

World Heritage Sites

Protected
Areas and
World
Heritage



CHINA DANXIA CHINA

Danxia describes a predominantly orange or purple-red sandstone rock formation eroded by past uplift and weathering into the spectacular and massive forms of mesas, peak clusters, pyramidal peaks, columns, sheer cliffs and ravines. Each of the six sites represents, on a range from least to most eroded, a danxia formation characteristic of southeastern China. Their rocks reveal the evolution of the geology and life forms of the Cretaceous period and display the rich biodiversity of their beautiful present-day subtropical forest landscapes.

COUNTRY

China

NAME

China Danxia

NATURAL WORLD HERITAGE SERIAL SITE

2012: Inscribed on the World Heritage List under natural criteria (vii) and (viii).

STATEMENT OF OUTSTANDING UNIVERSAL VALUE

The UNESCO World Heritage Committee adopted the following Statement of Outstanding Universal Value at the time of inscription:

Brief Synthesis

China Danxia is a serial property comprising six component parts (Chishui, Taining, Langshan, Danxiashan, Longhushan, and Jianglangshan) found in the sub-tropical zone of south-eastern China within approximately 1700 km crescent shaped arc from Guizhou Province in the west to Zhejiang Province in the east.

China Danxia is the name given in China to landscapes developed on continental red terrigenous sedimentary beds influenced by endogenous forces (including uplift) and exogenous forces (including weathering and erosion). It is characterised by spectacular red cliffs and a range of erosional landforms, including dramatic natural pillars, towers, ravines, valleys and waterfalls. The process of its development is characterised by a particular rock sequence, tectonic background, climatic conditions, erosional processes and landforms and these processes have been presented as an interim model.

Due to the combined endogenic (tectonic uplift) and exogenic (climatic, erosion, weathering) forces, and other factors, the Danxia landforms have been developed in red sedimentary sequences continuously from the Neogene until the present. The six component parts represent the most important examples of "least eroded" to "most eroded" Danxia landforms, providing a range of different aspects of the phenomenon, and illustrate both the range of landforms in relation to the forces and processes that formed them, together with a range of associated landscapes.

Criterion (vii): China Danxia is an impressive and unique landscape of great natural beauty. The reddish conglomerate and sandstone that form this landscape of exceptional natural beauty have been shaped into spectacular peaks, pillars, cliffs and imposing gorges. Together with the contrasting forests, winding rivers and majestic waterfalls, China Danxia presents a significant natural phenomenon.

Criterion (viii): China Danxia contains a wide variety of well developed red-beds landforms such as peaks, towers, mesas, cuerdas, cliffs, valleys, caves and arches. Being shaped by both endogenous forces (including uplift) and exogenous forces (including weathering and erosion), China Danxia provides a range of different aspects of the phenomenon of physical landscape developed from continental (terrestrial) reddish conglomerate

and sandstone in a warm, humid monsoon climate, illustrating both the range of landforms in relation to the forces and processes that formed them. The component parts represent the best examples of “least eroded” to “most eroded” Danxia landforms, displaying a clear landform sequence from “young” through “mature” to “old age”, and with each component site displaying characteristic geomorphologic features of a given stage.

Integrity

China Danxia satisfies the requirements of integrity. The property encompasses substantial elements of sufficient size to reflect the natural beauty and earth science values of Danxia landform from young stage through mature stage and to old stage. The boundaries of the China Danxia are adequate in relation to the nominated earth science and aesthetic values, and the buffer zone boundaries are also clearly defined. The level of management commitment appears adequate to the main challenges and threats that could face the property.

Protection and Management Requirements

The property is state owned and its protected status varies between the six component parts: most have national park status, though land status also includes national nature reserve, national forest, and geopark. Each one of the six component parts is protected under relative laws and regulations at national, provincial and local levels, which ensure the adequate long-term legislative, regulatory, institutional and traditional protection of the outstanding universal values.

Efficient management systems at different levels have been built with enough qualified staff in China Danxia areas. Planning for the serial property is advanced. An integrated management plan has been prepared for the property as a whole, as well as individual plans for the six areas in the series. These plans identify a clear rationale for management and mechanisms for the protection of the property. Research and adaptive management techniques, including baseline condition assessment and monitoring of change for both natural values and species have been established. Local communities are aware of the World Heritage nomination and all stakeholders are also very supportive of the World Heritage proposal, which ensures the long-term management.

IUCN MANAGEMENT CATEGORY

Unassigned

BIOGEOGRAPHICAL PROVINCE

Chinese Subtropical Forest (2.1.2) / South Chinese Rainforest (4.6.1)

GEOGRAPHICAL LOCATION

This series of six sites is located along an arc 1,700 km wide across six provinces of southern China. From east to west these are, in the east: Jianglangshan in west Zhejiang, Taining in northwest Fujian and Longhushan in northeast Jiangxi; to the south, Danxiashan in north Guangdong in southeast China; and to the west, in south-central China, Langshan in south Hunan and Chishui in north Guizhou. They span between 24°51'48" to 28°33'03"N and 105°47'39" to 118°35'02"E.

DATES AND HISTORY OF ESTABLISHMENT

1988: Danxiashan and Longhushan National Parks established; Danxiashan is the type location;

1992, 1993: Chishui National Nature Reserve and National Forest Park established;

1994: Taining and Chishui National Parks established;

2000: Taining National Forest Park established;

2001, 2002: Taining, Langshan, Longhushan and Danxiashan National Geoparks designated.

2002: Langshan and Jianglangshan National Parks established;

2004, 2005, 2008: Danxiashan, Taining and Longhushan Global Geoparks designated;

LAND TENURE

The property is owned by the state and is managed, under the national Ministry of Housing & Urban-Rural Development, by the Construction Department of each province working with the local World Heritage Management Committee.

AREA

The total area of the serial property is 82,151 ha. The buffer zones cover 136,206 ha:

Component part	Province	Area (ha) Property / Buffer	Coordinates of centre point
1: Chishui National Park (part) + Geopark + Chishui Alsophila National Nature Reserve 2: Chishui National Forest Park (part)	Guizhou	27,364 / 44,814	28°22'11"N x 105°47'39"E 28°25'19"N x 106°02'33"E
1: Taining Nat'l Park (north)+ Geopark (part) 2: Taining National Park (south) + Geopark (part) & Nat' l Forest Park (part)	Fujian	11,087 / 12,401	26°51'56"N x 117°02'22"E 27°00'37"N x 113°13'07"E
Langshan National Park (most) + Geopark & state land	Hunan	6,600 / 6,200	26°20'24"N x 110°46'45"E
Danxiashan National Park / Geopark	Guangdong	16,800 / 12,400	25°57'55"N x 113°42'12"E
Longhushan National Park / Geopark: Longhushan section + Guifeng section	Jiangxi	19,690 / 59,820	28°04'15"N x 116°59'05"E 28°19'03"N x 117°25'10"E
Jianglangshan Scenic Spot in Jianglangshan National Park	Zhejiang	610 / 571	28°31'44"N x 118°33'43"E
TOTAL		82,151 / 136,206	

ALTITUDE

The highest point of the six component parts is in Chishui at 1,730m which also has the greatest elevational range of 1,490m. The lowest point is at Longhushan at 48m with an elevational range of 1,007m. The high and low points of the others are: Jianglangshan, 824m-170m, Langshan, 818m-302m, Danxiashan, 625m-58m and Taining, 674m-200m. The average elevational range of these is 528m.

PHYSICAL FEATURES

Danxia describes characteristically scenic, usually orange or purple-red sandstone rock formations exposed in spectacular massive and sculpted forms. All the component parts except for Chishui are in the hills which lie on the Southeast China fold belt, the section of the Yangtze or South China plate underthrust by the Pacific plate. Under tectonic pressure in late Jurassic and early Cretaceous times this extended with much magmatic activity creating strong northeast-trending faults and several fault basins which were then submerged undersea. Into these shallow marine basins, red fluvial and alluvial sediments flowed during the mid and late Cretaceous period 145 to 65 million years ago. They now comprise the very thick sandstone and conglomerate deposits which form the danxia bedrock.

After the end of the Cretaceous, the subplate was continuously uplifted owing to the Himalayan tectonic movement, and the bedrock was eroded under humid subtropical conditions, both keys in the development of danxia. They were then deeply dissected along their various faults by physical and chemical weathering and existing rivers. The emergent landforms are seen in mesa-like blocks and cliff-walls, table peaks and peak clusters, cuestas, buttes, pyramids, towers, pillars, ravines and valleys, arches and caves. The red color, origin of the term red-beds, derives from ferric oxides deposited during their conversion to rock though it may also result from the weathering of arid deserts in the late Cretaceous climate. The resulting rugged formations clothed in subtropical forest and mists are of great beauty.

Each of the sites is representative of a development stage of the danxia of southeast China and, except for Chishui on the edge of the Sichuan depression, lie in the same faulted fold belt where the strata have remained largely horizontal. They are formed both of massive sandstone and cemented conglomerates which became the mesas and cliffs, and of thin siltstone and argillaceous layers which erode more easily. Each site displays a representative example of an erosional stage from young or least eroded to old or most eroded landforms. The surface weathering is very various, from smooth, ribbed, striated and grooved to pocked, scoured, fretted and honeycombed. These are water-formed landscapes with many rivers. The water is of high quality. Each site supports a richly biodiverse forest with considerable vegetational complexity due to the extreme fragmentation of habitats.

Young danxia landforms show strong relief with steep gorges and deep glens. These are exemplified in the two sites of Chishui and the northern section of Taining. Chishui in northern Guizhou is a fractured sandstone plateau of Cretaceous and Jurassic red beds with low mountains, incised canyons and huge cliffs in the western site, with peak-clusters, canyons and stepped valleys with waterfalls in the eastern site. It has the largest area and an elevational range of 1,490m. Taining in western Fujian is hilly country of sandy conglomerates over volcanic rocks with dense blocky peaks between narrow reticulated canyons, incised meanders and gullies. There are several lakes and rivers. The 3,600 hectare Lake Jinhu on the Jinsi river is in the more mountainous mature danxia landscape of the southern section. Taining has a great variety of cliff caves.

Mature danxia landforms are dominated by forest-covered peak clusters as seen in Langshan and Danxiashan, both in sandy conglomerates and sandstones over volcanic rocks. Langshan in southwestern Hunan, is early mature danxia with dense mazes of domed and awl-shaped peaks, cuestas, karst features, linear valleys, slot ravines, caves and natural bridges and is bisected by the Fuyijiang river. Danxiashan, the type locality, is in northern Guangdong where siltstone, gritstone, marlite and gypsum beds occur with the conglomerate and sandstone. It is late mature danxia with hilly peak clusters surrounded by columns, cuestas and mountain walls and is bisected by the Jinjiang river. It is a maze of landforms - slot valleys, rock arches and potholes. As a result of much uplifting it is a model of incised multi-stage erosion.

Old danxia landforms have isolated peaks surrounded by low gently sloping land and rivers. These are seen in Longhushan and Jianglangshan. Longhushan has late mature/early old stage erosion and hilly danxia in sandy conglomerate and sandstone. The northern Guifeng section is over 10 kilometres northeast of the southern part which is bisected by the Luxi river. It has inselbergs, clustered and isolated peaks, cuestas, gypsum and aeolian deposits. It also contains the fossil remains of plants, mussel-shrimps and dinosaur bones. Jianglangshan is of conglomerate over volcanic rock with the Cretaceous strata worn down, exposing an ancient denudation surface and one notable isolated peak.

CLIMATE

Five of the sites have a sub-tropical humid monsoonal climate; Chishui has a moist mountain version of the same climate. The average annual temperature for all the sites ranges between 19.7°C (Danxiashan) and 14°C (Jianglangshan), averaging 6.1°C in winter and 29°C in summer, with a January minimum of 4°C in Langshan and a July maximum of 33.7°C minimum in Taining. Rainfall averages 1,758mm in the four eastern sites and 1,368mm in the two western sites. Winters are short and dry, as is autumn. Summers and spring are rainy. Several different microclimatic conditions from droughty peaks to ravines with tropical vegetation are created by the rugged fragmentation of the land.

VEGETATION

Since south China was not glaciated in Quaternary times it became a fertile biotic refuge for ancient species. The sites are all within the Chinese Subtropical forest and the South Chinese Rainforest and the three eastern sites surround the Wuyishan massif, one of the most biodiverse of all comparable sites. The ruggedness of the topography has preserved the forests, their complex mosaics of plant communities and a wide range of vegetation types graded by elevation. The forest is mostly secondary except where inaccessible. 11 broad vegetation patterns with 23 vegetation types are described: subtropical evergreen broadleaf monsoon forest, evergreen deciduous broadleaf mixed forest on the Chishui plateau only, deciduous broadleaf forest, conifer forest, sclerophyllous forest, lianas, rock vegetation, aquatic, grassland and low brush in the gorges. There are also xeric communities on the bare summits, mesic communities in ravines and cliff-face vegetation. The 69 different formations and 424 plant associations are said to contain 61.5% of the major habitat types of the world.

The property contains 5,772 vascular plant species, including 591 ferns and 54 gymnosperms, in 1,271 genera and 293 families. 40 species are endemic to the property and 600 endemic to China. Of the 34 species on the IUCN Red List, 2 are Critically Endangered, 7 Endangered and 13 Vulnerable. In China 214 species are considered rare and endangered, 145 are on the Chinese Red List, 49 are key species and 104 species are listed by CITES. However, several species cited have not yet been assessed by IUCN for degree of threat.

The dominant family in the eastern sites is the Fagaceae with co-dominant Lauraceae, Theaceae, Magnoliaceae, Elaeocarpaceae and Symplocaceae. There are unusual locations especially on droughty and island mountain tops, in tropical microhabitats in deep ravines and in patches of old undisturbed forest, the most intact of which is in Chishui and the most diverse on Longhushan. There

are many ancient trees, especially in the western sites: 25 are said to be over 1,000 years old and 484 over 500 years old. A Taiwan juniper *Juniperus formosana* in Jianglangshan is 3,500 years old. Relict species found are ginkgo *Ginkgo biloba* (EN), Chinese fir *Cunninghamia lanceolata*, *Eucommia ulmoides* and *Camptotheca acuminata*.

Chishui's forest is largely primary vegetation of the central moist evergreen deciduous broadleaf type which covers 90% of the site over a range of 1,490 metres. It has 1,964 vascular plant species (2208 a also cited) with 20 on the IUCN Red List. Its extensive forest of relict dwarf tree fern *Alsophila spinulosa* is said to be the largest stand of Cyathaceae tree fern in Asia. It has 249 species of ferns. There are 27 relict and rare species including *Manglietia insignis*, *Fokienia hodginsii*, *Angiopteris fokiensis* and *Camellia luteoflora*. Taining's forest, like the others in the east, is of humid subtropical broadleaf evergreens but with some sclerophyllous forest. It has 1,276 vascular plant species of which 10 are on the IUCN Red List and 75 on the Chinese Red List. It covers over 90% of the property and shelters a mosaic of ecosystems. Six most endangered species are mentioned out of seventeen listed by IUCN: *Dendrobium officinale* (CR), *Isoetes sinensis* (CR), ginkgo (EN), *Torreya jackii* (EN), *Bretschneidera sinensis* (EN) and silverbell *Halesia macgregori* (VU).

Langshan has 85% vegetation cover and 76% forest cover. It has 1,421 vascular plant species, 52 on the IUCN Red List and is noted for three local endemics, *Chirita langshanica*, *Ranunculus xinningensis* both cliff-wall species, and *Firmiana danxiaensis*. 125 species of lianas, 63 epiphytes and 150 macrofungi are recorded. Danxiashan is 80% vegetated with tropical rainforest in the deep ravines. It has 1,757 vascular plant species of which 10 are on the IUCN Red List including the relict species plum yew *Cephalotaxus oliveri* (VU). Longhushan has 1,626 species of which 220 are endemic to China but only 5 are listed in the IUCN Red List. The forest includes conifer and bamboo forests. Jianglangshan, although small in area, has 1,880 vascular plant species, 51 of which are on the IUCN Red List. It has some sclerophyllous forest.

Component site	Vascular plant species / genera / families	Vegetation types / formations / associations	IUCN & National Red List Species	CITES Species	Notes
Chishui	1964 / - / -	11 / 91 / 117	20 / 95	35	13 gymnosperms 249 ferns 27 endemic
Taining	1276 / 608 / 192	8 / 24-40 / -	17 / 77	65	
Langshan	1421 / 200 / -	9 / 71 / -	52 / 21	41	125 lianas 63 epiphytes 150 macrofungi
Danxiashan	1757 / 447 / -	11 / 27 / 48	10 / 20	39	
Longhushan	1626 / 262 / 838	9 / - / -	5	18	220 Chinese endemics
Jianglangshan	1880 / 845 / 195	12 / 35 / 40	51 / 34	28	

The nomination cites slightly differing figures under different headings.

FAUNA

The present fauna of the area is rich and largely typical of the region. The six sites provide seven major animal habitats: forest, bush, farmland, wetland, water, bare rock and caves, and a wide range of vegetation types graded by elevation. Existing fauna over the whole property totals 836 vertebrates of 129 families and 37 orders, and 3,073 insect species totalling 3,913 species in 2449 orders and 520 families. 189 species from 54 families are endemic, rare and endangered - and more than 400 including animals of the buffer zones. Of 43 species cited on the IUCN Red List 2 are Critically Endangered, 11 Endangered and 9 Vulnerable; 80 species have 1st-class state level protection; 145 species are on the Chinese Red List. There are 47 species endemic to China (excluding insects): 11 mammals, 6 birds, 4 amphibians, 16 fish (but see Chishui below) and 10 other animals; and 66 species are listed by CITES.

Chishui has 404 vertebrates: 72 mammals, 147 birds, 37 reptiles, 31 amphibians, 117 fish of which 25 are endemic, and 1,264 insects. 25 species are on the IUCN Red List. Sambar deer *Rusa unicolor* (VU) occur there. Taining has 380 vertebrates and 1,509 insect species. 7 are on the IUCN Red List: Chinese pangolin *Manis pentadactyla* (EN) and the near threatened large Indian civet *Viverra zibetha*,

Asiatic golden cat *Catapuma temminckii* and Chinese serow *Capricornis milneedwardsii*. Yellow-billed tragopan *Tragopan caboti* (VU), silver pheasant *Lophurus nycthemera* and Chinese black-backed pheasant *Syrnaticus ellioti* are all recorded. Langshan has 210 vertebrates: 26 mammals, 94 birds, 35 reptiles, 19 amphibians, 36 fish and 816 insects. 2 are on the IUCN Red List. Sambar deer (VU) are found there, and the giant salamander *Andreas davidianus*. Danxiashan has 422 vertebrates: 88 mammals, 156 birds, 41 reptiles, 37 amphibians, 100 fish, and 1,023 insects. 73 are on the IUCN Red List: white-necked night pheasant *Gorsechius magnificus* (EN) being one. Longhushan has 387 vertebrates including sambar deer (VU). Its wetlands are important for migratory and wintering birds such as scaly-sided merganser *Merganser squamatus* (EN). Silver oriole *Oriolus mellianus* (VU) is also found there. Jianglangshan has 195 vertebrates. The white-necked night pheasant (EN) occurs there and 142 species are stated to be on the Chinese Red List.

Component site	Total excl. insects	Mammals	Birds	Reptiles	Amphibians	Fish	Insects	IUCN & National Red List Species	CITES Species
Chishui	404	72	147	37	31	117	1264	25 / 368	36
Taining	380						1059	7 / 43	47
Langshan	210	26	94	35	19	36	816	2 / 18	27
Danxiashan	422	88	156	41	37	100	1023	73 / 59	66
Longhushan	387							16 / 55	33
Jianglangshan	195							- / 142	31

The nomination cites differing figures under different headings.

CONSERVATION VALUE

Danxia, described from the type locality Danxiashan, are predominantly orange-red spectacularly eroded sandstone rock formations or red beds exposed in the massive forms of mesa-shaped peaks, pyramids, towers, cliffs and ravines. Each of the six sites is representative of the danxia formations of southeastern China and have been chosen to display an example on a range from least to most eroded. The rocks reveal past changes in the geological past and the life forms of late Mesozoic to Cenozoic times. The sites also exemplify the rich present-day biodiversity of their striking and beautiful subtropical forest landscapes. The eastern sites lie within a WWF Global 200 priority ecoregion and a WWF/IUCN Centre of Plant Diversity; all the sites except Jianglangshan are Geoparks.

CULTURAL HERITAGE

Most of the sites have been settled since Neolithic times 6,000-3,500 years ago, leaving plentiful stone tools, pottery and later, bronze vessels; agriculture developed 2,000 years ago. Traditional settlements were built in harmony with the environment, and the practice of Taoism is held to have begun in these mountains. To the Taoist the law of Nature was the highest law and reverence for the environment followed. Mountain temples and pilgrimages were and still are an essential part of the national respect for nature, and the sites are known to have been appreciated spiritually by the literati at least since the Tang dynasty. Care for historical, cultural and local religious relics is therefore a major part of the conservation of these areas. The relics include ancient cave temples, cliff grave sites and cliff carvings, petroglyphs, ancient and fortified villages and stockades. Longhushan, settled 2,600 years ago, is respected as the birthplace of Taoism and is one of its four sacred mountains. It has ancient coffin caves in its cliffs and one of its four colleges established during the northern Song. In Danxiashan Mount Shaoshi and Mount Danxia have attracted literati since Tang times and there are more than 40 cave temples with carved inscriptions, tablets and tombs. Taining has a Tang temple and 80 Buddhist grotto temples. Jianglangshan has attracted celebrated scholars since the Tang and has a famous old temple at Kaiming and an old academy, both founded in northern Song times.

LOCAL HUMAN POPULATION

The sites are in rugged relatively little populated country, except for Longhushan, where the local people have always depended on subsistence farming, fishing, hunting and tree felling. In 2007 the total population of the property was 34,026 and of the buffer zones, 100,259. Longhushan's populations were the highest: 23,966 (property) and 46,560 (buffer zone). Taining and Danxiashan being the least populated. The people are Han with a few Dong, Yao and Zhuang villages in Langshan and Chishui.

Component site	Population 2007	Visitors 2001	Visitors 2007
Chishui	4751	21,000	80,100
Taining	691	16,610	41,790
Langshan	3040	9000	48,000
Danxiashan	1578	44,590	110,650
Longhushan	23,966	28,900	53,900
Jianglangshan	0	10,100	25,600

VISITOR FACILITIES

Visitor numbers to the sites increased from 130,000 in 2001 to 360,000 in 2007, with Danxiashan and Chishui being the most and Jianglangshan the least visited. They have become part of China's thriving tourist industry and are well provided with facilities. All have visitor centres (Taining has five, Chishui two), and all but Jianglangshan have museums. Tourist paths and signage, waterways, observation pavilions and towers and some overnight accommodation are provided. Langshan has 38 km of paths and 27 km of boating waterways; Taining has 25 km of the latter. Tours are developed from sightseeing to more specialised experiences and to research projects in scientific tourism and ecotourism. As an important economic resource the sites are being aggressively advertised although the need to avoid or mitigate the resulting degradation is acknowledged. Tourism management plans have been made and local people provide transport, guides and local produce for sale.

SCIENTIFIC RESEARCH AND FACILITIES

A research expedition to Longhushan and Jianglangshan took place as early as the 17th century. Many studies have been made of the fossils. Recent stratigraphic studies have revealed much about the Earth and the life forms of the Cretaceous period, the formation of the basins in which the original sediments were laid down, the global tectonic movements which occurred during that time, their climatic environment and subsequent geomorphological development. Danxia landforms are in effect museums of Cretaceous geological and biotic change. The sites, especially Danxiashan, provide many opportunities for research on island-mountain and ravine habitats, complex vegetation communities, species distribution, biotic succession, rare, endangered and local endemic species, wetlands and village culture. Restoration of the native forest ecology is an ongoing part of the scientific mission. Research and adaptive management techniques, baseline condition assessment and long term monitoring of change for both natural values and species are undertaken by the staff of related universities and scientific institutions. The sites have been examined to provide a basis for management and educational tourism. 576 related references are listed in the nomination.

MANAGEMENT

The component sites of the property are under the authority of the national Ministry of Housing & Urban-Rural Development. They are managed by the Construction Department of each province with the local World Heritage Management Committee. Management of the sites as a group is coordinated by the China Danxia Natural Heritage Coordination Managing Committee. The sites of the property are already protected areas and, except for Jianglangshan and the smaller Guifeng section of Longhushan, are large enough to preserve their natural beauty and geomorphological values without threat to their integrity. Protected status varies between the six components. Most are National Parks; and there are also National Nature Reserves, National Forests, and Geoparks. Each site is protected under the relevant laws and regulations at both national, provincial and local levels, and sufficient management systems have been set up and qualified staff enrolled to ensure adequate long-term institutional and traditional protection of their outstanding universal value.

An integrated management plan has been prepared for the property as a whole, as well as individual plans for each area, all dovetailed with existing plans. Customary village conservation practices are encouraged. A policy of landscape restoration and afforestation of farmland on slopes will be followed. Several activities are prohibited on site unless licensed: hunting for food or trade, quarrying, mining, dredging, land reclamation, commercial uses, waste dumping, charcoal burning, herb-gathering and burying the dead. Areas of exemplary landscape, heritage displays and old villages are exclusion zones. Local communities and stakeholders are supportive, which should guarantee management success over the long term. Monitoring programs by satellite, from the air and in the field are followed for each site with some variations. Daily or frequent monitoring is carried out of weather, fire, tourist

numbers, water quality (and forest pests in Jianglangshan). Monitoring is quarterly of environmental quality, tourist facilities, village populations and land uses, natural disasters and plant species, and at greater intervals, of animal and alien species, forest pests, site boundaries and geology.

MANAGEMENT CONSTRAINTS

The smallest site Jianglangshan may be too small for its biological and ecological viability and protection of rare species to be guaranteed. Nevertheless most the rocky landscapes are little developed and, except for Longhushan, remain sparsely populated. Natural disasters can be destructive, especially mountain floods, landslides and dry season fires. Frequent fire patrols supported by professional fire protection are essential. There has been a little peripheral construction, tree-felling, use of forest resources or water pollution by the dumping of wastes upstream. The main present human pressures come from increasing tourism: the overuse of scenic spots on holidays, the building of tourist infrastructure, pollution and littering. These may require regular control of visitor numbers in future.

COMPARISON WITH SIMILAR SITES

There is no internationally agreed definition of sandstone danxia, which complicates comparisons. To be comparable a site should show a large range of sculptured forms in progressive stages of erosion in a subtropical forest of high biodiversity with rare species, religious and cultural significance and fossils. Elements of the landforms are found worldwide in many sites, showing two or three of these major characteristics, but often in arid land such as the famous formations of Utah and Arizona and so without the biodiversity and water landscapes of the danxia. In northern Australia, well vegetated Kakadu has cliffs and water but not the remarkable cone peaks of grassland Purnululu. In eastern Australia the Blue Mountains have columnar cliffs and peaks and subtropical forest but far less variety. The Grand Canyon in the U.S.A. has an iconic river, cliffs and sculpted forms but no forest within the canyon. More temperate Meteora has columnar peaks, religious sites and forest but no great range of forms and no water. The most comparable examples are in China which has more than 780 danxia sites in every climatic zone. Mount Wuyi, around which three of the designated areas are grouped, is a smaller area but has nearly all the characteristics except erosional variety. Mount Emei with the Leshan buddha has great biodiversity and similar but less geological variety. Qingchengshan and multicolored barren Zhangyeshan in the northwest have notable but fewer danxia forms, and the huge composite area of the Three Rivers of Yunnan contains forested danxia elements but in a far less accessible setting.

STAFF

The six properties together employ 1,326 full-time staff of which 344 are administrative and technical, 209 being college educated in a wide range of disciplines. There are 917 support staff plus 65 external consultants. Professional staff are trained and retrained in their fields and local people are trained in conservation, sustainable practices and as guides.

Component site	Professional staff	Technical staff	Other staff	Outside experts	TOTAL
Chishui	41	17	142	6	206
Taining	44	11	186	20	261
Langshan	28	12	141	8	189
Danxiashan	19	4	152	16	191
Longhushan	62	86	210	8	366
Jianglangshan	15	5	86	7	113
TOTAL	209	135	917	65	1326

The above staff are all in management, protection and patrols. They exclude the staff of commercial services such as dining, accommodation, travel, entertainment, shopping and search and rescue.

BUDGET

This is derived for all except Langshan from national, provincial and county funds, income from fixed assets and ticket sales. Funding between 2001 and 2007 (cited in U.S. dollars) almost quintupled:

Component site	Income 2001 (US\$)	Income 2007 (US\$)	Notes
----------------	--------------------	--------------------	-------

Chishui	147,790	547,000	most from ticket income
Taining	764,265	3,185,440	2003
Langshan	29,420	176,470	
Danxiashan	208,530	540,290	most from ticket income
Longhushan	174,700	2,272,350	2002
Jianglangshan	51,560	284,700	
TOTAL	1,410,095	7,006,210	

LOCAL ADDRESSES

Ministry of Housing & Urban-Rural Development of the People's Republic of China, 9, Sanlihe Road, Beijing, 100835, China. Website: <http://www.cin.gov.cn>.

The Director, Construction Bureau of Hu'nan Province, 86, Jiefang Road(Mid), Changsha City, 410003, Hu'nan, China. Website: <http://www.hnjs.gov.cn>.

The Director, Construction Bureau of Guangdong Province, 305, Dongfang Road(Mid), Guangzhou City, 510031, Guangzhou, China. Website: <http://www.gdcic.net>

The Director, Construction Bureau of Fujian Province, 242, Beida Road, Fuzhou City, 350001, Fujian, China.

The Director, Construction Bureau of Zhejiang Province, 8, Chengfu Road, Hangzhou City, 310025, Zhejiang, China. Website: <http://www.zjjs.com.cn>

The Director, Construction Bureau of Jiangxi Province, Nanchang City, 330046, Jiangxi, China.

The Director, Construction Bureau of Guizhou Province, Guiyang City, 550002, Guizhou, China.

REFERENCES

The principal sources for the above information were the original World Heritage nomination, the IUCN evaluation report and Decisions 34 COM 8B.1 and 35 COM 8B.60 of the UNESCO World Heritage Committee.

The Administrative Committee of Langshan National Park (2008). *The Management Plan of Langshan Nominated Site*. Xinning County, Shaoyang City, Hunnan Province.

Guizhou Institute of Architectural Design (2008). *Chishui of China Danxia Management Plan*. Guizhou Tongh Co.Ltd. for Planning and Consultation, Chishui.

ICOMOS (2010). *Danxia (China)*. Comments on the Nomination document. Paris.

IUCN (2012). *Red List of Threatened Species*. IUCN, Gland, Switzerland.

Longhushan-Guifeng National Park Heritage Coordination Committee (2008). *Protection and Management Plan for Longhushan World Natural Heritage Nominated Site 2008-2012*. Longhushan-Guifeng National Park Yingtan City & Shangrao City, Jiangxi Province.

The People's Government of Taining County (2009). *Taining World Natural Heritage Nominated Site Protection and Management Plan*. Taining County, Sanming City, Fujian Province.

Ro, L. & Chen, H. (2009). *Guangdong, Management Planning*. Planning and Research Institute Sun Yat-sen University, Danxiashan National Park.

Young, R., Wray, R. & Young, A. (2009). *Sandstone Landforms*. Cambridge University Press, Melbourne.

DATE

September 2012.