Information Sheet on Ramsar Wetlands

(RIS)

Name of the Site: Bitahai Wetland

Information Sheet on Ramsar Wetlands (RIS)

Categories approved by Recommendation 4.7, as amended by Resolution VIII.13 of the Conference of the Contracting Parties.

Note for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.

2. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Bureau. Compilers are strongly urged to provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of maps.

1. Name and address of the compiler of this form:

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DD MM YY

Designation date | Site Reference Number

2. Date this sheet was completed/updated:

Initially completed on August 27, 2003 and Updated on October 10, 2004.

3. Country:

The People's Republic of China

4. Name of the Ramsar site:

Bitahai Wetland

5. Map of site included:

Refer to Annex III of the *Explanatory Note and Guidelines*, for detailed guidance on provision of suitable maps.

a) hard copy (required for inclusion of site in the Ramsar List): *yes* ☑ -or- *no* ☐

b) digital (electronic) format (optional): *yes* ☑ -or- *no* ☐

6. Geographical coordinates (latitude/longitude):

N 27°46'~27°57', E 99°54'~100°08'

7. General location:

Include in which part of the country and which large administrative region(s), and the location of the nearest large town.

Bitahai Wetland Nature Reserve is located approximately 30 km to the east of the Shangri La County seat in the territory of Diqing Prefecture, Yunnan Province in Southwest China.

8. Elevation: (average and/or max. & min.)
Average: 3,568 m asl.

9. Area: (in hectares)
1,985 ha

10. Overview:
Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

Bitahai Wetland is situated in the core zone of the Hengduan Mountains Biogeographical Region, one of the three major floral diversity centres in China. The conservation target of the nature reserve include *Ptychobarbus chungtienensis chungtienensis,* a Grade I national protected fish species endemic to Bitahai. Bitahai is also the northern most highest well preserved closed plateau freshwater wetland in Yunnan Province. It belongs to a unique type of alpine morainal wetland nourished by the forest ecosystems composed of the primary alpine and subalpine temperate and warm conifers.

11. Ramsar Criteria:
Circle or underline each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11).

1 • 2 • 3 • 4 • 5 • 6 • 7 • 8

12. Justification for the application of each Criterion listed in 11. above:
Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

Criterion 1: It is a unique wetland type in China, which can be justified by its location of in the core zone of Hengduan Mountains Biogeographical Region with abundant biodiversity concentration, i.e. the core zone of the three new endemic centres of floral diversity in China, as well as with regard to its hydrological significance.

Pertaining to its hydrological significance, Bitahai is endowed with the following attributes:

- As one of the key catchment zones of the Qinghai-Tibet Plateau, Bitahai captures the runoff from rainfall, melting snow and ice and plays a critical role in effective flood prevention and control.
- Bitahai falls into the Jinsha River watersheds in the upper reaches of the Yangtze River. With insignificant fluctuations of the lake (water) surface, sustained and ample recharge of water sources, the outflow, smooth and lenthic, drops into the underground rivers through a cave 500 meters from the exit and confluences into the Yangtze River, which plays an important role in stabilizing the flow in the lower reaches of the Yangtze River.
- Lake water captured in Bitahai is of significance for water supply to the aquifers of magmatic rocks beneath the water body.
- Outflow of the Bitahai al pine lake is connected with underground rivers, constituting an integral element of the underground hydrology and stream systems that feed back and support the surface wetland ecosystems.
- Bitahai Wetland is critical for regulating and stabilizing regional climatic changes, and is representative of the peat system of carbonaceous aggradation.
- Bitahai is an intact and closed alpine freshwater lake. Its wetland and forest ecosystems surrounding the lake surface have been preserved in its pristine wilderness with little human-

induced disturbances. All these environmental services contribute critically to maintaining the high quality of lake water.

Criterion 2: Bitahai is an important habitat for *Ptychobarbus chungtienensis chungtienensis,* an extremely endangered fish species under Grade I national protection. Bitahai wetland possesses extremely high values in preserving the threatened ecosystems in the region. The wetland is characterized by:

- Special "pasture of mosaic formations" composed of *Batrachium bungei* and *Aconitum piepunense*, which are all endemic species in the Biogeographical Region.
- Rare formations of *Abies* spp. and *Tricholoma matsutake* (Both under Grade II national protection) nurtured by the special ambience of the wetland ecosystems and the forest ecosystems in the surroundings of the lake surface.
- The wetland environs of Bitahai are critical in supporting the formations of *Hippuris vulgaris*, a species of highest alpine distribution whose lowest limits of distribution is found only in Zhongdian.

Criterion 3: Bitahai is significant in maintaining the biological diversity in the biogeographical region.

- Bitahai is situated in a biodiversity hotspot with abundant species repository. This region is one of the new distribution centres of endemic flora in China;
- Bitahai accommodates the largest population of the endemic species *Ptychobarbus chungtienensis chungtienensis*.

Criterion 4: Bitahai is situated in the routes of wintering migratory birds, and forms an important wintering site and staging post for numerous valuable, rare and endangered wintering birds. Most importantly, Bitahai is a critical wintering site for the Black-necked Stork *Ephippiorhynchus asiaticus* endemic to plateau and alpine ecosystems. It also supports the fundamental ecological and evolutionary processes of *Ptychobarbus chungtienensis chungtienensis* population.

Criterion 7: Bitahai supports the endemic fish species (*Ptychobarbus chungtienensis chungtienensis*) in all evolutionary stages in its life history.

Criterion 8: Bitahai is a spawning ground and survival habitat for the endemic species *Ptychobarbus chungtienensis chungtienensis* which is narrowly distributed across China.

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13. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):
Name the relevant biogeographical region that includes the Ramsar site, and identify the biogeographical regionalisation system that has been applied.

a) biogeographical region:
Bitahai Wetland falls into the Palaearctic Region, in Qinghai-Tibet Plateau and the Himalaya Region (IV), Qinghai-Tibet Plateau (23), southeast of Qinghai-Tibet Plateau; Zhongdian-Deqin Mountain and Gorge Region.

b) biogeographical regionalisation scheme (include reference citation):
The biogeographical regionalization system is based on the China Biogeographical Regionalization Scheme (Yan Xie, 2004) and Yunnan Biogeographical Regionalization Scheme (Yang Yuming, 2003).

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14. Physical features of the site:
Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

- **Geology and physiognomy**

Bitahai Wetland is located in the eastern region of three great parallel rivers of the Hengduan Mountains Range in the southeastern edge of the Qinghai-Tibet Plateau. It is an alpine wetland and swamp area inlaid in the incised faults of the gorges in the Hengduan Mountains. In tectonic structures, it belongs to the Zhogndian-Jianchuan lithofaces in the West Yunnan Geosynclines of the Indio-China Faults in the Palaeozoic Group. Distributed in its exit in the east are small patches of limestone, the rest are extensive distributions of grit stone, metamorphic rock, phyllite, basalts, as well as alluvial, diluvia, morainal, lake and slope remnants from the Quaternary Series.

Bitahai is all surrounded by mountains covered by dense and lush forests. The lake basin stretches 2.8 km from east to west and 0.8 km from north to south, forming a closed alpine lake wetland ecosystem.

- **Origin**

The origin of the Bitahai Wetland is entirely natural. It is a negative physiognomy of compensatory plateau lake basin developed from multitudinous impacts of glaciers, incision encroachment and deposition, etc. In the process of drastic escalation of the Zhongdian Plateau, disparate rising and relative descending, or depression from incised erosion shaped the prototype of the lowlands, which was subsequently transformed by glacial movements and accumulated with massive moraine and glacial debris. After the retreat of glaciers, the lake was created by surface flow.

- **Hydrology**

Bitahai constitutes an integral region of the Jinsha River Watersheds. Sources of lake water supply derive mainly from rainfalls and snows. The largest portion of precipitation is received from early June. Annual precipitation from years of records averages 1,100 mm. There are five months of snow cover in a year that provides the most important sources for the entire water capacity in the lake. Another important inflow sources are the streams that inject into the lake along the west coast. Annual water volume generated for Bitahai totals 1.08×10^7 m^3. Surface area of the lake, with neither seasonal nor annual variations, maintains approximately at 170 hectares as a result of stable supply of water sources. The exit of lake water is located in the east of the lake, which is a small stream that flow 500 m to the east and drops into a limestone cave. The flow then empties into Luoji River and confluences with Jinsha River by way of Niru River.

- **Soil types and the chemical properties**

The main soil types of Bitahai are morass soils and bog peat. As a result of poor decomposition of organic matters under cool and cold climate, as well as anaerobic conditions, content of organic matters in the morass soils and bog peat is maintained at a very high level.

- **Water depth and fluctuations**

Historical records show that the average depth of Bitahai reaches 20 m, whereas measurement taking by Southwest Forestry College shows the depth ranges between 8 to 9 meters (2001). Supply of water sources of Bitahai is stable with little changes in water surface area, and water level remains almost constant.

- **Climates**

Lying amidst high mountains and deep valleys in the south-eastern extension of the Qinghai-Tibet Plateau, Bitahai Wetland is located in the horizontal zone of the subtropical climate and is characterized by the following features.

Bitahai is typical of western monsoon climate. Due to the impacts of the south-north parallel mountain terrains and atmospheric circumfluence, southerly and southwesterly winds overwhelm throughout the year. Dry and wet seasons are distinct, cutting between November to May as the dry

seasons of mostly clear days with ample sunlight reaching 1,505.7 h, or 69% of the annual total. But this season is dominated by snow cover. Distinct wet seasons last between May to November and are dominated by cloudy and rainy days with sunlight hours reaching 12% of the annual total. The season is typical of plateau climate of intense solar radiation. The annual sunlight averages 2,180.3 hrs. Annual temperature difference is insignificant whereas daily variations sharp. Long winter, absent summer and short spring and autumn is typical. The annual temperature averages 3.3ºC with lowest at -27.4ºC and highest at 25.6ºC. Cumulative temperature equal or greater than 10ºC totals 1,529.8ºC, lasting 122 days. Despite the characteristics of plateau climate, the area is warmer and more humid compared to similar elevations in the same region as a result of the regulatory impacts of the lake and adjacent forests. Relative elevation difference in Bitahai Nature Reserve is 979 m. Vertical zonal climates are distinctive, and characterized by two types of climate: temperate mountain, and temperate and warm mountain climate.

15. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, general land use, and climate (including climate type).

Geology and physiognomy of the catchment has been elaborated in the previous section. The catchment areas are largely dense alpine primary forests, totalling 2,000 ha. Soil distribution ranges from brown, dark brown and brown coniferous forest soils to sub-alpine meadow. Due to high elevation of the region, decomposing vitality of micro-organism is negatively affected by the cold climate, to some extent, which benefits accumulation of organic matters in surface soils. Consequently, content of organic matters in the soils adjacent the lake water is abundant. Total nutrient content is very high, whereas effective nutrients, especially rapid effective phosphorus is very low and pH stays largely between 5 and 6. pH of brown coniferous soil forests is strongly acidic at below 5. Electropositive is less than saturated, and cation exchange maintains intermediate or low. Landuse include forests and pastures. The climate belongs to western monsoon, but is distinctive of plateau climatic features (as described above).

16. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

Bitahai is a closed plateau fresh water lake that has been preserved intact. As one of the origins of the tributaries of the Yangtze River, Bitahai captures runoff from melting snow and rainfall and with stable supply of water sources, it plays a critical role in effective flood control and maintaining the equilibrium of water volume in the middle and lower reaches of the Yangtze River. Meanwhile, Bitahai Wetland is important in regulating and stabilizing regional climate changes. It nurtures special and intact habitats for abundant fauna and flora in the region, especially for *Ptychobarbus chungtienensis chungtienensis*. Besides, the ecosystems in Bitahai Wetland suffered little disturbances and have basically maintained its pristine status. Water accumulation in the lake sustains underground aquifers as an integral part of the underground hydrology. Good transparency and water quality shape part of the spectacular landscape of the plateau lake that possesses very high values for appreciation.

17. Wetland Types

a) presence:

Circle or underline the applicable codes for the wetland types of the Ramsar "Classification System for Wetland Type" present in the Ramsar site. Descriptions of each wetland type code are provided in Annex I of the *Explanatory Notes & Guidelines*.

Marine/coastal: A • B • C • D • E • F • G • H • I • J • K • Zk(a)

Inland: L • M • N • O • P • Q • R • Sp • Ss • Tp Ts • U • Va • Vt • W • Xf • Xp • Y • Zg • Zk(b)

Human-made: 1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • Zk(c)

b) dominance:
List the wetland types identified in a) above in order of their dominance (by area) in the Ramsar site, starting with the wetland type with the largest area.

Va, Xp, O, U

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18. General ecological features:
Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site.

Bitahai is wetland ecosystems composed of swamps, lake, wetland and the adjacent forest cover. High elevation differences led to the status of high speciation and endemism. In accordance with the classification systems established in *China Vegetation* and *Yunnan Vegetation*, six vegetation types such as alpine meadow, lake aquatic plants, hard evergreen broad-leaf forests, deciduous broad-leaf forest, warm coniferous forests and shrubbery are found in Bitahai; 11 vegetation subtypes i.e.sub-alpine meadow, sub-alpine swamp meadow, associations of emergent plants, floating-leaf plants, submerging plant, cold and warm montane hardwood evergreen broadleaf forests, birch forests, warm coniferous forests, warm and cool coniferous forests, temperate coniferous forests and temperate shrubberies, which can be further categorized into 34 formations and 49 associations. Elevation differences in the habitats created the ecosystems of alpine, sub-alpine temperate primary coniferous forests, alpine and sub-alpine meadows and plateau lakes. Common associations in Bitahai Wetland are sub-alpine meadow and sub-alpine swamp meadow that are dominated by species such as *Phlomis atropurpurea*, *Carex pleistogyna*, *Blysmus sinocompressus*, *Eleocharis louisiana, Deschampsia caespitosa, Sanguisorba filiformis*, *Kobresia capillifolia*, *Pedicularis longiflora var. tubiformis, etc.*. and important association of emergent plants, including plant communities that are dominated by following species *Hippuris vulgaris*, *Polygonum hydropiper*, *Glyceria tonglensis*, *Nymphoides peltatum*, *Myriophyllum spicatum*, *Potamogeton lucens*, *Potamogeton maackianus*, *Batrachium bungei*, etc. Indigenous natural floral associations in the adjacent zones are mainly temperate coniferous forests composed of spruce and *Abies spp.* distributed between 3,000 – 4,260 m asl. Dominant species include *Abies georgei*, *Picea likiangensis*, *Picea brachytyla var. complanata*, *Abies forrestii*, *A. forrestii var. smithii*, etc. The community associations are often composed of multiple strata enriched with a large number of species, covering *Rhododendrom spp.*, *Fargesia* spp., *Lonisira* spp., *Rosa* spp., *Sorbus* spp., *Gentiana* spp., *Primula* spp., etc. Common trees in the intermediate stratum include broadleaf trees of *Quercus* spp., *Acer* spp., *Betula utilis var. sinensis*. Shrubbery typically present in northern temperate coniferous forests is absent. As of today, no alien and invasive species have been found in the wetland ecosystems in Bitahai, making it one of the prime ecosystems. The lake water body is the habitat for *Ptychobarbus chungtienensis chungtienensis*, and the surrounding forests the resting sites for migratory birds. Along the shoreline, petals of *Rhododendron* spp. fall into the lake and become important food sources for fishes. Shoreline swamps are important wintering habitats for stork and many other migratory birds. Tiny fishes and shrimps, as well as aquatic plants provide major food sources for water birds. The repository of all organisms living in such habitats constitutes a stable food chain system.

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19. Noteworthy flora:
Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating,

e.g., which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS*.

Flora in Bitahai Nature Reserve is dominated by temperate elements with concurrent presence of tropical diversity. World wide-ranging species of Form, e.g. *Potamogeton lucens*, *Scirpus tabernaemontani*, *Alectoria virens Tayl* and *Phragmites communis Trin*, are found in the upper limits of distribution in the region. *Hippuris vulgaris*, another Form species of highest alpine distribution, are found in the lowest limit of distribution in the zone. Temperate floral elements totals as high as 362 genera, accounting for 70.2% of the total (568 genera) in the nature reserve, claiming conspicuous features of temperate flora, which differs significantly from those in other parts of Yunnan. Second to the temperate elements, are the genera distributed in the China-Himalayas Region that furnishes authentic evidence for the unique proximity between the Bitahai region and the Himalayas. Another outstanding feature of flora in Bitahai is highly concentrated endemism – there are 21 genera endemic to China but distributed in the nature reserve, taking up 8.64% of the total in China. Of the endemic genera, *Skapanthus* spp. is distributed only in this region. There are a total of 1,232 endemic species, or 54.2% of the total seed plant species in Bitahai Nature Reserve, of which, the important ones include *Acronema forrestii*, *Arenaria zhongdianensis*, *Gentiana chungdienensis*, *Lomatogonium zhongdianensis*, *Pedicularis zhongdianensis*, *Ranunculus zhongdianensis*, *Senecio chungtienensis*. This shows that the endemic elements of the genera in Bitahai Wetland Nature Reserve are dominated by more evolved ones, whereas the extent of floristic speciation remains pervasive, providing well-grounded evidence for the fact that Bitahai is located in one of the three centers of highest endemism in China – the new speciation and endemism center of Western Sichuan and Northwest Yunnan, whose biological diversity is particularly significant, both locally (in China) and globally.

20. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS*.

Fauna in Bitahai is prominent of the species in the Oriental Realm, especially those from its Southwest Region. Northern and southern fauna find their confluences here with outstanding features of vertical zonal speciation and abundant faunal endemism. Numerous endemic species or endemic species with very narrow distribution of the Hengduan Mountains are present. Vertebrates are characterized by small population, low quantity but high share of endangered and protected species. Of the mammals, there are *two* Grade I and *fourteen* Grade II national key protected species.

Amongst the most important fauna in Bitahai Wetland, birds and fishes take a noteworthy role. Most prominent in the fauna composition of birds and fishes are endemic elements of the Hengduan Mountains and the indigenous constituents, most of which are valuable, rare and endangered animals under various categories of national protection status. Important bird fauna include such plateau endemic species as *Grus nigricollis*, wide-ranging species as *Anas platyrhynchos, Podiceps ruficollis*, *Capella megala*, *Tringa totanus* and *Scolopax rusticola*, endemic species as *Tetrastes sewerzowi*, *Ithaginis cruentus*, *Psittacula derbiana*, *Prunella strophiata*, *Phoenicurus schisticeps*, *Phoenicurus auroreus*, *Garrulax maximus*, *and Phylloscopus pulcher*. And species with distribution in the Oriental Realm include *Ageithalos bonvaloti*, and *Phylloscopus proregulus* distributed in the Palaearctic Realm. All these birds of different faunal regions are species that rely solely on wetland or meadow for their survival.

21. Social and cultural values:

e.g., fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values.

Tranquil lake, fascinating wetland, colourful meadow mosaics as well as the unique landscape of "Green Mountains with half of the image inverted in a lake of crystal clear water" reflected from the forests in the mist, capture the adoration and aspiration of myriads of visitors. In Tibetan, "Bitahai" means "a lake as soft as yak felt". The spectacular scenery and biological diversity, the "soft" lake shapes an important and integral component of the tourism boom in Shangri La, and provides abundant resources for the livelihoods of the local communities and generates substantial economic income. On the other hand, rich tourism resources would benefit opening to the outside world and local socio-economic development, generating tremendous social benefits.

Tibetan is an ethnic nationality whose entire people have religious belief. In the traditional ethnic culture of the Tibetans, there are countless traditions and folklores that that treasure the care for nature and harmony with the nature. In Tibetan culture, high mountains with lush forest cover are religiously worshiped as "sacred mountains", vultures as "heavenly birds" and fishes are idolized as "divine fish" in the eight auspicious treasures. Tibetans possesses "human-earth perspectives" that advocate the harmony between human and nature. They believe that humans and animals are all lives of the natural world. In Tibetan, the term "animal" has twofold meanings of "life" and "nostalgia" that has nurtured the ecological ethics of the Tibetans to cherish life, to worship the nature, no killing and not eating fishes. In Bitahai and its adjacent communities, blending of the Tibetan culture and the nature is a very special trait of the region, which plays a very important role in nature conservation, especially for protecting wild animals. Besides, mysterious Tibetan culture is another highlight for tourism in the region that has rather high value for tourism.

Similar to Napahai and other wetlands in other parts of Yunnan, the wetland areas in Bitahai are not only isolated and scattered but also lack connecting water courses. Extraordinary endemism determines the fragility and instability of the ecosystems that deserve high values for scientific research. As one of the headwater zones of the upper reaches of the Yangtze River, sound preservation of the wetland area will contribute to mitigating natural disasters, e.g. floods in the lower reaches of the Yangtze River, and is critical for erosion control in the Jinsha River watersheds.

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22. Land tenure/ownership:

(a) Within the Ramsar site:

Within the scope of wetland areas, Bitahai covers the water body (172.47 hectares) and swamps and meadow (1,812.17 hectares). Bitahai Nature Reserve claims the sole property rights, management rights and users' rights of all the lands (*Forest Tenure Certificate No. 678, Zhongdian County of Yunnan Province*).

(b) in the surrounding area:

There are two types of landuse, namely, forests and pasture, in the surrounding area of the nature reserve. All the land within the nature reserve boundary is state-owned, and there are no remaining tenure disputes. Bitahai Nature Reserve claims the sole property rights, management rights and users' rights of all the lands (*Forest Tenure Certificate No. 678, Zhongdian County of Yunnan Province*).

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23. Current land (including water) use:

(a) within the Ramsar site:

There are no residents in Bitahai Nature Reserve.

(b) in the surroundings/catchment:

There are no residents in the surrounding area/catchment of Bitahai Wetland. Vegetation in the surrounding area and in the catchment are coniferous forests of *Abies* spp. and *Qurcus pannosa*, as well as pastures for grazing. All this vegetative cover is critical in conserving water, soil and maintaining the hydrological and environmental equilibrium in the Bitahai Wetland. Surrounding meadows are used for grazing and tourism activities. Production activities in the communities in the adjacent zone of the nature reserve are largely semi-husbandry and semi-agriculture. The majority of cash income is generated from collecting and selling *Tricholoma matsutake* mushroom, raising cows, selling diary products, e.g. cheese and barter, as well as providing horse riding services to tourists. All such resources uses pose threats on the Bitahai Wetland to various extents.

24. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

(a) within the Ramsar site:

Bitahai Wetland has been well managed, and so far there have been no destructive alterations and changes in patterns of resources use, nor development programs. Negative impacts on the wetland ecological characters is mainly the lack of research and monitoring equipment and facilities, which makes it impossible to conduct in-depth research and management of the conservation targets.

(b) in the surrounding area:

Presently, there are no ongoing activities inside the nature reserve that lead to degraded vegetation or erosion, and hence negative impacts on the wetland areas. However, along with the introduction of more open policies, various types of income activities are starting. Firstly, due to very good market sales of yak beef, local residents are rapidly developing animal husbandry. Most of the pastures in the adjacent zone of the nature reserve have been overgrazed. Especially in cold winters, large numbers of yak herds swarm into the nature reserve, posing too many difficulties on protected area management. Due to overgrazing and lack of adequate fallow lands, biomass and quality of pastures are declining, which directly affects the survival of wild herbivores. Secondly, along with improving transport roads and facilities, increasing poaching, fishing with explosives and collection of herbal medicines, etc. are disturbing and damaging the primary habitats of wildlife population. Thirdly, as one of the key scenic areas for tourism development in Shangri La County, visitors to the areas have been increasing. The surface vegetation is adversely affected by increased trampling of horses/carts, in a way, negatively impacting on ecology of the nature reserve. Fourthly, there are few technical staff in the nature reserve management agencies, insufficient funding and lack of necessary equipment and facilities posing as major constraints to the overall management of the nature reserve.

25. Conservation measures taken:

List national category and legal status of protected areas, including boundary relationships with the Ramsar site; management practices; whether an officially approved management plan exists and whether it is being implemented.

Bitahai has been approved by the People's Government of Yunnan Province as a provincial nature reserve since 1984. All the wetland areas are demarcated inside the nature reserve for protecting the extremely endangered fish species of *Ptychobarbus chungtienensis chungtienensis*. In order to implement effective nature reserve development and management, The Management Office of Bitahai Wetland Nature Reserve formulated clear management goals, covering baseline resources inventory, formulation of the master plan, building institutional structures, as well as developing the management plan of the nature reserve. These plans have been approved by the government of Yunnan Province. In accordance with the Management Plan, the nature reserve management agencies have implemented awareness education of the laws and regulations, including the Forest Law, the Pasture Law, the Wildlife Protection Law, the Nature Reserve Management Regulations, Wild Plant Protection Regulations, etc. Meanwhile, a number of large scale campaigns to track indiscriminate poaching and fishing have been conducted. Management efforts and patrolling

frequencies are intensified, which contributed to better regulated nature reserve management, and effective checking of wetland damages

26. Conservation measures proposed but not yet implemented:
e.g. management plan in preparation; official proposal as a legally protected area, etc.

In an effort to upgrade Bitahai Provincial Nature Reserve to the status of a national nature reserve, the Planning and Designing Institute of the State Forestry Administration, based on the achievements from the multidisciplinary comprehensive inventory carried out by scientists from Southwest Forestry College since 1998, formulated the Master Plan for Bitahai Provincial Nature Reserve in Yunnan in 2001. The plan was ratified by the Provincial Nature Reserve Evaluation Committee in March 2002, but was rejected at the National Nature Reserve Evaluation Committee; consequently, many of the conservation measures designed in the Master Plan were unable to be implemented. Subsequently, in order to enhance the protection of wetland resources and to resolve the conflicts between conservation and resources use, in 2004, Southwest Forestry College revised and improved the former Master Plan and reformulated the Master Plan for Bitahai Nature Reserve in Yunnan Province and the Master Plan for Ecotourism Development in Bitahai Provincial Nature Reserve. These plans innovatively proposed transport alternatives of battery-powered vehicles that are environmentally friendly than horse riding that is damaging the environment. The plan has passed the evaluation by the Provincial Nature Reserve Evaluation Committee in August 2004, and is now being revised for the final version.

27. Current scientific research and facilities:
e.g., details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

Research projects implemented in the nature reserve include:
(1) To conduct cooperative research with institutes, universities and colleges to build bases for research and field practice for educational purposes.
(2) Baseline resources inventory and the Master Plan organized and implemented by the Fifth Surveying Team of the Yunnan Provincial Forestry Department in 1982.
(3) Terrestrial wild animal inventory conducted by Kunming Institute of Zoology (KIZ), Chinese Academy of Sciences (CAS) in 1997;
(4) The multidisciplinary comprehensive Inventory of Bitahai Wetland Nature Reserve organized and implemented by Southwest Forestry College in 1998;
(5) The inventory of valuable, rare and endangered wild plants implemented in 2000;
(6) GEF-funded small research project kicked off in 2000 – Study on the environmental impacts of tourism in the nature reserve and the life behaviour of *Ptychobarbus chungtienensis chungtienensis*.
(7) Study on the Effective Conservation and Rational Use of *Ptychobarbus chungtienensis chungtienensis* implemented in cooperation with Kunming Institute of Zoology (KIZ), CAS in 2001;

Moreover, the nature reserve is an important base for research on the wetland ecosystems. There are tentative plans to conduct thematic studies on the valuable and rare wild animals and plants, spectacular natural landscapes, as well as the evolutionary history of the entire ecosystems.

The Bitahai Wetland Nature Reserve is equipped with patrol jeep and some simple observation and surveying equipment for daily bird watching. There are no means to conduct in-depth research projects, e.g. research on environmental change of habitats and biological traits of valuable and rare wildlife species. Moreover, there is no well-trained research and technical team in the nature reserve. A lack of specialized intellectuals who can stay reliably in the nature reserve for long term to implement research projects is obvious.

28. Current conservation education:
e.g. visitors' centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

The ecological services of Bitahai Wetland are very critical. Since the establishment of the nature reserve, government leaders at all levels have addressed great attention to learning of technical know-how and training of the management staff. In total, six person/times participated in training courses in protected area management, laws and regulations on social security, forestry economic and laws, etc.. Fifteen person/times joined in training courses for biodiversity conservation, social forestry, essentials and operational skills of computers. Through these training opportunities, the management capacity, research ability and over qualifications of the nature reserve staff were improved to some extent.

Publicity and awareness education is one of the effective approaches to promote the awareness of the general public towards wetland conservation. Since the founding of the nature reserve, the nature reserve management agencies, with the support of the government and forestry bureaus at all levels, conducted various forms of publicity and education activities. The TV and radio network is used to publicize all kinds of decrees, laws and regulations for nature reserve management and forestry development. Each year on the "National Bird Loving Day", education activities for loving birds are conducted. Efforts were also made to publish weeklies, e.g. *Ecology and Tourism*, *Green Homegarden*, etc.. More than 10,000 pamphlets and various types of publicity posters were printed and distributed. These efforts for publicity and education achieved substantial benefits, and the environmental and conservation awareness of the local residents adjacent the nature reserve have been strengthened to a certain level. Yet, due to the overall low education profile of the general public in the adjacent zones, despite the traditional awareness for nature conservation, a general lack of scientific knowledge for nature conservation is prevailing amongst the local population. Adding to a late start of the publicity and awareness education programs and low input in Bitahai Nature Reserve, infrastructures and needed equipment for publicity and awareness education are far from complete, and have not integrated into a systematic network. Constraints of limited funds also impeded the sustained implementation of the education and publicity activities at large scales. In particular, publicity and environmental education for ever increasing visitors and tourists is very much lacking.

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29. Current recreation and tourism:
State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

The pristine environment and scenery of Bitahai Wetland Nature Reserve have attracted a great number of visitors from home and abroad. The number of tourists is on the rise year by year, leapfrogging from 200 person/times to 15,000 person/times in 1996. In the subsequent three years, the number doubled annually, and reached an extraordinary high figure of 230,000 by 2002. Due to the lack of scientific planning and management, the number of visitors dropped to 100,000 person/times in 2003, and such a tendency continued into 2004. All tourism services inside the nature reserve are exclusively managed by the nature reserve agencies who allocate 25% of the revenue from admission for loan repayment and development fund of the nature reserve itself. The type of tourism belongs to mass sightseeing tourism, in which, tourists usually take horse rides to go around the Bitahai lake area for sightseeing and bird watching. Residents in the adjacent zones also provide homestay services for visitors.

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30. Jurisdiction:
Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept of Agriculture/Dept. of Environment, etc.

(a) The government agencies that are authorized with the jurisdiction over Bitahai Wetland Nature Reserve include the government of Yunnan Province, Diqing Tibetan Autonomous Prefecture and Shangri La County government; (b) The management sector who are authorized with rights for functional management of the nature reserve include the State Forestry Administration (SFA), Yunnan Provincial Forestry Department, Diqing Prefecture Forestry Bureau and Shangri La County Forestry Bureau.

31. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

The Management Office of Bitahai Nature Reserve is in direct charge of site management. The office is set up as part of and inside the Shangri La County Forestry Bureau in Diqing Tibetan Autonomous Prefecture. Mr. Wendong Ding is the director of the Management Office to take charge of the daily management and operation of Bitahai Wetland Nature Reserve.

32. Bibliographical references:

scientific/technical references only. If biogeographical regionalisation scheme applied (see 13 above), list full reference citation for the scheme.

1. *The Master Plan of Bitahai Nature Reserve*, the Inventory, Planning and Design Institute of the State Forestry Administration, March 2003.
2. *Report of the Multidisciplinary Comprehensive Inventory of Bitahai Nature Reserve*, Southwest Forestry College, etc., February 2002;
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5. *Lai Yang, Analysis of the Status Quo of the Distribution of Crane Species and Habitats in Yunnan Province.* International Crane Protection and Research, edited by Heilongjiang Provincial Forestry Department. China Forestry Publishing House, Beijing, 1990, P. 15~88.
6. Xianji Wen, Lai Yang and Xiaojun Yang, *Distribution of Water Birds in Plateau Wetlands of Yunnan.* Editor Yiyu Chen, *China Wetland Research*, Jilin Science and Technology Publishing House, Changchun. 1995 P. 248~255.
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8. Yan Xie , Study on the Biogeographical Regionalization Scheme of China. *Biodiversity and Conservation* , 13: P.1391~1471.
9. Yuming Yang, Biogeographical Regionalization of Yunnan Province (PhD. Dissertation).