WORLD HERITAGE NOMINATION - IUCN TECHNICAL EVALUATION

THREE PARALLEL RIVERS OF YUNNAN PROTECTED AREAS (CHINA) ID Nº 1083

1. DOCUMENTATION

i) **IUCN/WCMC Data Sheet:** 10 references

ii) **Additional Literature Consulted:** IUCN/WWF.1995. **Centres of Plant Diversity**. Vol. 2; Mittermeier, R. et.al., 2000. **Hotspots: Earth's Biologically Richest and Most Endangered Terrestrial Ecoregions**. Cons. Intl.; Myers, N. et al, 2000. Biodiversity hotspots for conservation priorities. ***Nature,*** 403,853-8; WWF/ICIMOD. 2001. **Ecoregion-Based Conservation in the Eastern Himalaya**; Thorsell, J. and L.Hamilton. 2002. **A Global Overview of Mountain Protected Areas on the World Heritage List**. Working Paper 6. IUCN; Gurung. H.1999. **Mountains of Asia**. ICIMOD; **China's Biodiversity: A Country Study**. 1998. China Environ. Science Press; Mackinnon, J. et.al. 1996. **A Biodiversity Review of China**. WWF; Birdlife Intl. 1992. **Putting Biodiversity on the Map**; Kingdon- Ward, F. 1985 (reprint); **The Mystery Rivers of Tibet**. Asian Publications; Wilkes, A. et.al. eds. **Links Between Cultures and Biodiversity**: Congress Proceedings. Yunnan Science and Technology Press.1033p. Fisher R.D. 1995. **Earth's Mystical Canyons** . Sunracer Publications Tucson. 152 p

iii) **Consultations:** 8 external reviewers contacted. Various government officials from Yunnan Construction Bureau and relevant Provincial and Prefecture contacts as coordinated by WH Management Committee Office; representatives from Yunnan and Tsinghua Universities and Chinese Academy of Sciences; The Nature Conservancy China Programme.

iv) **Field Visit:** Jim Thorsell and Les Molloy. October, 2002.

2. SUMMARY OF NATURAL VALUES

The Three Parallel Rivers nomination (1.7 mil.ha. in extent) consists of 15 protected areas in seven geographic clusters in the mountainous northwest of Yunnan Province. The 7 clusters are contained with a larger geographic unit of 3.4 mil. ha. administratively referred to as the Three Parallel Rivers National Park (IUCN Category VI) . The northern and western boundaries of the nomination abut Tibet and Myanmar respectively. The site name relates to the inclusion of sections of the upper reaches of three of the great rivers of Asia -the Yangtze (Jinsha), Mekong (Lancang) and Salween (Nu Jiang). Here the three rivers run roughly parallel, north to south, through steep gorges which in places are 3,000 m deep. At their closest, the three gorges are only 18 and 66 km apart, and for 70 km a fourth parallel river, the Dulong Jiang, flows along the western margin before entering Myanmar as one of the headwaters of the Irrawaddy River system.

The 1.7 million hectare site consists of a large portion of the Hengduan Shan, the major arc of mountains curving into Indochina from the eastern end of the Himalayas. The extent of the site is 310km from north to south (29° to 25° 30' N) and 180km from east to west (98° to 100° 30' E). More than 100 peaks in the Yunling, Gaoligong, Haba, and Baimang ranges are over 5000 m, while the

Meili Snow Mountains on the Tibetan AR border contain an impressive range of glaciated peaks over 6000 m. The highest peak is Mt Kawagebo (6740 m), from which the southernmost glacier in China, Mingyongqia, descends to an altitude of 2700 m.

The nominated area lies within an orogenic belt, where the edge of the Eurasian plate is being compressed by the underlying Indian plate as it is subducted along the line of the Lancang River fault. As the Hengduan Mountains were uplifted and intensely sheared, the pre-existing rivers continued to downcut, resulting in the extreme vertical relief of the mountains and gorges. Four types of igneous rock are evident: ultrabasic, basic, intermediate acid and alkali rock, as well as ophiolites (assemblages of igneous rocks that were once sea floor crust). The wide range of rock types throughout the site provide ample evidence of marine evolution under the Tethys seas (the shallow sea that existed during the early Mesozoic Era and separated the landmass of Laurasia in the north from Gondwanaland in the south).

The site also contains an outstanding variety of landforms, especially those in the alpine landscapes. There are more than 400 glacial lakes, each surrounded by moraines and other glacial landforms. A variety of spectacular alpine karst features include karst caves, calcareous tuff deposits and alpine karst peak clusters. There are also large areas of granite peaks and sandstone monoliths, the most impressive of the latter being the alpine *Danxia* landforms (old Tertiary red calcareous sandstone eroded by wind and water). Such varied terrain gives the region great scenic and geological interest.

The climate variety within the site is as outstanding as its topography, varying from subtropical in the valleys to frigid on the snow-covered mountain peaks. In the west, the south-western monsoon from the Indian Ocean brings an annual rainfall of up to 4,600 mm and creates a permanent snow- cover on peaks over 5,000m. The effect of this moist airstream drops off sharply as it moves eastwards, so that, at the other extreme, is in a rain-shadow and receives only 300 mm of rainfall annually. The Pacific Ocean monsoon affects the southeast of the site less strongly but does create humid, subtropical conditions in the valleys. Persistent fog limits human settlement above 2,500m.

The Three Parallel Rivers site is an epicentre of Chinese biodiversity. The southern part of the Hengduan Shan is considered by the Chinese Academy of Sciences to be the foremost of China's 11 terrestrial 'critical regions for biodiversity conservation'. It is also recognized as one of the world's 25 major biodiversity 'hotspots'. The reasons for the region's outstanding biodiversity are fourfold:

- The N-S river valleys have provided a corridor for the movement of biota for a long period. The Hengduan Mountains are a boundary 'mixing zone' for three of the world's major bio- geographical realms --East Asia, Southeast Asia and the Tibetan Plateau. The WWF consider this part of NW Yunnan to lie at the juncture of five of their 'Ecoregions'.
- The remarkable altitudinal gradients within the area, with mountain summits reaching 5000-6500 m while the riverbanks in the gorges below are around 1500-2000 m.
- The monsoonal climate (wet summers) affecting most of the area
- The ice-free status of most of NW Yunnan during the Pleistocene glaciations, allowing a variety of plants and animals to remain relatively undisturbed in refugia.

The site supports the richest diversity of higher plants in China as well as a remarkable range of fungi and lichens. Over 6000 plant species are listed and distributed within 22 recognised vegetation types, which range from the savannah shrublands of the hot, dry valley floors, through both evergreen and deciduous forests, and a wide variety of coniferous forests, to alpine meadows. These diverse vegetation communities contain over 20% of China's higher plants and 2,700 of the site's plants are endemic to China (distributed within 45 endemic

genera), while 600 of them are endemic to NW Yunnan; the Three Parallel Rivers Protected Areas contains the type locality for 1,500 of these plants. The history of the site has resulted in marked species differentiation from relict and primitive to highly evolved species, and 8.5% of China's rare and endangered species have been recorded in the area.

The site contains more than 200 species of rhododendrons, over 100 species each for gentians and primulas, and many species of lily and orchid, as well as many of the most noted Chinese endemic ornamental plants: gingko, the dove tree, four species of the blue poppy and two species of *Cycas*. The site is famous in European plant-collecting history because of the work of the Rev. Jean Marie Delavay, George Forrest, and Frank Kingdon-Ward (among many others) who made these plants known to Western horticulturalists. The diversity of conifers is outstanding; in addition to dozens of the main mountain forest trees *(Abies, Picea, Pinus, Cupressus* and *Larix),* there are many endemic or rare conifers. There are also around 20 rare and endangered plants which are relict species and survived the Pleistocene glaciations, including the Yunnan yew.

The area is the most outstanding region for animal diversity in China, and likely in the Northern Hemisphere. Two-thirds of the fauna within the nominated site are either endemic, or are of Himalayan-Hengduan Mountain types. The area is believed to support over 25% of China's animal species, many being relict and endangered. Many of China's rare and endangered animals are within the nominated area: 80 are listed in the Red Book of Chinese animals, 20 of which are considered endangered; 79 animals are listed on the CITES 1997 appendices; 57 are listed in the IUCN Red List of the World's Threatened Animals. Being near the boundaries of the East Asian, Southeast Asian and Tibetan biogeographic realms, the site also acts as a corridor where many species from each realm meet and reach their limits of distribution. Most of the rarer and endangered animals lie in the western part of the site, especially the long, narrow Gaoligong Shan border with Myanmar and the Yunling Mountains between the Lancang and Jinsha Rivers.

Approximately 40% of the protected areas in the nominated site are inhabited by some 278,000 people while 36,000 inhabitants reside in the core zones (mostly engaged in subsistence agriculture).

3. COMPARISONS WITH OTHER AREAS

Currently (Thorsell and Hamilton, 2002), 55 sites in the mountain biome have been inscribed on the World Heritage List, 16 of which are in the same biogeographic realm (Palearctic), two of which are in the Himalayan region (Sagamartha and Nanda Devi) and three in China's eastern Himalaya. The Three Parallel Rivers area is distinct from all of these particularly for its high level of bio/geodiversity and due to the geographical feature of 4 major parallel rivers. Although the summits of its mountain peaks do not reach those of Sagamartha (8848m) or Nanda Devi (7800m), the nominated area contains 118 peaks over 5000m elevation. The 1.7 mil. ha. extent of the nomination is much greater than the median size for other World Heritage mountain sites (285,000ha) and it would rank in the top 10 of the 55 existing sites in terms of size. Other major mountains in the eastern Himalaya – Hengduan Mountain system, such as in the Gongga Shan (Minya Konka), are also of high natural value but do not contain the exceptional bio/geodiversity of the Three Parallel Rivers area.

The Three Parallel Rivers of Yunnan Protected Areas site includes several of the 110 protected areas listed in the WCMC database for Udvardy's 'Sichuan Highlands' Biogeographic Province (BP). Its area of almost 1.7 million ha is not matched by any of the other protected areas in this BP. Three other protected areas within the 'Sichuan Highlands' are listed as natural World Heritage sites -the two natural sites, Jiuzhaigou (72,000 ha) and Huanglong (70,000 ha), both within the Min Shan in northern Sichuan, and a third mixed site,

Emei Shan, on the eastern margin of the Daxue Shan above the Chengdu Basin. Other mountainous forested nature reserves previously nominated within this province are Wolong and Longxi-Hongkou (the latter as part of the Mt Qingcheng nomination); both were deferred for further consideration by Chinese authorities as part of a future giant panda habitat nomination.

Jiuzhaigou and Huanglong are primarily listed because of their geochemical phenomena, especially their travertine terraces and pools. They are high altitude sites with none of the topographic complexity of the Three Parallel Rivers. They share some of the alpine and higher altitude coniferous and deciduous broadleaf forests, but have none of the humid or schlerophyllous evergreen broadleaf forests nor the *Taiwania* forests or the shrublands of the dry, hot river valleys. In terms of plant diversity, the proposed Three Parallel Rivers site is much richer than Jiuzhaigou, Huanglong, and Emei Shan (see Table 1 below).

Table 1: Numbers of plant species in World Heritage sites in 'Sichuan Highlands'

Plant Type	3 Parallel Rivers	Jiuzhaigou	Huanglong	Emei Shan
Pteridophyta	**500**	**100**	**100**	**200**
Gymnospermae	**40**	**20**	**20**	**20**
Angiospermae	**5,500**	**2,000**	**2,000**	**2,500**

North-west Yunnan and the Hengduan Mountains have always been ranked very highly because of their biodiversity in all major international studies comparing the world's remaining natural habitats and their priorities for conservation. These global studies include: the *Global* 200 of WWF, the 25 'hot spots' as defined by in Conservation International and Birdlife International priority bird areas. The Three Parallel Rivers site encompasses a large proportion of the Hengduan Mountains, and can therefore be considered to equate to a large extent with this global priority area for biodiversity.

The site covers less than 3% of the area of Yunnan (and only 0.2% of that of China) yet it contains an extraordinary concentration of animal biodiversity: 173 mammals (81 endemic), 414 birds (22 endemic), 59 reptiles (27 endemic), 36 amphibians (25 endemic), and 76 fish (35 endemic). When the diverse animal life within the nominated site is compared with the full Hengduan Mountains (see Table 2, below), it can be seen that the Three Parallel Rivers site contains 70-78% of the mammal and bird species, and 45-55% of the reptile, amphibian and fish species. This table also compares the animal diversity of the nominated site with that of the large neighbouring provinces of Tibet and Sichuan, and indeed, all of China, Myanmar or India. In all of these comparisons, the Three Parallel Rivers of Yunnan site stands out as an area of outstanding universal value in terms of its animal biodiversity.

Table 2: Richness of Wildlife in Three Parallel Rivers compared with neighbouring areas

Area	Mammals		Birds		Reptiles		Amphibians		Freshwater Fishes	
	Species	%*	Species	%*	Species	%*	Species	%*	Species	%*
3 Par. River	173		414		59		36		76	
Hengduan	221	78.3	590	70.7	117	50.4	81	44.4	137	55.5
Yunnan	300	57.7	802	52.0	152	38.8	112	32.1	382	19.7
Sichuan	222	77.9	625	60.6	85	69.4	91	39.6	241	31.5
Tibet	126	137	473	88.2	58	101.7	39	92.3		
China	609	25.1	1260	33.1	403	14.6	278	12.9	1010	7.5
Myanmar	300	57.7	967	43.1	241	24.3	75	48.0		
India	350	50.3	1200	37.7	453	13.2	182	19.8		

**species in the Three Parallel Rivers site as % of species in the area being compared*

In landform terms, the extreme differences in altitude between the mountains and gorges within the site is matched elsewhere within the Himalaya-Karakoram mountain chain, especially the gorge of the Yarlung Tsangpo in Tibet, Kali Gandaki between Annapuma and Dhaulagiri in Nepal, and the Indus Gorge beneath Nanga Parbat in Pakistan (each of which exhibit an altitudinal difference of more than 5000 m). However, the proximity of the parallel gorges of four major rivers is unique in Asia and elsewhere. For comparative purposes, Fisher (1995) lists the depth at their narrowest point of some of the world's most dramatic canyons:

Table 3: The depth at their narrowest point of some of the world's most dramatic canyons

Yarlung Tsangpo, Tibet	5045 m
Kali Gandaki, Nepal	4375 m
Colca Canyon, Peru	3670 m
Tiger Leaping Gorge, China	3640 m
*Salween Canyon, China	3046 m
Pilaya Canyon, Bolivia	3030 m
*Mekong Canyon, China	2500 m
Urique Canyon, Mexico	1860 m
Sinforosa Canyon, Mexico	1818 m
Batopilas Canyon, Mexico	1790 m
Copper Canyon, Mexico	1750 m
Grand Canyon, USA	1416 m

* Part of nominated site

The assemblage of ophiolite rocks associated with the mountain uplift and folding in this vast orogenic belt also occurs in the Karakoram Mountains of northern Pakistan. The mountains of NW Yunnan and the Karakoram have both resulted from the collision of the Indian Plate with the Eurasian Plate. Consequently, there are many similarities between the diverse deep ocean floor and 'island arc' rocks of both areas, each squeezed to the east and west, respectively, of the main collision uplands -the Himalaya Range and Tibet-Qinghai Plateau. The Karakoram ophiolite sequences are a key geological feature of the Central Karakoram National Park, an extremely mountainous area of more than 1,000,000 ha that has been nominated for World Heritage status by Pakistan (but subsequently withdrawn after objections relating to the unresolved Kashmir sovereignty issue were raised by India).

The Danxia (red/purple sandstone) within the Laojun Shan portion of the Three Parallel Rivers site is outstanding in terms of its high elevation (up to 4200 m), which results in extreme 'freeze-thaw' weathering and contributes to some remarkable Danxia landform features, including the 'tortoise shell' surface pattern. The Danxia rocks in the site are also outstanding in that they overlie directly rocks which are considered to be 1.3 billion years older. Danxia landforms are found at similar latitudes in southern China and are a major landscape feature of another World Heritage site -Wuyi Shan in Fujian Province. However, the Danxia in Wuyi is at much lower altitude and smaller in extent (less than 10,000 ha) compared with the Danxia in Laojun Shan (150,000 ha).

In summary, the Three Parallel Rivers site has an exceptionally wide range of natural features ranging from distinctive topography and varied geology to particularly high levels of biodiversity. All this is set within the spectacular setting of glaciated peaks rising from 760m in the depth of river gorges to 6740m. As one reviewer noted, "it would be difficult to find an area in any other mountainous region that would surpass the ecological and topographical diversity of this proposed site".

4. INTEGRITY

4.1. Legal Status

The 15 different protected areas that make up the nomination have a range of legal designations including national and provincial level Nature Reserves, national Scenic Areas as well as small areas administered by two Prefectures and one County. A further complication is the division of the area into core areas totalling about 60% of the nominated site (corresponding to IUCN Category I and II) and Buffer Zones (corresponding to IUCN Category IV). Another 1.7 million hectares envelope the entire unit and serves as an additional de facto buffer. This multiple-use buffer zone (IUCN Category VI) includes most of the lower altitude lands in the Jinsha, Lancang and Nu Jiang river valleys, -- more accessible localities which for the most part are used for agriculture, settlement (800,000 human residents), transportation and industry. All land within the nominated area is thus under some form of protection but the level varies considerably from strict protection (ie. no human use) to areas where human settlement and subsistence agriculture occurs. One of the 15 areas (Yunling Nature Reserve) was approved for provincial Nature Reserve status in December, 2002. It is also be noted that a UNESCO Biosphere Reserve exists in part of the Gaoligong Nature Reserve which may (or should) be expanded in future.

If it were not for the establishment of the Yunnan Three Parallel Rivers Management Committee as the coordinating and management body for the site, IUCN would have greater concerns over the mix of legal designations, the overlap between the various administrative agencies and the balance between the core and buffer zones. On the broader issue of protected area legislation in China, IUCN also would suggest this may be in need of review in order to rationalise procedures but this is a separate issue from this evaluation. At this point in time the legal status is considered adequate but may prove difficult and require reassessment in future.

4.2. Boundaries and rationale for serial nomination

As noted in section 2, this is a serial nomination comprising 7 separate clusters. Each unit in the cluster is intended to add "a piece of the puzzle" and a representative sample of the range of the biogeodiversity of the Hengduan Mountains. One cluster highlights the glaciers of the high peaks, another is important for habitat of endangered species such as the Golden Monkey, while others incorporate the Danxia landforms, alpine lakes or other natural features. Such an approach in an area that has been modified by human activities over thousands of years is similar to that in other serial sites, such as the Central Eastern Rainforests of Australia where intervening areas have transformed the natural landscape. In the case of the Three Parallel Rivers site, several of the units are proximal but others are separated by a distance of 15 km. with little opportunity for corridors to link them. The boundary/area ratio is extremely high. Spaces between the units occur due to their separation by precipitous river gorges, high mountain glacial divides and/or human settlement. Such a condition will result in a certain biological isolation which the authorities are aware of and are studying options for linking the units via protected area 'corridors' (eg. in the Gaoligong Mountains corridor and in several of the gorge reserves). This initiative is strongly supported by IUCN as it would help considerably to enhance the integrity of the overall site.

Along with consideration of corridors, continuing inventory and research is leading to identification of additional areas that merit protection to more fully provide coverage to the range of natural values found in the region. For instance, it has been suggested that the Meili Snow Mt. reserve might be extended into the Tibetan Autonomous Region. Yulong Xue Shan is another area which is a sacred mountain of the Naxi and has high biological values on its western slopes. Tiger Leap Gorge (Jinsha Jiang) is adjacent to the Haba Snow Mt. reserve and, as one of the most dramatic expressions of an incised canyon, would also add to the

overall justification for the nominated area. Finally, as more information on existing reserves is obtained, an expansion of the core zones within the total area is expected over the next few years.

In light of these ongoing initiatives, IUCN suggested to the Chinese authorities during the field mission that a review of a revised protected area system in the Hengduan be presented in 3 years time. Such a recommendation from the Committee has been made in other cases and, although the delineation of the 7 clusters is considered adequate at this time, it is clear that potential for improvements exists.

Finally, it is noted that the Hengduan mountain area extends partially into Myanmar as well as into the neighbouring province of Sichuan. Discussions with nature conservation agencies in those jurisdictions should be held with a view to potential transboundary cooperation. One existing mechanism to do this is through the "Greater Mekong Subregion Programme".

4.3. Management Planning

Substantial planning effort for the area has been conducted both at the regional level and site level. On the regional scale, the Yunnan Three Parallel Rivers Management Committee has prepared a "General Management Plan for the Three Parallel Rivers NP" as well as an "Action Plan on Protection of Three Parallel Rivers Area" and has begun a separate plan for resource conservation and monitoring. Nine of the 15 separate protected areas within the nominated site have approved management plans and the remaining 6 are underway with completion dates set for 2003. Additional support for the preparation of these plans has been contributed by the GEF and The Nature Conservancy (who also have prepared an ecoregion conservation plan and action plan for the area).

IUCN has not had the opportunity to review all the plans but several samples were seen during the field mission and were very well prepared (especially those prepared with the assistance of Tsinghua University). The General Management Plan, however, was of concern because it currently has a much greater emphasis on development (especially through tourism) than on nature conservation. The Plan mentions increases in the use of hydro power which, at the micro level can provide clean energy, but at more extensive levels could be potentially damaging to the natural values of the main rivers. This General Plan is due to be revised over the next few years and this imbalance between development and conservation should be corrected.

Planning documents thus abound, and implementation is now the key challenge. An impressive start has been made with visitor centres, boundary signs and field offices as visible examples of a conservation management presence. The Yunnan provincial government has budgeted 15 million yuan for each of the next 5 years for management and administration and an additional 200 million yuan for field conservation projects. The staffing of the World Heritage Management Bureau will grow to 25 by 2004. While all the signs for establishing an effective management regime are positive and government commitment is clearly behind conservation of the site IUCN has suggested to the authorities that a mission to review progress (along with expanded boundaries) should be conducted in 3-4 years time.

4.4. Human Activities

The nominated site is occupied by some 315,000 human residents (including 36,500 in the core zones) and has partially been modified by grazing, forestry, roads and settlement. For example, there are 27 villages in the Meili Snow Mts. reserve with 15 human economic activities recorded (mostly subsistence uses**)** .This number of people within a World Heritage natural site is substantially higher than any other site (Lake Baikal in Russia has some 50,000 residents). Fortunately, much of the site is still relatively undisturbed and continues to

perform its ecosystem functions. This is partially explained by the inaccessibility of the higher slopes and the relatively light impact of the subsistence activities of the resident populations. Nevertheless, the "naturalness" of the nominated area, mostly at the lower elevations and plateaus, has been reduced by several thousand years of human use.

To partially address the problem, particularly on steep slopes where farming is unsustainable, the Chinese authorities have had a poverty alleviation programme in place for some years to provide alternate lands outside the protected areas. The policy is to aim for a reduction of an additional 16,000 people from the core zones and a limit placed of 298,000 in the buffer zone. In any case, the management of the site is certainly complicated by the presence of the human population (most of whom are ethnic minorities) and principles of consultation and participation must necessarily follow.

4.5 Tourism

Despite the remoteness of the area and the difficulty of access, the natural and cultural attractions of the region drew an estimated 188,500 visitors in 2001. About 90% of these were domestic in origin. Most of the tourism is concentrated in the peripheral areas of Gaoligong Mt. where hotels are available. Secondary sites are at the Meili Snow Mt. viewpoint and at the Shudu Lake. There are plans to develop driving, hiking, boating and riding opportunities; accommodation will be based in the main six (and 17 smaller) towns and the recreational use will be concentrated at the margins of the nominated site. Nevertheless, the General Management Plan forecasts that tourism growth will increase at least five-fold. Core areas do not allow entry to visitors.

From experience IUCN has gained with the inability of some World Heritage site managements to handle the pressures of rapidly-increasing numbers of tourists in other natural World Heritage sites in China, IUCN registers concern over future rapid tourist growth in the Three Parallel Rivers site. Although there is obvious potential for expansion of visitor facilities and attendant economic benefits to local communities, large scale mass tourism with its tendency to introduce inappropriate facilities is likely to cause damage to the intrinsic values of the site, and to the cultural stability of the minority peoples. Tourism development thus should be carefully planned in advance and its impacts closely monitored.

4.6 Involvement of NGO's and donors

Not surprisingly, the area has gained the attention of several international conservation groups who are supporting projects in the area, primarily TNC but also WWF and CI. The National Science Foundation (USA) has done resource inventory studies. The Government of the Netherlands is supporting community projects and the GEF has provided funds for management plans. Additional support from all these groups for the efforts of the Chinese authorities is an indication of the wide interest and concern about conservation in the area.

5. ADDITIONAL COMMENTS

5.1 Cultural values

Similar to many other countries in Asia, nature and culture are seen as inseparable in China. This is especially the case in the nominated area where the Tibetan, Lisu, Nu, Dulong, Bai, Pumi and Naxi minority peoples have been residing in the area and utilising its accessible resources (mostly on a subsistence basis) for thousands of years. The linkage of their rich cultures to the land are evident in many ways -through their religion and their mythology, art, dance, music, poetry and songs. The local status of the Meili Snow Mountain as a sacred area, off-limits to mountaineers, is one reflection of their reverence for wild nature and the vigour

of the local culture. The continued existence of the cultural heritage of the area is well-recognised and supported in the management plans and in the slogan and logo of the site.

5.2 Name of site

As the term "Three Parallel Rivers National Park" used in the original nomination document covers a much larger area than the nominated site (including lands which were not protected areas), a more accurate name for the site was requested. During the field inspection a technical group discussion on the issue suggested the alternative name: "Three Parallel Rivers Protected Areas". The name "Three Parallel Rivers of Yunnan Protected Areas" has been proposed by the Chinese authorities in a supplementary information report. Confirmation of this revised name is required.

6. APPLICATION OF WORLD HERITAGE CRITERIA

The Three Parallel Rivers of Yunnan Protected Areas have been nominated under all four natural criteria.

Criterion (i): Earth's history and geological features

The site is of outstanding value for displaying the geological history of the last 50 million years associated with the collision of the Indian Plate with the Eurasian Plate, the closure of the ancient Tethys Sea, and the uplifting of the Himalaya Range and the Tibetan Plateau. These were major geological events in the evolution of the land surface of Asia and they are on-going. The diverse rock types within the site record this history and, in addition, the range of karst, granite monolith, and *Danxia* sandstone landforms in the alpine zone include some of the best of their type in the mountains of the world. *IUCN considers that the nominated site meets this criterion.*

Criterion (ii): Ecological processes

The dramatic expression of ecological processes in the Three Parallel Rivers site has resulted from a mix of geological, climatic and topographical effects. First, the location of the area within an active orographic belt has resulted in a wide range of rock substrates from igneous (four types) through to various sedimentary types including limestones, sandstones and conglomerates. An exceptional range of topographical features - from gorges to karst to glaciated peaks -- is associated with the site being at a "collision point" of tectonic plates. Add the fact that the area was a Pleistocene refugium and is located at a biogeographical convergence zone (ie. with temperate and tropical elements) and the physical foundations for evolution of its high biodiversity are all present. Along with the landscape diversity with a steep gradient of almost 6000m vertical, a monsoon climate affects most of the area and provides another favourable ecological stimulus that has allowed the full range of temperate Palearctic biomes to develop.
IUCN considers that the nominated site meets this criterion.

Criterion (iii): Superlative natural phenomena or natural beauty and aesthetic importance

The deep, parallel gorges of the Jinsha, Lancang and Nu Jiang are the outstanding natural feature of the site; while large sections of the three rivers lie just outside the site boundaries, the river gorges are nevertheless the dominant scenic element in the area. High mountains are everywhere, with the glaciated peaks of the Meili, Baima and Haba Snow Mountains providing a spectacular scenic skyline. The Mingyongqia Glacier is a notable natural

phemonenon, descending to 2700 m altitude from Mt Kawagebo (6740 m), and is claimed to be the glacier descending to the lowest altitude for such a low latitude (28° N) in the northern hemisphere. Other outstanding scenic landforms are the alpine karst (especially the 'stone moon' in the Moon Mountain Scenic Area above the Nu Jiang Gorge) and the 'tortoise shell' weathering of the alpine Danxia.
IUCN considers that the nominated site meets this criterion.

Criterion (iv): Biodiversity and threatened species

Northwest Yunnan is the area of richest biodiversity in China and may be the most biologically diverse temperate region on earth. The site encompasses most of the natural habitats in the Hengduan Mountains, one of the world's most important remaining areas for the conservation of the earth's biodiversity. The outstanding topographic and climatic diversity of the site, coupled with its location at the juncture of the East Asia, Southeast Asia, and Tibetan Plateau biogeographical realms and its function as a N-S corridor for the movement of plants and animals (especially during the ice ages), marks it as a truly unique landscape, which still retains a high degree of natural character despite thousands of years of human habitation. As the last remaining stronghold for an extensive suite of rare and endangered plants and animals, the site is of outstanding universal value.
IUCN considers that the nominated site meets this criterion.

7. RECOMMENDATIONS

IUCN recommends that the Committee **inscribe** the Three Parallel Rivers of Yunnan Protected Areas on the World Heritage List on the basis of natural criteria (i), (ii), (iii) and (iv). The Committee is also advised, based on the above discussion on integrity issues, to make the following recommendations:

- Commend the authorities for the planning initiatives made to date and encourage completion of the remaining six protected area management plans and a revision of the General Management Plan,

- Note concerns over the nature and extent of future tourism (section 4.5 above), resident human population (section 4.4 above) and hydro development (section 4.3 above) that may affect the nominated site.

- Encourage the continued refinement of the boundaries of the site, including the addition of other areas of equally high natural value, expansion of core zones, controls over extent of resident populations and discussion of transboundary issues with neighbouring jurisdictions,

- Request the Chinese authorities to invite a mission in 3-4 years time to: (1) review progress with implementation of management plans and, (2) to assess revisions to the boundaries of the site.

- Confirm the revised name of the site with the Chinese authorities,

- Commend the cooperative efforts of The Nature Conservancy, WWF, the GEF and others for their assistance in strengthening the efforts of the Chinese authorities,