbance to the shy giant pandas, forcing them to abandon

areas of suitable habitat.

Solution to this problem is complex and requires a multi-pronged approach including:

- Strict zoning of where collecting is permitted and of what species
- Supervision that collecting follows the agreed regulations
- Development of artificial rearing of medicinal plants in transitional zones and experimental zones of the nominated area
- Cooperation from the traditional medicine factories about bans on the buying of endangered species and the identification of substitutes in traditional prescriptions
- Extension work among communities engaged in collection of medicinal plants (and animals).
- Improved monitoring of the impacts of plant collecting on wild populations

2.3.9 Introduction of exotic species

Whilst the management authority both welcomes and encourages the efforts at reforestation of degraded areas within the nominated area, strict regulations and controls must be put in place to ensure that only appropriate local species are planted.

Use of exotic species, even from other parts of China, could cause threats to the native fauna and flora through the spread of alien invasive forms and species. Currently several non-native species of Larch (*Larix*), pines (*Pinus*), *Pauwlonia* and other trees, shrubs and flowers are being planted and this should be halted. Adequate nurseries for the rearing of local seed should be established to meet local reforestation needs.

The same rules should include prohibition of introduction of new bamboo species into the ecosystem out of misguided hope this will help giant panda.

2.3.10 Construction of infrastructure

A road through the Wolong Nature Reserve to Aba Tibetan Autonomous Prefecture traverses the nominated area. This is a busy route for lorries and buses and does cause some disturbance to roadside vegetation and wildlife. Another road from Baoxing to Mt. Siguniang is planned to be enlarged to bring more tourists in. Road construction and improvement is one of the major activity of the current Western Development Program. Road access is no doubt a key element in improving local people's livelihoods, but it is essential that careful planning is in place to avoid further fragmentation of panda habitats. Many roads lead into the nominated area for access to townships and farmlands are result from previous logging operations and some are already abandoned after the logging ban in 1998.

In addition, power lines, water channels and several hydropower plants exist and are being built within the nominated area. These features are regarded as essential services for local

development. However, the heritage management authorities should ensure that all such services and infrastructures are designed and managed in ways that cause the minimum of impact to the natural environment.

2.3.11 Capture of giant pandas from the wild

In addition to losses due to poaching, the panda population has suffered from excessive levels of capture and removal from the wild. Between 1950 and 1970 at least 70 wild pandas were captured for domestic and international zoos.

The people of Sichuan have always shown great love and care for the giant panda and Annex 4 lists many examples of spontaneous and often heroic actions taken to help and save pandas found to be in trouble. As a result nearly 80 wild pandas have been rescued into captivity within the province over the past 20 years. Some of these were quickly and properly returned to the wild but many have ended up in zoos or in special breeding centers for giant panda.

In many cases these rescues were genuine and essential to save the life of the animals in question but it is certain that the payment of financial incentives may have resulted in some healthy animals being caught unnecessarily. For this reason the government ceased the offer of financial rewards since 1988. In addition, zoos are also prohibited from offering financial 'thank you's to suppliers of rescued animals. Furthermore, a new "rescuing policy" was issued by the State Forestry Administration in 1999 to stop random capture of wild pandas. The management agencies must continue to ensure that only animals in real need of help are taken into captivity and that animals are assigned to the most suitable facility for their own well-being.

There are enough giant pandas in captivity to maintain a healthy captive population. No new animals need to be caught for this purpose. The breeding of captive population should be raised in efficiency so as to be self-sufficient and the programme for releasing captive born pandas back into the wild to boost waning wild populations or achieve outbreeding between different populations should be pursued with greater vigor.

2.3.12 Weak management

Although great efforts have been taken by the government in establishing nature reserves and scenic parks, the basic units of the nominated world heritage, lack of qualified human resources, together with inadequate funding becomes the major bottleneck for effective management of those sites. Enhancing management of these units will be one of the most important tasks of the world heritage.

The above is an incomplete list of factors that influence or threat panda population and habitat.

Some of these factors are interlinked to each other, and some are causes of others. For example, development of mass tourism often requires road construction and more fuelwood collection, which have negative impacts on habitat. It is important that the conservation management strategy deals not only the direct causes but also root causes of habitat degradation and wildlife population decline.

2.4 Natural disasters

In addition to human caused threats, natural disasters should also be taken into account. The nominated area is located in the complex mountains and valleys with frequent natural calamities such as earthquakes, floods, debris flows, landslides, fires and synchronous mass flowering and death of bamboo.

2.4.1 Earthquake

The nominated area is located in the north-south earthquake belt in China. Three earthquakes with magnitude over 6 have occurred in history, respectively with the epicenter in the north end of the Labahe Nature Reserve with a magnitude of 6.5 in Sept., 1927; the epicenter in the west part of the south end of the Labahe Nature Reserve with a magnitude of 6 in June 21, 1941; and the epicenter on southeast verge of Mt. Daxuefeng Scenic Area with a magnitude of 6.25 in Feb. 24, 1970.

2.4.2 Floods

In the Jiabin Mountain Ranges, the rainfall is 150mm during 24 hours and 220mm during 72 hours, which results in 1.5 serious floods each year. Continuously heavy rain from July 27 to Aug. 4 in 1966 within the territory of Baoxing County destroyed all of the houses and cultivated land where in the Yanjing District Government was located.

2.4.3 Debris flow and landslide

The nominated area is located in the intermediate dangerous zone with debris flow and landslide, but the distribution of debris flow and landslide is different. The debris flow on July 8th, 1964 resulting from the heavy rain in Dengchigou of Baoxing County resulted in 29 deaths and 2 natural villages forced to remove. There has been over 10 debris flows with different destructive degrees within Mt. Siguniang Scenic Area in the past 40 years.

2.4.4 Forest fire hazard

With the implementation of the State Forest Conservation Stipulations, no large-area forest fire

occurred in the past 30 years, while small fires took place occasionally that were caused by burning the grass on wasteland or burning the crop remains for fertilizer. Most of the nominated area is in a very humid zone where the chances of large-scale fire are very small but some western forests are in a rain-shadow and could become fire-prone in a dry year. In conclusion, fire prevention is one of the important tasks for the management of the proposed heritage site.

It is worth mentioning that most of the above natural disasters can also be induced or intensified by human factors: forest cutting may increase landslide and floods; monocultured plantations are fragile to forest fires, etc.. So it is critical to reduce or stop human caused threats.

2.4.5 Bamboo blooming

As one of giant panda's staple food, arrow bamboo bloomed and then withered in the early 1980s. The most serious ecological disaster in the past 50 years, from the point of view of the giant panda, affected nearly the whole nominated area in 1983, when more than 60% arrow bamboo bloomed (up to 95% specifically in Wolong and Pujigou, northwest in Baoxing County) and almost all arrow bamboo in places at 2300 ~ 3500 m above sea level bloomed and then withered.

Much publicity has been given to periodic mass flowering events of bamboo although it is part of the bamboo's normal life cycle, and usually there are two or more species of bamboo living in most panda habitats. However, bamboo flowering could become disastrous when the habitat is fragmented with only one species of bamboo available. The best strategy to minimize the damage to the wild panda population of future bamboo flowering episodes appears to be to ensure that adequate corridors and habitat connections remain to link giant panda sub-populations. For this reason the management plan for the Heritage Park places great emphasis on maintaining and re-establishing connectivity throughout the region and between the different protected areas and scenic sites of the nominated area.

3 Conservation and Management Strategies of the World Heritage

This management plan and strategy was developed in a participatory manner that involved Sichuan Forestry Department (SFD), Sichuan Provincial Planning Committee, Sichuan Environmental Protection Bureau (EPB), Sichuan Construction Department (SCD), Sichuan Land Resource Department, Sichuan Tourism Bureau, Ya'an City Government, Chengdu City Government, Aba Prefecture Government, Ganzi Prefecture Government, and all 7 nature reserves and 9 scenic parks, as well as the 12 counties where the parks and reserves located. Views from different agencies were coordinated and confirmation documents signed.

3.1 Management objectives

Goal (long-term)

The biodiversity, ecosystem and habitat of the giant panda will be effectively protected in the world

heritage site; social and economic development of human population will be harmonized with the natural environment

Objectives

- The giant panda population and habitat well protected so that the “flagship” species will live and expand;
- Natural features of outstanding global significance notably rare and endangered species, overall biodiversity, scenic values and geomorphic interests effectively protected in the World Heritage;
- The Upper-Yangtze watershed and forest ecosystem well protected to provide adequate ecological services locally and to downstream;
- Rich cultural heritage protected and perpetuated;
- Local community development sustainable - environmental pressures from development reduced; ecotourism well managed and sustainable, negative impacts to environment from other livelihoods and threats (see section 2.2) are minimized;
- Increased public awareness and participation in conservation - making the world heritage a show case for environmental education and communication.

3.2 Management approaches

3.2.1 Zonation

Principles of the zonation

To ensure management feasibility and effectiveness, the nominated world heritage is divided into different zones according to the “Conservation Management Regulation on Sichuan World Heritage”. These zones are:

Nominated area: including a core zone and a buffer zone;

Transitional zone: the area surrounding the nominated area, or conservation zone.

The following criteria were considered when the zones were divided:

1) The world heritage: mainly considered the area covers all major panda habitats and special natural and ecological landscapes of the Qionglai Mountains. It includes:

Core zone

- Concentrated panda distribution.
- Complete panda habitat.
- Concentration of biodiversity and original distribution of important type species.
- Relatively intact natural ecosystem and landscape.
- Low in human population, density less than 0.2/km².
- Core zone of nature reserves and scenic parks.

Buffer zone Rest of the conservation zone outside of core zone, human population density 4.9/km²

2) Transitional zone: Controlled area outside of the nominated area to ensure proper protection of the world heritage

Nominated area is 9 510 km², including core zone 5 370 km² and buffer zone 4 140 km². transitional zone is 5 290 km².

The regions concerned including the nominated area and its transitional zone involve 12 counties of 2 ethnic autonomous prefectures and 2 cities as indicated in following tables.

Administrative division of the nominated area

Administrative division		Nominated area or conservation zone (km ²)	Core zone (km ²)	Buffer zone (km ²)	Transitional zone (km ²)
Aba Prefecture	Wenchuan County (including Wolong Special District)	2 330 (2 000)	1 890 (1 720)	440 (280)	530
	Xiaojin County	980	70	910	1 540
	Lixian County	820	40	780	460
	Subtotal	4 130	2 000	2 130	2 530
Ya'an City	Baoxing County	2320	1 780	540	740
	Tianquan County	970	630	340	290
	Lushan County	580	400	180	400
	Subtotal	3 870	2 810	1 060	1 430
Chengdu City	Dujiangyan City	160	40	120	90
	Chongzhou City	200	110	90	170
	Dayi County	150	100	50	250
	Qionglai County	-	-	-	210
	Subtotal	510	250	260	720
Ganzi Prefecture	Kangding County	930	310	620	530
	Luding County	70	-	70	80
	Subtotal	1 000	310	690	610
Total		9 510	5 370	4 140	5 290

Distribution of the world heritage units

City/ prefecture	World heritage units	Nominated area (km ²)			Transitional zone (km ²)
		Subtotal	Core zone	Buffer zone	
Aba	Wolong National Nature Reserve	2 000	1 720	280	-
	Mt. Siguniang National Park	450	70	380	-
	Mt. Siguniang National Nature Reserve	530	-	530	1 540
	Miyaluo Provincial Park	820	40	780	460
	Caopo Provincial Nature Reserve	330	170	160	530
Ya'an	Fengtongzhai National Provincial Nature Reserve	540	340	200	-
	Mt. Jiajin Provincial Park	1 780	1 440	340	740
	Labuhe Provincial Nature Reserve	240	200	40	-
	Mt. Erlang Provincial Park	730	430	300	290
	Heishuihe Provincial Nature Reserve	370	260	110	-
	Mt. Lingjiu - Mt. Daxuefeng Provincial Park	210	140	70	400
Chengdu	Mt. Qingcheng - Dujiangyan National Park	160	40	120	90
	Mt. Jiguan - Jiulonggou Provincial Park	200	110	90	170
	Mt. Xilingxueshan National Park	150	100	50	250
	Mt. Tiantai Provincial Park	-	-	-	210
Ganzi	Jintang - Kongyu Provincial Nature Reserve	930	310	620	530
	Lanan Provincial Park (in plan)	70	-	70	80
Total		9 510	5 370	4 140	5 290

World heritage in different counties

No	Total area and population			Core zone		Nominated area		Transitional zone		Nominated area + transitional zone	
	County	km ²	Pop*1000	km ²	%	km ²	%	km ²	%	km ²	%
1	Baoxing	3 114	55	1 780	57	2 320	75	740	23	3 060	98
2	Wenchuan	4 083	110	1 890	46	2 330	57	530	13	2 860	70
3	Lushan	1 193	123	400	34	580	49	400	34	980	82
4	Tianquan	2 390	143	630	26	970	41	290	12	1 260	53
5	Chongzhou	1 090	646	110	10	200	18	170	16	370	34
6	Dayi	1 338	496	100	7	150	11	250	19	400	30
7	Dujiangyan	1 208	594	40	3	160	13	90	7	250	21
8	Kangding	11 423	108	310	3	930	8	530	5	1 460	13
9	Lixian	4 313	44	40	1	820	19	460	11	1 280	30
10	Xiaojin	5 583	77	70	1	980	18	1 540	28	2 520	45
11	Luding	2 165	77	-	-	70	3	80	4	150	7
12	Qionglai	1 378	640	-	-	-	-	210	15	210	15

Management norms for different zones and areas

Management of the world heritage will be conducted under the following legislations:

- Conservation Management Regulations on Sichuan World Heritage, by Sichuan Provincial Government (2002)
- Regulation on Nature Reserves of the People's Republic of China, by State Council (1994)
- Regulation on Nature Reserves of Sichuan Province, by Sichuan Provincial Government (2000)
- Regulations on Scenic and Historical Areas Management, by State Council (1985)
- Regulations on Scenic and Historical Areas Management in Sichuan, by Sichuan Provincial Government
- Planning Criteria on Scenic and Historical Areas, a National Standard, by State Council. (1999)

The following norms should be followed in management:

Core zone

Essentially natural or will be allowed to return to a natural condition. Within this zone no logging, hunting, burning, collection of medicinal plants, habitation, mines and industries will be permitted. Tourism will be strictly controlled to small-scale ecotourism in limited localities, no mass tourism allowed. Roads and infrastructures will be minimized-no new roads and large new infrastructure, such as hydropower facilities, allowed and no expansion of existing ones permitted. Research will be limited to non-destructive collection, observation and monitoring, grazing will be permitted only above the treeline in summer months in approved areas where there are inadequate natural grazers to maintain the alpine meadows and under permit. Abandoned farmland will be encouraged to recolonize naturally. Mines and polluting factories will be closed. Incentives should be provided to inhabitants inside core zone, to encourage voluntary resettlements to outside.

Buffer zone

This zone, lying within the nominated area and being managed primarily for conservation, does contain some human residents and more activities will be permitted than in the core zone. No agriculture expansion allowed, lands steeper than 25% will be replanted with bamboo and trees to accelerate return to natural state and serve as corridors for giant pandas. Remaining agricultural areas will be demarcated and serve as limits for human occupation. Construction of infrastructure is restricted and micro-hydro plants to reduce dependence on firewood will be permitted. Dependence on natural firewood will also be phased out through development of alternative energy resources. Tourism is allowed but restricted under carrying capacity and closely monitored. Construction of access roads and tourist facilities will be allowed within pre-agreed limits. Mines and polluting factories will be gradually closed. Grazing will be permitted only in fenced fields. Manipulative research permitted but no outside species to be introduced.

Transitional zone

Lying outside the nominated area, comprises additional lands of natural reserve, national park or provincial park status where conservation remains the dominant theme. However, this zone also includes various towns, roads, dams, hydropower stations, mines, factories, villages and farmlands along the valleys. Logging, hunting and burning natural vegetation are banned in this zone. Resource use should be sustainable. Farmland steeper than 25% will be converted to forest or grassland under an ongoing national programme. Tourism is allowed under monitoring. Polluting industries will be closed down. No new industry of negative environmental impact permitted.

3.2.2 Establishment of an effective management mechanism

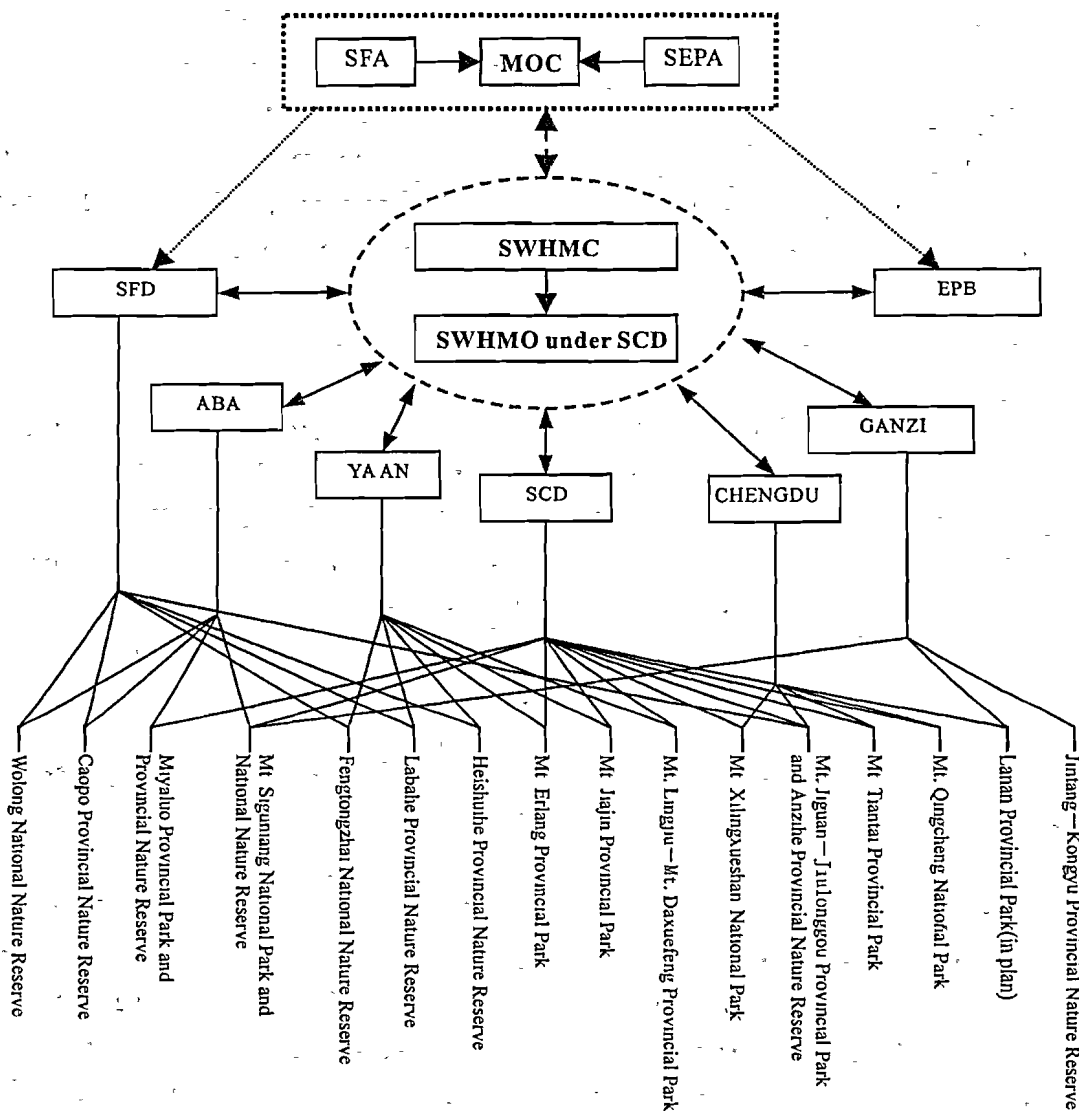
The nominated area covers the area of 12 counties in two prefectures and two cities, including 7 reserves and 9 scenic parks that are currently management under Sichuan Forestry Department (SFD), Sichuan Environmental Protection Bureau (SEPB) and Sichuan Construction Department (SCD). Thus management of the world heritage will involve coordination of multi-agencies. Sichuan Provincial Government has established a multi-institutional steering committee to handle the world heritage application, an office is also set up in SCD. In order to guarantee effective and consistent management of such a large area, a formal management mechanism should be structured as follows:

- Based on the existing steering committee, establish a “Sichuan World Heritage Management Committee (SWHMC)”, which should be headed by a vice governor with top authority in the province. Its members will include representatives from SCD, SFD, EPB and other relevant departments such as the Provincial Planning Committee and Land and Resource Department, as well as governments of Chengdu City, Ya’an City, Aba Prefecture and Ganzi Prefecture.
- Set up a “Sichuan World Heritage Management Office (SWHMO), as an executive office of the above committee to be responsible to day to day coordination and communication. This office should be under SCD, consistent to the implementation focal point of World Heritage Convention in China.
- A parallel Scientific Committee is also important to ensure management decisions are based on scientific basis.

Terms of References of the committee and the executive office include several aspects:

- Relying on existing management system, build management consensus among involved agencies.
- Coordinate communications and management consensus among parties; develop new policies and legislations on management when necessary.
- Responsible for organizing monitoring and evaluation on management of the world heritage, making sure that the monitoring and evaluation are scientific, comprehensive and independent.
- Develop and update overall management plan for the world heritage, incorporating the monitoring results into such a plan.

The WH management structure is illustrated here



Note:

MOC	Ministry of Construction of the People's Republic of China
SFA	State Forestry Administration of the People's Republic of China
SEPA	State Environmental Protection Administration of the People's Republic of China
SWHMC	Sichuan World Heritage Management Committee
SWMO	Sichuan World Heritage Administrative Office
SCD	Sichuan Construction Department
SFD	Sichuan Forestry Department
EPB	Environmental Protection Bureau of Sichuan Province
ABA	Aba World Heritage Administration Committee
YA'AN	Ya'an World Heritage Administration Committee
CHENGDU	Chengdu World Heritage Administration Committee
GANZI	Ganzi World Heritage Administration Committee

The management unit of the world heritage is a nature reserve or a scenic park. Each unit remains in its original management structure, receives administrative support from local governments and technical support from its focal department. Thus each department will maintain its existing authority and responsibility. The main differences in management for the world heritage are increased coordination among institutions and enhanced monitoring.

3.3 Conservation and management programs

Some of the following programs are ongoing and some are proposed. The purpose of making this plan is to coordinate activities that are managed by different departments so efforts will not be duplicated and returns maximized.

3.3.1 Management programmes

Expansion of nature reserves

Under the framework of approved Sichuan Wildlife and Nature Reserve Program, expand the area of existing reserves and establish new nature reserves in the nominated area based on the results from the third national panda population and habitat survey.

Effective management of world heritage units and law enforcement

Review existing management plans from individual reserves or scenic parks, updating and adjust goals and objectives according to the needs of the world heritage, strengthen law enforcement and implement the management plans.

Implementation of conservation plans on giant panda and other important endangered species

This is part of the ongoing Sichuan Wildlife and Nature Reserve Program, has been approved by the national government.

Restoration of panda habitat and re-establishing corridors

Integrating current ecological restoration policies and the needs of panda habitats, restoring steep farmland into needed panda habitat. Special attention will be placed on maintaining connectivity across vulnerable bottlenecks or corridors in the giant panda distribution. Corridors have been identified both by examination of forest connectivity using satellite images and also based on field surveys, especially the third national panda survey and ongoing monitoring by panda reserves as follows:

- Guobayangou (Fengtongzhai Nature Reserve) – upstream tributaries of the Huangshuihe (Da-xuefeng Scenic Spot);
- Dengchigou (Fengtongzhai Nature Reserve) – upstream tributaries of the Huangshuihe (Da-xuefeng Scenic Spot);

- Huoshiqi (Fengtongzhai Nature Reserve)–Dahe (Heshuihe Nature Reserve);
- Ruobigou (Mt. Jiajin Provincial Park)–Dashuigou (Fengtongzhai Nature Reserve);
- Ganyanggou (Mt. Jiajin Provincial Park)–upstream tributaries of the Baishahe (Mt. Erlang Provincial Park);
- Meilichuan (Mt. Jiajin Provincial Park)–Baisha River (Mt. Erlang Provincial Park);
- Upstream of the Talahe (Mt. Erlang Provincial Park)–upstream of the Labahe (Labahe Nature Reserve).

A new assessment should be conducted when the data of the third national survey on the giant panda and its habitat is made available.

Such corridors provide links between normally separate breeding sub-populations centered in different valleys but become extremely important in maintaining out-breeding between these populations, such as dispersal of young pandas. Such corridors must be especially important in the event of mass flowering and die off of bamboo, allowing safe passage to neighboring valleys where the bamboo may be out of synchrony and more plentiful. Special efforts will be made to preserve and protect the vegetation and bamboo cover of these corridors so that they are available to pandas whenever they wish to move from one sub-population to another. Where corridors have been encroached by former logging or agricultural activities, an active programme of habitat restoration will be applied involving planting of shade trees and tussocks of the appropriate bamboo species to form an underscore. Natural regeneration will be encouraged.

Corridors link other areas, such as the connection of the Jiajin Mountain habitat and Jiguan Mountain-Qingcheng Mountain habitat, located between the Huangshui Stream (Mt. Daxuefeng Scenic Spot) and the Heishuihe (Heishuihe Nature Reserve), as well as the connection of Jiguan-Qingcheng Mountain habitat and Wolong habitat is located on the watershed divide of Anzihe of Wenjing River (Jiguan Mountain-Jiulong Gully Scenic Spot) and Xihe Stream of Shoujiang River (Wolong Nature Reserve). All these corridors are vital for the natural reproduction of wild giant pandas, to maintain outbreeding.

The center areas planned for the nominated area are the main places where traces of giant panda have been found, which include all the vital corridors crossing watershed divides, and it is also the places with golden monkey, takin and Chinese monal. Those places with many traces of giant panda and other rare animals are defined as buffer zones; the places with scattered trace of giant panda and small number of wild animal are defined as transitional zone.

Eliminating or reducing environmental damage from mines and polluting industries

Mines and polluting industries in core zone will be closed immediately; the ones in buffer zones will follow. In the transitional zone, mines and industries will be requested to be monitored closely. The ones causing much environmental impact will to closed in a phased manner. The

land damaged by the mines will be restored as needed. A discussion on such a program has already been initiated by the World Heritage Office with local government during the preparation of this management plan.

Population control in the world heritage

Health education and family planning tools will be introduced. Incentives will be provided to those living inside the core zone to relocate voluntarily.

Community participation in management of the world heritage

Communities inside the world heritage and its transitional zone will integrate its development in line with the world heritage management criteria; in the mean while, the world heritage management will also involve communities so community development and world heritage management will become harmonized.

Management planning and updating

Upon acceptance of the site by World Heritage Committee, all involved agencies will be asked to review current plans, and if necessary, will be brought into line with this overall plan. All further revisions of those management plans and all subsidiary site development or programme development plans relevant to lands within the WH site will have to be developed in a participatory manner and approved by the Sichuan World Heritage Management Committee. A 5-year planning cycle will be necessary to update the overall WH management so management criteria, regulations and legislations, and support will be evaluated and adjusted according to the needs. Information collected from monitoring will be reflected into the management planning. Sichuan World Heritage Office will organize a participatory process, inviting all the management units and involved governmental and non-governmental agencies to discuss issues and needed strategies in the revised overall management plan.

3.3.2 Monitoring

Currently a monitoring system has been designed and began implemented in panda reserves in the region. The Chinese Academy of Sciences and the Sichuan Forestry Institute also have monitoring stations set up for various ecological parameters. The idea here is to enhance the existing monitoring system, to build a network among institutions so information will be integrated, and to fill the gaps in monitoring both geographically and technically. Monitoring will be conducted by staff in each WH unit through proper training, technical assistance will be provided by scientists or members of the WH Scientific Committee. Digitalized databases for each WH unit will be set up. The World Heritage Office will be responsible to coordinate monitoring plans and activities from each WH unit; a research institution will be identified to gather information from each unit and to analyze the trends. A GIS based management system will be established.

The monitoring programme has several elements. In several cases it is essential to establish sound

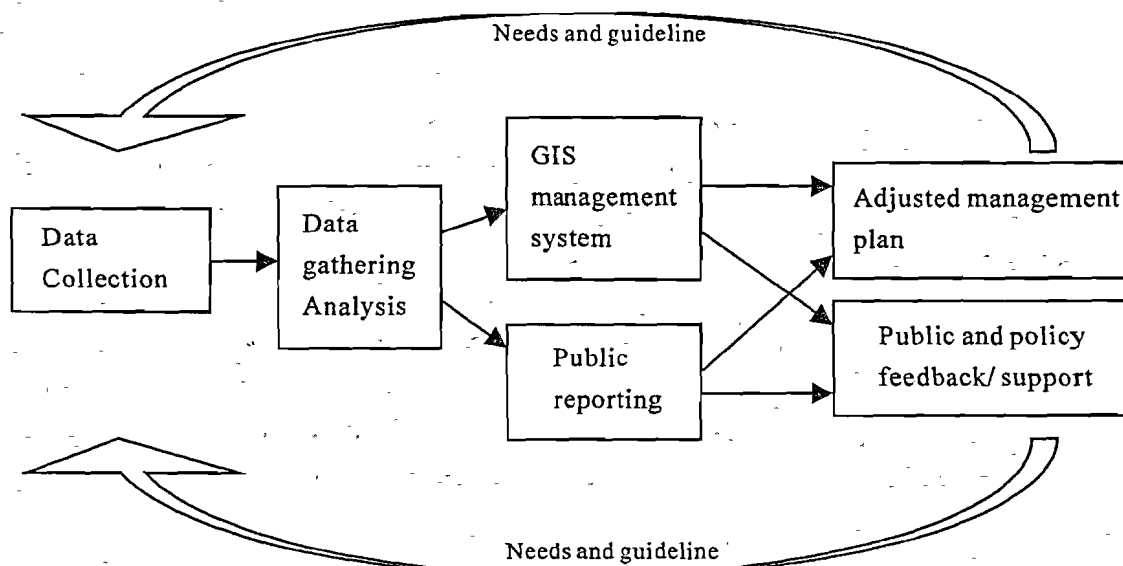
baseline data at the outset.

The following table summarizes the different subjects to be monitored (including baseline data collection) and recommended institutions to undertake the tasks:

Data to collect in monitoring	Responsible agencies
Overall vegetation cover using satellite imagery time series	A research institution in Sichuan
Physical parameters 'C climate, river flow, and sediment loads etc.	Trained staff from protected areas and relevant ecological observation stations
Condition of vegetation and especially bamboo by foot patrols and sample quadrates in respective management units	Staff of respective protected areas
Giant panda and other significant wildlife by foot patrol reports and periodic recensus	Staff of respective protected areas
Socio-economic conditions in local communities and trends of their livelihoods	Trained staff from protected areas and teams contracted by Sichuan WH Administration Office
Tourism development, numbers of visitors, revenues and impacts on scenic areas and environment	Trained staff from protected areas, county EPB offices and Dept of Tourism
Pollution from residual industries in transitional zone	Provincial and county EPB offices and contracted research institutions
Progress on respective action programmes and governmental policies	Respective executing agencies for different programmes, contracted research institutions

Monitoring is useless without proper reporting. In addition to their normal reporting to their mother units, each management units within the WH site will be required to prepare periodic reports for submission to the Sichuan World Heritage Administration Office whose role will be to collect these reports and prepare an overall annual progress report on the whole WH site.

A completed monitoring flow is shown as following:



3.3.3 Research

A programme of research would have several components and many projects. Research would be undertaken by various departments, scientific institutes and universities and also international collaborators and programmes.

The research programme would build on the considerable research already undertaken and ongoing, particularly the work undertaken at Wolong and Dujiangyan and the continued interest of research institutes, universities and organizations in and outside of Sichuan.

Research would be most encouraged in areas that can help in the improvement of management and conservation of the area, notably:

- Establishment of GIS database for monitoring vegetational changes from remote sense data and integration with wildlife data reported during monitoring and census.
- Continued studies of ecology of wild giant pandas and other precious wildlife (pheasant, golden monkey, red panda, takin etc.)
- Captive breeding and reintroduction trials of selected rare species
- Ecology and flowering patterns of bamboo species
- Continuing inventory of unsurveyed regions and lesser known taxa
- Habitat restoration methodology
- Taxonomic studies of special species groups "C rhododendrons, lilies, pheasants etc.
- Artificial propagation and processing of medicinal plants
- Socio-economic studies and surveys

All applications for conducting research must be submitted to the responsible management agency concerned, but must also be communicated with and coordinated by the Sichuan World Heritage Administration Office. In each case a clear contract should be drawn up between the management agency and the researchers concerned clarifying the nature of the research, ownership of intellectual property of the results, deposition of duplicate specimens, reports and publications, acknowledgements and citations. Agreed inputs from each side must be specified such as assistance in housing, transport, translation, maps or data to be provided or guides needed. Fees may be charged by management units for their assistance. All foreign researchers must be accompanied by national counterparts at the expense of those foreign researchers.

3.3.4 Public Awareness and environmental education

A comprehensive education programme will be developed aimed at three groups:

- Schools in local towns and villages
- Local communities living in the conservation zone
- Visitors and tourists

In collaboration with respective management units, a series of information/interpretation centers will be constructed. Existing museums, public access breeding centers and education centers will also be improved. Maps, displays, brochures, booklets and other materials will be produced.

Courses will be developed for use in local schools aimed at educating children about the importance of maintaining watershed functions, fire control, and the amazing local biodiversity. The materials should foster a love and pride in their local heritage and also show the benefits that can accrue to the local economy through careful protection of the site and through eco-tourism. School outings will be organized to show the children the beautiful scenery and wildlife of their surroundings.

Extension services reaching remote villages and households in the conservation zone will deliver special materials on reforestation, erosion control, waste disposal, watershed protection, biodiversity importance. This will be reinforced by the placement of educational posters and by active support programme in developing more sustainable livelihoods and recruitments into the protection, monitoring, research, tourism and other active programmes.

3.3.5 Capacity building

Goals

Uniformly insure the quality standards and methods of GIS management through propagating new conceptions, theories, information and technology concerning the World Heritage; improve levels in profession and management, expand academic exchange between various countries in governing the world heritages.

Objects

The program includes basic training and skill training, especially the application of GIS method in management matters. It is planned to establish a special provincial training course within an existing training center for the capacity building of world heritage staff at various levels, based on a training need assessment. A management training plan for the protection of giant panda and natural & cultural heritage will be implemented during 2002 ~ 2010.

Organization

Set up a training center under the Sichuan World Heritage Administration Office; Compile textbooks for training and set professional lectures; Encourage staffs to get advanced studies in colleges and other institutions at home or abroad. 800 ~ 1200 staffs are to be trained during the year between 2003 and 2010. In addition, study tours and training workshop are planned for the staffs to visit a number of international world heritage natural sites to broaden their experience and raise standards.

3.3.6 Tourism management and ecotourism development

Eco-tourism is one of the world's fastest growth sectors and this is through in China also. Not only are numbers of international tourists visiting China continuing to increase but also rising living standards within China is driving a fast growth in domestic tourism. The eco-tourism programme will be developed with the objectives of raising revenue for the local economy and creating education and awareness for the general public.

The types of development and the levels of tourism will be strictly controlled within carrying capacity of the various scenic and cultural areas concerned and with a great care to minimize disturbance to wildlife, to protect the environment and to be sensitive to local culture.

Every encouragement will be given to small-scale, low impact tourism enterprises developed and managed by local communities to ensure that a high percentage of the revenues realized remain within the regional and reinforce further protection of the site.

Large-scale, external investments will be resisted as these would have higher impact and much of the revenue would be taken away from the locality and local economy.

To ensure that these principles can be realized, all tourism development plans should be approved by the Sichuan World Heritage Administration Office.

A list of scenic areas already identified for development or already being managed for tourism is given above. Additional sites may be identified to meet growing demand for tourist destinations and to reduce impacts by spreading the tourism pressure.

For instance it is suggested to build a special museum at the mouth of the Dengchi Valley close to the main road from Baoxing to Fengtongzhai, to celebrate and interpret the amazing collecting work of Pere Armand David. Baoxing County under its former name of Moupin is one of the great type specimen collecting sites of the planet. Whilst stationed at the Dengchi Mission between 1862 and 1875 David not only first described to science the giant panda but also first collected several hundred other type specimens of mammals, birds (65 new species), other animals and plants. The famous dove tree is named in his honor *Davidia involucrata*. Many of these local type specimens are splendidly carved on marble slabs along the roadsides of Baoxing Town. Such a museum would be of extreme interest to visitors entering passing into the county interior and should be a source of pride and inspiration to county officials and residents. The museum would also recognize the international nature and global significance of such biodiversity heritage.

An overall tourism management plan will be developed for the world heritage to regulate construc-

tions of tourist facilities and to set up site-specific norms on tourism development in different zones within the world heritage.

3.3.7 Sustainable community development

Hardships to the already poor local communities imposed by further restrictions on their agriculture and grazing activities will be more than compensated for by an active support programme focused on developing less destructive and more sustainable livelihood and industries. An assessment will be necessary to identified targeted groups and feasible alternatives to develop environmental friendly livelihoods. It is obviously a long-term work. One useful approach is to attract social development organizations to work side by side with nature reserves and conservation organization. Potential projects on community development in this area are:

- Alternative energy, such as biogas and micro-hydro power
- Sustainable non-timber forest product (NTFP) collection and marketing
- Community-based ecotourism development, especially homestay lodges, tour guide training and handicraft making
- Training on advanced, environmental-friendly farming techniques
- Valuable cash tree planting
- Alternative livelihood skill training

It is important to link these livelihoods development activities with communities' involvement in conservation actions.

4 Budgetary Resources Required

Since the site is managed as 16 different properties each with their own budget and management plan and several only partly inside the WH site, it is difficult to give an exact figure for current or future financing and financing will continue to come from many different directions. For instance China has recently launched its Great Western Development Programme, which will target the western provinces for special investments to help them catch up economically with the eastern half of the country. Funding from this programme can be used for improving communications, infrastructure, tourist facilities, development of alternate livelihoods, forest protection and reforestation works.

The current national ecological restoration programs and conservation programs implemented by the State Forestry Administration and Sichuan Forestry Department will also provide significant funding in supporting panda habitat restoration; nature reserve expansion or establishment; law enforcement, reserve management, giant panda and other wildlife researches, etc.

Staff salaries of over 500 state employees are already covered under the payroll at provincial or county levels. Major increases are seen in China in the area of public sector investment in tourism and other industries. Undoubtedly investments by Sichuan Provincial Government will rise markedly if the funds raised through panda exhibition loans are received on the understanding that they will be reinvested into conservation of the giant panda. Such earnings can make a substantial contribution to the costs of protecting the site.

The table below summarizes anticipated budget requirements over the first 8 years as a WH Site. The figures are based on 2000 costing and will rise with inflation.

RMB: Yuan

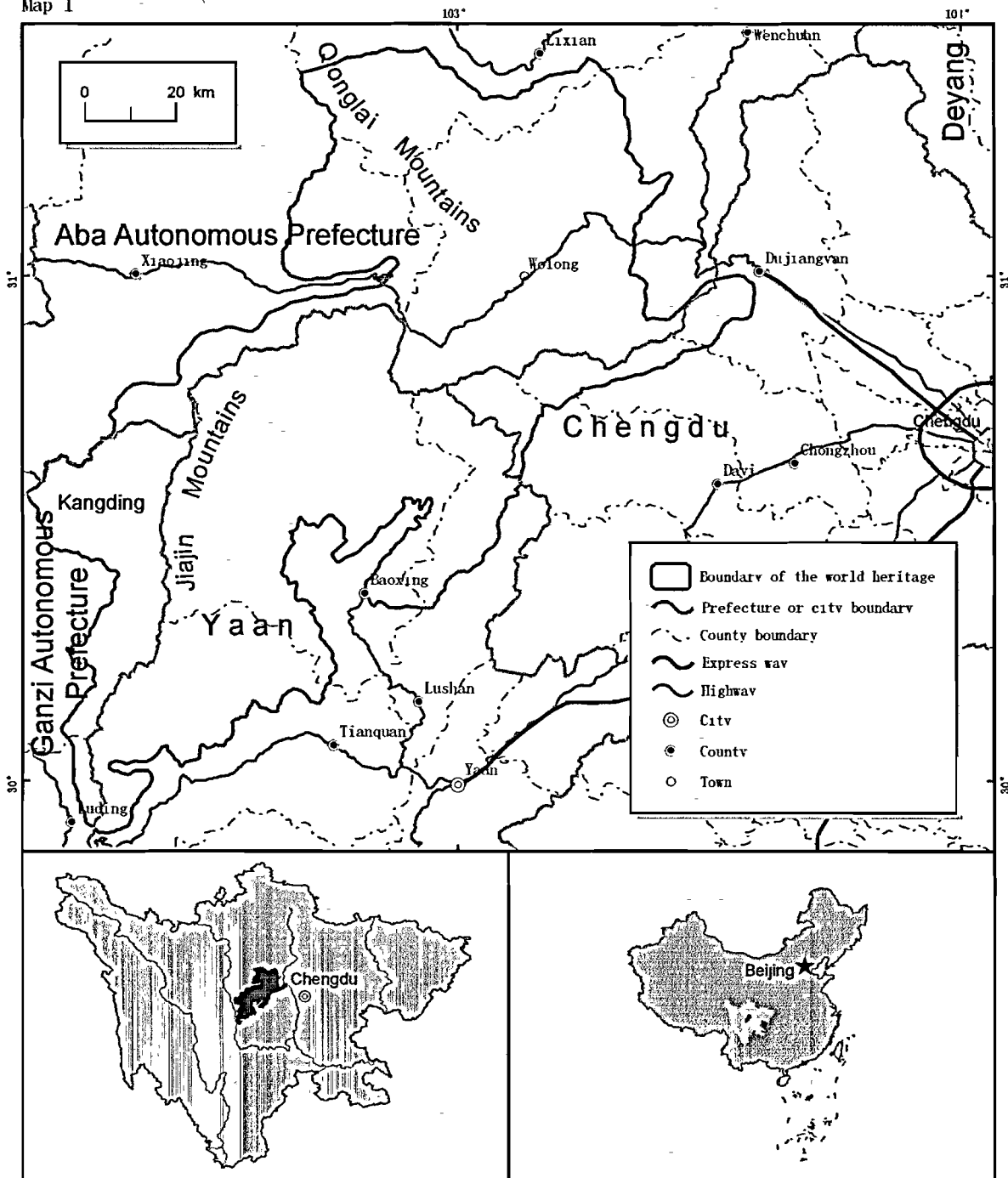
Programme	(2003~2010)Budget	Source of funds
Management Programmes	404,000,000	Covered under ongoing government payrolls of approved management plans and current governmental programs such as NFPP, "Grain to Green", and Wildlife and PA programme
Law Enforcement	8,000,000	Included in routine government budgets
Eliminating or reducing environmental damage from mines and polluting industries	390,000,000	State, Sichuan Provincial and Local governments
Panda corridor protection and habitat restoration	580,000,000	Ongoing national programmes such as NFPP, Grain to Green and updated panda conservation action plan
Management Planning	3,000,000	SWHAO to coordinate with different PAs
Monitoring	58,000,000	Covered under routing PA activities but at site level SWHAO to raise source for additional funding
Research	58,000,000	Many national, provincial programmes plus international collaboration sought
Education/extension	30,000,000	Provincial Government
Eco-tourism development	37,300,000	Some local government investment. Mostly from private investors
Training/capacity building	30,000,000	International funds to be sought
Development of livelihoods	51,000,000	Some government funding, other assistance to be sought from international agencies
Total	1,956,000,000	Various sources, mostly committed or sponsored by Chinese government.

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Location Map of the Nominated Area

Map 1

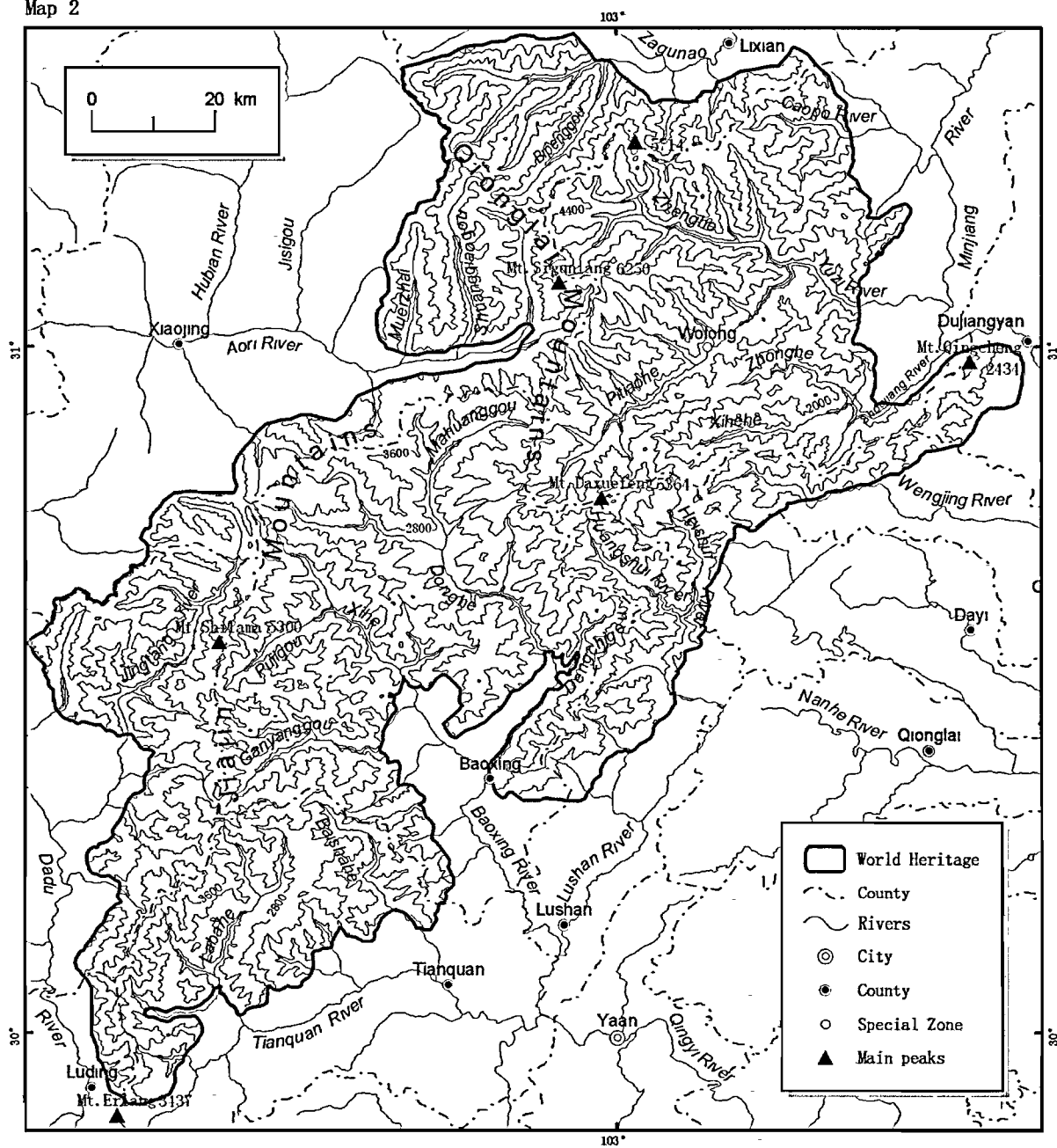


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Topographical Map of the Nominated Area

Map 2



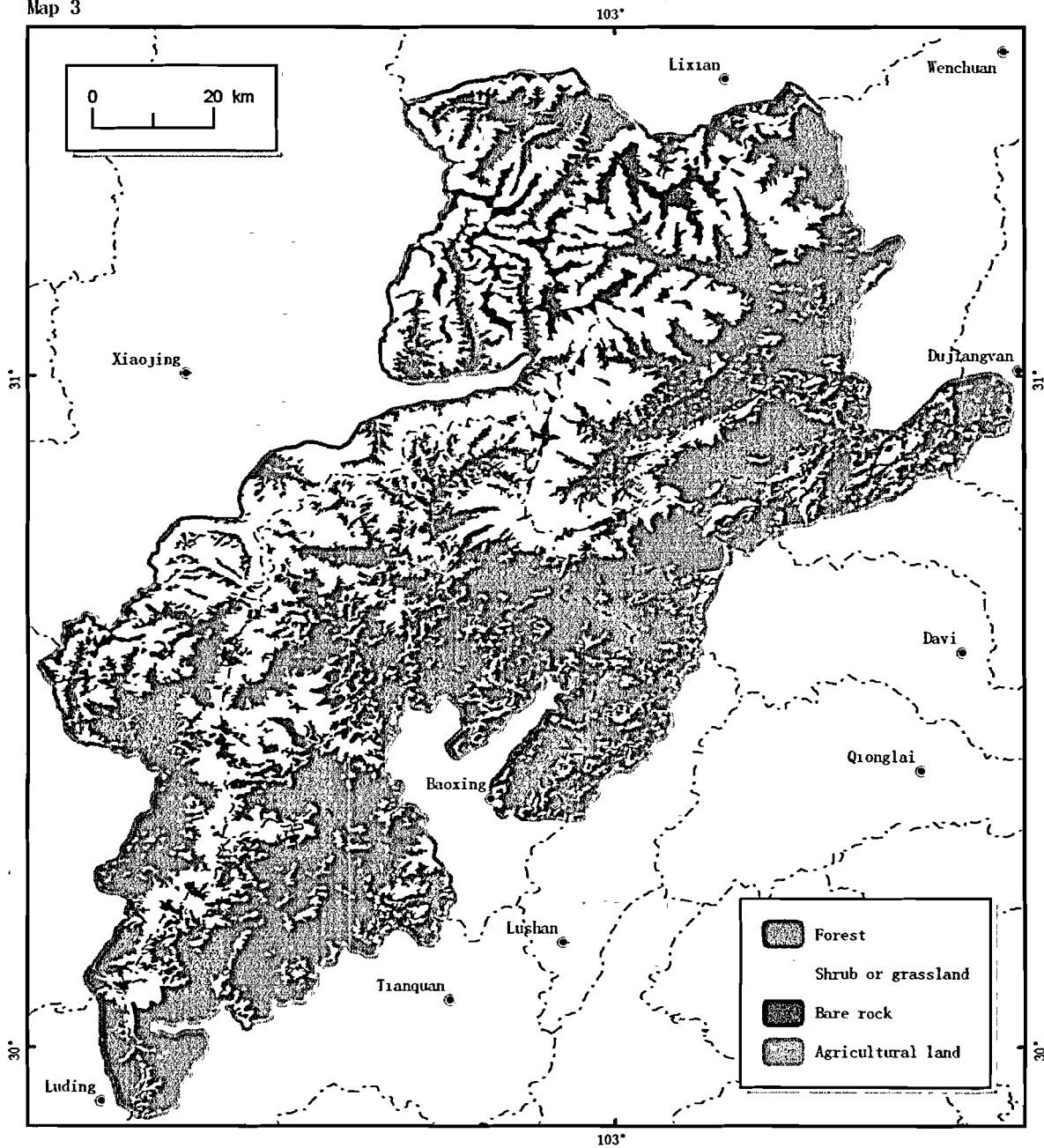
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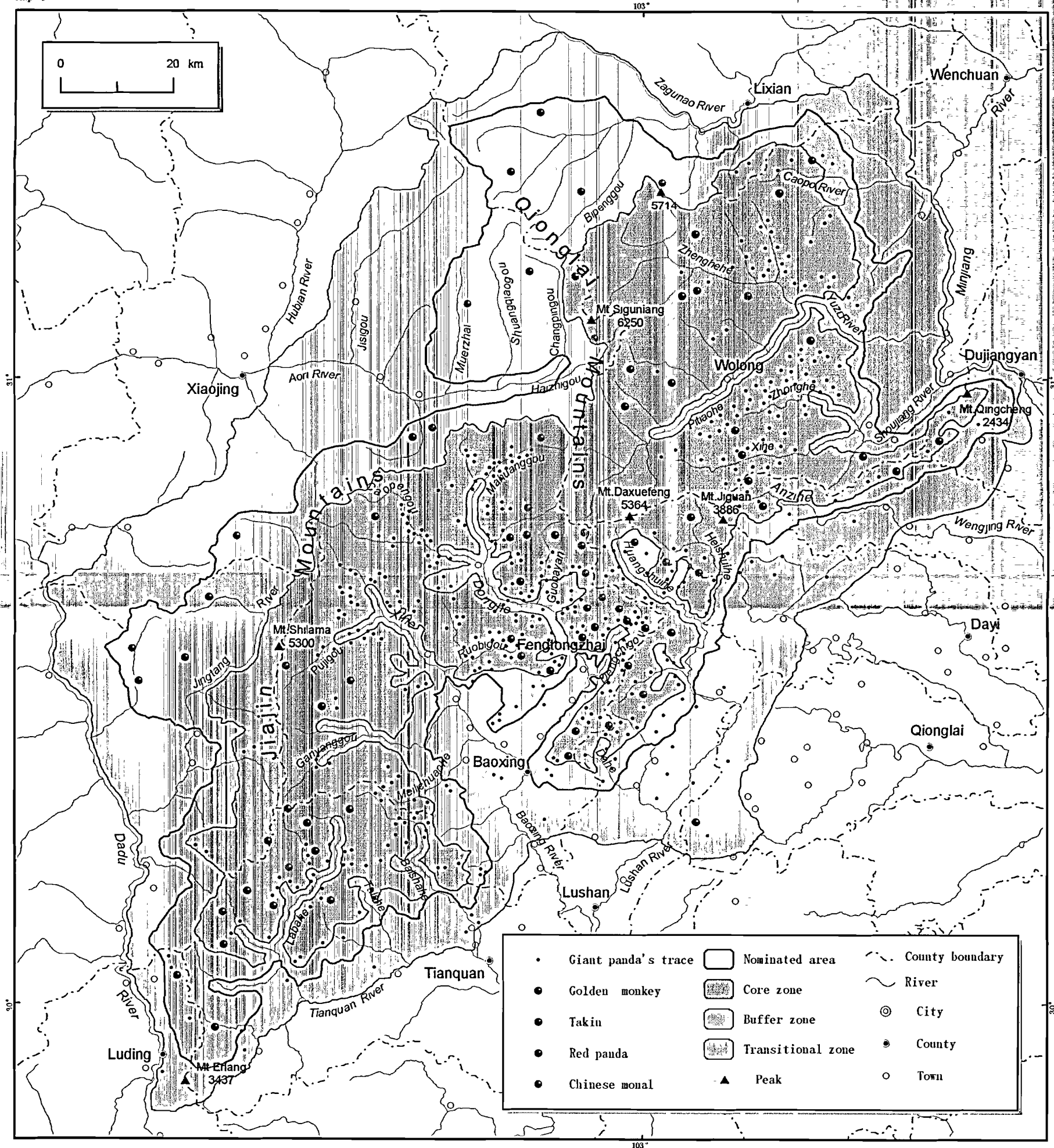
Vegetation Map of the Nominated Area

Map 3



Map of the Nominated Area for the Overall Plan

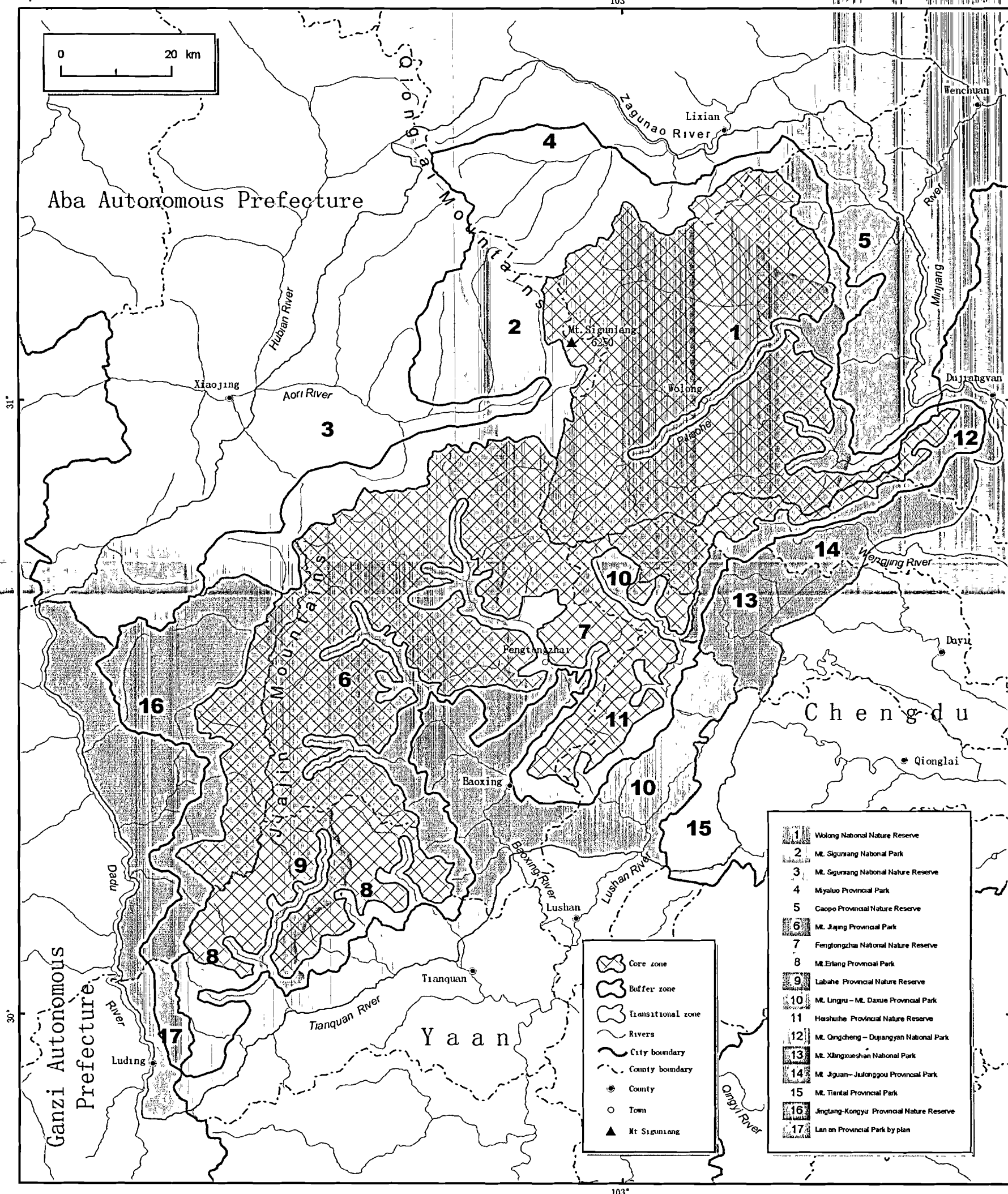
Map 4



Map for the Planned Protection in the Nominated Area

Map 5

103°



103°

四川大熊猫栖息地

——卧龙·四姑娘山·夹金山脉世界自然遗产提名地

补充信息和边界调整

以下修订、解释和补充材料将作为提名材料的一部分，旨在回答 IUCN 的专家大卫·谢泼德 (David Sheppard) 对四川大熊猫栖息地世界遗产提名地的评估后在成都最终会议上的意见以及 2005 年 10 月 28 日给建设部的信中的问题。

补充材料是按照 IUCN 所提出的问题（斜体字）的顺序排列的。

1 关于卧龙旅游发展计划的更多详情

下面的文字是从《卧龙生态旅游概念性总体规划》中翻译整理的。这个规划包括了 3 个地点的发展，其中耿达和卧龙在外围保护区中，第三个地点则在提名地中。我们将指出在世界遗产提名地被接受之后，为了世界遗产地的管理和保护，这个规划将受到世界遗产地的整体管理计划和省里的遗产条例的制约。举例来说，新的宾馆的建设必须与资源的完整性以及当地的景观相协调等等，游客量也需要降低。

1.1 卧龙生态旅游规划总结

发展旅游的目标 将有利于大熊猫野外放归的科学研究、大熊猫原生环境恢复、游客对大熊猫的观赏和科普学习、地方产业结构调整、当地居民从旅游业获得经济效益。

适宜项目评价结论 卧龙大熊猫观赏、银龙峡谷和邓生—巴朗山是游客和专家最感兴趣的三大资源富集区，再加上耿达乡和卧龙镇两个旅游镇的建设，将形成功能互补、完整的旅游区结构。重点突出大熊猫观赏活动。

规划范围 本次规划对象是卧龙自然保护区的允许开发区域，包括幸福沟景区、正河沟景区、卧龙山水度假区、熊猫沟—五一棚景区（熊猫沟）、银龙峡谷景区、邓生—巴朗山高山生态景区。

定位 以观赏大熊猫野外生活和科研保护为主题的科普研修和生态旅游及度假休闲的旅游目的地。

产品构成 大熊猫栖息地原生环境体验；大熊猫主题的生态旅游；栖息地的休闲度假旅游；生态环保类的小型会议旅游。

项目布局 规划中有 3 个主要部分。

板块一 耿达镇大熊猫科教旅游区

- 幸福沟景区 游客接待中心；耿达镇；大熊猫生态科普教育基地；生态农庄；中国大熊猫繁育中心；牛坪自然生态体验游览区。

- 正河沟景区 正河沟生态旅游。

- 七层楼沟景区 野生动物生态养殖基地。

板块二 卧龙镇山水度假区

- 卧龙山水度假区 卧龙镇；国际会议中心；卧龙山水度假；卧龙河漂流（卧龙关—卧龙）。

板块三 大熊猫寻踪生态旅游区（小规模生态旅游，不进行接待设施建设）

- 熊猫沟—五一棚景区（熊猫沟） 熊猫沟庇护所；熊猫沟大熊猫观测点；五一棚大熊猫观测点。

- 银龙峡谷景区 油竹坪观高山杜鹃；热水塘野生动物观测；石棚子野外生存体验营；风香坪观雨燕；沟口极限运动。

- 邓生—巴朗山高山生态景区 邓生生态营；巴朗山高山草甸；向阳坪云海；巴朗山垭口；魏家沟观景台；烧火坪观景台。

1.2 重点规划区域的总结

耿达羌式小镇 游客信息中心及交通枢纽，全区游览车的起点站，游人可以在此换乘车辆游览其他景点；羌式商业餐饮街；羌寨酒店接待（初步考虑为四星级）；羌寨居住部落；羌寨度假村。

生态科普教育基地 入口管理区：包括进入园区的大门及配套的售票、管理、办公、游览车停靠点和入口广场；生态教育馆；泥石流灾害体验；竹林迷宫；露天剧场；熊猫纪念林；树屋；草地休闲运动。

耿达大熊猫半野生放养园 入口管理区；大熊猫野外半放养区；大熊猫野外全放养区；伴生动物半放养区；科研管理区；大熊猫捐助园。

河流游憩 要布置木栈桥。

生态农庄 结合现有村落改造成山郊野林风情的一个小村落；遛马等活动。

牛坪自然生态体验区 骑马，徒步参观，露营。

七层楼沟景区 可开展梅花鹿、雉鸡、岩羊等野生动物的生态养殖。

正河沟景区 开展科学考察、研究等专业化的生态旅游。

卧龙镇 将现有 300 间客房的卧龙山庄进行总体改造，达到五星级酒店标准；卧龙大熊猫博物馆；

卧龙风情大世界 在卧龙山庄附近建一大型的保持常温的玻璃大厅，内部种植大量植物，其内部的人造景观与外面的自然景观交相呼应。具体可设置温泉、药疗、康体养生、休闲氧吧、歌舞演艺等。

卧龙山水度假 卧龙镇国际会议中心接待小型会议（利用现有设施）；卧龙湖生态电站；沿原省道旁统一宽窄不一的水渠使滨水的平地形成一个小岛，在小岛上种成片竹林，并建独栋式酒店，使建筑掩映在竹林中；利用花红树山上的村民房屋，改造成羌寨聚落民居，山上的喇嘛庙保留修缮；漂流。

熊猫沟——五一棚景区 观察金丝猴和猕猴；通过全息三维激光技术制作模拟动态的更新世时期熊猫及其伴生动物剑齿象、中国犀、中国貘、鬣羚等；设置就餐（主要为西餐）和咖啡茶饮，紧急救护和直升机简易停机坪；熊猫沟和五一棚大熊猫观测站。

银龙峡谷景区 攀岩，蹦极，穿梭车站，野营，建立步行游览道。

邓生生态营 休息区。小型餐饮和休息厅、森林浴场、野营。

巴朗山高山生态景区 向阳坪云海观台，休息区，道路，咖啡区，野营等。

其它建设 有崩塌地质现象的地区做了防崩塌设计；水处理厂；给水厂；通信电缆；邮局；地面电视卫星接收装置等。

1.3 社会效益

直接效益 10年在旅游方面可直接产生运营的总收入约45.6亿元（理论推算）；旅游项目可直接创造就业岗位1500—2000个（含卧龙和耿达镇旅游从业人员）。

间接效益 本项目可间接创造就业岗位约4500—6000个；促进该地区服务人员的文化素质提高，外来的游客同时也对当地居民带来新的文化、生活方式和信息；促进本区及周边经济发展，保护区建设完善及生态旅游的开展，将带动本区及周边地区交通、商业、服务、畜牧、农副产品、食品加工、地方及民族工艺品等各业的发展。

1.4 环境影响评价

1.4.1 环境容量

包括空间容量、设施容量、自然环境容量和社会心理容量。卧龙生态旅游区受自然地形控制，坡度大，坡向复杂，河流切割沟谷，造成可游空间容量较小，自然环境容量受限，社会心理容量较低，因此旅游容量主要由设施容量决定。未来全区旅游住宿接待最大容量的理论值为7300人/日。若按住宿和过境游的游客比例为1:2计算，则过境游客量为14600人/日，则全区设施容量最大为21900人/日。

1.4.2 施工期中的主要环境影响

废水、垃圾 施工中要产生施工废水、生活污水和垃圾。如果污水不经处理就地排放，会影响周围地表水、地下水及土壤环境。被影响的地表水有卧龙河水。施工营地排放的生活垃圾和土石方，如随意堆放，会随雨水流入河道、水库，影响河道水库水质，其浸出物也会渗入土壤，影响土壤环境和地下水水质。

废气、噪声 产生CO、CO₂、NO₂、粉尘、噪声。

植被 区内主要植被类型为冷杉林、高山草地、铁杉针阔叶混交林，油竹林和冷箭竹林零星分布。施工过程中，开挖、施工营地、临时加工厂等需要占用林地与清除树木，造成部分植被的损失和破坏。

动物 工程施工会减少陆生动物的栖息地、切断迁徙的廊道，对其生境造成部分影响。但是卧龙山水度假区的建设会增加人工繁殖大熊猫的栖息地面积。

水土流失与塌方 工程施工扰动地表，破坏原地貌、植被。大量土石方开挖会造成地表裸露，很容易发生塌方危险，易于被侵蚀。施工中有大量土料临时堆积，在大雨冲刷下易形成水土流失。弃渣堆积物也会造成水土流失。弃渣场的影响主要有以下两种形式：一是改变原生地貌，二是改变局部区域的产汇流特性。

水文 工程跨过河流需对河流采取导流措施，减少对河流防洪排涝的影响。花红树新建电站水坝，将形成新的水面，改变小气候。

农业生产 工程需要征用耕地，实施移民，大部分逐步转化为旅游业从业人员。农业产量减少，通过其它地区获得补偿。

交通 省道改线将影响部分交通流量。施工时的重型车辆，可能会加重交通负荷，引起交通阻塞，造成沿途居民日常出行不便。

人群健康 工程施工时，施工人员较集中，对人群健康带来影响。

1.4.3 运营期的环境影响

废水 废水主要为管理人员与住宿游客的生活污水。排出的废水需要进行污水处理。

废气 废气主要是餐饮业排放的油烟和汽车尾气。厨房油烟污染不仅严重破坏视觉景

观，且是大气中挥发性有机物（VOC）和 PM10（颗粒小于 10 μ m 的可吸入颗粒物）的主要来源之一。

垃圾 主要包括宾馆饭店的生活垃圾、游客游览过程中产生的垃圾等。

噪声 主要来自运送外来游客的汽车噪声和省道上过境的汽车噪声。花红树和熊猫沟口、银龙峡谷沟口紧邻省道，会受到较大影响。过境交通线贯穿邓生—巴朗山旅游区，使得该区面临道路一侧的噪声也较大。噪声可达 90 分贝以上，沿道路呈线状发散。

交通 游客增加后，卧龙镇与银龙峡谷之间的交通密度将增加，会降低交通速度，同时降低沿线周边居民点的出行速度。

人群健康 外来游客可能带来传染性疾病，也可能受到当地传染病、地方病的感染。

1.4.4 环境保护中采取的缓解措施

废水、垃圾 施工期的砂石料冲洗废水需设沉淀池处理，含油废水需设隔油沉淀池，生活污水需设处理装置，建造旱厕，粪便由农民定时拉走，用作施肥。运营期对游客进行管理和教育，加强环境意识，设置垃圾桶、处理场和生态型公厕，安排环卫人员定时清理。将酒店餐馆的废水排入管网，再入污水厂处理。住宿设施设置中水系统，用于浇灌树木花草等周边植被，处理后的出水水质应达到《生活杂用水水质标准》（CJ25.1-89）。特别注意对耿达乡、卧龙镇家庭旅馆的给排水系统进行完善，避免交叉感染。

大气 交通沿线设立绿化带；加强当地汽车尾气排放控制管理，加强汽车尾气治理，对超标排放的车辆严格处理。施工作业人员采取劳动保护措施。施工范围内的定居点按照总体规划要求搬迁出景区范围，免除影响。入驻的餐饮业单位须安装油烟净化设施。对烟囱进行景观改造，不妨碍游客的视觉效果，同时结合周边活动项目。

噪声 建设道旁绿化带；景区内汽车限速行驶，一般应低于 60km/hr，并禁止使用喇叭；加强景区内的车流和交通噪声管理；过境机动车分时段管理。

生物多样性 施工结束后，在道路沿线和建设用地的室外空间增加种植地方物种，不引入外来物种，补偿和恢复部分临时占地影响的植被；部分在施工期被清除的植被则需要迁至它处；在施工当中，禁止施工人员追逐、捕猎野生动物；开放运营之后，对游客和景区管理人员加强教育，禁止追逐、捕猎。

文物古迹 工程区可能存在一些尚未探明的地下文物，施工单位在施工活动中，如遇文物古迹，不能擅自处理，应与文物管理部门联系，进行妥善处理；减少工程开挖对沿线文物古迹或历史建筑的破坏。

水土流失 禁止工程在施工现场附近开凿土石料场；弃渣采取集中堆放方式，弃渣场选择荒沟、荒坡等地，应进行水土流失防治，避免生态破坏问题；尽快恢复植被。

人群健康 防止当地的流行性传染病、地方病及自然疫源性疾病的蔓延与发展，同时防治外地游客带来痢疾、肝炎等传染病；餐饮、住宿等设施要按规定采取严格的分餐控制、消毒及管理措施。

1.5 生态移民

人类定居点主要沿卧龙河和耿达河沿岸河谷呈块状分布，在海拔 2520m 以下。耕地时常受到野生动物的侵扰，同时耕地扩张减小了野生动物的栖息地面积。为使环境保护和经济社会协调发展，在发展旅游业的形势下，生态移民势在必行。根据保护区资金缺乏的现实情况，生态移民分三个阶段进行，在 20 年内形成耿达乡和卧龙镇两个主要聚居区。生态移民不仅把农业人口移居到集镇，还要积极将他们纳入当地旅游业和天然林保护工程的发展中来。我们会对他们进行培训，并且提供工作机会。在第二十年耿达乡由乡升级为镇，

形成耿达乡 4016 人，卧龙镇 2000 人。

有 5000 人需要移民。

第 1 年～第 5 年：生态移民 1000 人，提供 400 个培训机会和 200 个就业机会。

第 6 年～第 10 年：生态移民 1500 人，提供 600 个培训机会和 300 个就业机会。

第 11 年～第 20 年：生态移民 2500 人，提供 1000 个培训机会和 500 个就业机会。

2 宝兴河流域已经存在和计划建设的大坝图，其位置与提名地的关系

2.1 宝兴河发展水电的规划细节

我们附加了一幅宝兴河的图（图 1），标出了已经存在的和计划建设的水坝和水利设施的位置。这幅图显示了提名地的边界。大多数的规划只影响到河流的下游，并且位于核心区的山谷底部，与天然林生态系统有一定距离。

大多数的电站包括了小规模的电线网络，并在河流的不同地点将部分河水分流。

大多数的电站都在提名地的下游。只有硃碛和民治电站将会对世界遗产地造成直接影响。我们在以下总结了民治电站的赔偿协议。

2.2 四川华能宝兴河民治电站对蜂桶寨国家级自然保护区的赔偿协议（摘要）

从工程批准开工后的年度算起，华能公司每年补偿给保护区 20 万元。

华能公司将支持保护区增加管理人员。

工程中占用保护区林地、损毁植被和林木，按国家林业有关规定办理手续和补偿。

3 硃碛大坝的图，包括（a）大坝的位置，（b）水坝淹没区，以及（c）移民安置区。这些图应显示水坝淹没区与所提名的世界遗产地边界的关系。还应附上环境影响评价报告的总结和补偿措施的总结

大卫·谢泼德（David Sheppard）特别要求更多的关于硃碛电站规划的细节，因为这个大坝就位于提名地的中心位置。

需要指出，这个山谷几百年来一直是藏族的镇子，这个镇子周围呈“星形”的农业发展也有了较长的历史。因此这里的大熊猫栖息地已经上移到山谷中较高的地段，在山谷的西北和东南方向仍然连接成一片（大于 10km）。

大坝的建设将会包含约 2000 个村民的再安置。他们的安置地在计划位于已有的农田和退化的次生林和灌丛（图 3、图 4）。在这个过程中，熊猫的栖息地不会丧失。水电工程所发的电可以以电代柴，减少由收集薪柴带来的大熊猫栖息地丧失。

大坝的位置被标注在图 2 上。当大坝蓄水完成后，正常水面海拔为 2140 米。在水位以上的森林将被严格地保护来防止水土流失。

大坝汇集的水经过一个长约 18km 的地下管道落入位于蜂桶寨的水电站。另有 3 个更小的出口将一部分水引入位于宝兴沟主路沿线的村子中的小型涡轮流中。在图 3 和图 4 中标出。

这些引水管线通过在山体上挖掘数百米深的隧道来实现。它们不会直接影响到山体表面的植被以及上部的大熊猫栖息地。

大坝将会减少在硃碛和蜂桶寨之间主河道的水流。这种影响将超过 14 公里，使得大熊猫更加容易地过河，这可能会增进大熊猫种群的交流，但对淡水生物多样性会有明显的影响。

图 2 显示了硃碛的坝址与镇子的对比关系，并且表示出了当蓄水完成后淹没的界限。

下面列出了从规划中总结出来的相关的详细信息。

3.1 硃碛大坝的数据

• 水库数据

正常蓄水位：2140 米

死水位：2060 米

水库面积（2140m 时）：401 公顷

平均深度：53 米

正常蓄水位以下库容：2 亿立方米

调节库容：1.87 亿立方米

淹没面积：400 公顷

• 影响（正常蓄水位：2140 米）

移民：1964 人

农业人口：1653 人

淹没影响耕地：205 公顷

各类房屋面积：14.28 公顷

淹没森林面积：118.93 公顷

• 安置计划

农业安置

开垦宜农荒地 96.7 公顷，安置移民 1120 人；

调整耕地 32.7 公顷，安置移民 358 人；

开垦宜园荒地 23.3 公顷；

改良中高山牧场草地 336.7 公顷；

共计改良面积：96.7+23.3=120 公顷。

住所

分散建房安置 651 人，硃碛新集镇集中安置 1142 人，共计安置 1793 人。

硃碛新镇位于柳洛沟右侧的坡地上，海拔在 2170 米到 2300 米。规划人均用地 75 平方米，到 2004 年，规划安置人口 1140 人，共计 85500 平方米。

根据安置规划，共计 2299 人将迁移（1900 人从淹没地区，其他从下游）。整个安置区将以新的硃碛镇为中心。现在已经有 3166 个原住民生活在安置区。

（下面的部分从发展规划和其环境影响评估报告中翻译过来）

3.2 环境保护的目标

保护蜂桶寨国家级自然保护区及其生物资源和物种不受工程影响，保护工程及其周边区域的生态环境；

保障并改善工程地区移民和居民生产、生活质量；

维护工程河段现有水域功能；

保障大坝下游工农业生产用水及下游基础设施、建筑物和人民生命财产的安全；

保护工程地区的植被，防止工程地区水土流失。

3.3 工程方案对环境的考虑

坝址的选择避免了较大地震的发生，水库诱发地震震级在里氏 3.0-4.0 级范围内。

选择 2140 米的正常蓄水位时，考虑到对淹没区和移民区的动物栖息地、文物古迹以及景观资源等的最小影响，和水库的最大效益。

为了减少对保护区的影响，工程选择了右岸隧洞引水方案。因为左岸引水线路将穿越蜂桶寨保护区的核心区且地质条件不佳。而且，工程选择修建地下厂房，因为它有更好的地质条件以及对保护区更小的影响。

考虑到对蜂桶寨国家级自然保护区的潜在影响，输电线路从东河右岸走线。

为了保护植被，工程输变电路全部采用铁塔，在有林木的地方采用高塔，尽量不砍伐树木。

3.4 负面影响的分析

工程施工 废水，废气，噪声，开挖，弃渣，施工占地，交通运输（主要是车辆的增加），施工人员进驻。

工程运行 水库蓄水将会改变原来的热平衡，使库区及其附近的气温、湿度等气象因子发生变化。流速减小，对水质、水温将有一定的影响。它也会影响消落区景观和岸坡的稳定。下泄流量的变化，对下游用水及群众生产、生活有一定影响。大坝将阻断鱼类的自然通道。大坝至厂房间将形成季节性减水河段，将会影响沿河居民的生产、生活以及水生生物。

水库淹没使工程地区耕地减少 205 公顷，淹没房屋 162612 平方米及部分林地。

1900 人需要安置。

输电线路 将会平整、拓宽约 1.3km 的施工道路，将破坏一些植被，产生一定量的废渣，造成水土流失。噪声将低于 60dB。无线电干扰水平在 45-50dB 之内。静电感应的空间场强不超过 5kV/m。这三个值都不高，符合相应标准。

3.5 减少影响的主要措施

• 水

建造沉淀池减少悬浮物；在施工区的生活区建立旱厕，粪便可以作为肥料；修建沼气池。

• 固体废弃物

规划建立 7 个渣场；在各施工生活区分别设置 2 个生活垃圾桶，每天由汽车将生活垃圾运至就近的弃渣场堆放；建立垃圾堆放场；在蓄水前对库底进行清理。

• 大气

选用符合国家有关卫生标准的施工机械和运输工具，使其排放的废气符合国家有关标准；尽量采用草袋覆盖爆破面，以减少爆破产生的粉尘；配备洒水车 2 辆，施工期每日早、中、晚在工区来回洒水，以减少扬尘。

• 声环境

选用符合国家有关标准的施工机具；

空压机等噪声值较高的机械尽量设置在室内或洞内作业，减少在夜间工作；

在施工爆破中，尽量避免放大炮和夜间爆破；

施工人员佩戴防噪声耳塞、耳罩或防噪声头盔；

设立标志牌限制车辆时速；

施工车辆在盐井至锅巴岩路段禁止大声鸣笛，得胜沟施工支洞的车辆禁止鸣笛。

• 环境保护

工程不应该影响保护区和整个流域的气候；

在蓄水线以上种树；

建立 7 个废渣场；

采取一些工程措施来防治水土流失；

在工程结束后，弃渣场和建设占地应该变为农田或者种植树木和草；

建设结束后，移走临时的建筑设施，清扫废弃杂物；

在永久公路（包括环库公路）两旁种植行道木，公路长 48.7 公里，每株间距 3 米，共需种植 32467 株；

在土质松散、石质风化严重等不良地质地段边坡采用护面墙或内挡墙防护；

在移民安置区，前期的建筑垃圾作为填方，填入需要填平的低洼地。开垦一些宜农荒地，并改良现有农田。进行道路绿化，公园绿地建设和宅旁绿化。

• 生物保护对策

蜂桶寨国家级自然保护区

保护区管理处在得胜沟加强生态环境监测，重点监测大熊猫等珍稀保护生物；

尽量减少新修公路，减少汽车运输对陆生动、植物的影响；

加强对于施工人员的宣传教育，严禁捕杀和伤害施工区内的珍稀动、植物，禁止施工人员食用蛙类和蛇类；

做好火源管理，加强防火宣传教育，建立施工区森林防火及火警警报系统；

尽量采用无声爆破，不放大炮和夜间放炮；

对进入施工区的运输车辆限制车速，严禁鸣放高音喇叭；

工程竣工后，恢复保护区周围环境景观；

建设单位向保护区提供技术和财政支持。（见赔偿协议）

珍稀植物

在施工区，对影响的连香树、水青树、领春木、大叶柳等珍稀植物采取移栽或修建防护栏等保护措施；

在淹没区夹金山公园下缘的四川红杉和连香树采取移栽的措施。

植被

防火和火灾意识教育；

通过种树、种草来恢复退化的景观和植被。

动物

对于居民和游客的宣传教育；

设置警示牌来增加野生动物保护意识。

水生生物

对硃砂水库以上各支流以及宝兴河西河流域加强渔政管理，并将东河流域的锅巴岩沟等较大支流作为宝兴裸裂尻等特有鱼类的保护河段。

• 社会环境改善对策

通过分析，工程竣工后，只有 15 人由于流量的减少而缺水，将建立自来水管网来解决这一问题；

施工人员应该灭蚊、灭蝇、灭鼠、灭蟑螂等以减少传染病的传染媒介，加强工区内食堂、餐厅的卫生管理，每季度进行一次卫生检查，取得卫生许可证的人员方可从事餐饮工作；

在施工人员进驻工地前，各施工单位应对施工人员全面进行健康调查和疫情建档，只有没有传染疾病的人员可以参加工作；

各施工单位应明确卫生防疫责任人；
各施工单位应备用痢疾、肝炎等常见传染病的处理药品和器材；
水库蓄水后，迫使淹没区鼠类向水位线以上迁移，可能造成鼠密度增加和疫源地扩大，应该灭鼠以控制其密度；
进行移民预防接种；
做好移民区人畜饮水规划；
加强建筑、生活垃圾和污水的管理。

- **文物古迹保护**
对工程建设中涉及相关地段的文物古迹，能避则避，不能避则进行发掘或迁移等措施；发现未曾考察到的文物古迹，及时通知文管部门采取抢救措施。
- **旅游**
水库将为当地增加一新的旅游景点资源；
红军长征纪念碑将被淹没，水库蓄水前将采取补救措施，在正常蓄水位以上重建。
- **当地的生产和生活**
由于水流将发生骤变，将设立一些警示牌并进行宣传教育对当地居民进行预警。
- **输变线路建设**
尽量避让森林和文物古迹；
建设结束后，恢复被毁坏的植被。
- **环境监测**
建立监测项目包括水质监测、大气监测、噪声监测和生态环境监测；
- **环境管理**
设置环境管理机构。

3.6 主要的效益

对于当地经济发展有益；
水能减少了火力发电的污染；
改善了当地居民的生活质量，减少对蜂桶寨国家级自然保护区的资源压力。

3.7 硃碛电站对蜂桶寨国家级自然保护区赔偿协议（摘要）

为加强保护区对野生动物的管理，增设野生动物监测站、保护站各 3 个；
华能公司支持保护区解决管理人员不足的困难，保护区管理处增加管理人员 23 人、林区公安人员 3 人，其费用由公司补偿；
华能公司为保护区提供部分防火、通讯设备及交通工具；
工程开工后，施工期所发生林地占用、植被和林木损毁按国家有关规定补偿；
双方除按《宝兴河硃碛龙头水库电站对四川蜂桶寨国家级自然保护区影响分析论证意见》的要求办理外，对临时涉及的管理问题，双方再进一步协商解决；
补偿费用的支付在工程批准可研报告后，保护区增加设备、设施所需费用由华能公司一次性向保护区补偿 150 万元。工程批准开工后，每年由华能公司向保护区补偿 50 万元。

4 映秀-小金公路改建工程的相关信息（诸如环境影响报告的英文总结，环境影响缓解方法总结等等）

4.1 道路升级工程

这是阿坝州的一条县级公路：起点映秀，穿过卧龙自然保护区，翻过巴朗山山口，沿奥日沟延伸，最后进入小金县城（见图 6）。现有公路在图 6 上已有标注。这条公路的从映秀至邓生的路段将拓宽至 8.5 米，困难路段 7.5 米；从邓生至巴朗山山口的路段拓宽至 7.5 米，困难路段 6.5 米。

该公路总长 162 公里，包括皮条河源头的许多盘山公路。该公路约一半在提名地内，另一半在外围保护区内。道路改建工程将拓宽皮条河至巴朗山后 4 公里（双桥沟和日隆沟的交汇处）的 147 公里的路段。

新公路绝大部分是在旧公路的基础上修筑，但是在陡峭地段重新选择路线。此外，巴朗山最陡峭的路段将用约 8 公里的隧道替代。目前仍在考察两个备选的隧道位置（见图 5）。

隧道将减少噪音污染，降低对高山动植物和环境的干扰。

以下段落是从公路改建工程的环境影响评价报告（2005 年 11 月）中直接翻译过来的。

4.2 工程的环境影响

占地及生态影响

改建项目的实施需要拓宽路基，不可避免地要征用土地，使土地面积减少。本次改建路基部分新增占地 27.9 公顷，弃土场占地 21 公顷，桥梁预制场、路面拌和场、施工营地等临时占地 3.3 公顷。

在路基成形过程中，特别是在中、高山的路段，项目改建还存在一定的土石方量，将对原地形地貌以及自然景观造成一定程度的破坏；项目在选线、设计、施工过程中将优化土石方平衡和土石方的纵向调运，但仍然会有部分的弃方需要堆置在弃土场，弃土场的形成将改变原有土地的利用性质，占压部分地表植被。本次改建共有挖方 193 万方，填方 80.9 万方，弃方 112.1 万方。

路基工程、收费站、桥梁、涵洞等工程构造物的建设将永久性占用土地，使植被生境破坏，生物个体失去生长环境，影响的程度是不可逆的。本次改建新增永久性占用土地面积 27.9 公顷，其中耕地 7.0 公顷，林地及草灌 20.9 公顷；临时占地约 24.3 公顷，临时占地中弃土场占地 21.0 公顷，临时占地类型没有耕地，主要为林地及草灌。占地范围内主要的植物资源是一些普通的乔木、灌木和草种，包括冬青、山毛榉、黄槐、落叶松、小叶柳、山海桃、苔草、沿阶草等。其中比较有优势的是人工种植的落叶松、红杉、苔草。

对于珍稀濒危植物，项目的开展对这些物种不构成威胁。据调查和寻访，拟改建公路沿线 200 米范围内除三道桥段有四川红杉外，没有其他珍稀濒危的植物资源。只要在施工进行时，能够加强施工管理，杜绝红线外草木损坏，同时强化施工人员文明施工及环境生态保护等意识，项目改建应该不会对保护区的珍稀濒危植物造成大的影响。

本工程施工可能影响的是一些比较多见的两栖类、爬行类、鸟类、小型兽类等动物。施工期间，由于施工人员的进驻和施工机械的往返运作，对这些野生动物的影响结果主要是施工噪音引起其迁移，但不会对其种群数量造成毁灭性影响。根据调查和寻访结果，拟改建公路沿线 200 米范围内，没有受保护的珍稀濒危动物资源。

公路工程项目建设中生态方面一个重要的负面影响就是可能造成一定量的水土流失。土石方工程施工时，土体表层结构改变，质地松散，在未做防护方程前如遇雨水冲刷，极

易侵蚀造成崩塌，产生较严重的水土流失。经预测，本次项目在不采取任何措施的情况下，施工期间项目区水土流失量达 38.54 万 t，其中，主体工程区（含基边坡、路面等）的水土流失量为 1.36 万 t，弃土场 36.54 万 t，拆迁安置为 59.85t，营地及施工场地 287.41t，施工期新增水土流失量 37.06 万 t。

环境空气影响

本次公路改建施工过程中，灰土拌和采用站拌。站拌是指在灰土拌和站按设计的灰土比进行的集中拌和，拌和好的灰土由车辆直接运送到施工路段。站拌污染集中在拌和站。下风向 150m 处基本符合环境空气质量一级标准日均值 $0.12\text{mg}/\text{m}^3$ 。其它作业环节产生的 TSP 污染一般可控制在施工现场 50~200m 范围内，在此范围以外将符合一级标准。

本次改建项目采用水泥砼路面，而非沥青混凝土路面，仅进行沥青表处。所以，本项目在施工过程中沥青的熬炼和摊铺等污染环境空气的工序规模很小，沥青烟和苯并（a）芘的影响不大。而且，项目所在地区空气清新，环境容量较大，不会产生区域性污染。

水环境影响

公路沿线共设中桥 930 米/16 座，小桥 279 米/14 座。中桥施工工程量稍大，施工人员相对集中，施工过程中的生活垃圾、生活污水、粪便如果胡乱排放，会给地表水水质带来污染。

桥墩施工时的开挖、建筑材料的洒漏等会增加河水浊度，水中的 SS 将略有增加。施工机械有机溶剂的泄漏会对桥下水体产生局部污染，但这种污染通过强化施工管理可以减轻。桥梁施工围堰以及桥梁施工中产生的建筑垃圾如不及时拆除和清理，雨季来临，容易淤塞溪沟，污染水体。

项目对水体环境的潜在影响不至于改变水体功能和引起水环境质量的大面积恶化，通过提高施工质量、加强施工管理可以起到较显著的效果。

声环境影响

本次公路改建施工期间，作业机械品种较多，这些机械的运行以及器械的碰撞都成为公路施工期间的噪音源。按建筑工厂噪音标准 GB12523-90 规定，昼间噪声限值为 70~75dB，夜间为 55dB。施工机械噪声预测结果显示：施工机械噪声级昼间在距施工地点 40m 范围以外能够满足标准限值，夜间在距施工点 150m 范围以外能够符合标准限值。施工噪声可能会对保护区的某些敏感、胆小、喜安静的野生动物的正常生活带来一定的负面干扰。

营运期声环境影响主要来自交通噪声。根据营运期交通噪声预测结果，沿线声环境保护目标受交通噪声影响较大，特别是卧龙特区，小金县境内属于 1 级标准区，营运近、中、远期境内主要的声环境敏感点在昼间和夜间都有不同程度的超标。具体情况如下：在营运近期，昼间基本能够满足 1 类标准，夜间超标量在 2.9~6.6dB 之间；在营运中期，昼间超标量在 1.1~2.8dB 之间，夜间超标量在 5.6~9.1dB 之间；在营运远期，昼间超标量在 1~4.1dB 之间，夜间超标量在 7.5~10.8dB 之间。

营运期主要通过安装通气隔声窗的措施来缓解部分居民点的营运期噪声超标问题，再辅以相应的行车路政管理措施，能够满足项目所在地区的声环境质量标准。

4.3 项目实施的正面效益

九环线映秀至日隆公路是省道 S303 线的一段，是连接九环线和卧龙大熊猫自然保护区及东方圣山四姑娘山的唯一通道，也是连接川西北小金、丹巴等县域省会成都的最便捷

通道。

另外，作为省道 S303 线的一段，本次项目是通往川西及西藏的一条重要通道，也是阿坝州公路网主骨架之一。省道 S303 处于国道 G317 线（川藏北线）和国道 G318 线（川藏南线）这两条重要进藏公路之间，通过省道 S211、S210、S215，北接阿坝州府马尔康，南连甘孜州府康定。本项目与上述国道、省道共同构成川西阿、甘地区重要的公路主骨架，服务于当地社会、科研、经济。

项目投入营运后，能够发展旅游事业，把我省旅游资源优势尽快转化为旅游产业优势和经济优势；能够完善四川省和地区公路网、改善区域现有公路交通状况；能够实现区域经济、社会、科研快速协调持续健康发展；能够稳固边疆、促进民族团结、满足国防建设的需要。

项目建设遵循“以人为本”的指导思想，把行车的安全舒适性、公路路容景观以及大自然风光景致有机地结合，相互协调配合。项目在实施过程中，将竭力排除现有道路的工程隐患，针对路域地质病害进行整治，为路基、路面工程设计完善的排水系统，能够确保边坡稳定和安全，预防产生滑坡，防止坡面土壤侵蚀，对水土流失起到有效的防治作用。公路改建完成以后，伴随路面的硬化、项目工程防护措施的逐一落实和生态恢复举措的逐渐发挥作用，路域生态系统质量能够恢复到扰动前的水平，部分原有工程地质灾害严重的路段经过治理还将优于项目实施以前的水平。

4.4 环评结论

本次公路改建项目辐射影响的区域是我国重要的以保护大熊猫、珙桐等珍稀濒危野生动植物及其栖息地的卧龙自然保护区，该区域在国内为具有重要的环保、生态和科研地位。所有，本次改建项目的是是要以珍稀濒危动植物保护、科研、教育为前提，以栖息地和生态环境不受影响为根本，着眼于可持续发展目标，最终实现生态、社会、经济的协调统一。本次改建项目主要在现有道路基础上进行，公路级别低，占地面积小，交通量不大，而且位于卧龙保护区的试验区；公路两侧 200 米范围内没有发现受保护的珍稀濒危动植物资源；大熊猫经常出没的地区与项目区存在一定的高差和距离。

虽然项目在实施过程中不可避免地存在一定的地表扰动和人为活动的介入，对项目区环境空气、水体环境、声环境构成暂时的或者潜在的负面影响，但这些影响都是短时期的，程度较轻的，而且只要管理得法，措施得当，这些影响都是可以得到缓解和控制的。

所以，本评价认为：只要能够完全落实报告提出的各方面环境保护环节和恢复措施，以及项目水土保持方案提出的水土保持措施，从环境保护的角度来讲，项目的建设不会对项目区内的环境质量造成严重的、毁灭性的影响，项目的实施是可行的。

4.5 建议

切实加强施工管理，严格约束施工行为，禁止红线外扰动；

在初步设计和施工图阶段，进一步优化项目方案，特别是路线选择和路基填筑方面；

在施工图阶段，优化土石方纵向调运，进一步降低废方数量，探索石质方量，特别是弃方的处理方法，做到不裸露，不乱弃，不妨碍观瞻；

要特别注意少数拆迁户的安置问题，既不能影响拆迁户的生活质量，降低其现有生活水平，更不能在保护区内随意安置，压缩保护区面积，引发相应的生态环境问题；

卧龙关小学处，靠近学校教室一侧，建议在项目完成后强化拦挡、防撞安全设施。鉴于该小学办学规模较小，生源有限，如果能够与邻近的其他小学合并办学，相应的环境影

响可以得到彻底的消除。

5 世界遗产提名地边界修改意见

5.1 边界修改的依据与原则

根据 David Sheppard 来访期间以及他在 2005 年 10 月 28 日的信件中提出的建议,我们对遗产提名地的边界提出以下修改意见。

在考虑遗产提名地边界问题时,我们尽可能遵循以下原则:

- 世界遗产地边界内的地域基本上完整地处于自然状态;
- 遗产地的面积尽可能扩大,并且足以保护整个邛崃山系的大熊猫种群。该种群较大(约 500 头大熊猫),足以保证长期的种群存活力。
- 除了一些小地区外,遗产地边界所包含的是一个相互连接的而非片断化的地域;
- 边界内的地域大部分已经划定保护区,并受到现有法律最严格的保护。尚未划为保护区的部分,在遗产地管理计划明确描述了获得最严格保护地级别的步骤,包括省世界自然遗产地条例的规定,这个条例可能实际上比国家法律更有效。
- 此外,我们了解到,IUCN 正在积极参与协助中国政府正在制订的有关自然保护区的保护和管理方面的法律。
- 遗产地边界沿着清晰的自然特征(如分水岭、河流)或沿着栖息地的界限(如天然林的边缘)勾划。
- 我们已经对边界进行过修改,排除大型基础设施和受人类活动影响大的区域。

5.2 提名地边界修改

根据 IUCN 和其他专家的建议,对提名地的边界做如下修改:

• 排除镇、村,耕地,大型基础建设和开展大规模旅游的地块

卧龙自然保护区内的卧龙镇(沙湾)和耿达乡,由人口密集的居民区和周边的农田组成。这两个镇将成为卧龙旅游发展的焦点,和保护区沟尾迁移下来的农民的安置区。因此,这两个镇不再划入提名地,而是将其并入缓冲区。

古老的藏族城镇饶碛(当地人称为 Yaoji)位于提名地的中心。该镇所在地沟谷宽阔,适合耕种,目前有几个寺庙和大面积的耕地。饶碛还计划在当地建坝蓄水(水库面积 4 平方公里)。因此,该镇不适合划入世界遗产地,应排除出去。水坝建成后,居住在洪水淹没的土地上约 1900 位居民将搬迁到这块遗产地划出去的部分。(详见上文)

在其它几个遗产地边缘的村庄,也通过调整早期提议的边界,把较大成片的耕地排除出去。

邓池沟是一个例外。尽管这条沟被大量开垦,并且居住着许多农户,但是它是一个非常重要的模式标本收集地。因为邓池沟具有高度的科学和文化价值以及保护性管理的需求,它应该划入提名地。

锅巴岩(白云山和红军栈道)的大理石开采点排除到缓冲区中。在管理计划中列举了许多减少采矿点的生态影响的方法。值得指出的是,该区域仍然保持天然状态,大熊猫还在利用这片栖息地,因此把它划入缓冲区是有利的。

世界遗产地内的其他分散的小型开采点和工厂将被关闭、转移。

提名地内仍然保持天然状态的区域,仍被大熊猫所使用。这些区域是整个生态系统和

提名地连续性的关键部分，尽管存在小型的基础建设，如道路、桥梁、小路、分散的农场、水管和电线杆。必要时，管理机构能够有权去控制和消除这些设施的影响，恢复栖息地。这种部分受干扰的区域的总面积不到提名地总面积的 5%。

附图 8 标注了遗产地内各个县的所有乡镇。这些镇都在遗产地边界之外。缓冲区内有 41 个乡镇。

- **与已有的保护区边界一致，特别是核心区**

提名地以及缓冲区的边界与数个现有保护地的边界一致。此外，还有一些国有林因其面积大、完整性高而划入遗产地（参考管理规划的图 5）。现有保护地规划好的核心区已经划入遗产地。而对一些没有清晰核心区的保护地，则选择其生态条件最好的部分划入遗产地，而且这些区域将来也应该划到这些保护地的核心区内。

- **包含最重要的需保护的栖息地，特别是大熊猫保护**

我们力图将所有重要的大熊猫和其它珍稀濒危物种的栖息地划到边界内。CI 利用 GIS 将各种数据层叠加，确定了生物多样性优先区域；两次详细的大熊猫调查（1986 至 1988 年第二次大熊猫调查，2003 年至 2004 年第三次大熊猫调查）提供了大熊猫生活范围的精确定位。调查数据点已经叠加到边界图和卫星图片上，以显示遗产地的连续性和涵盖的范围。

对遗产地边界的较小的修改，使得遗产的地范围更加完善，并为将来连接大熊猫邛崃山种群和岷山种群（在都江堰过岷江），甚至天全县东南和荥经县的种群提供了可能。此外，我们还缩小了宝兴县的隔离带——熊猫偶尔在这些隔离带上跨越宝兴河。

5.3 提名地和缓冲区的边界修改意见总结

提名地申报文件中将不再使用三个区划。虽然保护地内有三个区划的情形，但就遗产地而言，我们只有两个区划：严格保护的核心区和允许农业耕作和其他一些人类活动的缓冲区。只有核心区划入提名地。

修改过的核心区有全部原有的核心区和原先提议的一般保护区组成，以下修改所涉及的一般保护区除外。

添加的地块

在提名地的东部增加三个小的地块，以扩大提名地内的大熊猫栖息地面积，增加提名地内的大熊猫在提名地内或提名地与临近野生熊猫种群之间迁入或迁出的机会。值得注意的是，在天全—泸定主公路的西南部，有一个健康的熊猫种群。另外两个地块临近宝兴县城。在这个地方，沿着宝兴河分隔开的两条支脉，仍然有熊猫活动。宝兴河最窄的地方是潜在的连接熊猫种群的走廊，因为冬季水位很低，熊猫可以在某些地方过河。

沿日隆河的边界向下扩展一点，与森林边缘看齐。

所有这些添加的地块原本都在原先提议的过渡区，即缓冲区内。

排除的地块

在原有的一般保护区中有 14 个小地块从核心区中剔除，原因是这些地块人口密集，天然栖息地少，不适合划入世界自然遗产地。其中 12 个位于提名地的边缘，位于人口密集的沟谷中。其中 5 个在外围地点的边界之内，因此成为飞地。这 5 个地块包括卧龙自然保护区内的沙湾镇和耿达乡，宝兴县的一个藏族聚居地碓磑镇，以及宝兴县锅巴岩的大理石开采点。

缓冲区的修改意见

修改后的缓冲区包括原文本中的缓冲区，上文提及的飞地和修改，以及天全县一个新加的很小的地块。该地块处于天全—泸定公路的南侧，用以保证临近的天全县南部的熊猫种群有一个立足点。将来可以把这个地块进一步扩大，把整个天全大熊猫种群包括进来。

目前，提名地的总面积为 9,245 平方公里，缓冲区总面积 5,271 平方公里。

边界的调整经历了一个专家提议，地方反馈的过程。首先由马敬能博士、吕植博士和四川遗产办及建设部的官员共同根据熊猫分布，现有自然栖息地的分布，以及 IUCN 专家大卫·谢泼德（David Sheppard）提出的边界划定的原则，修订了原有的边界。然后遗产所在县、市（州）根据实际情况进行了确认，排除了有开发项目和村镇的地方，并把这些区域划入了遗产地的缓冲区。

6 关于提名地管理的说明

本遗产提名地是一个达 9,245 平方公里的大面积地区。这么大的面积对保护和管理有很大的挑战。各级政府的积极性很高并作出了承诺，要保证遗产地的完整性和其生物多样性价值。此外，四川省是中国第一个颁布了世界遗产地管理条例的省份。在过去的两年里省政府下令关闭和停建了许多影响提名地价值的开发项目，包括 176 个矿和污染企业，以及 25 个中小型水电项目。目前，提名地已经完成了一个综合的管理计划，同时成立了一个由不同利益相关者参与的管理机构。一旦提名得到批准，一个更为详细的管理实施计划就会展开。与此同时，在由北京大学和保护国际协助下，一个有关邛崃山系大熊猫遗产地生物多样性监测的规划正在进展中。

7 关于大熊猫栖息地自然遗产的系列提名

大熊猫分布在包括邛崃山脉在内的 6 大山脉，位于青藏高原东缘。目前的四川大熊猫栖息地自然遗产地提名，即卧龙·四姑娘山·夹金山（邛崃山脉）提名地是一个大熊猫栖息地系列提名的一部分。由于邛崃山脉栖息地完整性较高，管理边界相对清楚，因此优先提名。中国政府正在实施的“中国大熊猫及栖息地保护工程”将极大地改善其他熊猫栖息地的状况，使之满足世界自然遗产地提名的条件。我们将逐一对大熊猫栖息地进行申报，尽量把满足条件的栖息地都纳入自然遗产范围。

**Report to IUCN on Nomination as a Natural World
Heritage Site of the Sichuan Giant Panda Sanctuary
——Wolong, Mt. Siguniang and Jiajin Mountains**

Additional information and boundary revisions

四川大熊猫栖息地
——卧龙·四姑娘山·夹金山脉世界自然遗产提名地
补充信息和边界调整

**MINISTRY OF CONSTRUCTION
OF THE PEOPLE'S REPUBLIC OF CHINA**

中华人民共和国建设部

December 2005

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补充信息和边界调整

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Report to IUCN on Nomination as a Natural World Heritage Site of the Sichuan Giant Panda Sanctuary ——Wolong, Mt. Siguniang and Jiajin Mountains

Additional information and boundary revisions

Following the inspection visit of David Sheppard of IUCN PAP to the Sichuan Giant Panda World Heritage Nomination Site and in response to his comments made during the final meeting in Chengdu and in a follow up letter to the Ministry of Construction dated 28 October 2005, the following revisions, clarifications and amendments have been made to the nomination documents.

This new information is organized under headings (in italics) as requested by IUCN.

1 More detail on the Wolong Tourism Development Plan

The following passages are translated from the existing Wolong Eco-tourism Development Plan. The plan involves development of three sites, two – Gengda and Wolong are within the buffer zone, the third is inside the nominated site. We would point out that after WH nomination is accepted, this plan will need to be revised in line with the overall management plan for the WH site and follow the requirement of provincial regulations for management and protection of WH Sites. For instance construction of new hotels must be compatible with scenery and local styles etc. Capacity limits may need reduction.

1.1 Wolong eco-tourism plan summary

The objectives of tourism development

Developments should benefit the program of returning Giant Panda to the wild, recovering the Panda's original habitat, visitors' viewing and education, adjusting local industry and developing local people's economy.

The conclusion of the evaluation for appropriate tourism options

Wolong, Silver Dragon canyon and Dengsheng - Balangshan Pass are identified as the best three sites for tourism development for nature viewing in the reserve. These sites are most interesting to tourists and experts alike and have high tourism potential. These places plus Gengda township and Wolong town will form an integrated tourism infrastructure. Viewing giant pandas is the focus attraction.

The program range

The objects of the tourism program are located at the sites where tourism is allowed within Wolong Nature Reserve, including Xingfu Valley, Zhenghe Valley, Wolong Landscape Holiday area, Panda valley-Wuyi Canopy, Silver Dragon canyon and Dengsheng- Balangshan Pass, which tourists pass through along the road.

Orientation

Viewing Panda's wild life, scientific research and conservation are the priority, plus education, ecotourism, recreation and leisure.

Tourism products

Creating the original Panda habitat experience; using Giant Panda as the theme of eco-tourism; recreation and holiday tourism in its natural habitat; ecological and environmental protection and conference tourism.

Item distribution

There are three main parts of this program:

- Gengda giant panda education tourism area
Xingfu valley: reception center, gengda town, giant panda ecological education station, ecological farm, hetauping giant panda breeding center, niuping natural ecological experience tourism area.
Zhenghe valley: eco-tourism.
Seven floors valley: wild animal ecological breeding station.
- Wolong landscape holiday area
Wolong town, international conference center, Wolong landscape. Wolong river rafting (from Wolongguan to Wolong).
- Seeking panda sign eco-tourism area (small-scaled ecotourism without building new facilities)
Panda valley-Wuyi canopy: panda valley shelter, panda observation point in panda valley and Wuyi canopy.
Yinlong canyon: to see alpine azaleas in Youzhuping, to observe wild animals in Reshuitang, Shipengzi wild living experience camp, to observe swifts in Fengyuping, extreme sports at the entrance of the canyon.
Dengsheng-Balangshan alpine ecological scenery: Dengsheng ecological camp, alpine

meadows on Balangshan, cloud sea in Xiangyangping, narrow mountain pass of Balangshan, Weijia valley viewing platform, Shaohuoping viewing platform.

1.2 The summary of program in key areas

Gengda Qiang minority town: information center, traffic hub (the start of tourist cars), Qiang minority commercial restaurant street, Qiang minority hotel (four star), Qiang minority holiday village.

Ecological educational station: public management area, including gateway, management office, parking area and a square at the entrance; ecological education station; experience of mud and stone flow; bamboo labyrinth; the open air theater; Panda monument forest; tree house; and leisure sports on grassland.

Gengda township panda rearing park, including:

Tourism along the river: building wood bridge;

Ecological farm: rebuild the former village, horse riding;

Ecological experience area in Niuping: Riding horses, walking, camping;

Seven floors valley: raising wild animals, such as deer, pheasants, blue sheep and so on.

Zhenghe valley: mainly for scientific survey and research.

Wolong town: rebuild Wolong mountain villa to reach 5 star hotel level; Wolong Giant Panda Museum; build a glass house for plants. There are also hot springs, oxygen bar, dancing and so on.

Wolong township landscape holiday: small-scaled international conference center; Wolong Lake ecological hydroplant; form a small island to plant bamboo and build a hotel; rebuild some Qiang houses; repair the temple; river rafting.

Panda valley: attract golden monkeys and macaques for viewing; simulate ancient animals with 3D laser image; establish restaurant and coffee bar; first aid station; emergency helicopter parking apron; giant panda observation station.

Yinlong valley: climbing on the rock face; bungee jumping; start point of tourism cars; camping; building trail.

Dengsheng ecological camp: restaurant, gift shop, rest hall, forest bathhouse, camp and parking area.

Balangshan: cloud sea observation platform, rest area, trail, coffee area, camping ground.

Others engineering to prevent steep banks collapsing; waste water disposal facility; water supply factory; communication cable; post office; satellite dish for TV reception.

1.3 Social benefits

Direct benefit: It is estimated there would be about RMB 4,560 million income from tourism in ten years (in theory). This could create 1500-2000 jobs.

Indirect benefit: It could create 4500-6000 jobs indirectly. It could increase local people's knowledge, and the visitors could bring new culture, new lifestyles and new information. It would accelerate the development of this and surrounding areas. It would stimulate other industries, such as transport, trade, servicing, farming, catering, local and national arts and crafts, etc.

1.4 The environmental impact evaluation

Environmental capacity: including the spatial capacity, facility capacity, natural environmental capacity and social psychological capacity. Because of its steep slopes, complex aspect and valleys cut by rivers, the tourism environmental capacity is mainly limited by facility capacity.

The maximum capacity of living in the whole area is 7,300 people per day. If the ratio of tourists who stay overnight to one-day trippers is 1:2, the number of one-day trip tourists is 14600 people per day. So in total the facility capacity is estimated at 21,900 people per day.

Main environmental impacts during the construction process

- **Waste water and garbage:** Construction mainly produces construction waste water, sanitary waste water and garbage. If waste water is discharged without treatment, it would influence the surrounding surface water, underground water and soil. The Wolong (Pitiao) River would be influenced. If garbage, waste earth and rock are tipped casually, they could be washed into rivers and reservoirs by rain, which could influence the water quality. Moreover, the extract would go into the soil and influence the underground water and soil.
- **Exhaust gas and noise:** Construction work will produce CO, CO₂, NO₂, dust and noise.
- **Vegetation:** The main vegetation types of this area are fir forest, alpine meadow, hemlock broadleaf mixed conifer forest, and some fragmentary bamboo breaks. During construction, digging, work camps and temporary working factories need to occupy woodland. Some trees would be cleared, which would involve destruction of some natural vegetation.

- **Animal:** The construction will marginally decrease wildlife habitat and may cut across some migration corridors. However, Wolong landscape holiday area will increase habitat area of panda by artificial propagation.
- **Water and soil loss & erosion:** The construction will disturb the earth's surface, disturb former physiognomy and vegetation. Digging of earth and rock will cause the surface to be exposed to erosion resulting in water and soil loss during rains. Waste residue will also cause water and soil loss. The waste residue site will change the original physiognomy and change the characteristic of runoff water and affluxion.
- **Hydrographic condition:** Some structures will cross streams and this will cause a need for diversions. It could decrease the impact of controlling flood. Huahongshu will build a new dam, which will form a small lake and change local micro climate.
- **Agriculture:** The construction will occupy farmland and resettle people. These people will mainly become staff serving in the tourism industry. The agricultural production will be reduced. Other land could be offered to compensate this.
- **Traffic:** Changing the road will influence some traffic. Heavy construction vehicles will temporarily increase the burden of traffic and cause traffic jams, which will be inconvenient for local people.
- **People health:** During the construction period, the density of staff will be relatively high; this could cause some health problem.

The environmental impact during construction operations

- **Waste water:** This is produced by management and tourists. It needs sewage disposal.
- **Exhaust gas:** It is mainly produced by cars and restaurants. The smoke from kitchens not only influences the scenic value, but also is the main source of volatile organic matter and PM10.
- **Garbage:** This mainly includes the garbage from hotels and visitors.
- **Noise:** Mainly from the vehicles including the vehicles which bring tourists here and the vehicles just pass through here. Huahongshu, the entrance of Panda Valley and the entrance of Silver Dragon canyon are next to the road, so these areas would be influenced more. The road goes across the Dengsheng – Balangshan pass, which also causes a lot of engine noise along the road in this area too. The noise can reach 90dB, distributed divergently along the road.

- **Traffic:** Because of increased visitor levels, the traffic density between Wolong town and Silver Dragon canyon will increase. This will reduce the traffic speed and be inconvenient to local people.
- **Health:** Visitors from other areas might bring new infective diseases or be infected by local diseases.

Mitigation measures planned for environmental protection

Waste water and garbage: The waste water of flushing stone and earth needs a deposition pool. The waste water containing oil needs a deposition pool which can separate oil. Sanitary waste water needs special cesspool equipment. Design of toilets can allow the faeces to be taken by farmers as fertilizer. During construction period, we would educate visitors to increase their environmental consciousness. We would set up some garbage cans, garbage disposal plants and ecological toilets and arrange staff to clear rubbish. The waste water from hotels would go initially into a pipe then to the sewage disposal factory. Residential areas will be equipped with a water system which could be recycled water for watering surrounding plants. We should pay more attention to the drainage system of family hotels in Wolong town and Gengda township to avoid health risks.

Atmosphere: Growing some green belt along the road; Reinforcing control of car emission; Punishing the owners of cars which discharge above set standards. The construction staff should take some safeguard measures. The residential quarters in construction areas should be moved outside. The restaurant should install equipment to clear smoke. We would change chimneys in order not to influence visitors' views and to combine other activities.

Noise: To plant a green belt along the roadside; to limit the speed of cars to 60km/h and forbid using of horns; to strengthen the management of vehicle noise; to ban the passing of cars at certain times of night.

Biodiversity: After construction, planting some local species in construction areas and along the road, but not introducing exotic species. Compensate and restore some vegetation influenced by temporary occupation. Some vegetation cleared in construction should be transposed to other places. During construction, forbid staff from chasing and hunting wild animals. Educate visitors and managers of this area not to chase and hunt wild animals.

Cultural relics and historical sites: There might be some unknown cultural relics under ground in this area. If such are found during construction, staff could not deal with this on their own. They should contact the cultural relic management authorities. We should reduce the destruction of any cultural relics and historic buildings.

Water and soil loss: Forbid digging earth and rock near the construction site. Waste residue should be collected, and be disposed of in barren valleys or slopes. Minimise water and soil loss, avoid ecological damage and restore vegetation as soon as possible.

Health of people: Prevent the local epidemic of infective diseases, endemic diseases and natural epidemic diseases spreading. Meanwhile, prevent and cure diarrhoea, hepatitis and so on. Hotels and restaurants should carry out strict dish control, disinfection and management measures.

1.5 Ecological migration

Residents are mainly distributed along Wolong (Pitiao) River and Gengda River Valleys, below 2520m elevation. Their farmland is regularly disturbed by wild animals, and farmland encroachment reduces the habitat of wild animals. In order to develop more harmoniously and meet the needs of tourism development, ecological migration (resettlement) is necessary. This activity is planned in three stages, it will form new assemble residence area in Wolong town and Gengda Township over a 20 year period. Residents will be encouraged to change to work in tourism and natural forest protection program. Training and jobs will be offered. After 20 years, there will be 4016 people in Gengda and 2000 in Wolong town.

A total of 5000 local people need to be resettled.

Year 1 to 5: resettle 1000 people and offer 400 training slots, 200 jobs.

Year 6 to 10: resettle 1500 people and offer 600 training slots, 300 jobs.

Year 11 to 20: resettle 2500 people and offer 1000 training slots, 500 jobs.

2 Map of existing and planned dams on the Baoxing River which are in proximity to the nominated site

2.1 Details of Hydro development plans for the Baoxing River

We append a map (map 1) of the Baoxing river indicating the position of existing and planned hydro-dams and facilities. The map shows the boundaries of the nomination area. Most of these plans affect only the lower stretches of the river and are in the valley bottom of the buffer area far away from natural forest ecosystems.

Most of the plants involve small scale wiers, diverting a portion only of the river flow at different points.

Most of the stations are downstream of the nomination area. Only Yaoji project (see details below) and Minzhu plant (minimal) will have direct impact on the WH site. We append a copy

of the compensation protocol proposed for the Minzhi Plant project.

2.2 The compensation protocol from Minzhi Plant in Baoxing River to Fengtongzhai National Nature Reserve (Summmarised)

Since the construction starts, the company should pay to the reserve two hundred thousand yuan each year.

The company will cover costs for the nature reserve to increase staff levels for management.

The company will compensate for the woodland or vegetation occupied by construction or damaged trees according to the national rules.

3 Maps of the dam at Yaoji, including (a) dam location; (b) impoundment area, and (c) resettlement area. These maps should show the relationship of the impoundment to the proposed WH boundary. Also a copy of the English executive summary of the EIA report and a summary of mitigation measures would be appreciated.

David Sheppard had specifically asked for more details about the plans for Yaoji because among other things there is a dam being built in this valley which is in a very central position within the nominated site.

It should be pointed out that this valley has been a Tibetan town for hundreds of years and the star-shaped agricultural development around the town are of long standing. The giant pandas have retreated to higher elevations where there is a wide habitat connections (> 10 km in all directions) on both the north west and south east sides of the valley.

The dam construction will involve the resettlement of about 2000 villagers and farmers. The site for their resettlement is indicated in existing farmland and degraded secondary forest/scrub land on maps 2 and 4. There is no direct panda habitat loss in this process. The electricity generated by this project may help to reduce pressure to clear additional land for agriculture as well as collection of firewood for the town, which is a positive potential of reducing the encroachment of the giant panda habitat.

The location of the dam is marked on map 1 to 4. This shows details of the dam location in relation to the town and indicates the flood line when the dam is full at a height of 2140m. Forest immediately above the water line will be strictly protected and reinforced to prevent land slippage.

The water from the dam will be channeled along 18 km of underground pipes before being

dropped into the hydropower station close by Fengtongzhai reserve headquarters. Three smaller outlets will drop some of the water down pipes through small turbines at villages along the main road in the Baoxing valley. These are also marked on maps 3 and 4.

The water pipes are tunneled several hundred metres deep through the mountains and will not affect the surface vegetation or panda habitat above. They are anyway of very narrow gauge.

The dam will reduce waterflow in the main river bed between Yaoji and Fengtongzhai. This will have the effect of making this stretch of over 14 km. easier for giant pandas to cross the river and will improve rather than disrupt the contiguity of the panda population.

Moreover the production of electricity at small stations along the river valley will have the effect of reducing dependence on firewood of those few farmers living along the road and thus take pressure off the panda habitat on the hill sides above.

The following table details relevant information about the project summarized from the development plan.

3.1 Relevant details of Yaoji Dam project

Reservoir Data

- Normal Impounded Level: 2140 m
- Stagnant Water Level: 2060 m
- Reservoir Area: 401 ha
- Average Depth: 53 m
- Total Reservoir Capacity: 200 Million m³
- Regulating Reservoir Capacity: 187 Million m³
- Inundated Area: 400 ha

Impact: (Normal impounded level=2140 m)

- Migrants: 1964
- Agricultural Population: 1653
- Area of Inundated Farmland: 205 ha

- **Area of Inundated Building area:** 14.28 ha
- **Area of Inundated Forest:** 118.93 ha

Resettlement Plans

Production area:

- **New Cultivation Area:** 96.7 ha for 1120 people
- **Regulating Cultivation Area:** 32.7 ha for 358 people
- **New Plantation Area:** 23.3 ha
- **New Alpine Grazing Area:** 336.7 ha
- **Total Reclamation Area:** $96.7 + 23.3 = 120$ ha

Residential area:

- Scattered houses for 651 people, and concentrated residence site for 1142 people, totally 1793 people.
- New Qiaoqi (Yaoji) Township is located at right banks of Liuluo Valley, with the elevation from 2170m to 2300m. $75\text{m}^2/\text{person} * 1140\text{people (year 2004)} = 85,500\text{m}^2$
- According to the resettlement plan, a total of 2299 people will be moved due to Qiaoqi project (1900 from inundation area, others downstream). Total resettlement area will take new Qiaoqi Township as its centre. At present there are already 3166 original inhabitants living at the resettlement area.

The following sections are translated from the development plan and its environmental impact assessment (EIA).

3.2 The goal of environmental protection

- Prevent Fengtongzhai National Nature Reserve and its biological resources from being negatively impacted; Protect ecological environment of this project and surrounding area.
- Ensure and improve the quality of production and livelihood of the migrants and local people

- Preserve the existing water function of the river
- Ensure water supply for factories and agriculture downstream; secure the safety of basic establishments, buildings and people's lives.
- Protect the vegetation and conserve water and soil.

3.3 Considerations when designing the program

The location of this dam is chosen to avoid big earthquakes up to level 3.0 to 4.0 on the Richter scale.

When selecting the water storage level, to ensure that the inundation area, migration and habitat of animal, historical relics, historical sites and landscape should be minimally affected by the water storage level, the project chooses 2140m as the level, which could gain the most benefit.

In order to reduce impact on the nature reserve, the project chooses the right side tunnel along the river to lead water to the hydro plant, because the left one is in the core zone of the nature reserve and has poor geological conditions. Furthermore, the project chooses to construct an underground plant because it has better geological condition and less impact on the nature reserve.

Transmission and transformation of electricity project: Considering the potential impacts on the Fengtongzhai National Nature Reserve, the wire for transmission of electricity is along the right side of Dong He.

To protect vegetation, the project would try to construct high steel pylons in forested areas so as to avoid cutting trees.

3.4 Analysis of negative impacts

Construction: Waste water, exhaust gas, noise, digging, waste residue, land occupation, traffic (increased vehicles), construction staff.

Operation: water storage will change the balance of heat, temperature, humidity and so on. The speed of flow will be reduced, which could influence the water quality. It will also influence the landscape and steady slope. The quantity of flow will change, which would influence the aquatic life and production downstream. The dam will block the natural passage of fish. The flow will be decreased in some parts of river, which will influence wildlife, productivity and aquatic life.

It will flood 205 ha farmland, 162,612 m² housing and some woodland. Migration of 1900 persons will be necessary.

The transmission electricity line: We will rebuild around 1.3 km road, which will destroy some vegetation and produce some waste residue. The noise will be below 60dB. The wireless interrupt will be between 45-50dB. Electrostatic induction will be below 5kV/m. None of these three numbers are at all high.

3.5 The main measures to reduce impacts

Water

Build a deposition pool to reduce suspended particles. Build toilets in residential areas and the faeces could be used as fertilizer. Build bio-gas (methane) tanks.

Solid waste material

Build 7 sites for waste residue. Set 2 garbage cans in each constructive living area and transport the garbage to the garbage receptacles every day by truck. There will be a garbage dumping site. Clean out the bottom silt of the dam regularly.

Air

Select machines and transport tools whose exhaust emissions meet the national standards.

Try our best to use grass bags to cover the blasting surface to avoid the dust produced by blasting operations in construction.

There will be two spraying cars watering in the morning, noon and night to decrease dust around the construction site.

Acoustical Environment

Select machines whose sound could meet the national standards.

Some machines which could produce high noise should work interiorly and not work at night.

Any blasting work should use only small blasting caps and not work at night.

Construction staff should wear earplugs and helmets to prevent noise damage.

Set signs to limit the speed of vehicles.

Construction vehicles will be forbidden using their horns between Yanjing to Guobayan, and cars will be forbidden using horns in Densheng Valley construction branch hole.

Ecological environment

This project should not influence the climate in the nature reserve or the whole river.

Plant forest above the water storage level.

Build 7 sites for waste disposal.

Carry out some construction measures to conserve water and soil.

After the project, the land occupied by the waste disposal plant and construction would be changed to farmland or planted with grass and trees.

At completion of this construction, remove temporary construction structures and clean up all waste.

Plant trees on both sides of the road around the reservoir. The road is 48.7km, and we will plant one tree every 3m, so there would be 32,467 trees.

In the loose soil and steep areas we will build some protection walls.

In the settlement area, the construction garbage will be used for land fill. We will cultivate some new land for farming and improve the existing farmland. We will green road, park and the area surrounding houses.

Measures to protect terrestrial life

- **Fengtongzhai National Nature Reserve**

Nature Reserve management will strengthen monitoring in Dengsheng Valley with emphasis on Giant Panda and other rare animals.

Avoid building new roads and decrease vehicle traffic.

Strengthen the education of construction staff. Forbid hunting and damage to rare wildlife. Forbid eating of frogs and snakes.

Control fire effectively; enhance the fire prevention awareness; strengthen fire prevention, detection and fighting capacity and fire warning system.

Any blasting work should use small blast caps and not work at night.

Limit the speed of vehicles coming into construction sites and forbid use of loud horns (claxon).

After construction, recover the landscape surrounding the nature reserve.

Construction company could offer technical and financial support to nature reserve. (The compensation protocol).

- **Rare plant**

In construction area, we will transplant and build protective fences for some rare plants.

In flooded area of Jiajin Mountain Park, we will transplant any threatened endangered plants.

- **Vegetation**

Fire protection and fire risk awareness.

We will plant trees and grass to recover any degraded landscape and vegetation.

- **Animal life**

Implement education program for residents and visitors
Set signs to increase the wild animal protection consciousness.

- **Aquatic life**

Enhance fishing management in the branch rivers above Yaoji reservoir and the western branch of Baoxing River. Make some big branch rivers of Donghe as the protected river of some special fishes.

Improving the social environment

According to our ysis, after this project is put in place, there will be only 15 people who will lack water due to reduced river flow. We could lay on tap water to solve this problem.

Construction staff should kill mosquitoes, flies, mice, roaches and so on in order to decrease the vectors of infection.

Enhance the management of canteens and restaurants in the construction area. There will be sanitary checks every quarter, if they could not pass the check, they cannot get the permission to continue.

Before the construction staff coming into the construction area, the construction unit should check the health condition of their staff and set up monitoring files. Only staff free of infection should be selected for work.

Every construction unit should make sure there are some staff responsible for health.

Every construction unit should prepare necessary medicines and medical equipment.

After water storage, rats would migrate, so we need to kill rats to control their density.

Do vaccination of migrants.

Implement the drinking water plan for people and livestock in resettlement area.

Enhance the management of building and disposal of garbage and sewage.

Historic relics and sites

If the project can keep away from historic relics and sites, we will keep away. If not, we would dig up and transport them.

If we find new relics should tell the management department.

Tourism

The reservoir would add a new viewing site for tourism.

The monument of he Red Army March will be flooded, and it will be rebuilt in the new town.

Local production and safeguarding life

Because the water flow would change markedly, we will set some alarm signs and education for

pre-warning local people of expected changes.

The electrical transmission line

Keep away from forest and historic relic sites.

After construction, restore any damaged vegetation.

Environment monitoring

Set up monitoring programs for water, atmosphere, noise and ecological environment

Environment management

Set up special environmental office.

3.6 The main benefits

Good for local economic development.

Hydro power reduces pollution from coal power

Improves the life quality of local people and good for the protection of Fengtongzhai National Nature Reserve.

3.7 The compensation protocol from Yaoji Reservoir to Fengtongzhai National Nature Reserve (Summarised)

In order to enhance the management of the nature reserve, it will increase three wild animal monitoring stations and three protection stations.

The electrical company will pay for the increased nature reserve staff including 23 managers and 3 forest police.

The company would provide the reserve with some fire-fighting equipment, communication equipments and vehicles.

The company will compensate for any forest or other natural vegetation occupied by construction or for damaged trees according to the national rules.

Regarding other management problems, the two sides should hold discussions to find solutions.

After the project gets permission, the company should pay one million and five hundred thousand yuan to the nature reserve for increasing equipment and facilities. When the construction starts, the company will pay an additional five hundred thousand yuan to the nature reserve.

4 Relevant information on proposed road improvements, particularly in relation to the Yingxiu-Xiaojin road (such as the English summary of the EIA report, summary of environmental mitigation measures etc

4.1 Road Upgrading Project

This is the county road that now crosses from Yingxiu through Wolong Nature Reserve, across Balangshan Pass and down the Aori valley to Xiaojin town in Aba prefecture (see map 6). The lower parts of the road from Yingxiu to Dengsheng will be widened to 8.5 m with difficult sectors left at 7.5m. The upper sections of the road from Dengsheng over the Balangshan pass will be widened to 7.5 m with difficult sectors left at 6.5 m.

The road has a total length of 162 kms, including many switchbacks in the head of Pitiao Valley. Approximately half of this road length lies within the nomination area and half within the buffer zone. The project to upgrade the road will widen 147 km of this road from the Pitiao Valley to the point about 4 km beyond Balangshan at the junction of Shuangqiaoagou and the Aori valleys.

Mostly the road will follow its present alignment but in steep places some re-routing will be undertaken. In addition the steepest part at Balangshan will be replaced by a tunnel of c. 10 kms. Two alternative positions for the tunnel are still under consideration (see detailed map 5).

Such a tunnel would reduce noise pollution and disturbance to alpine fauna, flora and environment.

The following passages are a direct translation from the EIA of the road improvement plan (dated November 2005).

4.2 The environment impact of this project

Land occupied and ecological impacts

This upgrade project will broaden the roadbed, so it can not avoid occupying additional land. In this project, additional roadbed will occupy 27.9 hectare, the area of tipping soil will occupy 21 hectare, and the sites to put bridges, the temporary sites for mixing materials for road surface, camps for construction staff, etc. will occupy 3.3 hectares temporarily.

In the progress of shaping the roadbed, especially in the middle and high road sections, the project also needs some rock, which will destroy the original terrain and physiognomy to some degree. We will optimize the balance and transport of the rock in selection, design and construction, however, there will be some abandoned rock to dispose of. This work will change

the original land use and press some vegetation on the surface of ground. This project will dig 1.93 million cubic m. tip 930,000 cubic m. fill 809,000 cubic m. and spread 1.12 million cubic m. of material.

Roadbed, toll gates, bridges, culverts and so on will occupy land permanently, which will destroy the vegetation, and the living creatures will lose their habitat irreversibly. This project will occupy 27.9 hectare of land permanently, including 7.0 hectare farmland, 20.9 hectare woodland, grass and scrub. Moreover, this project will occupy land around 24.3 hectare, including 21.0 field for tipped soil. This is distributed on farmland but mostly in woodland, grassland and scrub. The brief plant source in occupy land are some common trees, bush and grass, including spiny oak *Quercus*, beech *Fagus*, pagoda tree, larch *Larix*, willow *Salix*, wild peach trees *Prunus*, *Carex*, maimendong (*Ophiopogon japonicus*) and so on. Of these, relative dominant species are larch (*Larix*), red fir *Picea* and *Carex*.

To rare and endangered plant, this project will not threaten them. Based on investigation, except for Master's larch (*Larix mastersiana* Rehd. et Wils) in San Dao Qiao, there is no other rare plant the 200m range along the road. If we can enforce management, forbid destroying plant outside the red line and strengthen the consciousness of construction staff on environmental protection and peaceful construction, this project would not influence the rare plants in the nature reserve greatly.

This construction will probably influence some common amphibians, reptiles, birds and small animals. In this project, because of construction staff and machines, the main impact is the animal migration of noise. However, this would not damage the population. Based on investigation, there is no protected rare animal in the range of 200m along the road.

One of the important negative impacts in road construction is water and soil loss. When taking earth and stone, the structure of soil surface will change and become loose. If there is raining before protection, it is very easy to collapse because of eroding, and cause severe water and soil loss. By forecast, if this project does not take any measure, the water and soil loss in construction will be three hundred eighty five thousand four hundred ton. Of these, the main project area would be 13,600 tons, the field for throwing soil would be 365,400 tons, migration would be 59.85 tons, camp and construction field would be 287.41 tons, the new increasing water and soil loss amount would be 370,600 tons.

Impacts on air quality

In this construction, lime soil mixture will use station mixing, which means that lime soil mixing stations follow the designed lime-soil ratio to mix the concentrate and the mixture lime soil will then be transported to the road construction site directly. The pollution of this mixture method is mainly in the mixing station. The 150 m in leeward direction basically accord with

the environmental air quality standard I, 0.12 mg/m³ per day in average. Generally speaking, the TSP pollution caused by other tasks could be controlled in the 50-200m range of construction site. Outside this area, the quality will accord with standard I.

This project will use a cement and concrete road surface, not an asphalt and concrete road surface. Asphalt will only be used to do some minor surface processing. Thus, the air pollution caused by asphalt boiling and spreading is significantly reduced. The impact of smoke of asphalt and benzopyrene will not be big. Furthermore, air of the project area is fresh and breezy; the environmental dispersal capacity is relative great, so it would not cause regional pollution.

The impact on water quality

Along the road, there are 16 middle sized bridges (total length 930m), 14 small bridges (total length 279m). The construction of middle sized bridges is of larger scale and the construction staff is more concentrated. Therefore, if rubbish, waste water and dejecta are released at random, it would pollute the surface water.

The digging and tipping of construction material during pier construction would increase the turbidity of river water and the SS in water would increase marginally. The organic solvent spillage from construction machines would cause oil pollution to the water under bridges; however, this pollution could be reduced by enforcing strict construction management procedures. The construction rubbish produced by cofferdams and bridge construction could block the stream and pollute water during the rainy season, if it could not be cleared and removed in time.

The potential impact of this project would not change water function or cause widescale deterioration of water environment quality. Improving the construction standards and enforcing strict construction management would have prominent effect in limiting impacts.

The impact on acoustical environment

There are lots of machines in this project. Thus, the operation of these machines would be a source of noise. According to the construction field noise standard GB12523-90, the threshold value of noise in day time is 70-75 dB and 55dB at night. The forecast result of machine noise shows that the noise could meet the threshold value outside 40 m far away from the construction spot, and at night the distance is 150m. The noise would probably influence some sensitive, timid, quiet-seeking animals.

In operation time, the main impact on acoustical environment is traffic noise. According to forecast result of traffic noise shows that, along the road, the noise influence the protect area much more, especially in Wolong, Xiaojin county, which belong to 1st standard area. In near,

mid and long time scales, in the main acoustical environment sensitive spots, the noise level is above standard both in day and night. In detail, in the short term, it could meet 1st standard in the daytime, the excess level at night is between 2.9 and 6.6 dB; In the mid-term, the excess level in the day is 1.1-2.9 dB and 5.6-9.1 dB at night; In the long term, the excess level in the day is 1-4.1dB and 7.5-10.8 dB at night.

We use ventilating noise isolation windows to lighten this problem in some residential areas. Moreover, we would carry out some management measure on traffic. Therefore, the project could be brought within the acoustical environment quality standards.

4.3 Benefits of this project

This road is a part of province road S303. It is the only passage connecting the nine loop, Wolong Giant Panda Nature Reserve and the oriental sacred mountain, Si guniang Mountain. It is also the most convenient passage to connect the Xiaojin、Danba county in the northwest of Sichuan province to Chengdu.

Furthermore, as a part of S303 road, this project is an important way to go to western Sichuan and Tibet, also a main link in the Aba prefecture road web. S303 road spans between national roads G317 and G318, which are important roads entering Tibet. By province roads S211, S210, S215, it connects Ma er kang, the capital of Aba prefecture in the north to Kangding county, the capital of Ganzi prefecture in the south. This project and the national road, province road mentioned above constitute the main roads of Aba and Ganzi prefecture. It can serve benefits for local society, research and economy.

After the project is finished, it can help develop tourism and consummate the road web of Sichuan province and local area, It can also make the society, research and economy develop harmoniously, sustainably and rapidly. It can make border area stable and secure.

The project follows the idea “people foremost”. It combines the comfort of driving, the road views and the nature scene together. In the construction process, we would try our best exclude the potential threats of the project, deal with geological failure, design good a drainage system, all of which could make the side slopes steady and safe, prevent earth slides, prevent soil erosion and water and soil loss. After the project, the road surface would become hard, the protection measure would be carried out, thus the environment quality would recover to the former condition, some sections of the original road which were prone to regular landslides will be improved.

4.4 The conclusion of the environmental evaluation

The area this project would influence is Wolong Nature Reserve, which is an important area for

protecting rare wild plants and animals such as giant panda, dovetree, etc. Thus, this project must not damage their habitat and ecological environment and must consider conservation, research and education. It should have sustainable development in mind and achieve benefits for ecology, social welfare and economy.

This project is mainly built on the former road line; the level of the road is low; total land area is small; traffic is not heavy and it is suitable for the experimental zone of Wolong. There are no rare plants and animals known within the 200m range along the road. The area where panda is usually active is some distance from this project.

Although there will be some disturbance on the air, water, acoustical environment temporarily and potentially, these impacts are short-term and light. If we could manage the construction properly and take suitable mitigation measures, these impacts could be minimized and controlled.

Above all, this evaluation demonstrates that if we could carry out all the measure in this report and take measures to conserve water and soil from the environmental view, the project would not make any serious impacts. Therefore, this project could be undertaken.

4.5 Suggestion

Strengthen construction management; control the construction activities; forbid disturbance outside the red line (200m).

Improve the project plan, especially the way of route selection and roadbed fill-up.

Improve the transportation of earth and stone, decrease the waste earth and stone.

Regarding the need for migration of farmers. This should not negatively influence their lives and leave them scattered about the nature reserve.

In Wolongguan preliminary school, close to the teachers' house, we suggest that it should have safety equipment after the project. Because it is a small school, if it could be combined with other schools, its environmental impact would disappear.

5 *Revision of the boundary of the World Heritage Nomination Site*

Following the advice given during the visit of David Sheppard and also in his letter of 28th October 2005, we have made the following revisions to the boundary of the site.

We have, as far as possible followed the following principles:

- The area included within the WH property boundary is almost entirely in a natural state;
- The area is as large as possible and is sufficient to protect almost the entire population of giant pandas in Qionglai Mountains and this is a large enough population (about 500 animals) to ensure long term population viability;
- The boundaries enclose the site as a single contiguous and not fragmented area, albeit with a few small enclaves;
- Most of the area is already classed as nature reserve and thus enjoys the highest level of protection available under existing law, steps are outlined in the management plan to achieve the highest level of protection over the few parts of the site not yet given the status of protected area, including specific regulations for World Heritage Sites at provincial level which will in fact carry more weight than national law;
- In addition we know that IUCN is aware that China is currently revising and strengthening the national legislation for Nature Reserve protection and management;
- The boundaries follow clearly defined natural features such as catchment ridges, rivers or the habitat limits such as edge of natural forest;
- We have revised the boundary so as to exclude major infrastructures and areas of major human impact.

As per suggestions of IUCN and other experts the boundary of the nominated site has been revised to:

- ***Exclude towns, villages, agriculture land, major infrastructures and sites of high impact tourism***

The townships of Wolong (Shawan) and Gengde within the Wolong Nature Reserve, already comprise residential towns surrounded by agricultural land. They will further be the focus of tourism developments for the Wolong Tourism development and resettlement sites for the program of migrating farmers from upper valleys of the reserve. As such these towns should not be included in the nomination site and are excluded by an extension of the Buffer zone tongue now extending to include Gengda and an enclave to Wolong (Shawan).

The old Tibetan town of Qiaoqi (locally pronounced Yaoji) lies in the centre of the nomination area. The town has several temples and extensive agricultural farmland due to its favourable broad valley bed location. There is also a plan to build a dam and establish a 4 sq.km. reservoir at this site. This site is thus also not suitable for inclusion within the WH

site and is excluded as an enclave. The flooded land will displace approximately 1900 people who will be resettled within the enclave boundary. (Details given above).

The earlier proposed boundary has been adjusted at several other peripheral valleys where agricultural lands need to be excluded from the WH site.

An exception is made for the valley of Dengchigou. Although this valley is largely agricultural and houses a number of farmers it constitutes a very important scientific type locality collecting site. It should be included within the nomination areas because of its high scientific and cultural value and need for protective management.

The marble mines of Guobaiyan (Baiyunshan and Hongjunzhando) are excluded as an enclave (buffer zone). A number of measures are listed within the management plan to reduce the impacts of these mines. It should be noted that this area remains mostly natural and is still used by giant pandas so retention within the buffer zone is advantageous.

Other small scattered mines and factories within the WH site will be closed and removed.

Areas of the nomination site which remain mostly natural, are still used by giant pandas and form an essential part of the overall ecology and continuity of the area remain within the nomination boundary although there may be minor infrastructure such as roads, bridges, trails, scattered farms and water pipes and electricity pylons. This will give the management agencies greater authority to control and, where necessary, eliminate their impacts and allow habitat restoration. The total of such partially disturbed areas remains less than 5% of the total nomination site.

Map 8 attached to this report indicates the location of all townships in the counties comprising the Heritage Site. All are now located outside the site boundary. 41 townships are located within the buffer zone.

- ***Coincide with existing reserve boundaries, particularly core zones***

The nomination site including buffer zones corresponds with the complete boundaries of a number of existing protected areas, apart from a few areas of state forest that will be added for reasons of size and completeness (refer to map 5 of management plan).

Where existing protected areas have already delineated core areas, these are included within the heritage site. Where existing protected areas have not made firm delineation of core areas, the most ecologically appropriate areas have been selected for the core area of the WH site. These areas should now be included within the core areas of those reserves.

- ***Include the most important habitats for conservation, particularly for panda conservation***

Great efforts have been made to select boundaries that include all important habitat for

giant panda and other endangered and valuable species. CI have undertaken a GIS overlay exercise to identify areas of high biodiversity priority and two very detailed surveys of giant pandas (survey 2 1986-8 and survey 3 2003-4) give precise locations of the extent of giant panda occupation. The data points from both these surveys have been overlaid over the boundary maps and satellite background to show the contiguity and degree of inclusion achieved.

Minor boundary revisions have marginally improved this cover and opened up future potential for eventually relinking the Qionglai Panda populations with other populations in Minshan (across the Min River in Dujiangyan sector) and with populations in SE Tianquan, as well as narrow the gap at Baoxing township where occasionally pandas may cross the Baoxing river.

Summary of Revisions to Nomination Area boundary and buffer

There will no longer be three zones shown in nomination documents. Although some internal zoning may occur in practice, as far as nomination is concerned there will be only two zones: - a strictly protected core zone and a buffer zone in which agriculture and some other human activities are allowed. Only the core area will constitute the nomination site.

The revised core area consists of the entire original core area together with the originally proposed buffer zone = protection zone apart from the following changes.

- **Additions**

Three small extensions along the eastern side of the nomination area are added to enlarge the area of occupied giant panda habitat within the nomination area and increase the opportunities for pandas within the nomination site to emigrate and immigrate both within the site and between the site and adjacent wild panda populations. In particular a good population is known to exist on the southeast side of the main Tianquan – Luding road. Two of these extensions are added close to Baoxing town where pandas still exist along two spurs separated by the Baoxing river. The close gap across the river would now be a potential panda corridor for population links since in winter the river level is very low and giant pandas could scramble across at some points.

The boundary of the site down the Aori river is extended downwards slightly to the forest edge.

All these additions are within the originally proposed transitional zone = buffer zone.

Extractions

Fourteen small areas of original protection zone are excluded from the new core area

because they are highly populated, have low natural habitat and are unsuitable for inclusion within a Natural World Heritage Site. Twelve of these are peripheral to the site in populated valleys around the edge of the boundary. Five of the excluded areas are contained within the external site boundary and thus constitute enclaves. These include Shawan town and Gengda town within the Wolong Nature Reserve and the Tibetan town of Yaoji in Baoxing County as well as the marble mines at Guobaiyan in Baoxing county.

- ***Revision to the buffer zone***

The revised buffer zone consists of the original transitional zone = buffer zone with the addition of those enclaves and revisions to the nomination area mentioned above plus one very small addition in Tianquan county where a small area is added to the south of the Tianquan – Luding road to secure a foothold in the neighbouring giant panda population of S Tianquan county. At a future date it may be possible to extend the site further to include the entire Tianquan giant panda population.

The total area of the nomination site now measures 9,245 sq. km. and the buffer zone 5,271 sq. km.

- ***Process of boundary revision***

The revision of the boundary involved a consultation process that John McKinnon and Lu Zhi first revised the boundary according to the panda survey data and distribution of existing natural habitat, following the principles listed by David Sheppard. Then each county and prefecture reviewed the new boundary and further clarified the areas where are existing developing projects or villages and towns, and thus eliminated these sites or included them into the buffer zone.

6 Additional note on management

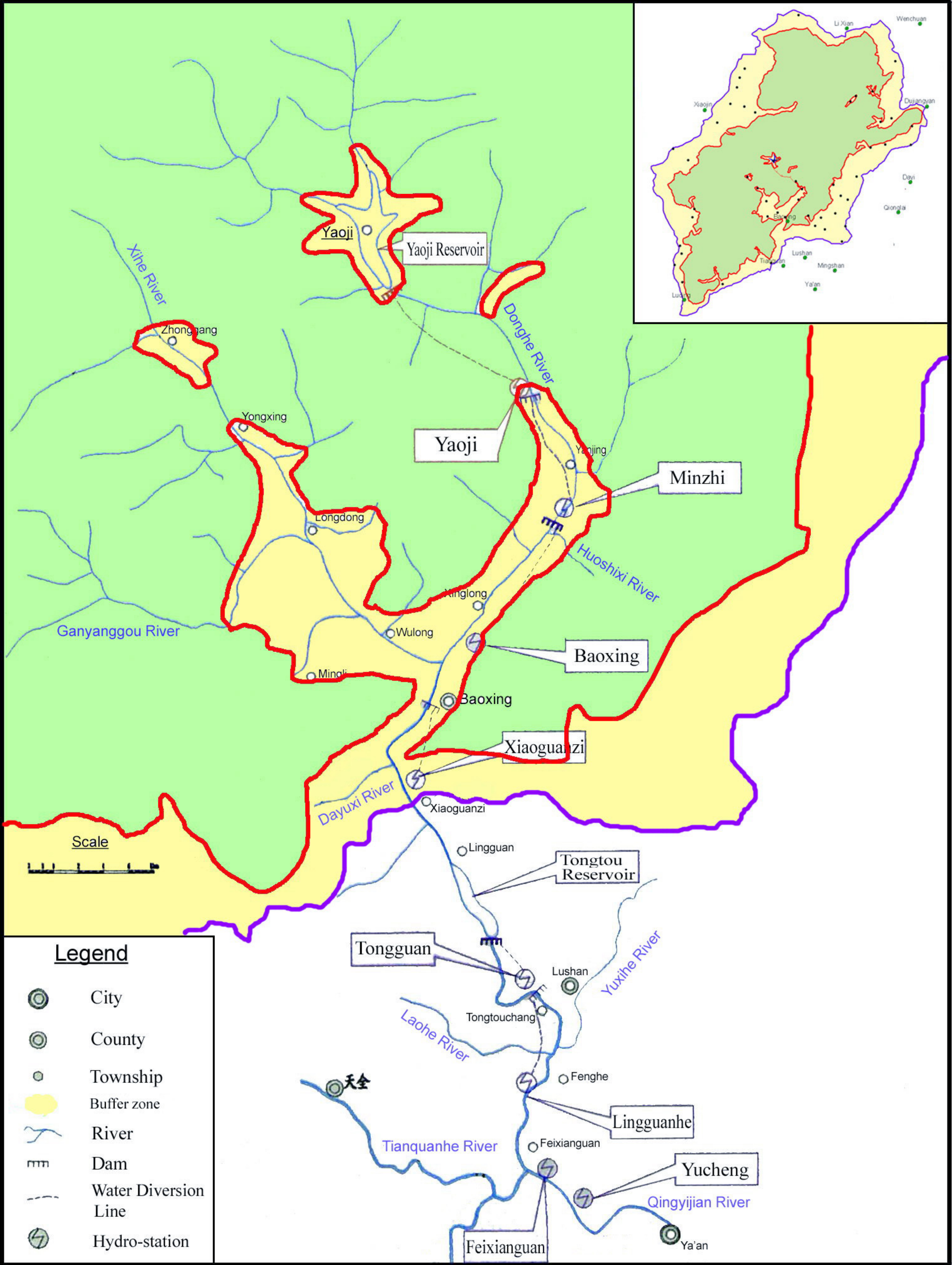
The nominated site is a large area of 9,245 sq. km. Protection and management of this will present a big challenge and the government at different levels have shown great enthusiasm and commitment to safeguard the intactness of the natural and biodiversity value of this site. In addition to the provincial regulation on world heritage management, the first of this kind in China, there have been many high impact development projects closed down or suspended in past two years, including 176 mines and polluting factories and suspending 25 small to medium hydropower projects inside the nominated area and the buffer zone. Currently, a comprehensive management plan has been developed which included a multi-stakeholder management infrastructure. Once the nomination is approved, a more detailed implementation plan will then developed. In mean time, a biodiversity monitoring plan is also under development with assistance from Conservation International and Peking University.

7 Additional note on serial nomination of Giant Panda Habitat World Heritage

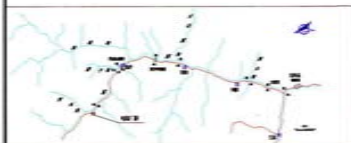
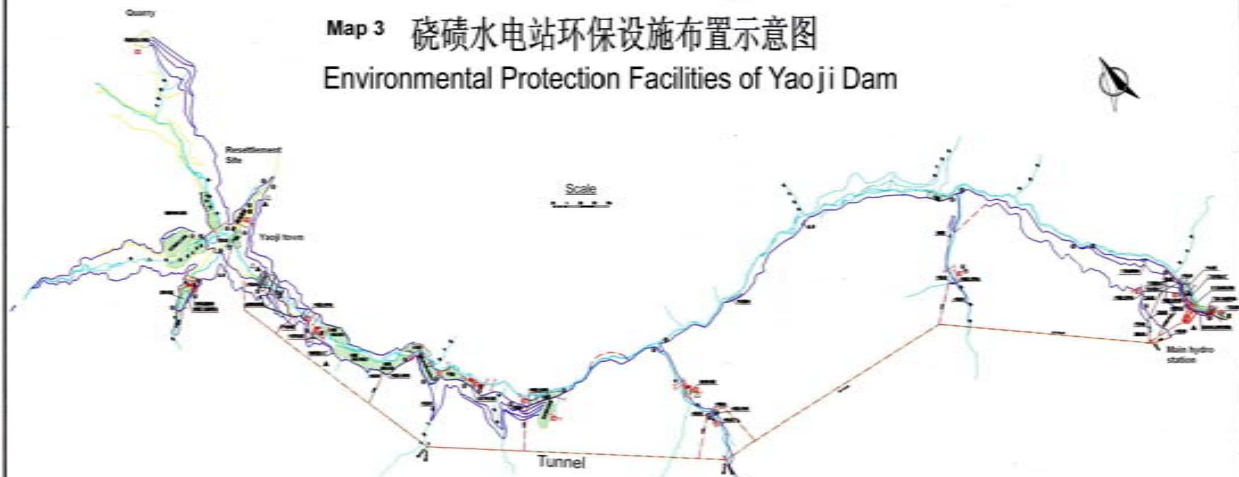
Sichuan Giant Panda Sanctuary meant to be a serial nomination that will eventually include 6 mountain ranges along the east edge of Tibetan Plateau. Currently, the Qionglai Mountains – Wolong, Siguniang and Jiayin Mountains, is the one that is most intact with a clearer management boundary among all panda habitats and therefore made the first site to be nominated as the World Heritage Site. The ongoing National Giant Panda Conservation and Management Plan will make great improvement on rest of the panda habitats so they could meet the nomination criteria of World Heritage Site, especially the intactness. We will take a step-wised approach to extend the nomination of other panda habitats as soon as they meet the criteria.

Map1 Planned Hydro-Stations of Baoxing River

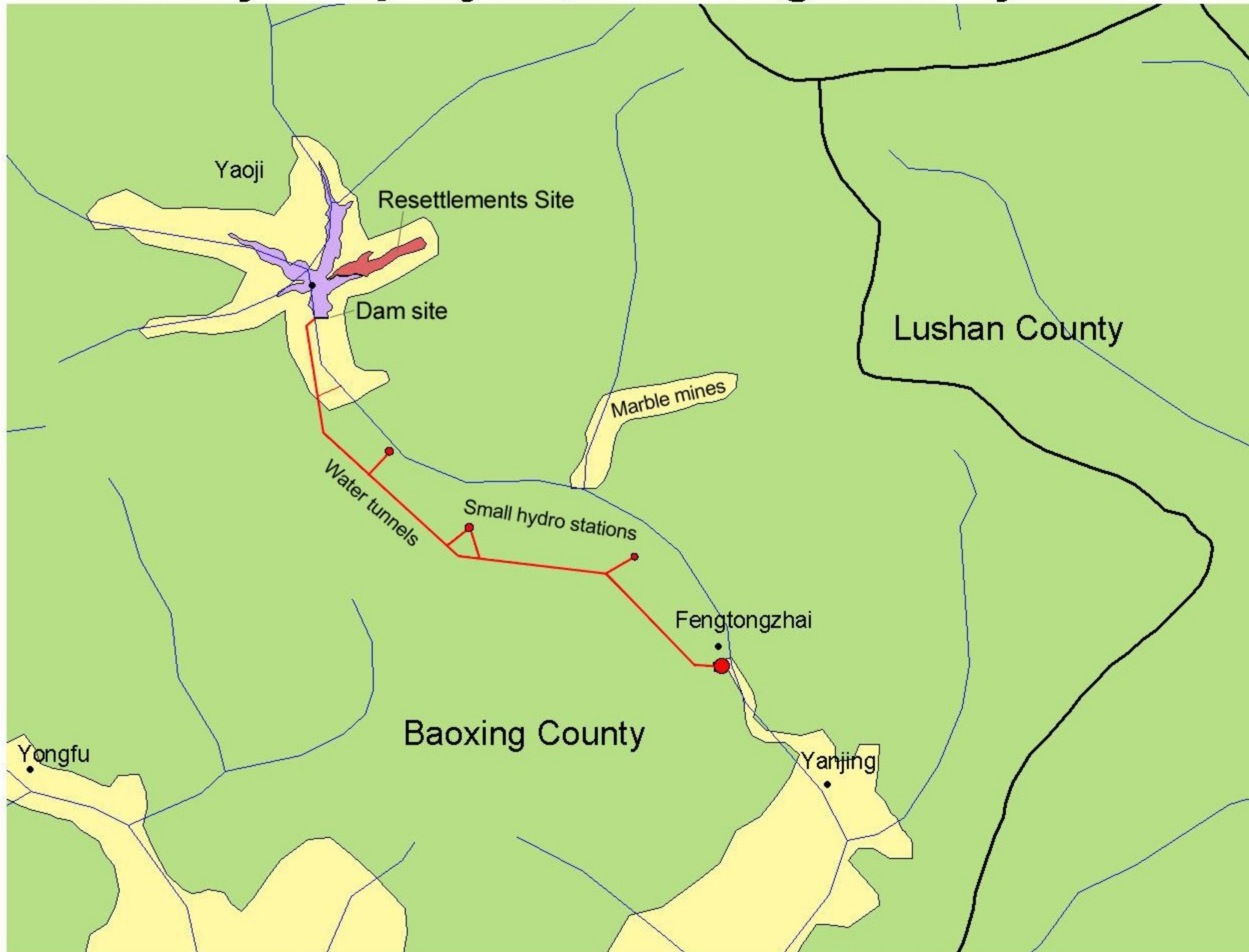
宝兴河梯级水电站平面布置示意图



Map 3 磷碛水电站环保设施布置示意图
Environmental Protection Facilities of Yaoji Dam

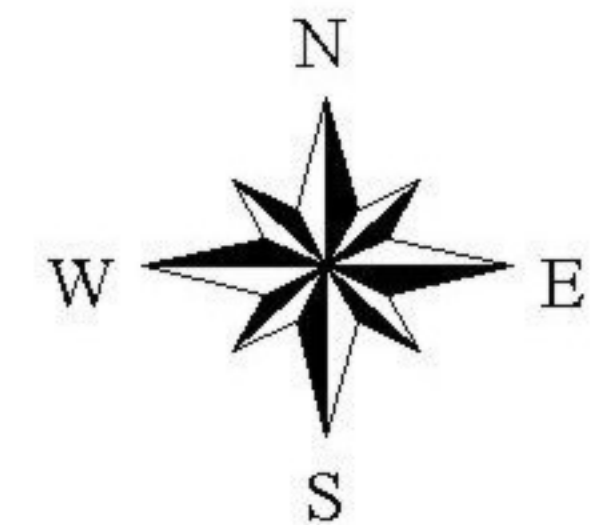


Map4 Close up of Yaoji dam and hydro project, Baoxing County



Legend

- Townships
- Hydro
- Pipes
- Rivers
- Resettlement
- Lake
- County
- Boundary
- Bufferzone



10 0 10 20 Kilometers

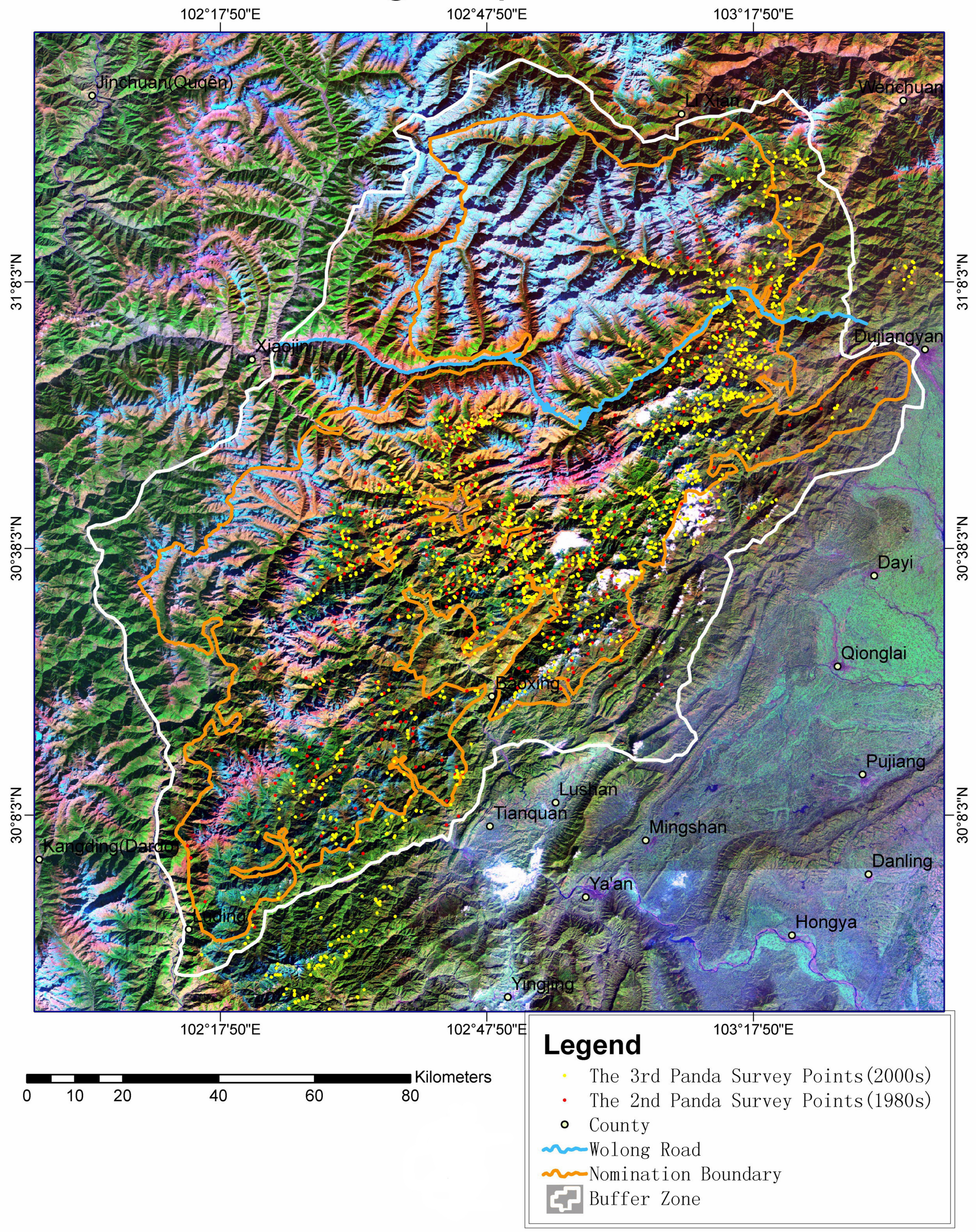
Map 5. Details of central section of road improvement plan (south uppermost)



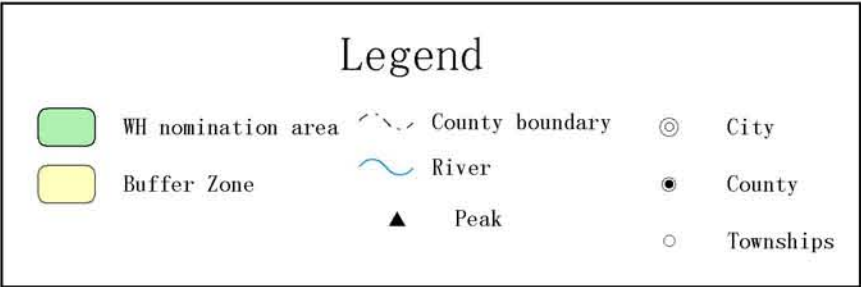
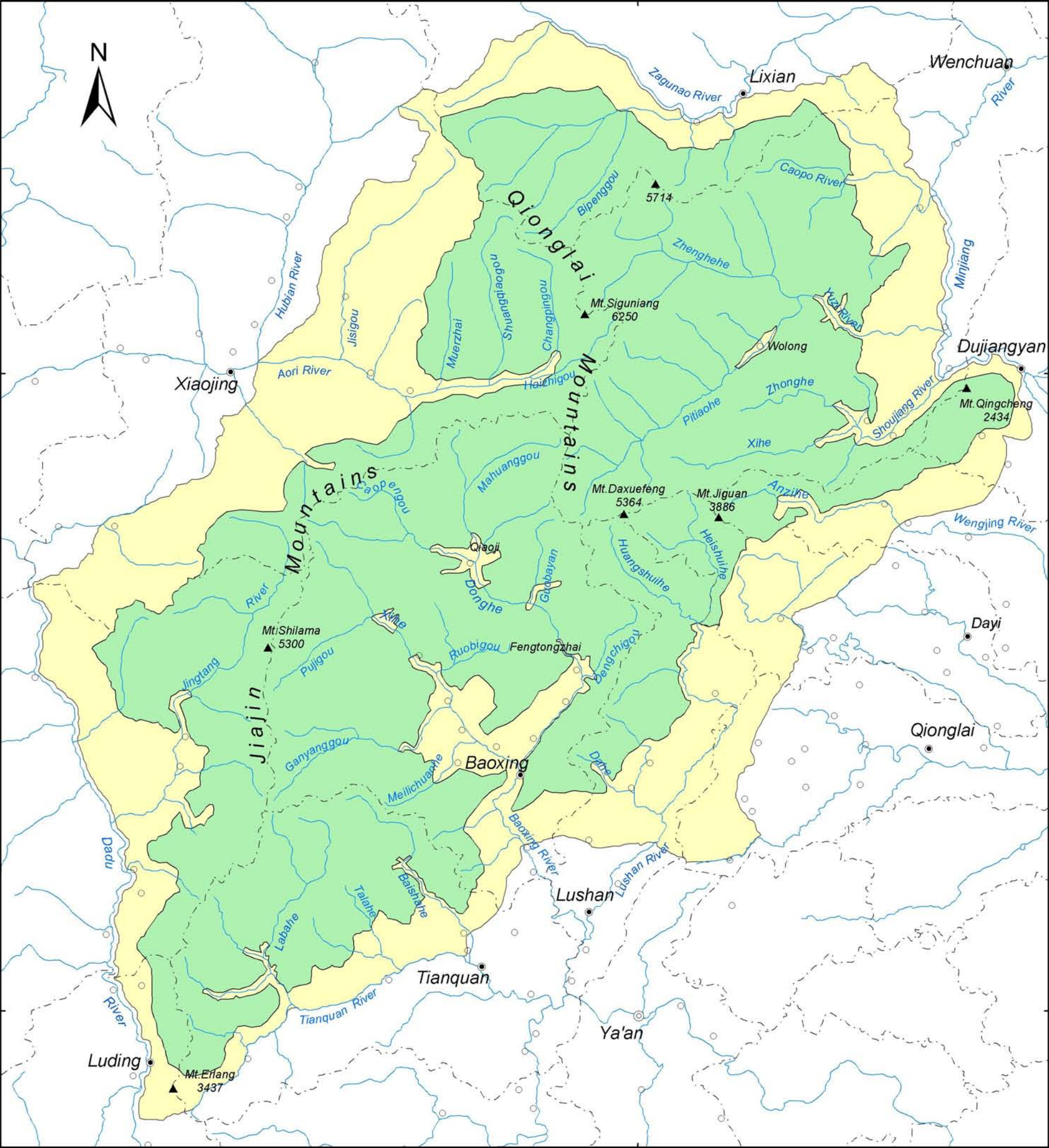
Map 6 Close up of Wolong Road Upgrade Sector



Map 7 Boundary and buffer of nomination site in relation to giant panda distribution



Map 8 Revised Boundary and Buffer of WH Nomination Site with Townships and Counties



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The World Conservation Union

Mr Wang Fengwu
Deputy Director General
Department of Urban Development
Ministry of Construction
No 9. Sanlihe Rd
Beijing 100835
Peoples Republic of China

31 January 2006

Dear Mr. Wang,

IUCN Evaluation of the Sichuan Giant Panda Sanctuary – Wolong, Mt. Siguniang and Jiajin Mountains – Nominated for inclusion on the World Heritage List

The IUCN World Heritage Panel met in Gland, Switzerland, from the 16 to 20 January 2006 to examine current World Heritage nominations for natural and mixed properties and cultural landscapes. This included eight new natural properties, one mixed property, one natural property extension and five cultural landscapes. The IUCN Panel examined in detail each nomination file and any supplementary information from the State Party, reports of the field missions, desk reviews from international experts and other references regarding the properties.

IUCN seeks to develop and maintain a dialogue with States Parties during the evaluation process to allow them every opportunity to supply the necessary information and to respond to any questions that arise. In this regard, thank you for responding to IUCN's previous questions. I confirm that IUCN received a copy of the "Additional information and boundary revisions" submitted in hard copy and CD Rom on the 16 January 2006.

In order to complete the IUCN evaluation of the Sichuan Giant Panda Sanctuary, and in line with the Operational Guidelines for the World Heritage Convention (2 February 2005, paragraph 168), we would like to clarify a few additional points as outlined below.

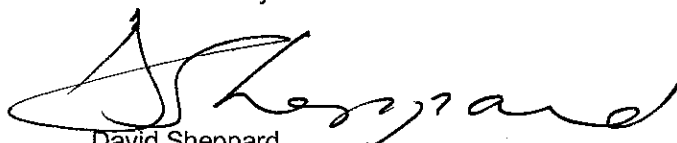
1. In relation to the dam at Yaoji, the additional information document (Section 3) notes that the water from the dam will be channeled along 18 km of underground pipes before being dropped in the Fengtongzhai reserve headquarters. Also that the dam will reduce water flow in the main river bed between Yaoji and Fengtongzhai. Please clarify what are the expected direct and indirect impacts of the underground pipes and the reduced water flow.
2. It is understood that the Wolong Tourist Development Plan proposes developments outside of the nominated property. However, please clarify what the specific developments will occur within the nominated property and what direct impacts are anticipated.
3. Please submit the following additional maps of the nominated property:
 - (i) A topographic map at the largest scale available showing the revised boundaries of the nominated property and its buffer zone; and
 - (ii) A detailed topographic map of the Wolong Valley, clearly marking the boundaries of the nominated area and the buffer zone.

Please provide your response to the above questions as soon as possible, in order to facilitate our evaluation process, but no later than the **31 March 2006**, as per the Operational Guidelines (2 February 2005, paragraph 168). Please note that any information received after the 31 March 2006 will not be considered by IUCN or the World Heritage Committee (Decision 28 COM 14B.57). It should be noted,

however, that while IUCN will carefully consider supplementary information submitted, it cannot properly evaluate a completely revised nomination or large amounts of new information submitted at the last minute. Therefore, please keep your response brief and restricted to the questions outlined above. May I remind you that supplementary information should be submitted to the UNESCO World Heritage Centre in three copies and electronic form.

Should you have any questions concerning this letter please do not hesitate to contact Ms. Georgina Peard (Tel: +41 22 999 0158, Fax: +41 22 999 0025, Email: georgina.peard@iucn.org). Please also note that David Sheppard will be in China from 14 to 16 February 2006 and will be happy to discuss this further. Thank you again for your collaboration and support for the implementation of the World Heritage Convention.

Yours sincerely



David Sheppard
Head, Programme on Protected Areas

Cc. H. E. Mr Zhang Xuezhong, Ambassador, Permanent Delegate of China to UNESCO
Mr Tian Xiaogang, Secretary-General, Chinese National Commission for UNESCO
Ms. Aban Marker Kabraji, Regional Director, IUCN Asia Regional Office
Dr Seth Cook, China Programme Coordinator, IUCN Beijing Liaison Office
Dr. Bill Bleisch, Director China Programme, Fauna and Flora International,
Giovanni Boccardi and Alessandro Balsamo, UNESCO WH Centre

中华人民共和国联合国教科文组织全国委员会

NATIONAL COMMISSION OF THE PEOPLE'S REPUBLIC OF CHINA FOR UNESCO
COMMISSION NATIONALE DE LA REPUBLIQUE POPULAIRE DE CHINE POUR L'UNESCO

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23 March 2006

Subject: Additional Information for the Sichuan Giant Panda Sanctuary- Chinese Nomination for Inclusion on the World Heritage List

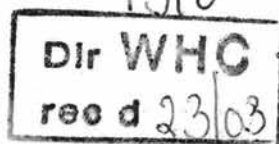
Dear Mr. Bandarin,

As requested by Mr. David Sheppard, head of Programme on Protected Areas of IUCN (31 January 2006), I am pleased to submit to you an additional information for the Sichuan Giant Panda Sanctuary- the Chinese Nomination for Inclusion on the World Heritage List.

Thank you for your continued support to the preservation of world heritage sites in China.

With my best regards!

Sincerely yours,



JF
cc: A. Balsano
G. Boccard

TIAN Xiaogang
Secretary-General

Mr. Francesco Bandarin
Director
World Heritage Centre
7 place de Fontenoy
75352 Paris 07 SP
France
Fax: 33 1 45 68 55 70

**Notes on request for additional information regarding
Sichuan Giant Panda Nomination for World Heritage**

Sichuan World Heritage Management Office
March 23, 2006

1. The Yaoji dam project will draw off water along an underground tunnel for 18 km.

The impact on this was explained in the earlier notes. As the tunnel is low bore (3-4m diameter) and several hundred metres under the ground for most of its length, its impact on the forest ecosystem will be negligible in extent and impact. Only a few tens of square meters of the surface will be affected for entrance tunnel, exit tunnel and possible ventilation pipe.

There will be some small but unpredicted effect on river life – insects and fish and birds that feed on them in the section that will experience reduced water flow. SEPA are setting up 3 monitoring stations that would monitor conditions to ensure these impacts do not threaten the protected area. However, we point out that flow will not be totally cut so connectivity is always maintained. Minimum water flow is estimated at 3 cubic metres per second. Fish and other wildlife can move up and down the river as before. Furthermore, the construction company will pay more than 3 million yuan to build fishing protection stations and Baoxing River Rare Fish Rescue Center in Yongfu, Yaoji, and Yanjing (see map). As mentioned in our earlier notes, the lower water level will have a positive impact on giant pandas since it will be easier and safer for them to disperse across the river, thus strengthening population connectivity.

During construction, the constructing company will strengthen environmental education. The company will check the construction conditions every month and award the construction contract unit in order to enhance the protection from forest fire. Furthermore, the company forbids their staff entering into the nature reserve. Local government will also take four times annually special checks plus additional irregular examinations. Killing wild animals and clearing vegetation are forbidden.

There are lots of measures taken to reduce the production of waste water, dust, noise and so on as we have listed in the earlier notes. In 2003 and 2004, Ya'an Environment Monitoring Department has done selective examination and tested two times the building site. The results showed that the condition of the building site is accordance with the national standards.

The company has made contract with the Sichuan Environment Monitoring Center to monitor the influence of the construction regularly. The outcome will be used to improve the construction. The company will offer a compensation package to Fengtongzhai Nature Reserve as we have referred before in our earlier notes.

2. Regarding the physical tourism developments planned for Wolong

All infrastructure development are listed under the two locations of Wolong Town and Gengda Town and in the excluded enclaves and are thus outside the nomination site. Only those developments planned for further up the Pitiao valley in Silver Dragon Canyon, Dengsheng and Balangshan lie within the nomination area proper. These consist of small constructions to allow visitors to view and experience scenery, wildlife and sea of clouds. Even these plans will be reviewed again if the site is accepted as a WH site, to ensure that only developments suitable for a World Heritage Site are in fact constructed. The impacts of such sites will be low since the area open for visitors is very small compared to the total huge area of the reserve. All below items will be re-evaluated once the WHS is approved:

Developments originally planned within Wolong and Gengda enclaves:

- Gengda Qiang minority town: information center, traffic hinge (the start of tourist cars), Qiang minority commercial restaurant street, Qiang minority hotel (considered as four star hotel), Qiang minority village, Qiang minority holiday village.
- Ecological educational station: manage area of people: including gate, management, office, parking area and square at the entrance; ecological education station; experience of mud and stone flow; bamboo labyrinth; the open air theater; Panda monument forest; tree house; leisure sports on grassland.
- Gengda Panda raising park
- Tourism along river: building wood bridge
- Ecological farm: renovate the former village, horse riding
- Ecological experience area in Niuping: Riding horses, walking, camping
- Seven floors Valley: Raising wild animals, such as spotted deer, pheasants, blue sheep and so on
- Zheng He Valley: mainly for scientific survey and research
- Wolong Town: renovate Wolong mountain villa to reach 5 star hotel level; Wolong Giant Panda Museum; build a glass hall for plants, there are also hot spring, oxygen bar, dancing and so on.
- Wolong landscape holiday: international conference center; Wolong Lake ecological hydroplant; form a small island to plant bamboo and build hotel; rebuild some Qiang houses; repair temple; river rafting.

Developments originally planned inside WH nomination area:

- Panda Valley: cable car; attract golden monkeys and macaques; set restaurant and coffee bar; first aid station; helicopter parking apron; Giant Panda observation station.
- Silver Dragon Valley: rock climbing; start of tourism cars; camping ground; wildlife trail.
- Dengsheng Ecological Camp: restaurant, gift shop, rest hall, forest bathhouse, camp and parking area.
- Balang Mountain: cloud sea observation platform, rest area, trail, coffee area, camping ground.

3. Maps

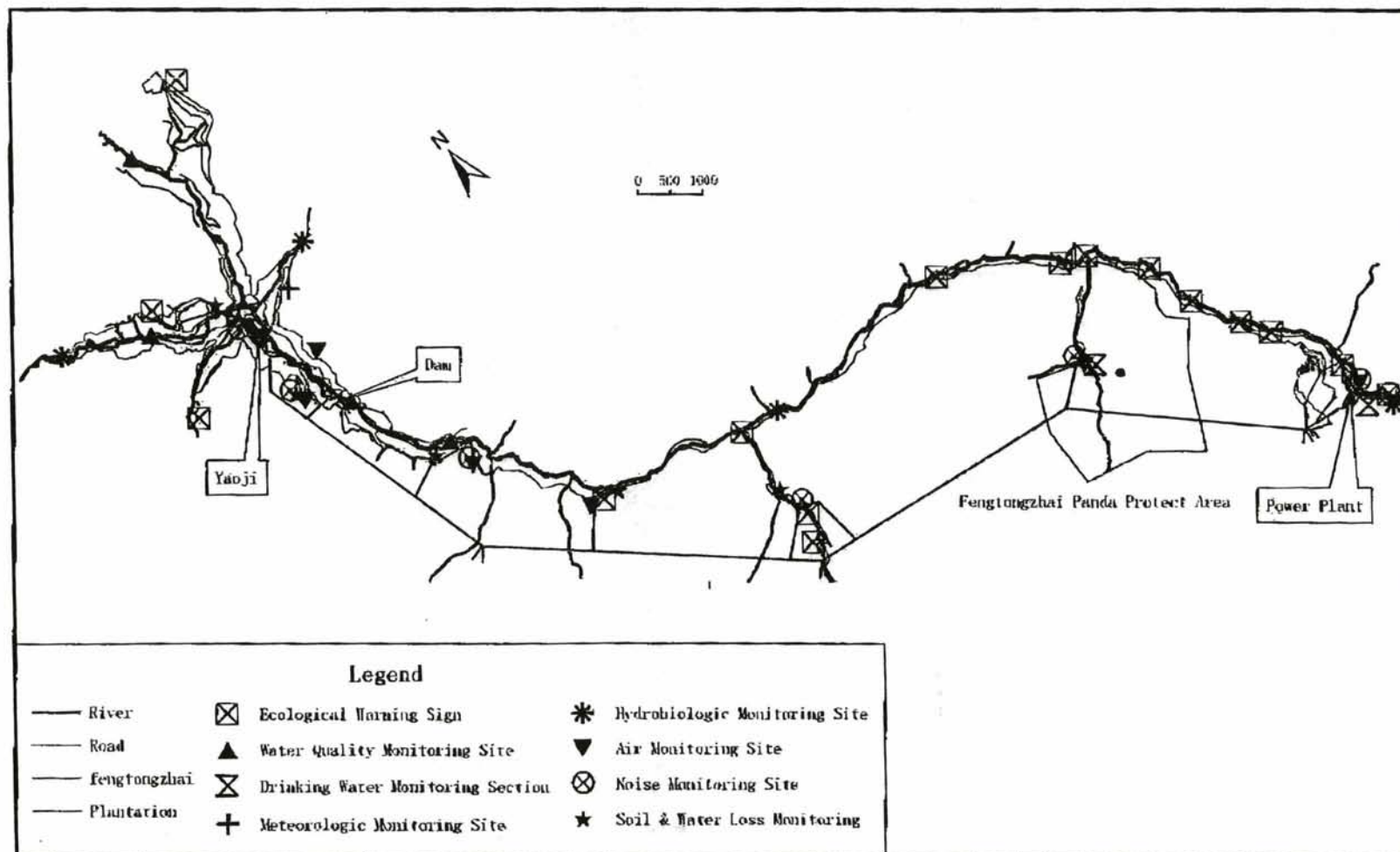
Two maps are provided by Sichuan World Heritage Management Office:

1. Yaoji Dam and the location of environmental measure

2. Topographic map of the nominated site

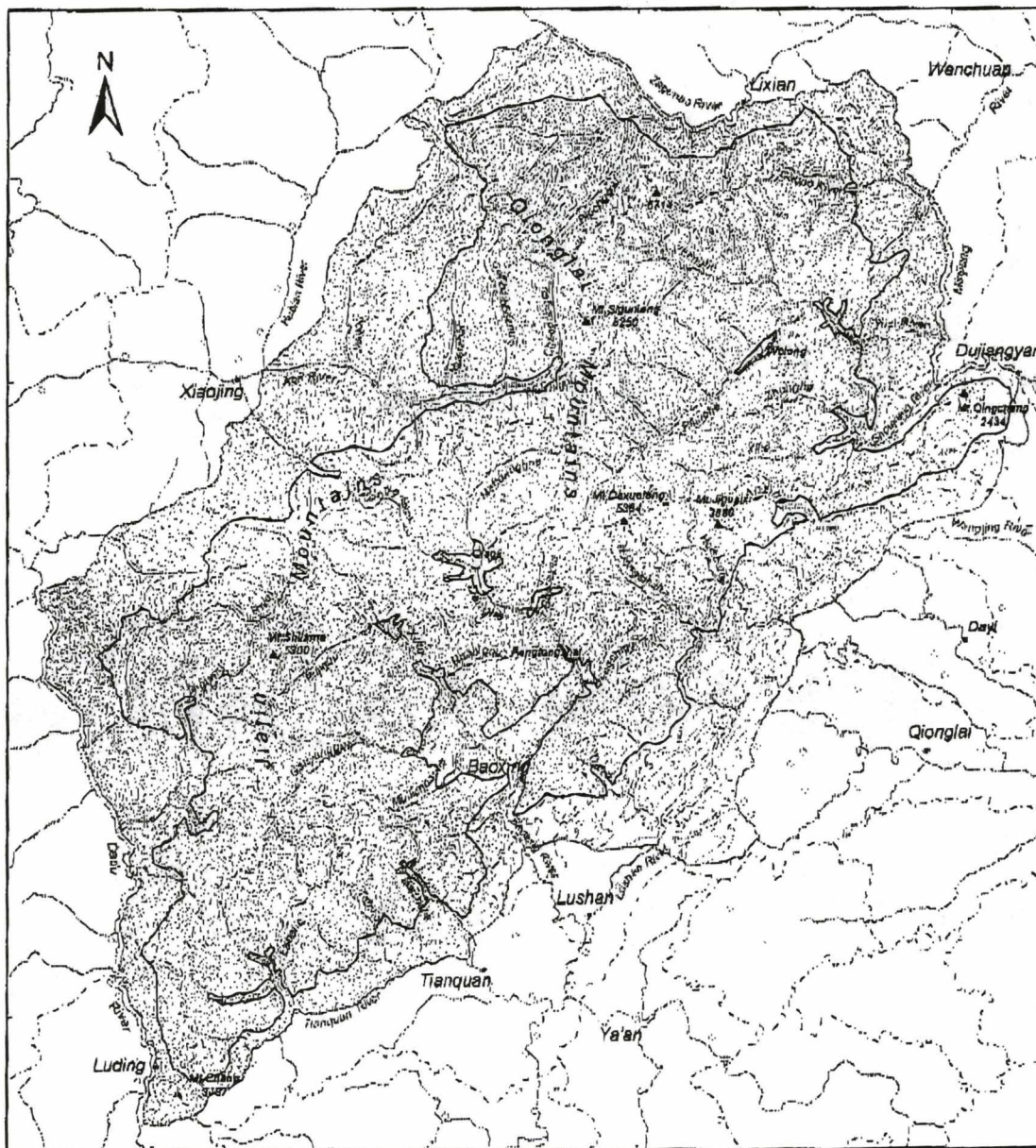
No. 2 map is the best available topographic map that we could provide. To meet IUCN's request on a topographic map of Wolong, we marked Wolong's boundary on it.

硃碛水电站环境监测布局图
Yaoji Dam and the Location of Environmental Measure



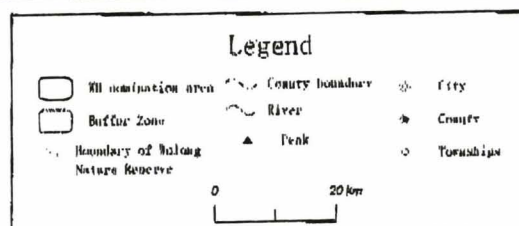
Topographic Map of the WH Nomination Site

世界遗产提名地与缓冲区地形图



Sichuan Giant Panda Sanctuary
- Wolong, Mt. Siguniang and Jialin Mountain

四川大熊猫栖息地
—— 卧龙·四姑娘山·夹金山脉



WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

SICHUAN GIANT PANDA SANCTUARY – WOLONG, MT. SIGUNIANG AND JIAJIN MOUNTAINS (CHINA) - ID N° 1213

INTRODUCTORY NOTE: This is the third time the State Party (China) has nominated a natural World Heritage property for the protection of Giant Pandas. Parts of the currently nominated property have been included within the two previous nominations, specifically the Wolong National Nature Reserve (nominated in 1986 as the Wolong Giant Panda Reserve) and the Mt Qingcheng and Dujiangyan National Park (nominated in 2000 as part of the Mt Qingcheng and Dujiangyan Irrigation System). In both cases the World Heritage Committee noted the potential of the property to meet natural criteria but deferred the proposal to enable the State Party to bring forward a larger nomination and to address management issues.

1. DOCUMENTATION

- i) **Date nomination received by IUCN:** April, 2005
- ii) **Additional information requested from and provided by the State Party:** IUCN requested supplementary information on the 28 October, 2005 following the IUCN Evaluation Mission. The State Party response was received on 5 December, 2005, including revised boundaries and responses to all the issues raised by the IUCN mission. Additional information was requested from the State Party on 31 January, 2006 following the IUCN World Heritage Panel meeting in January 2006. A response to this request was received from the State Party on 23 March, 2006.
- iii) **IUCN / WCMC Data Sheet:** five references
- iv) **Additional Literature Consulted :** IUCN/WWF. 1995 **Centres of Plant Diversity**. Vol. 2; MacKinnon, J., Xie Y., Lysenko s., Chape S., May I., and Brown C. **GIS Assessment of the Status of Protected Areas in East Asia**. IUCN/UNEP-WCMC; Myers, N., Mittermeier, R.A., Mittermeier, C.G., Gustavo, A.B., Kent, J., 2000. Biodiversity hotspots for conservation priorities. **Nature**, 403, 853-8; Thorsell, J., and Hamilton, L., 2002. **A Global Overview of Mountain Protected Areas on the World Heritage List**. Working Paper 6. IUCN; Xie, Y., Wang S., and Schei, P. (Eds), (2004) **China's Protected Areas**. China Council for International Cooperation on Environment and Development; Mackinnon, J. et al 1996. **A Biodiversity Review of China**. WWF; Ministry of Construction (2002); China State Environmental Protection Administration (1998). **China's Biodiversity: A Country Study**, China Environmental Science Press, Beijing
- v) **Consultations :** 15 external reviewers. Extensive consultations were undertaken in China during the field visit, including with representatives of relevant government agencies, local communities, researchers and other stakeholders.
- vi) **Field visit :** David Sheppard and Bill Bleisch, September/October 2005.
- vii) **Date of IUCN approval of this report:** 11 April, 2006

2. SUMMARY OF NATURAL VALUES

The nominated property, the Sichuan Giant Panda Sanctuary (SGPS), is located in the Qionglai and Jiajin Mountains between the Chengdu Plateau and the Qinghai-Tibetan Plateau. It fringes the Sichuan basin on the west and is located approximately 100 km from Chengdu City. SGPS includes seven nature reserves and nine scenic parks in four prefectures and covers an area of 924,500 ha, surrounded by a buffer zone of 527,100 ha. The high ranges of the Qionglai Mountains are predominantly Triassic siltstone, limestone and slate, while the western half of the Jiajin Mountains, their continuation to the south, are mainly Permo-carboniferous rock. On the east side of the mountains

the land is heavily ridged, forested and deeply dissected by the valleys and gorges of perennial rivers falling from the glaciated snow-covered peaks and alpine meadows. The range of landforms within the nominated property contributes to its high scenic value. More than 20 special scenic areas have been identified within the property, each possessing its own unique features. These include steep forested valleys, scenic rivers, rocky crags, wide alpine meadows and the mountain peaks of Mt Siguniang.

Fauna: The nominated property protects the main habitat of the giant panda, which is recognized as a "National Treasure" of China and is a flagship for global

conservation efforts. The giant panda is listed as an endangered species under the IUCN Red List of Threatened Species and is inscribed as a Class 1 Protected Animal by the Chinese Government. This species is a relict species from the paleo-tropic forests of the Tertiary Era and has evolved into a unique specialized herbivore of the Order Carnivora. The giant panda feeds almost exclusively on bamboo in the wild and its preferred habitat is between 2,200m to 3,200m. As a unique single species and family the giant panda is highly significant in taxonomy and is very important for studying mammal classification and evolution. Within the nominated property the main centres of giant panda population are in the Wolong Reserve in Wenchuan county in the northeast; Fengtongzhai Reserve in Baoxing county in the southeast; and in Mt. Jiajin Provincial Park in the Jiajin Mountains to the southwest. The nominated property features a number of other endemic and threatened animal species. There are 542 species of vertebrates, including 109 species of mammals in 25 families (more than 20 % of all Chinese mammals). Globally endangered mammals, apart from the giant panda, are the red panda, the snow leopard and clouded leopard. The nominated property is an important centre of endemism for some bird taxa and features 365 birds in 45 families, 300 of which breed locally.

Flora: The total flora of the nominated property is between 5,000 and 6,000 species in over 1,000 genera. 50 genera are endemic to China (20% of its total) and 67 plant species are nationally protected. The reasons for this diversity include the wide range of different habitat types afforded by the large altitudinal range, sharp climatic gradation, the variety of rock and soil types and the wide and complex connections with other major floristic regions. Within the nominated property there are 794 angiosperm genera, (77% of China's total), 24 gymnosperm, 70 pteridophyte and 102 bryophyte genera. Many species are relicts, isolated during the extreme climatic fluctuations of the Pleistocene in the moisture trap created by the high plateau to the west. The nominated property has many representatives of plants with long evolutionary histories; species such as the dove tree are often referred to as living fossils. It is probable that there are many species yet to be discovered. The nominated property is a significant global diversity centre for many plant groups such as roses, peonies, magnolias, maples, primroses, bamboos and rhododendrons. More than 100 species of rhododendron are listed for the area. Of the property's 22 orchid species, nearly 40% are endemic. Many western ornamental garden plants were discovered in these mountains. The property is a major source and gene pool for hundreds of traditional medicinal plants, many now rare and endangered.

3. COMPARISON WITH OTHER AREAS

Comparison for giant panda conservation: There is particular emphasis on the importance of the property as habitat for the giant panda. The giant panda occurs only in China in a very narrow belt within Western Sichuan, south western Gansu and southern Shaanxi. It is estimated that the nominated property includes approximately 500 giant pandas representing more than 30% of the global population (1,600 Pandas). Giant

pandas are conserved in nearly 40 other nature reserves in China, including the nature reserves in Minshan Mountains, Qinling Mountains, Liangshan Mountains and Xiangling Mountains. However, the nominated property constitutes the largest and most significant remaining contiguous area of panda habitat in China and thus the world. It is also the most important source of giant panda for establishing the captive breeding population of the species. The presence of giant pandas within the nominated property and in other nature reserves in China underlines the importance of effective landscape level planning which protects the habitat within these reserves, and the areas between them, to ensure the long term survival of the giant panda.

Worldwide comparison with similar World Heritage properties: The nominated property features significant altitudinal zonation, with an altitudinal range of 5,670m, from the subtropical, through temperate to alpine zones. A comparable altitudinal zonation exists in the Three Parallel Rivers World Heritage property in Yunnan, China (5,980m), which also rises from the subtropical to the alpine, and in Kinabalu Park in Malaysia (3,943m). Figure 1 compares flora, bird and mammal species of the nominated property with other comparable World Heritage properties worldwide, (including Kilimanjaro with a range of 4,065m and the temperate site of Yosemite).

The nominated property compares favourably with other comparable World Heritage property. The concentration of diversity on Kinabalu, a property of three-quarters the area, is similar, but its iconic mammal, the orang-utan, is more widely dispersed in Malaysia and Indonesia than the panda is in central China. The nominated property is one of the botanically richest sites of any temperate region in the world or indeed anywhere outside of the tropical rain forests. It is important for bird conservation and two Endemic Bird Areas (as defined by Birdlife International) occur within the nominated property. This significance is reinforced by its classification as one of the world's top 25 Biodiversity Hotspots selected by Conservation International (CI) (Myers et al, 2000) and as one of the Global 200 Ecoregions defined by WWF. Underlining the comparative importance is the large size of the nominated property and the fact that it protects a wide variety of topography, geology, and plant and animal species.

Comparison with other World Heritage properties in China: Four other Chinese World Heritage properties have been inscribed under natural criterion (iv): Mount Emei Scenic Area, Mount Huangshan, Mount Wuyi and the Three Parallel Rivers of Yunnan. Comparative biodiversity data are summarized in the Figure 2 below.

The nominated property has significantly higher biodiversity values and global significance than all other Chinese World Heritage properties except the Three Parallel Rivers of Yunnan property, which is much larger. In addition, the nominated property has some features in common with Jiuzhaigou (72,000 ha) and Huanglong (70,000 ha), both within the Minshan in northern Sichuan. These properties are primarily listed for their scenic beauty and geochemical phenomenon, especially their travertine terraces and pools. They are high altitude

Figure 1. Comparison of nominated property to other comparable World Heritage properties worldwide

World Heritage property	Size (ha)	Plant species	Mammal species	Bird species
Yellowstone (USA)	899,200	1,050	58	290
Yosemite N.P. (USA)	308,200	> 1,400	74	230
Olympic N.P. (USA)	369,600	500	50	180
Great Smoky Mountains N.P. (USA)	209,000	1,500	> 50	> 200
Sagarmatha N.P. (Nepal)	233,000	c. 2000	28	152
Kinabalu Park (Malaysia)	75,300	5,000-6,000	112	326
Kilimanjaro N.P. (Tanzania)	18,300	2,500	140	179
Nominated Property	924,500	> 4,000	132	> 365

Figure 2. Comparison of nominated property to other comparable World Heritage properties in China

World Heritage property	Size (ha)	Plant species	Mammal species	Bird species
Mount Emei Scenic Area	15,400	3,200	51	256
Mount Huangshan	15,400	c.800	48	170
Mount Wuyi	99,975	2,888	71	256
Three Parallel Rivers	1,680,000	6,000	173	417
Nominated Property	924,500	> 4,000	132	> 365

properties and do not have the altitudinal range, topographical complexity and biodiversity of the nominated property.

4. INTEGRITY

4.1 Legal Status

The nominated property is covered by a range of laws and regulations at national and provincial levels. These include the “Regulations of the People’s Republic of China on Nature Reserves” and “Regulations on the Management of Nature Reserves of Sichuan Province”. A specific regulation relating to protection of World Heritage in Sichuan Province has been developed, to apply to the nominated property, and this represents the first of its kind in China. These regulations provide an adequate legal framework for protection of the nominated property. The challenge is to ensure their effective implementation and to ensure there is effective coordination between all relevant agencies and stakeholders.

4.2 Boundaries

The boundaries of the nominated property have been designed to maximise the protection of panda habitat based on the latest panda survey data, carried out in 2003-2004, as well as the distribution of existing natural

habitat. The original boundary of the nominated property included towns, agricultural development and a number of infrastructure developments. The issue of boundaries was discussed in detail by the IUCN evaluation mission in October 2005, and IUCN requested the boundaries of the nominated property be revised to address a number of key issues. An amended boundary was submitted by the State Party in December 2005 to respond to these points. The key features of the new boundary are that it has been revised to:

(a) Allow a clearer and simpler zonation: The boundary of the nomination has been revised to delineate the strictly protected core zone and a surrounding buffer zone in which agriculture and some other human activities are allowed. Only the core area constitutes the nominated property.

(b) Exclude towns, villages, agriculture land, major infrastructures and sites of high impact tourism: The townships of Wolong (Shawan) and Gengde within the Wolong Nature Reserve are now excluded from the nominated property. All other townships are located outside the boundary of the nominated property. The old Tibetan town of Yaoji lies in the centre of the nominated area. The town has extensive agricultural farmland and it is proposed to build a dam and establish a 400 ha reservoir at this site. This site is therefore not suitable for inclusion within the World Heritage property and is excluded as an enclave. This is discussed further under point 4.4 below. The earlier proposed boundary has been

adjusted at several other peripheral valleys where agricultural lands need to be excluded from the World Heritage property. An exception is made for the valley of Dengchigou. Although this valley is largely agricultural and houses a number of farmers, it constitutes a very important scientific type locality collecting site. The marble mines of Guobaiyan (Baiyunshan and Hongjunzhandao) are excluded as enclaves from the nominated property. Other small scattered mines and factories within the nominated property will be closed, infrastructure removed and the areas rehabilitated. Other minor infrastructure exists within the nominated property, including roads, bridges, trails, scattered farms and water pipes and electricity pylons. Approval of this nomination would give the management agencies greater authority to control and, where necessary, eliminate their impacts and allow habitat restoration. The total of such partially disturbed areas remains less than 5% of the area of the nominated property. The long term objective should be to relocate or remove infrastructure which is not essential for on going management of the property.

(c) Coincide with existing reserve boundaries, particularly core zones: The nominated property corresponds with the boundaries of a number of existing protected areas, apart from a few areas of state forest lands that will be added for reasons of size and completeness. A process should be initiated to complete the boundary rationalization, including the addition of areas of state forest and other areas, to ensure that all areas within the nominated property have the highest level of protective status. This should be completed within a period of two years.

(d) Include the most important habitats for conservation, particularly for panda conservation: The boundaries of the nominated property have been designed to maximise the protection of giant panda habitat based on the latest panda survey data, carried out in 2003-4, as well as the distribution of existing natural habitat. Conservation International (CI) has undertaken a GIS overlay exercise to identify areas of high biodiversity priority and two very detailed surveys of giant pandas (survey 2: 1986-8 and survey 3: 1998-2002) give precise locations of the extent of giant panda occupation. The data points from both these surveys have been overlaid over the boundary maps and satellite background to show the contiguity and degree of inclusion achieved. Minor boundary revisions have marginally improved this cover and opened up future potential for eventually relinking the Qionglai panda populations with other populations in Minshan (across the Min River in Dujiangyan sector) and with populations in south east Tianquan; as well as to narrow the gap at Baoxing township where occasionally pandas may cross the Baoxing river. Accordingly, the revised boundary now constitutes the most important portion of remaining giant panda habitats out of the mountain systems still containing wild pandas. It has the largest connected area of occupied giant panda habitat in Sichuan, the largest area of suitable "potential" habitat for giant panda and is less fragmented than other mountain ranges in Sichuan.

4.3 Management

General Government agencies at different levels in China have shown great enthusiasm and commitment to safeguard the biodiversity values of the nominated property. It is important that this enthusiasm is matched with a commitment to ensure the nominated property is adequately staffed and resourced. The level of management between the different components of the nominated property varies considerably at present, with the highest level of management at the Wolong Nature Reserve and with lower levels of management in the other reserves within the nominated property.

Management Plan A management plan has been prepared for the nominated property and has the following goal: *"The biodiversity, ecosystem and habitat of the giant panda will be effectively protected in the world heritage site and social and economic development of the human population in the area will be harmonized with the natural environment guidelines for the area and for management of different types of use"*. The management plan identifies a number of management objectives and a zoning plan which flow from this goal. There is a general aim of maintaining a higher standard of protection within the core zone, and also to avoid further habitat fragmentation and loss of connectivity, particularly between centers of current giant panda distribution. The management plan is a comprehensive document and provides a sound framework for site management. However, management arrangements within the nominated property are complex, including seven nature reserves and nine scenic parks in four prefectures and a range of different prefectural, provincial and national government management agencies. Effective coordination, as well as the clarification of responsibilities of the different agencies involved, will be essential if the management plan is to be effectively implemented.

World Heritage Management Committee (WHMC) The management plan establishes a mechanism to achieve coordination, through the establishment of a World Heritage Management Committee formed under the Provincial Government. With this arrangement a management office has been established under the Department of Construction with executive responsibility for management of World Heritage properties. The WHMC will play a particularly significant role in relation to: building consensus among individual agencies; developing and coordinating new management programmes; and monitoring the effectiveness of conservation efforts. It is essential that the WHMC be given sufficient powers and has real authority and financial resources to ensure it can carry out its role effectively. Direct involvement of national government in World Heritage management and in the Committee is essential in providing authority and coordination to strengthen site management. In particular, the central Ministry of Construction Office should play a strong role. The WHMC must be involved in the review and approval of major development proposals which may impact on the natural values of the nominated property. In addition, any subsequent revision of the management plan and associated site development plans within the nominated property should be approved by the WHMC.

Staffing and training: There are currently more than 500 conservation staff working within the nominated property, including more than 40 senior professional staff. The majority of these staff work in the Wolong Nature Reserve. It is important that the level of staffing is progressively increased within all reserves within the nominated property, with the aim of ensuring the level of staffing and management is equivalent to that within the Wolong Nature Reserve within a ten year period. Training should be based on a training needs assessment, and should be coordinated through the Sichuan World Heritage Administration Office. It should include aspects such as training in basic protected areas skills, such as monitoring and the application of GIS methods, as well as the development of study tours and training workshops to other relevant natural World Heritage properties to broaden the experience of local staff.

Budget: The funding for protected area management within the nominated property from 1963 to 2000 was RMB 320,000,000 (USD 38,325,000 at 2000 rates). This funding is provided from the national government, the Sichuan Provincial government, and from relevant prefectural and county governments. In addition there has been substantial donor investment, particularly within the Wolong Nature Reserve. From 2003 to 2010 the projected budget is RMB 1,956,000,000 (about USD 233,500,000). This increased funding proposed appears to be adequate but this should be regularly reviewed. It is important that: (a) funding is allocated in line with the provisions of the management plan for the property; (b) that current levels of government funding, at all levels, are increased; and (c) that planning and implementation of the budget for the nominated property is overseen by the WHMC.

4.4 Threats

Dam Construction at Yaoji: The town of Yaoji is located in a valley in the middle of Baoxing county just south of Wolong, thus placing it within the geographic centre of the nominated property. Yaoji has been a Tibetan town for hundreds of years and agricultural development around the town is of long standing. Giant pandas have retreated to higher elevations where there are wide habitat connections on both the north-west and south-east sides of the valley. This area has limited natural values and has been excluded from the nominated property as an enclave. It is noted that the World Heritage Committee has previously approved the inscription of enclaves within natural World Heritage properties, such as is in relation to the Kakadu National Park in Australia. Plans are well advanced to build a hydroelectric dam at Yaoji and to establish a 400 ha reservoir at this site. The town of Yaoji is adjacent to the proposed dam site and the State Party provided the following advice on the dam at Yaoji in December, 2005 and in March 2006: (a) dam construction and associated flooding will displace approximately 2,000 people who will be resettled within the boundary of the enclave, within existing farmland and degraded secondary forest/scrub land; a re-settlement plan has been developed and is being implemented; (b) the dam impoundment, when it is full at a height of 2,140m, is entirely within the boundary of the enclave and does not encroach on the nominated property; (c) water from the dam will be channeled along 18 km of low bore (3-4 meters diameter) underground

pipes which will be tunneled several hundred meters deep through the mountains and will not affect the surface vegetation or panda habitat above; (d) The State Environmental Protection Authority will undertake hydrological monitoring of the river; and (e) there is no panda habitat loss involved in the construction of this dam.

It appears that dam construction will not have a major impact on the nominated property, in view of the fact that impacts are concentrated within the existing enclave. There may be potential for indirect impact on the nominated property but this cannot be ascertained at this stage. Should the property be inscribed on the World Heritage List, it is critical that: (a) the impact of the dam and the associated relocation of people from Yaoji, on the values of the property be closely monitored; (b) effective mitigation measures are applied to minimize the impacts associated with dam construction, the impoundment and the relocation of the village; where possible measures to encourage the establishment of panda habitat should be implemented; and (c) impacts and mitigation measures be assessed two years after inscription.

Ecotourism and the Wolong Tourism Development Plan:

There is considerable potential for the growth of tourism within and adjacent to the nominated property. For example, it is reported that the tourist growth to the nominated property exceeded 48% (from 430,000 to 640,000) over the last three year period. Tourism can have both positive and negative impacts and it is essential that it is carefully planned and sympathetic to the values of the property. There are a number of proposals to develop tourism within and adjacent to the nominated property. The nomination document notes that 12 scenic resources are 'to be developed' within the nominated property and there are currently major tourism proposals, within the Wolong Valley, concentrated in two towns, Wolong (Shawan) and Gengda, through the development and implementation of the Wolong Tourism Development Plan. This Plan includes proposals for major development, including expansion of accommodation, up to a limit of 7,300 beds. The appropriateness of some of the proposed developments has been questioned such as proposals to build a cable car in Panda Valley. The following principles should apply to the development of tourism within the property: (a) all major tourism development and associated infrastructure should be outside the nominated property, and should be located either within the buffer zone or adjacent areas; (b) clear limits should be established on tourism development, specifically accommodation, within and adjacent to the nominated property; (c) carrying capacity limits should be defined for sensitive natural areas within and adjacent to the property; and (d) the focus on tourism development within and adjacent to the nominated property should be to encourage appreciation and understanding of the natural values of the property, particularly the important role of the property in panda conservation; and (e) any income deriving from tourism in and adjacent to the nominated property should benefit conservation efforts within the property. In relation to the Wolong Tourism Development Plan it is considered that an independent expert review should be undertaken of the existing plan, under the direction of the World Heritage Management

Office, to assess the impacts of the proposals on values within the nominated property and to recommend modifications that may be required.

Road Construction - Yingxiu – Xiaojin road: There is currently a proposal to upgrade the county road that now crosses from Yingxiu through Wolong Nature Reserve, across Balangshan Pass and down to Xiaojin. Upgrading will involve widening parts of the road and also developing a 10 km tunnel at the Balangshan Pass. Alternative routes are currently under consideration for this tunnel. This road is currently located within the buffer zone and within part of the nominated property. The development of a tunnel at Balangshan Pass will reduce traffic flow across the pass and would thus reduce noise pollution and disturbance to alpine fauna, flora and environment. An environmental impact study has been undertaken and a number of mitigation measures proposed. It is not anticipated that there would be major adverse impact on the values of the nominated property from this upgrading. However, there may be potential for increased traffic flow within the Wolong Valley and this should be carefully monitored by the World Heritage Management Office.

5. ADDITIONAL COMMENTS

5.1 Scientific Research and Education

The nominated property is very important for research and education. Substantial research programmes have been implemented within parts of the nominated property, particularly within the Wolong Nature Reserve, for many years. A number of national panda surveys have been conducted and these have progressively improved the state of knowledge regarding panda distribution and ecology. Assistance from international NGOs, including WWF and CI has been very important in assisting research and monitoring programmes within the nominated property. The successful Wolong Panda Breeding Centre at Hetaoping was set up in 1983 and is the world's largest and most successful captive breeding centre for giant panda. It has provided a major focus for research efforts, as well as being a major source for pandas sent to many domestic and international zoos. The nominated property has thus made an important contribution to scientific research, public education and international cooperation. This should continue. It is important that field research be continued and expanded throughout all of the nominated property. A clear research programme should be developed for the property. All applications for conducting research must be submitted to the responsible management agency concerned, but must also be communicated with and coordinated by the Sichuan World Heritage Administration Office.

5.2 Landscape Level Planning

Fragmentation of habitat makes it essential that large intact areas of panda habitat are adequately protected and also that green corridors are established to enable movement of panda species and to avoid inbreeding of panda populations. Accordingly, it is very important to

ensure habitat connectivity between the nominated property and surrounding areas where pandas are located. Special attention should be placed on maintaining connectivity across vulnerable bottlenecks or corridors in the distribution of giant pandas. The location and design of corridors should be based on the best information, particularly that available from satellite images and field surveys, especially the third national panda survey and ongoing monitoring by staff within the nominated property. Where corridors have been encroached by logging or agricultural activities, an active programme of habitat restoration should be applied involving planting of relevant native species, particularly those which improve panda habitat.

5.3 Cultural Values

The nominated property appears to have important cultural values. Records of the giant panda date back 2,500 years, and a Han emperor once set up a panda breeding house. The temples of Mount Qingcheng where Taoism is believed to have been founded, and the 2,200-year old Dujiangyan irrigation system to the north of the nominated property, were inscribed on the World Heritage List for cultural values in 2000. Mount Siguniang, within the nominated property, is considered to be a sacred mountain by Tibetans. To the south in Baoxing are early Han buildings and the 19th century Franco-Qing mission station at Dengchigou, where Père David, the French missionary who first described the panda, was based. It is important that cultural values within the nominated property are identified and appropriately protected.

5.4 Local Populations

Following the revision of the boundaries, all county towns are located outside the nominated property; 41 townships seats are located within the buffer zone. Local communities have shown a strong interest in panda conservation and their involvement in supporting the management of the nominated property should be encouraged. There have been a number of direct and indirect impacts on local communities in and around the property in recent years. These include: (a) the closure of a number of development projects, including 176 mines and polluting factories; (b) the suspension of a number of small to medium hydropower projects inside the nominated property and the buffer zone; (c) and a logging ban associated with the Natural Forest Protection Programme and the "grain to green" habitat restoration programme. These are positive initiatives which should be supported but it is important that local communities are not unfairly deprived of opportunities for satisfactory livelihoods. Local people should be allowed and assisted to derive benefits from appropriate tourism associated with the property. They should also be informed and involved, where possible, in management of the property.

6. APPLICATION OF CRITERIA / STATEMENT OF SIGNIFICANCE

The Sichuan Giant Panda Sanctuary has been nominated under all four natural criteria. Previous IUCN evaluations of giant panda nominations in China have noted the potential to meet natural World Heritage criteria.

Criterion (i): Earth's history and geological features

The high ranges of the Qionglai Mountains are predominantly Triassic siltstone, limestone and slate, and the western half of the Jiain Mountains are mainly Permo-carboniferous rock. The property has evidence of glacial and tectonic activity and has features a diverse range of rocks of different ages and types. There are a number of glaciers, and a high region of U-shaped valleys, horns, cirques and arêtes. The property provides good examples not only of glaciation (past and present) but also of fluvial incision under relatively pristine sub tropical conditions. There is the prospect for future geomorphological research on the processes operating in a dynamic range of biomes, including landslides, debris flows, flood events and seismic effects. These characteristics are of interest but are not of outstanding value. The key features of the property are not uncommon in other areas of the world and they are also represented within other World Heritage properties. IUCN considers that the nominated property does not meet this criterion.

Criterion (ii): Ecological Processes

The nominated property protects a range of natural systems, reflecting the high level of altitudinal zonation. Many elements of the flora and fauna are abundant, diversified and complicated in their origins – as is to be expected in a mixing zone between the subtropical flora of East Asia and the temperate flora of the Himalayan/Qingzang Plateau. Accordingly, the property plays a key role in understanding the evolution of the flora and fauna of Central and South West China. However, the diversity of natural systems is better represented within other mountain / forest sites in China, particularly the Three Parallel Rivers of Yunnan Protected Areas, where the dramatic expression of ecological processes has resulted in a far more dramatic mix of geological, climatic and topographical effects. The range of natural systems is also better expressed in a range of World Heritage properties outside of China. IUCN considers that the nominated property does not meet this criterion.

Criterion (iii): Superlative natural phenomena or natural beauty and aesthetic importance

The property has important scenic value, reflecting the range of landforms and features within the nominated property which contribute to its high scenic value. A number of scenic areas have been identified within the property, including representation of steep forested valleys, scenic rivers, wide alpine meadows and mountain peaks. The scenery of Mt Siguniang itself is dramatic. However, IUCN concludes that the scenic values within the property are better displayed within many other World Heritage properties. Mountain scenery, for example is better represented within properties such

as Sagarmatha National Park, Nepal. IUCN considers that the nominated property does not meet this criterion.

Criterion (iv): Biodiversity and threatened species

There is a strong and compelling case for inscription of the nominated property under this criterion. The property includes more than 30% of the world's population of giant panda and constitutes the largest and most significant remaining contiguous area of panda habitat in the world. It is also the most important source of giant panda for establishing the captive breeding population of the species. The nominated property is also one of the botanically richest sites of any temperate region in the world or indeed anywhere outside of the tropical rain forests. This significance is reinforced by its classification as one of the world's top 25 Biodiversity Hotspots selected by Conservation International and the Global 200 Ecoregions defined by WWF. Underlining the outstanding value is the large size of the nominated property and the fact that it protects a wide variety of topography, geology, and plant and animal species. The nominated property has exceptional value for biodiversity conservation and can demonstrate how ecosystem management systems can work across the borders of national and provincial protected areas. IUCN considers that the nominated property meets this criterion.

7. RECOMMENDATION

IUCN recommends that the Committee **inscribe** the Sichuan Giant Panda Sanctuary: Wolong, Mt Siguniang and Jiain Mountains (China) on the World Heritage List on the basis of natural criterion (iv).

IUCN also recommends that the State Party be requested to:

- a) ensure the "Sichuan World Heritage Management Committee" has sufficient powers, resources and authority to ensure it can effectively carry out its role in relation to management of the property, including in relation to the review and approval of any major development proposals which may impact on the natural values of the nominated property;
- b) review existing infrastructure within the property with a view to better controlling impacts and, where possible, removing infrastructure and allowing habitat restoration with native species;
- c) review the possibilities for future addition of areas of high nature conservation value to the property, with priority to those areas which are particularly important for panda habitat and which are close to, but outside, the property. Options for developing conservation corridors linking the property with other suitable areas of panda habitat should also be reviewed;
- d) progressively increase the level of staffing and resources within all reserves within the property, with the aim of ensuring that the level of staffing and management in all areas of the property is equivalent

to that within the Wolong Nature Reserve within a ten year period;

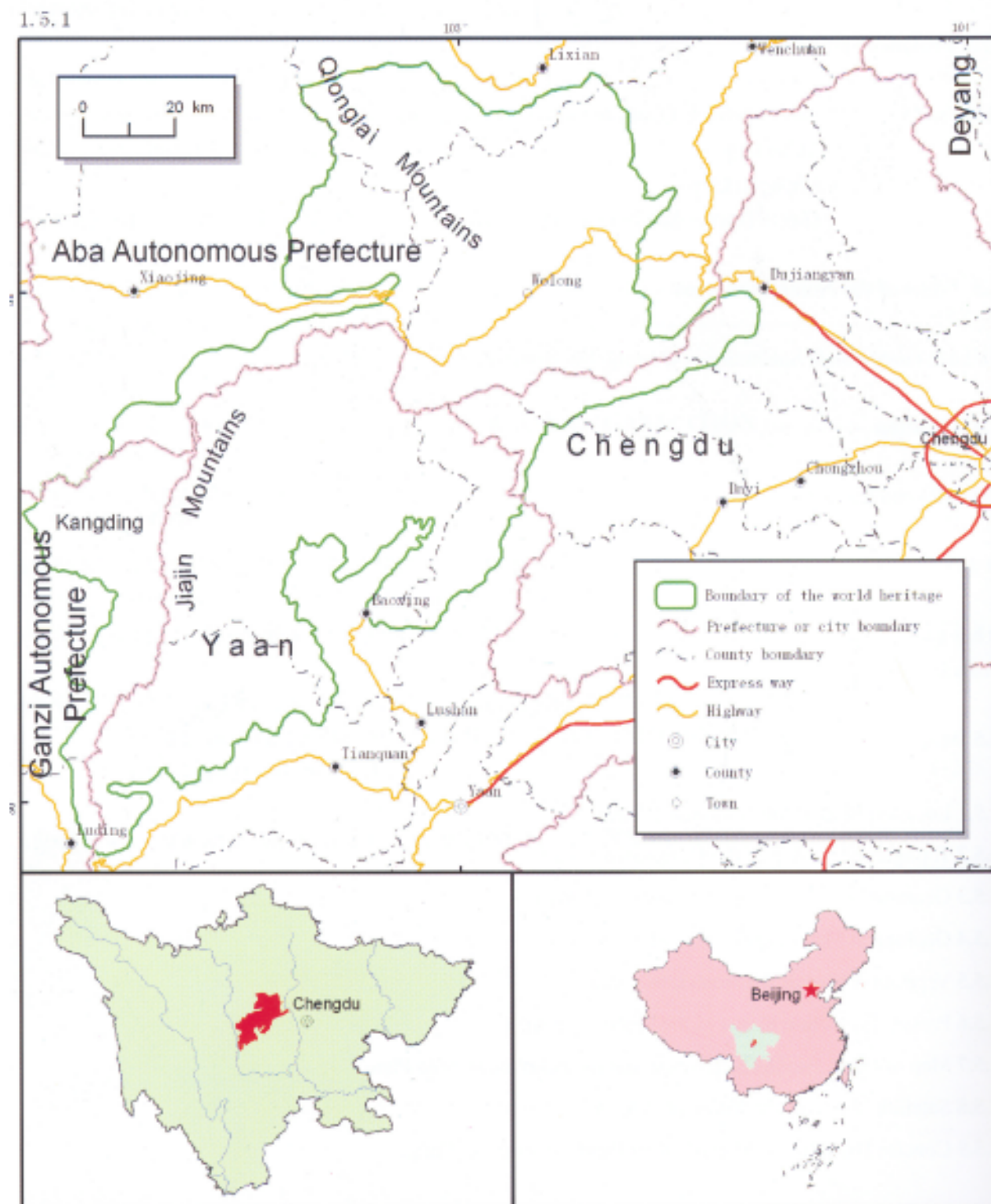
- e) in relation to the existing and proposed dams, ensure that: (a) the impact of the dam at Yaoji, and the associated relocation of people, on the values of the property be closely monitored; (b) effective mitigation measures are applied at Yaoji to minimize the impacts associated with dam construction, the impoundment and the relocation of the village; with priority to implementing measures to encourage the establishment of panda habitat; and (c) no additional dams are built within the property;
- f) in relation to the Wolong Tourism Development Plan, undertake an independent expert review of the existing plan, under the direction of the World Heritage Management Office, to assess the impacts of the proposals on values within the nominated property and to recommend modifications that may be required. The World Heritage Office should also play a role in establishing tourism development guidelines, review of proposals and development of recommendations for mitigation of impacts for any major tourism development which may affect the values of the property;
- g) address other management issues included in this evaluation report, including in relation to local populations, scientific research and education; and
- h) consider changing the name of the nominated property to "The Sichuan Giant Panda Sanctuaries" from the currently proposed name of: "The Sichuan Giant Panda Sanctuary: Wolong, Mt Siguniang and Jiajin Mountains"

IUCN recommends that Committee encourage the State Party to invite a mission to the property in 3 years to assess the implementation of the above recommendations and other recommendations outlined in the IUCN Evaluation Report.

Finally, IUCN commends the State Party for the process of consultation and scientific research involved in the preparation of the nomination dossier for this property, and for effectively addressing IUCN recommendations to enhance the conservation and management of the property.

Map 1: Location of nominated property

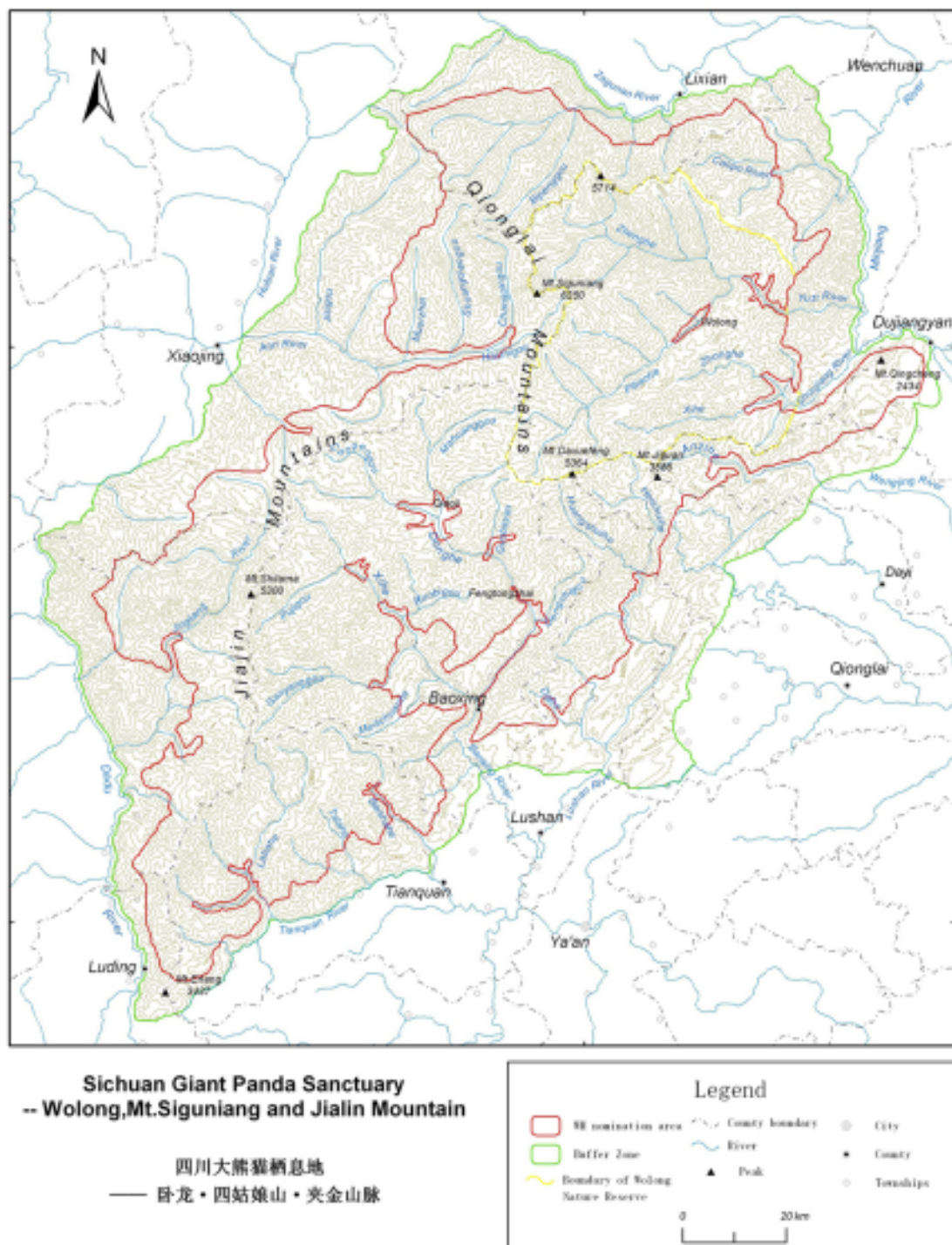
Location Map of the Nominated Area



Map 2: Boundaries of nominated property

Topographic Map of the WH Nomination Site

世界遗产提名地与缓冲区地形图



CANDIDATURE AU PATRIMOINE MONDIAL - ÉVALUATION TECHNIQUE DE L'UICN

SANCTUAIRE DU GRAND PANDA DU SICHUAN – WOLONG, MONT SIGUNIANG ET MONTAGNES DE JIAJIN (CHINE) ID N° 1213

NOTE D'INTRODUCTION : pour la troisième fois, l'État partie Chine propose un bien naturel du patrimoine mondial en vue de protéger le grand panda. Des secteurs du bien proposé actuellement avaient été inclus dans les deux propositions précédentes, en particulier la Réserve naturelle nationale de Wolong (proposée en 1986 sous le nom de Réserve du grand panda de Wolong) et le Parc national du mont Qingcheng et Dujiangyan (proposés en 2000 sous le nom de Mont Qingcheng et système d'irrigation de Dujiangyan). Dans les deux cas, le Comité du patrimoine mondial a noté la capacité de remplir les critères naturels mais a différé la proposition pour permettre à l'État partie de présenter une proposition plus ambitieuse et de régler le problème de la gestion.

1. DOCUMENTATION

- i) **Date de réception de la proposition par l'UICN** : avril 2005
- ii) **Informations complémentaires demandées puis fournies par l'État partie** : l'UICN a sollicité des informations complémentaires le 28 octobre 2005, suite à sa mission d'évaluation sur place. La réponse de l'État partie est arrivée le 5 décembre 2005 et contenait une révision des limites ainsi que des réponses à toutes les questions soulevées par la mission de l'UICN. Des informations supplémentaires ont été demandées à l'État partie le 31 janvier 2006, suite à la réunion des experts du patrimoine mondial de l'UICN, en janvier 2006. L'État partie a répondu à cette demande le 23 mars 2006.
- iii) **Fiches techniques UICN/WCMC** : cinq références.
- iv) **Littérature consultée** : IUCN/WWF. 1995 **Centres of Plant Diversity**. Vol. 2; MacKinnon, J., Xie Y., Lysenko S., Chape S., May I., and Brown C. **GIS Assessment of the Status of Protected Areas in East Asia**. IUCN/UNEP-WCMC; Myers, N., Mittermeier, R.A., Mittermeier, C.G., Gustavo, A.B., Kent, J., 2000. Biodiversity hotspots for conservation priorities. **Nature**, 403, 853-8; Thorsell, J., and Hamilton, L., 2002. **A Global Overview of Mountain Protected Areas on the World Heritage List**. Working Paper 6. IUCN; Xie, Y., Wang S., and Schei, P. (Eds), (2004) **China's Protected Areas**. China Council for International Cooperation on Environment and Development; Mackinnon, J. et al 1996. **A Biodiversity Review of China**. WWF; Ministry of Construction (2002); China State Environmental Protection Administration (1998). **China's Biodiversity: A Country Study**, China Environmental Science Press, Beijing
- v) **Consultations** : 15 évaluateurs indépendants. De larges consultations ont eu lieu en chine, durant la mission, notamment avec des représentants des organismes publics compétents, des communautés locales, des chercheurs et autres acteurs.
- vi) **Visite du bien proposé** : David Sheppard et Bill Bleisch, septembre/octobre 2005.
- vii) **Date à laquelle l'UICN a approuvé le rapport** : 11 avril 2006.

2. RÉSUMÉ DES CARACTÉRISTIQUES NATURELLES

Le bien proposé, le Sanctuaire du grand panda du Sichuan (SGPS), est situé dans les montagnes Qionglai et Jiajin, entre le plateau de Chengdu et le plateau Qinghai-tibétain. Il longe le bassin du Sichuan à l'ouest et se trouve à environ 100 km de la ville de Chengdu. Le SGPS comprend sept réserves naturelles et neuf parcs paysagers dans quatre préfectures ; il couvre une superficie de 924 500 ha et il est doté d'une zone tampon de 527 100 ha. Les hautes chaînes des Qionglai sont surtout constituées de siltites, de calcaires et d'ardoises du Trias, tandis que le secteur occidental des montagnes de Jiajin, qui est leur prolongement vers le

sud, est essentiellement constitué de roches permocarbonifères. À l'est des montagnes, les terres sont fortement crénelées, couvertes de forêts et profondément découpées par des vallées et des gorges de rivières pérennes descendant de pics glacés, couverts de neige et de prairies alpines. La gamme topographique du bien proposé contribue à sa grande qualité paysagère. Plus de 20 zones paysagères spéciales ont été identifiées dans le bien, chacune possédant ses propres caractéristiques. Elles comprennent des vallées boisées escarpées, des rivières pittoresques, des pitons rocheux, de vastes prairies alpines et les sommets du mont Siguniang.

aune : le bien proposé protège le principal habitat du grand panda, animal considéré comme un « Trésor national » en Chine et qui est l'emblème des efforts de conservation au niveau mondial. Le grand panda est considéré En danger dans la Liste rouge des espèces menacées de l'UICN et inscrit comme animal protégé de Catégorie 1 par le Gouvernement chinois. Le grand panda est une espèce relique des forêts paléotropiques de l'ère tertiaire qui a évolué pour devenir un herbivore spécialisé unique dans l'ordre des carnivores. Dans la nature, il se nourrit presque exclusivement de bambous et occupe, de préférence, un habitat situé entre 2200 et 3200 m. Espèce unique d'une famille unique, le grand panda est extrêmement important pour la taxonomie et pour l'étude de la classification et de l'évolution des mammifères. Dans le bien proposé, les principaux centres de population du grand panda sont la Réserve de Wolong dans le comté de Wenchuan au nord-est ; la Réserve de Fengtongzhai dans le comté de Baoxing dans le sud-est ; et le Parc provincial du mont Jiayin dans les montagnes Jiayin au sud-ouest. Le bien proposé comprend aussi plusieurs autres espèces animales endémiques et menacées. Il y a 542 espèces de vertébrés, y compris 109 espèces de mammifères réparties en 25 familles (plus de 20 % de tous les mammifères chinois). Les mammifères en danger au niveau mondial, outre le grand panda, sont le petit panda, la panthère des neiges et la panthère nébuleuse. Le bien proposé est un centre d'endémisme important pour certains taxons de l'avifaune et accueille 365 espèces d'oiseaux réparties en 45 familles dont 300 se reproduisent au niveau local.

La flore : la flore totale du bien proposé compte entre 5000 et 6000 espèces appartenant à plus de 1000 genres. Cinquante genres sont endémiques de Chine (20 % du total de la Chine) et 67 espèces de plantes sont protégées au plan national. Cette diversité s'explique, notamment, par la large gamme des types d'habitats favorisée par l'important gradient altitudinal, le gradient climatique prononcé, la variété des types rocheux et pédologiques et les liens étendus et complexes avec d'autres régions floristiques. Dans le bien proposé, il y a 794 genres d'angiospermes (77 % du total de la Chine), 24 gymnospermes, 70 genres de ptéridophytes et 102 genres de bryophytes. Beaucoup d'espèces sont des reliques, ayant été isolées durant les fluctuations climatiques extrêmes du Pléistocène dans le piège humide créé par le haut plateau à l'ouest. Le bien proposé comprend de nombreux représentants de plantes qui ont une longue histoire évolutive ; certaines espèces, telles que la davidée involuquée, sont souvent considérées comme des fossiles vivants. Il est probable que de nombreuses espèces sont encore à découvrir. Le bien proposé est un centre de diversité mondiale important pour de nombreux groupes de plantes telles que les roses, les pivoines, les magnolias, les érables, les primevères, les bambous et les rhododendrons. Plus de 100 espèces de rhododendrons sont décrites dans la région. Sur les 22 espèces d'orchidées du bien, près de 40 % sont endémiques. Beaucoup de plantes de jardin ornementales des pays occidentaux ont été découvertes dans ces montagnes. Le bien est une source principale et un bassin génétique pour des centaines de plantes médicinales traditionnelles dont beaucoup sont rares et en danger.

3. COMPARAISON AVEC D'AUTRES SITES

Comparaison pour la conservation du grand panda : l'accent est mis tout particulièrement sur l'importance du bien comme habitat du grand panda. Le grand panda n'existe qu'en Chine, sur une étroite ceinture au sein du Sichuan occidental, du sud-ouest du Gansu et du Shaanxi méridional. On estime que le bien proposé comprend environ 500 grands pandas représentant plus de 30 % de la population mondiale (1600 pandas). On conserve le grand panda dans près de 40 autres réserves naturelles de Chine, y compris les Réserves naturelles des montagnes Minshan, des montagnes Qinling, des montagnes Liangshan et des montagnes Xiangling. Toutefois, le bien proposé constitue la plus grande et la plus importante zone contiguë d'habitat du panda en Chine et en conséquence, dans le monde. C'est aussi la plus importante source de grands pandas pour l'établissement de populations de l'espèce en captivité. La présence de grands pandas dans le bien proposé et dans d'autres réserves naturelles de Chine souligne l'importance d'une planification efficace au niveau du paysage pour protéger l'habitat à l'intérieur de ces réserves et les régions qui les unissent et pour garantir la survie à long terme du grand panda.

Comparaison mondiale avec des biens du patrimoine mondial semblables : le bien proposé présente une zonation altitudinale importante, avec un gradient de 5670 m, qui va de zones subtropicales à des zones alpines, en passant par des zones tempérées. Il existe une zonation altitudinale comparable dans le Bien du patrimoine mondial des Aires protégées des trois fleuves parallèles au Yunnan, en Chine (5980 m), qui passe aussi de la zone subtropicale à la zone alpine, et dans le Parc de Kinabalu en Malaisie (3943 m). La figure 1 compare les espèces de plantes, d'oiseaux et de mammifères du bien proposé avec celles d'autres biens du patrimoine mondial comparables dans le monde (y compris le Kilimandjaro qui a une gamme altitudinale de 4065 m et le site tempéré de Yosemite).

Le bien proposé se compare favorablement avec d'autres biens du patrimoine mondial comparables. La concentration de la diversité à Kinabalu, un bien dont la superficie atteint les trois quarts de celle du bien proposé, est semblable mais le mammifère emblématique, l'orang-outan, est plus largement dispersé en Malaisie et en Indonésie que le panda ne l'est au centre de la Chine. Le bien proposé est un des sites les plus riches sur le plan botanique de tous les sites de régions tempérées du monde et même de tous les sites en dehors des forêts tropicales ombrophiles. Il est important pour la conservation des oiseaux et deux zones d'oiseaux endémiques (définies par BirdLife International) se trouvent dans le bien proposé. Cette importance est renforcée par sa classification comme l'un des 25 points chauds mondiaux de la biodiversité sélectionnés par Conservation International (Myers *et al.*, 2000) et comme l'une des 200 écorégions du monde définies par le WWF. Les grandes dimensions du bien proposé renforcent l'importance comparative de même que le fait qu'il protège une grande diversité d'espèces de plantes et d'animaux et de caractéristiques topographiques et géologiques.

Figure 1. Comparaison du bien proposé à d'autres biens du patrimoine mondial comparables dans le monde entier

Bien du patrimoine mondial	Dimensions (ha)	Espèces de la flore	Espèces de mammifères	Espèces d'oiseaux
Yellowstone (E.-U.)	899 200	1050	58	290
P.N. de Yosemite (E.-U.)	308 200	> 1400	74	230
P.N Olympic (E.-U.)	369 600	500	50	180
P.N Great Smoky Mountains (E.-U.)	209 000	1500	> 50	> 200
P.N Sagarmatha (Népal)	233 000	env. 2000	28	152
Parc de Kinabalu (Malaisie)	75 300	5000-6000	112	326
P.N du Kilimandjaro (Tanzanie)	18 300	2500	140	179
Bien proposé	924 500	> 4000	132	> 365

Figure 2. Comparaison du bien proposé à d'autres biens du patrimoine mondial comparables en Chine

Bien du patrimoine mondial	Dimensions (ha)	Espèces de la flore	Espèces de mammifères	Espèces d'oiseaux
Paysage panoramique du mont Emei	15 400	3200	51	256
Mont Huangshan	15 400	env.800	48	170
Mont Wuyi	99 975	2888	71	256
Trois fleuves parallèles	1 680 000	6000	173	417
Bien proposé	924 500	> 4000	132	> 365

Comparaison avec d'autres biens du patrimoine mondial en Chine : quatre autres biens du patrimoine mondial chinois ont été inscrits sur la base du critère naturel (iv) : le Paysage panoramique du mont Emei, le mont Huangshan, le mont Wuyi et les Aires protégées des trois fleuves parallèles au Yunnan. Les données comparatives sur la biodiversité sont résumées dans la figure 2 ci-dessus.

La valeur du bien proposé pour la biodiversité et son importance générale sont considérablement plus élevées que celles des autres biens du patrimoine mondial chinois à l'exception des Aires protégées des trois fleuves parallèles au Yunnan qui est un bien beaucoup plus grand. En outre, le bien proposé présente certaines caractéristiques en commun avec Jiuzhaigou (72 000 ha) et Huanglong (70 000 ha), tous deux situés dans le Minshan, dans le Sichuan septentrional. Ces biens sont principalement inscrits pour leur beauté panoramique et les phénomènes géochimiques, en particulier leurs terrasses et bassins de travertin. Ce sont des biens de haute altitude qui ne présentent pas la gamme altitudinale, la complexité topographique et la biodiversité du bien proposé.

4. INTÉGRITÉ

4.1 Statut juridique

Toute une série de lois et règlements aux niveaux national et provincial s'appliquent au bien proposé. Il s'agit des « Règlements de la République populaire de Chine sur les réserves naturelles » et des « Règlements sur la gestion des réserves naturelles de la province du Sichuan ». Un règlement particulier concernant la protection du patrimoine mondial dans la province du Sichuan a été mis au point pour application au bien proposé : une première en Chine ! Ces règlements fournissent un cadre juridique adéquat pour la protection du bien proposé. La difficulté consiste à garantir leur application réelle et à veiller à ce qu'il y ait une coordination réelle entre les organismes et les acteurs pertinents.

4.2 Limites

Les limites du bien proposé ont été conçues de manière à maximiser la protection de l'habitat du panda d'après les dernières données de recensement du panda obtenues en 2003-2004, ainsi que d'après la distribution de l'habitat naturel actuel. Les limites

originales du bien proposé comprenaient des villes, des zones agricoles et plusieurs infrastructures. La question des limites a été discutée en détail par la mission d'évaluation de l'UICN en octobre 2005 et l'UICN a demandé que les limites du bien proposé soient révisées afin de tenir compte de plusieurs de ces problèmes. Les limites modifiées ont été soumises par l'État partie en décembre 2005 en réponse à ces exigences. Ce qui caractérise principalement les nouvelles limites c'est qu'elles :

a) Permettent une zonation plus claire et plus simple : les limites du bien proposé ont été révisées de manière à définir une zone centrale intégralement protégée et une zone tampon environnante dans laquelle des activités agricoles et autres sont autorisées. Seule la zone centrale constitue le bien proposé.

b) Excluent des villes, des villages, des terres agricoles, de grands travaux d'infrastructure et des sites où l'impact du tourisme est élevé : les villes de Wolong (Shawan) et Gengde dans la Réserve naturelle de Wolong sont désormais exclues du bien proposé. Toutes les autres villes sont situées en dehors des limites du bien proposé. L'ancienne ville tibétaine de Yaoji se trouve au centre de la zone proposée. La ville a beaucoup de terres agricoles et, sur ce site, la construction d'un barrage et d'un réservoir de 400 ha est en projet. Le site, dont l'intégration dans le bien du patrimoine mondial n'est pas appropriée, en est exclu sous forme d'enclave. Cette question est discutée plus à fond dans le paragraphe 4.4 qui suit. Les limites proposées précédemment ont été ajustées dans d'autres vallées périphériques où les terres agricoles doivent être exclues du bien du patrimoine mondial. L'exception est la vallée de Dengchigou. Bien qu'elle soit essentiellement agricole et que l'on y trouve plusieurs agriculteurs, elle constitue une localité type très importante du point de vue scientifique. Les carrières de marbre de Guobaiyan (Baiyunshan et Hongjunzhando) sont exclues, sous forme d'enclaves, du bien proposé. D'autres petites mines et usines dispersées dans le bien proposé seront fermées, l'infrastructure démolie et les zones réhabilitées. Il existe d'autres infrastructures mineures à l'intérieur du bien proposé, notamment des routes, des ponts, des chemins, des fermes dispersées et des conduites d'eau et des pylônes électriques. Si cette proposition est adoptée, les organismes responsables de la gestion disposeraient d'une autorité plus grande pour contrôler et, au besoin, éliminer les impacts et permettre la restauration de l'habitat. Le total des zones partiellement perturbées reste inférieur à 5 % de la superficie du bien proposé. L'objectif à long terme devrait être de déplacer ou d'éliminer l'infrastructure qui n'est pas essentielle à la gestion du bien.

c) Coïncident avec les limites de la réserve existante, en particulier des zones centrales : les limites du bien proposé correspondent à celles de plusieurs aires protégées en place, à l'exception de quelques forêts du domaine public qui seront ajoutées pour des raisons de dimensions et d'intégrité. Un processus devrait être lancé afin de mener à bien la rationalisation des limites, notamment pour y ajouter des zones de forêts publiques et autres, afin de garantir que toutes les zones se trouvant dans le bien proposé jouissent du statut de

protection le plus élevé. Cela devrait être terminé en l'espace de deux ans.

d) Incluent les habitats les plus importants pour la conservation, en particulier pour la conservation du panda : les limites du bien proposé ont été conçues de manière à maximiser la protection de l'habitat du grand panda d'après les dernières données de recensement sur le panda, obtenues en 2003-2004, ainsi que d'après la distribution de l'habitat naturel existant. Conservation International a entrepris un exercice de superposition SIG afin d'identifier les zones prioritaires du point de vue de la biodiversité élevée et deux études très détaillées des grands pandas (étude 2 : 1986-1988 et étude 3 : 1998-2002) donnent les emplacements précis de l'étendue de l'occupation du terrain par le grand panda. Les données des deux études ont été reportées sur les cartes des limites et sur une image satellite afin de montrer la contiguïté et le degré d'intégration obtenu. Des révisions mineures des limites ont amélioré de manière marginale cette couverture et ont ouvert la possibilité de relier un jour les populations de pandas de Qionglai avec d'autres populations du Minshan (par-delà le fleuve Min dans le secteur de Dujiangyan) et avec des populations du sud-est du Tianquan ; ainsi que de combler le fossé dans l'agglomération de Baoxing où il se peut que les pandas traversent occasionnellement le fleuve Baoxing. En conséquence, les limites révisées comprennent désormais la portion la plus importante des habitats restants pour le grand panda, sans compter les systèmes orographiques qui abritent encore des pandas sauvages. Le site comprend la plus grande zone reliée d'habitats occupés par le grand panda au Sichuan, la plus grande zone d'habitats « potentiels » convenant au grand panda et il est moins fragmenté que les autres chaînes de montagnes du Sichuan.

4.3 Gestion

Générale : à différents niveaux, les organismes publics chinois ont fait preuve de beaucoup d'enthousiasme et d'engagement en faveur de la sauvegarde des valeurs de diversité biologique du bien proposé. Il est essentiel que cet enthousiasme s'accompagne d'un engagement à faire en sorte que le bien proposé dispose d'un personnel et de ressources suffisants. Le niveau de gestion, entre les différents éléments du bien proposé, varie considérablement : il est nettement plus élevé dans la Réserve naturelle de Wolong que dans les autres réserves du bien proposé.

Plan de gestion : un plan de gestion a été préparé pour le bien proposé avec l'objectif suivant : « la biodiversité, l'écosystème et l'habitat du grand panda seront efficacement protégés dans le bien du patrimoine mondial, tandis que le niveau de développement socio-économique des populations de la région sera harmonisé aux directives sur l'environnement naturel de la région et pour la gestion de différents types d'utilisations ». Le plan de gestion définit un certain nombre d'objectifs et un plan de zonation qui en découle. Le but général est de maintenir une protection de niveau élevé dans la zone centrale et d'éviter toute nouvelle fragmentation de l'habitat et perte de connectivité, en particulier entre les centres actuels de distribution du grand panda. Le plan de gestion est un document

complet qui offre un cadre solide pour la gestion du site. Toutefois, les dispositions de gestion dans le bien proposé sont complexes, notamment parce qu'il y a sept réserves naturelles et neuf parcs paysagers dispersés entre quatre préfectures, ainsi que toute une série d'organismes de gestion aux niveaux préfectoral, provincial et national. Il sera essentiel d'assurer une coordination efficace et d'éclaircir les responsabilités des différentes agences concernées si l'on veut que le plan de gestion soit efficacement appliqué.

Comité de gestion du patrimoine mondial (CGPM) : le plan de gestion établit un mécanisme chargé de la coordination et, pour cela, établit un Comité de gestion du patrimoine mondial placé sous la direction du gouvernement provincial. Dans ce cadre, un bureau de gestion a été créé sous l'égide du Département de la construction qui est responsable de l'exécution de la gestion des biens du patrimoine mondial. Le CGPM jouera un rôle particulièrement important vis-à-vis de : l'établissement d'un consensus entre chacune des agences ; l'élaboration et la coordination de nouveaux programmes de gestion ; le suivi de l'efficacité des efforts de conservation. Il est essentiel que le CGPM dispose de pouvoirs suffisants et d'une autorité réelle ainsi que de ressources financières pour pouvoir remplir efficacement son rôle. La participation directe du gouvernement national à la gestion du patrimoine mondial et au Comité est fondamentale pour garantir autorité et coordination propres à renforcer la gestion du site. Le Bureau du ministère de la Construction devrait, en particulier, avoir un rôle fort. Le CGPM doit participer à l'évaluation et à l'approbation des grands projets de développement qui pourraient avoir des incidences sur les valeurs naturelles du bien proposé. En outre, toute révision ultérieure du plan de gestion et tout plan de développement associé, dans le bien proposé, devraient être approuvés par le CGPM.

Personnel et formation : il y a actuellement plus de 500 employés qui travaillent à la conservation dans le bien proposé, en particulier plus de 40 cadres supérieurs. La majorité de ces personnes sont actives dans la Réserve naturelle de Wolong. Il importe que les effectifs des employés soient progressivement accrus dans toutes les réserves du bien proposé pour faire en sorte que le niveau de personnel et de gestion soit équivalent, d'ici 10 ans, à celui de la Réserve naturelle de Wolong. La formation doit s'appuyer sur une évaluation des besoins de formation et devrait être coordonnée par le Bureau d'administration du patrimoine mondial du Sichuan. Elle devrait comprendre des aspects tels que la formation à des aptitudes de base en matière de conservation des aires protégées, par exemple le suivi et l'application des méthodes SIG, ainsi que l'organisation de voyages d'études et d'ateliers de formation vers d'autres biens du patrimoine mondial naturel afin d'élargir l'expérience du personnel local.

Budget : le financement de la gestion des aires protégées dans le bien proposé, entre 1963 et 2000, s'élevait à RMB 320 000 000 (USD 38 325 000 au taux de change de 2000). Le financement est fourni par le gouvernement national, le gouvernement de la province du Sichuan et par des gouvernements de préfectures et de comtés concernés. En outre, on constate un investissement important des donateurs, en particulier

dans la Réserve naturelle de Wolong. De 2003 à 2010, le budget projeté est de RMB 1 956 000 000 (environ USD 233 500 000). Ce financement accru semble être suffisant mais il convient de le réviser régulièrement. Il importe que : a) le financement soit attribué en fonction des dispositions du plan de gestion du bien ; b) que les taux actuels de financement par le gouvernement, à tous les niveaux, soient augmentés ; et c) que la planification et l'application du budget pour le bien proposé soient supervisées par le CGPM.

4.4 Menaces

Construction d'un barrage à Yaoji : la ville de Yaoji est située dans une vallée au milieu du comté de Baoxing, juste au sud de Wolong, ce qui la place dans le centre géographique du bien proposé. Yaoji était une ville tibétaine. Elle existe depuis des centaines d'années et le développement agricole, dans ses alentours, est très ancien. Les grands pandas se sont retirés en plus haute altitude, là où les connections entre les différents habitats sont nombreuses, sur les pentes nord-ouest et sud-est de la vallée. Cette zone présente peu de valeurs naturelles et a été exclue du bien proposé par la création d'une enclave. Il est à noter que le Comité du patrimoine mondial a déjà approuvé l'inscription d'enclaves dans des biens naturels du patrimoine mondial, comme dans le cas du Parc national du Kakadu, en Australie. Les plans de construction d'un barrage hydroélectrique à Yaoji et d'établissement d'un réservoir de 400 ha sur les lieux sont bien avancés. La ville de Yaoji touche au site proposé pour le barrage et l'État partie a fourni l'avis suivant sur le barrage de Yaoji en décembre 2005 et en mars 2006 : a) la construction du barrage et la mise en eau associée déplaceront environ 2000 personnes qui seront réinstallées dans les limites de l'enclave, sur les terres agricoles et les terres de forêts/broussailles secondaires dégradées ; un plan de réinstallation a été mis au point et est appliqué ; b) la retenue, lorsque le barrage sera plein (hauteur 2140 m), est située entièrement dans les limites de l'enclave et n'empiète pas sur le bien proposé ; c) l'eau du barrage sera canalisée par 18 km de canalisations souterraines de faible ouverture (3 à 4 mètres de diamètre) à plusieurs centaines de mètres de profondeur à travers les montagnes et n'affectera pas la végétation de surface ni l'habitat du panda ; d) l'Autorité d'État de protection de l'environnement entreprendra un suivi hydrologique de la rivière ; et e) aucune perte d'habitat du panda ne sera imputable à la construction de ce barrage.

Si l'on considère que les impacts seront concentrés à l'intérieur de l'enclave existante, il semble que la construction du barrage n'aura pas d'incidence grave sur le bien proposé. Il pourrait y avoir des impacts indirects possibles sur le bien proposé, mais on ne peut l'affirmer pour l'instant. Si le bien est inscrit sur la Liste du patrimoine mondial, il est fondamental : a) d'exercer un suivi rigoureux sur l'impact du barrage et de la réinstallation associée des gens de Yaoji sur les valeurs du bien ; b) d'appliquer des mesures efficaces pour atténuer le plus possible les impacts associés à la construction du barrage, à la retenue et à la réinstallation du village ; et de mettre en œuvre, dans la mesure du possible, des mesures favorables à l'établissement de l'habitat du panda ; et c) d'évaluer

les impacts et les mesures d'atténuation deux ans après l'inscription.

L'écotourisme et le Plan de développement du tourisme de Wolong : il existe un potentiel extraordinaire d'expansion du tourisme à l'intérieur et aux alentours du bien proposé. La croissance du tourisme à destination du bien proposé aurait, par exemple, dépassé 48 % (de 430 000 à 640 000 visiteurs) depuis trois ans. Le tourisme peut avoir des effets positifs et négatifs et il est essentiel de le planifier soigneusement de manière qu'il soit harmonisé avec les valeurs du bien. Il existe différentes propositions de développement du tourisme à l'intérieur et aux alentours du bien proposé. Le dossier de proposition note que 12 ressources paysagères devront être « mises en valeur » dans le bien proposé et il y a actuellement plusieurs grands projets touristiques pour la vallée de Wolong, concentrés dans deux villes - Wolong (Shawan) et Gengda, dans le cadre de l'élaboration et de l'application du plan de développement du tourisme de Wolong. Ce plan comprend des propositions de développement important, notamment l'expansion de l'hébergement jusqu'à 7300 lits. Le bien-fondé de certains des projets a été remis en cause : par exemple, la proposition de construire un téléphérique dans la Vallée du panda. Les principes suivants doivent être appliqués au développement du tourisme dans le bien : a) les principaux projets de développement touristique et l'infrastructure associée doivent être concentrés à l'extérieur du bien proposé, soit dans la zone tampon, soit dans les zones environnantes ; des limites claires doivent être fixées pour le développement du tourisme et, en particulier, l'hébergement à l'intérieur et à proximité du bien proposé ; c) il convient de définir les limites de la capacité de charge pour les zones naturelles fragiles à l'intérieur et à proximité du bien ; d) le développement du tourisme à l'intérieur et à proximité du bien proposé doit se concentrer sur l'appréciation et la connaissance des valeurs naturelles du bien, en particulier sur le rôle important du bien pour la conservation du panda ; et e) tout revenu provenant du tourisme dans le bien proposé et dans les environs doit profiter aux efforts de conservation déployés dans le bien. En ce qui concerne le Plan de développement du tourisme de Wolong, une évaluation du plan existant devrait être réalisée par des experts indépendants, sous la direction du Bureau de gestion du patrimoine mondial, afin de déterminer les impacts des propositions sur les valeurs du bien proposé et de recommander toute modification nécessaire.

Construction d'une route de Yingxiu à Xiaojin : il est proposé d'améliorer une route cantonale qui relie actuellement Yingxiu à Xiaojin en traversant la Réserve naturelle de Wolong par le col de Balangshan. L'amélioration consistera à élargir des tronçons de la route et à créer un tunnel de 10 km au col de Balangshan. D'autres options sont actuellement à l'étude pour ce tunnel. La route passe actuellement dans la zone tampon et dans une partie du bien proposé. La construction d'un tunnel au col de Balangshan réduirait la circulation à travers le col et ainsi la pollution acoustique et la perturbation de la faune, de la flore et du milieu alpins. Une étude d'impact sur l'environnement a été entreprise et plusieurs mesures d'atténuation sont proposées. On ne pense pas qu'il y

aurait des incidences graves sur les valeurs du bien proposé mais il se pourrait que la circulation augmente à travers la vallée de Wolong, et le Bureau de gestion du patrimoine devrait soigneusement étudier la question.

5. AUTRES COMMENTAIRES

5.1 Recherche scientifique et éducation

Le bien proposé est très important pour la recherche et l'éducation. Depuis de nombreuses années, de grands programmes de recherche sont en cours dans certains secteurs du bien proposé, en particulier dans la Réserve naturelle de Wolong. Plusieurs études nationales du panda ont été réalisées et ont permis d'améliorer progressivement l'état des connaissances relatives à la répartition et à l'écologie du panda. L'aide d'ONG internationales telles que le WWF et Conservation International a été capitale pour les programmes de recherche et de suivi à l'intérieur du bien proposé. Le Centre d'élevage du panda de Wolong, dont les efforts ont été couronnés de succès, a été créé en 1983. C'est le centre d'élevage en captivité le plus grand du monde pour le grand panda et celui qui a obtenu les meilleurs résultats. Il a permis de concentrer les efforts de recherche et il représente une source principale pour les pandas envoyés dans de nombreux parcs zoologiques nationaux et internationaux. Le bien proposé a donc apporté et devrait continuer d'apporter une contribution majeure à la recherche scientifique, à l'éducation du public et à la coopération internationale. Il importe que la recherche sur le terrain se poursuive et prenne de l'expansion à l'échelle du bien proposé. Il faut aussi qu'un programme de recherche clair soit mis au point pour le bien. Toutes les demandes de recherche doivent être soumises à l'organisme de gestion responsable, mais aussi communiquées et coordonnées par le Bureau d'administration du patrimoine mondial du Sichuan.

5.2 Planification à l'échelle du paysage

L'habitat étant fragmenté, il est essentiel que de vastes zones de l'habitat du panda soient dûment protégées mais aussi que des corridors verts soient établis pour permettre le déplacement des pandas et éviter ainsi la consanguinité dans les populations. En conséquence, il est très important de garantir la connectivité de l'habitat entre le bien proposé et les zones voisines où l'on a observé des pandas. Une attention particulière doit être accordée au maintien de la connectivité entre des goulots d'étranglement ou corridors vulnérables dans la répartition des grands pandas. L'emplacement et la conception des corridors doivent s'appuyer sur les meilleures informations disponibles, en particulier celles qui proviennent d'images satellite et d'études de terrain, notamment le troisième recensement national du panda et le suivi que réalise actuellement le personnel dans le bien proposé. Lorsque les corridors font l'objet d'empiètement pour l'exploitation du bois ou les activités agricoles, il serait bon d'appliquer un programme actif de restauration de l'habitat avec plantation d'essences indigènes pertinentes, en particulier celles qui améliorent l'habitat du panda.

5.3 Valeurs culturelles

Le bien proposé semble présenter d'importantes valeurs culturelles. Les descriptions du grand panda datent de 2500 ans et un empereur Han avait même établi une maison de reproduction du panda. Les temples du mont Qingcheng où l'on pense que le taoïsme a vu le jour et le système d'irrigation de Dujiangyan, vieux de 2200 ans, au nord du bien proposé, ont été inscrits sur la Liste du patrimoine mondiale pour leurs valeurs culturelles en 2000. Le mont Siguniang qui se trouve dans le bien proposé est considéré, par les Tibétains, comme une montagne sacrée. Au sud, à Baoxing, on trouve des constructions du début de la période Han et la station de la mission franco-Qing du 19^e siècle où a vécu le Père David, le missionnaire français qui a décrit pour la première fois le panda. Il importe que les valeurs culturelles du bien proposé soient identifiées et dûment protégées.

5.4 Populations locales

Depuis la révision des limites, toutes les villes de comté sont situées en dehors du bien proposé ; 41 sièges d'agglomération sont situés dans la zone tampon. Les communautés locales ont montré un intérêt marqué pour la conservation du panda et leur participation en appui à la gestion du bien proposé doit être encouragée. On note un certain nombre d'impacts directs et indirects sur les communautés locales à l'intérieur et aux environs du bien depuis quelques années. Cela comprend : a) la fermeture de plusieurs projets de développement, y compris 176 mines et usines polluantes ; b) la suspension d'un certain nombre de projets hydroélectriques de petite et de moyenne dimensions à l'intérieur du bien proposé et dans la zone tampon ; c) une interdiction d'exploitation du bois associée au Programme de protection de la forêt naturelle et le programme de restauration de l'habitat « de l'agriculture à la nature ». Ce sont des initiatives positives qui doivent être soutenues, mais il importe que les communautés locales ne soient pas privées injustement de possibilités d'obtenir des moyens d'existence satisfaisants. La population locale doit être autorisée et aidée à retirer des avantages d'un tourisme approprié associé avec le bien. Elle doit aussi être informée et participer, dans la mesure du possible, à la gestion du bien.

6. APPLICATION DES CRITÈRES / IMPORTANCE

Le Sanctuaire du grand panda du Sichuan est proposé au titre des quatre critères naturels. Lors d'évaluations précédentes de propositions concernant le grand panda en Chine, la possibilité de remplir les critères naturels du patrimoine mondial avait été notée.

Critère (i) : histoire de la terre et processus géologiques

Les hautes chaînes des montagnes Qionglai sont essentiellement formées de siltites, de calcaires et d'ardoises du Trias, tandis que la partie occidentale des montagnes de Jiajin est essentiellement formée de roches permocarbonifères. Le bien présente des

traces d'activité glaciaire et tectonique et diverses gammes de roches, d'âges et de types différents. Il y a plusieurs glaciers et une haute région de vallées en U, d'aiguilles, de cirques et d'arêtes. Le bien présente de bons exemples non seulement de glaciation (passée et présente), mais aussi d'incision fluviale dans des conditions subtropicales relativement vierges. Il présente la possibilité de recherches géomorphologiques futures sur les processus à l'œuvre dans une gamme dynamique de biomes, y compris des glissements de terrain, des flux de débris, des phénomènes d'inondation et des effets sismiques. Ces caractéristiques sont intéressantes mais ne sont pas de valeur exceptionnelle. Les caractéristiques principales du bien ne sont pas rares dans d'autres régions du monde et sont également représentées dans d'autres biens du patrimoine mondial. L'UICN considère que le bien proposé ne remplit pas ce critère.

Critère (ii) : processus écologiques

Le bien proposé protège une gamme de systèmes naturels reflétant la forte zonation altitudinale. De nombreux éléments de la flore et de la faune sont abondants, diversifiés et compliqués dans leurs origines – comme on peut s'y attendre dans une zone où se mêlent la flore subtropicale de l'Asie de l'Est et la flore tempérée du plateau himalayen/Qingzang. En conséquence, le bien joue un rôle clé dans la connaissance de l'évolution de la flore et de la faune de la Chine centrale et du Sud-Ouest. Toutefois, la diversité des systèmes naturels est mieux représentée dans d'autres sites de montagne/forêt de Chine, en particulier les Aires protégées des trois fleuves parallèles au Yunnan où l'expression spectaculaire des processus écologiques résulte en un mélange beaucoup plus spectaculaire d'effets géologiques, climatiques et topographiques. La gamme des systèmes naturels est également mieux exprimée dans divers biens du patrimoine mondial en dehors de la Chine. L'UICN considère que le bien proposé ne remplit pas ce critère.

Critère (iii) : phénomène naturel ou beauté et importance esthétique exceptionnelles

Le bien a une valeur esthétique importante car toute la gamme des formes et caractéristiques topographiques que l'on y trouve contribue à sa grande valeur paysagère. Plusieurs zones paysagères ont été identifiées dans le bien, y compris des représentations de vallées boisées à pic, des rivières pittoresques, de vastes prairies alpines et des pics montagneux. Le paysage du mont Siguniang lui-même est spectaculaire. Toutefois, l'UICN conclut que les valeurs esthétiques du bien sont mieux représentées dans beaucoup d'autres biens du patrimoine mondial. Le paysage de montagne, par exemple, est mieux représenté dans des biens tels que le Parc national de Sagarmatha, au Népal. L'UICN considère que le bien proposé ne remplit pas ce critère.

Critère (iv) : biodiversité et espèces menacées

L'inscription du bien proposé sur la base de ce critère se justifie de manière forte et convaincante. Le bien comprend plus de 30 % de la population mondiale du grand panda et constitue la zone contiguë d'habitat du

panda la plus grande et la plus importante au monde. C'est aussi la source la plus importante de grands pandas pour l'établissement de populations de l'espèce en captivité. Le bien proposé est aussi, du point de vue botanique, l'un des sites les plus riches de toutes les régions tempérées du monde et même de toutes les régions en dehors des forêts tropicales ombrophiles. Cette importance est renforcée par son classement parmi les 25 principaux points chauds de la biodiversité sélectionnés par Conservation International et l'une des 200 écorégions mondiales définies par le WWF. La valeur exceptionnelle est renforcée encore par les vastes dimensions du bien proposé et le fait qu'il protège une grande variété de formes topographiques et géologiques ainsi que d'espèces animales et végétales. Le bien proposé a une valeur exceptionnelle pour la conservation de la biodiversité et peut démontrer comment la gestion des écosystèmes peut fonctionner par-delà les limites des aires protégées nationales et provinciales. L'UICN considère que le bien proposé remplit ce critère.

7. RECOMMANDATION

L'UICN recommande au Comité d'**inscrire** le Sanctuaire du grand panda du Sichuan – Wolong, mont Siguniang et montagnes de Jiajin (Chine) sur la Liste du patrimoine mondial sur la base du critère (iv).

L'UICN recommande aussi que l'État partie soit prié :

- a) de veiller à ce que le « Comité de gestion du patrimoine mondial du Sichuan » jouisse de pouvoirs, de ressources et d'autorité suffisants pour pouvoir gérer efficacement le bien, notamment en ce qui concerne l'évaluation et l'approbation de tout grand projet de développement qui pourrait avoir des incidences sur les valeurs naturelles du bien proposé ;
- b) de réviser l'infrastructure existante dans le bien, dans le but de mieux contrôler les impacts et, dans la mesure du possible, d'éliminer les infrastructures et de permettre la restauration de l'habitat avec des espèces indigènes ;
- c) d'examiner les possibilités d'ajouter, à l'avenir, des régions d'importante valeur pour la conservation de la nature en donnant la priorité aux régions qui sont particulièrement importantes pour l'habitat du panda et qui sont proches, mais en dehors, du bien. Il serait bon d'examiner également des options d'établissement de corridors de conservation reliant le bien avec d'autres zones qui conviennent à l'habitat du panda ;
- d) d'augmenter progressivement les effectifs du personnel et les ressources dans toutes les réserves du bien dans le but de garantir que le niveau des effectifs et de la gestion de toutes les zones du bien soit équivalent, d'ici 10 ans, à celui de la Réserve naturelle de Wolong ;
- e) en ce qui concerne les barrages existants et proposés, de veiller à : a) exercer un suivi rigoureux de l'impact du barrage de Yaoji et de la réinstallation associée des populations sur les valeurs du bien ; b) appliquer des mesures efficaces à Yaoji afin d'atténuer les impacts associés à la construction du barrage, à la retenue et à la réinstallation du village ; mettre en œuvre, de manière prioritaire, des mesures pour encourager l'établissement d'habitats du panda ; et c) n'autoriser la construction d'aucun autre barrage dans le bien ;
- f) en ce qui concerne le Plan de développement du tourisme de Wolong, de confier à des experts indépendants la réalisation d'une évaluation du plan existant, sous la direction du Bureau de gestion du patrimoine mondial, afin de déterminer les impacts des projets sur les valeurs du bien proposé et de recommander les modifications nécessaires. Le Bureau du patrimoine mondial devrait aussi établir des directives sur le développement du tourisme, évaluer les propositions et préparer des recommandations pour atténuer les impacts de tout grand projet de développement du tourisme qui pourrait affecter les valeurs du bien ;
- g) de résoudre tout autre problème de gestion mentionné dans le présent rapport d'évaluation, y compris en ce qui concerne les populations locales, la recherche scientifique et l'éducation ; et
- h) d'envisager de changer le nom du bien proposé pour adopter celui de « Sanctuaires du grand panda du Sichuan » à la place du nom proposé de : « Sanctuaire du grand panda du Sichuan : Wolong, mont Siguniang et montagnes de Jiajin ».

L'UICN recommande au Comité d'encourager l'État partie à inviter une mission dans le bien, dans trois ans, afin d'évaluer l'application des recommandations ci-dessus et d'autres recommandations proposées dans le rapport d'évaluation de l'UICN.

Enfin, l'UICN félicite l'État partie pour le processus de consultation et de recherche scientifique qui a présidé à la préparation du dossier de proposition de ce bien et pour avoir traité efficacement les recommandations de l'UICN en vue d'améliorer la conservation et la gestion du bien.

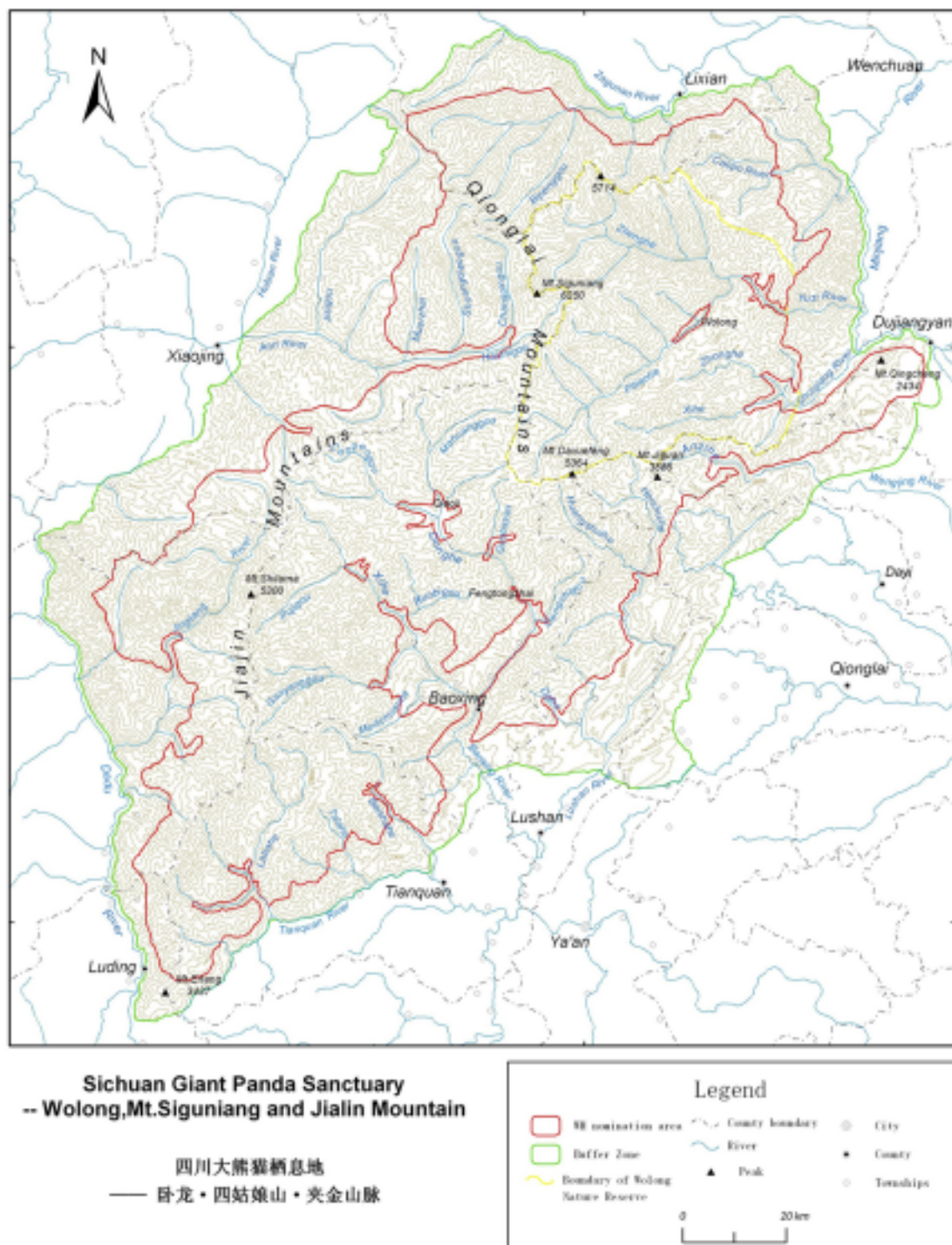
Carte 1: Localisation du bien proposé



Carte 2: Limites du bien proposé

Topographic Map of the WH Nomination Site

世界遗产提名地与缓冲区地形图





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WORLD HERITAGE CENTRE / CENTRE DU PATRIMOINE MONDIAL

H. E. Mr ZHANG Xuezhong
Ambassador
Permanent Delegate of the People's
Republic of China to UNESCO
UNESCO House

Ref : WHC/APA/06/143/CB/GB

23 August 2006

**Subject: Nomination of properties for inscription on the World Heritage List
Sichuan Giant Panda Sanctuaries (N 1213), China**

Dear Ambassador,

I have the pleasure to inform you that the World Heritage Committee, at its 30th session (Vilnius, Lithuania, 8 - 16 July 2006), examined the nomination of *Sichuan Giant Panda Sanctuaries* and decided to **inscribe** the property on the World Heritage List. Please find enclosed the decision **30 COM 8B.22** of the Committee concerning the inscription.

I am confident that your Government will continue to take the necessary measures for the proper conservation of this new World Heritage property. The World Heritage Committee and its Secretariat, the World Heritage Centre, will do everything possible to collaborate with you in these efforts.

The *Operational Guidelines for the Implementation of the World Heritage Convention* (paragraph 168), request the Secretariat to send to each State Party with a newly inscribed property a map of the area(s) inscribed. Please examine the attached map, as well as the notification of the characteristics of the property, and inform us of any discrepancies in the information by **15 October 2006**.

The inscription of the property on the World Heritage List is an excellent opportunity to draw the attention of visitors to, and remind local residents of, the *World Heritage Convention* and the outstanding universal value of the property. To this effect, you may wish to place a plaque displaying the World heritage and the UNESCO emblems at the property. You will find suggestions on this subject in paragraphs 127-128 of the *Operational Guidelines for the Implementation of the World Heritage Convention*.

../..

In many cases States Parties decide to hold a ceremony to commemorate the inscription of a property on the World Heritage List. Upon request to the World Heritage Centre by the State Party, World Heritage Certificate can be prepared for such an occasion.


I would be grateful if you could provide us with the name, address, telephone and fax numbers and e-mail address of the person or institution responsible for the management of the property so that we may send them World Heritage publications.

Please find attached the brief descriptions of the property, prepared by IUCN and the World Heritage Centre, in both English and French. As these brief descriptions will be used in later publications, as well as on the World Heritage web site, we would like to have your full concurrence with their wording. Please examine these descriptions and inform us, by **15 October 2006** at the latest, if there are changes that should be made. If we do not hear from you by this date, we will assume that you are in agreement with the text as prepared.

Furthermore, as you may know, the World Heritage Centre maintains a web site at <http://whc.unesco.org/>, where standard information about each property on the World Heritage List can be found. Since we can only provide a limited amount of information about each property, we try to link our pages to those maintained by your World Heritage property or office, so as to provide the public with the most reliable and up-to-date information. If there is a web site for the newly inscribed property, please send us its web address.

A copy of the *Decisions of the World Heritage Committee* will be sent to you shortly.

Please accept, dear Ambassador, the assurances of my highest consideration.


Francesco Bandarin
Director

cc: The People's Republic of China National Commission for UNESCO
Fax: (86 -10) 6601 79 12

IUCN
UNESCO Office in Beijing

**Extract of the Decisions adopted by the 30th session of the World Heritage Committee
(July 2006)**

Decision 30 COM 8B.22

The World Heritage Committee,

1. Having examined Documents *WHC-06/30.COM/8B* and *WHC-06/30.COM/INF.8B.2*,
2. Inscribes the Sichuan Giant Panda Sanctuary – Wolong, Mt. Siguniang, and Jiayin Mountains, China, on the basis of natural criterion (iv):

Criterion (iv): The Sichuan Giant Panda Sanctuary includes more than 30% of the world's population of giant Panda and constitutes the largest and most significant remaining contiguous area of panda habitat in the world. It is the most important source of giant panda for establishing the captive breeding population of the species. The property is also one of the botanically richest sites of any temperate region in the world or indeed anywhere outside of the tropical rain forests. Underlining the outstanding value is the large size of the nominated property and the fact that it protects a wide variety of topography, geology, and plant and animal species. The nominated property has exceptional value for biodiversity conservation and can demonstrate how ecosystem management systems can work across the borders of national and provincial protected areas.

3. Requests the State Party to:
 - a) Ensure the “Sichuan World Heritage Management Committee” has sufficient powers, resources and authority to ensure it can effectively carry out its role in relation to management of the property, including in relation to the review and approval of any major development proposals which may impact on the natural values of the nominated property;
 - b) Review existing infrastructure within the property with a view to better controlling impacts and, where possible, removing infrastructure and allowing habitat restoration with native species;
 - c) Review the possibilities for future addition of areas of high nature conservation value to the property; with priority on those areas which are particularly important for panda habitat and which are close to but outside the property. Options for developing conservation corridors linking the property with other suitable areas of panda habitat should also be reviewed;
 - d) Progressively increase the level of staffing and resources within all reserves within the property, with the aim of ensuring that the level of staffing and management in all areas of the property is equivalent to that within the Wolong Nature Reserve within a ten year period;
 - e) In relation to the existing and proposed dams, ensure that:

- (i) the impact of the dam at Yaoji, and the associated relocation of people, on the values of the property be closely monitored;
 - (ii) effective mitigation measures are applied at Yaoji to minimize the impacts associated with dam construction, the impoundment and the relocation of the village; with priority to implementing measures to encourage the establishment of panda habitat;
 - (iii) no additional dams are built within the property;
- f) In relation to the Wolong Tourism Development Plan, undertake an independent expert review of the existing plan, under the direction of the World Heritage Management Office, to assess the impacts of the proposals on values within the nominated property and to recommend modifications that may be required. The World Heritage Office should also play a role in establishing tourism development guidelines, review of proposals and development of recommendations for mitigation of impacts for any major tourism development which may affect the values of the property;
- g) Address other management issues noted in this evaluation report, including in relation to local populations, scientific research and education;
- h) Consider changing the name of the nominated property to “The Sichuan Giant Panda Sanctuaries” from the currently proposed name of: “The Sichuan Giant Panda Sanctuary: Wolong, Mt Siguniang and Jiajin Mountains”;

Encourages the State Party to invite a mission to the property in 3 years to assess the implementation of the above recommendations and other recommendations outlined in the IUCN Evaluation Report;

Commends the State Party for the process of consultation and scientific research involved in the preparation of the nomination dossier for this property, and for effectively addressing IUCN recommendations to enhance the conservation and management of the property.

Surface and coordinates of the property inscribed on the World Heritage List by the 30th session of the World Heritage Committee (Vilnius, Lithuania, 2006) in accordance with the Operational Guidelines (2005).¹

China				
Serial ID No.	Name	Area	Buffer zone	Centre point coordinates
N 1213	Sichuan Giant Panda Sanctuaries	924 500 ha	527 100 ha	N30 50 00 E103 00 00

The following map (see next page) submitted by the authorities represents the site as inscribed by the 30th session of the World Heritage Committee.

¹ Information abstracted from document WHC-06/30.COM/8B presented to the 30th session of the World Heritage Committee (Vilnius, Lithuania, 2006).

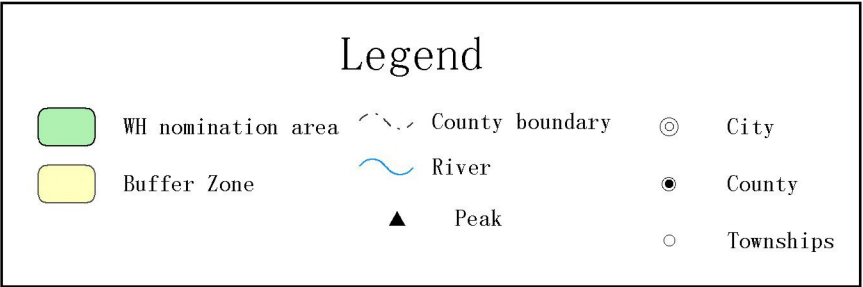
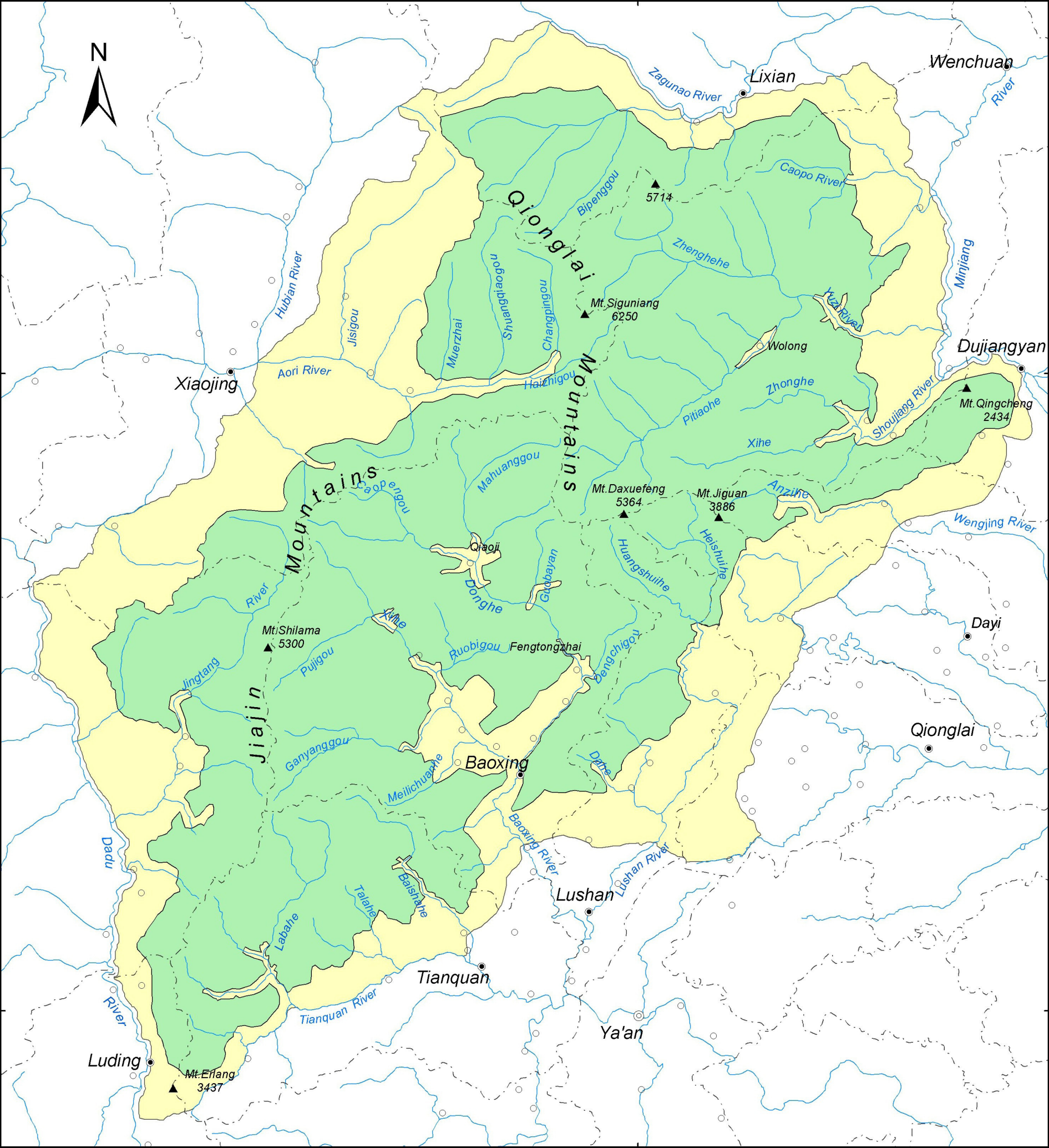
Brief Description

Sichuan Giant Panda Sanctuaries, home to more than 30% of the world's highly endangered pandas, covers 924,500 ha with seven nature reserves and nine scenic parks in the Qionglai and Jiajin Mountains. The sanctuaries constitute the largest remaining contiguous habitat of the giant panda, a relict from the paleo-tropic forests of the Tertiary Era. It is also the species' most important site for captive breeding. The sanctuaries are home to other globally endangered animals such as the red panda, the snow leopard and clouded leopard. They are among the botanically richest sites of any region in the world, outside the tropical rain forests, with between 5,000 and 6,000 species of flora in over 1,000 genera.

Brief Description in French

Les Sanctuaires du grand panda du Sichuan qui abritent plus de 30 % de la population mondiale de pandas géants. Situés dans les montagnes Qionglai et Jiajin, les sanctuaires s'étendent sur 924 500 ha et comprennent sept réserves naturelles et neuf parcs paysagers. Ils constituent aujourd'hui la plus grande zone contiguë d'habitat de ce panda - une relique des forêts paléotropiques de l'ère tertiaire – qui est une espèce particulièrement menacée. C'est aussi la plus importante source de grands pandas pour l'établissement de populations de l'espèce en captivité. De plus, les sanctuaires abritent un certain nombre d'espèces en danger à l'échelle mondiale comme le petit panda, la panthère des neiges et la panthère nébuleuse. Sur le plan botanique, il s'agit de l'un des sites les plus riches du monde, en dehors des forêts tropicales ombrophiles, avec sa flore qui compte entre 5 000 et 6 000 espèces appartenant à plus de 1 000 genres.

Map 8 Revised Boundary and Buffer of WH Nomination Site with Townships and Counties



WHL/APA
received by fax 16/10/2006
GB via FJ
cc: A.B.

中华人民共和国联合国教科文组织全国委员会

NATIONAL COMMISSION OF THE PEOPLE'S REPUBLIC OF CHINA FOR UNESCO
COMMISSION NATIONALE DE LA REPUBLIQUE POPULAIRE DE CHINE POUR L'UNESCO

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13 Oct 2006

Subject: Modification on the text of property of Sichuan Giant Panda Sanctuaries (N 1213), China


Dear Mr. Bandarin,

Referring to your letter of 23 August 2006 concerning about the brief description of the property of Sichuan Giant Panda Sanctuaries, prepared by the World Heritage Centre, having consulted with relevant authorities, I would like to inform you that we have some modification on the description of the property of Sichuan Giant Panda Sanctuaries. We suggest that two more animals, the Gold monkey and Takin, be added to the list of globally endangered animals of the sanctuaries. So we suggest that the sentence "The sanctuaries are home to other globally endangered animals such as the red panda, the snow leopard and clouded leopard" be replaced by "The sanctuaries are home to other globally endangered animals such as the red panda, the Gold monkey, Takin, the snow leopard and clouded leopard".

We have no modification for other part of the description for the property of Sichuan Giant Panda Sanctuaries.

Please accept, Sir, the assurances of my highest consideration.

Yours sincerely,



Tian Xiaogang
Secretary-General