CLP Report

Assessment and conservation of threatened bird species at Laojunshan, Sichuan, China

Submitted by

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To

Conservation Leadership Programme, UK

Contents

1. Summary

Laojunshan Nature Reserve is located at Yibin city, Sichuan province, south China. It belongs to eastern part of Liangshan mountains and is among the twenty-five hotspots of global biodiversity conservation. The local virgin alpine subtropical deciduous forests are abundant, which are actually rare at the same latitudes and harbor a tremendous diversity of plant and animal species. It is listed as a Global 200 ecoregion (WWF), an Important Bird Area (No. CN205), and an Endemic Bird Area (No. D14) (Stattersfield, *et al.* 1998). However, as a nature reserve newly built in 1999, it is only county-level and has no financial support from the central government. Especially, it is quite lack of scientific research, for example, the avifauna still remains unexplored except for some observations from bird watchers. Furthermore, the local community is extremely poor and facing modern development pressures, unmanaged human activities might seriously disturb the local ecosystem.

We conducted our project from April to June 2007, funded by Conservation Leadership Programme. Two fieldwork strategies were used: “En bloc-Assessment” to produce an avifauna census and ecological assessments; "Special Survey" to assess the conservation status of some threatened endemic bird species.

During our investigation, sixty-eight bird species, belonging to eight orders and nineteen families were recorded. Among these species, sixty-six are summer breeders, 54.4% are only located in the Oriental Realm and 45.6% are widely distributed in both Oriental and Palearctic realms. Birds of Timaliidae family are dominant in Passeriformes order while Phasianidae dominant in the other orders. The Shannon-wiener index (H) is 3.0996, species evenness (J) is 0.7133, and C index is 0.1160. There are over nine Chinese endemic bird species and at least three have strict range: Sichuan Partridge (*Arborophila rufipectus*, EN); Omei Shan Liocichla (*Liocichla omeiensis*, VU) and Emei Leaf-warbler (*Phylloscopus emeiensis*, LC). Sichuan Partridge and Emei shan Liocichla are common seen in Laojunshan. Moreover, one species and four species belong to the first-class and second-class of National Protected Animals respectively. We studied population density of Sichuan partridge

and Omei Shan Liocichla, and one nest for each species was found and reported in the Chinese Journal of Zoology with CLP acknowledged.

Most of the local people are extremely poor, and some nationalities, such as the Yi nationality, have the hunting traditions. Human activities, such as over grazing along the border of the reserve, heavily collecting medicine materials, edible bamboo shoots, mushroom and wild vegetable, pilgrimage to the summit and unmanaged tourism.

We conducted various community activities in local villages and schools and trained the rangers of the reserve with scientific research.

For its unique avifauna, its represent of rare virgin subtropical deciduous forests, and urgent community pressures, we believe that Laojunshan Nature Reserve should be uploaded to national level.

2. Study area

Laojunshan Nature Reserve (103°48′36″-104°05′24″E, 28°38′24″-28°51′00″N) is located at Pingshan County, Yibin City, south of Sichuan province, bordering northeast Yunnan province. It belongs to Liangshan mountains, an hotspot of world biodiversity conservation. It is the watershed of the Jinshajiang River and the Minjiang River, two branches of the Yangtze River.

The majority parts are at an altitude of 1100-2000 meters, with the summit of 2009 meters. Total area of the reserve is 10213.3 ha. Two core districts, separated by an tea farm and their distance is m. The main function of the reserve is to protect Sichuan Partridge and its typical habitat---virgin subtropical broadleaf forest.

Map of the Laojunshan Natural Reserve.

The climate of the reserve belongs to subtropical humid climate, with longer winter and shorter summer. Annual rainfall is over 1500 mm and 60% of which happens in summer. Mean annual temperature is 12-14.7 □, with extreme temperatures of 29□

and -10□.

The local vegetation is dominant by virgin broadleaf forest, including conifer-broadleaf forest and bamboo thickets. Because of the suitable climate, abundant rainfall, and steep topography, habitat and microhabitat are quite various.

The forest of the Laojunshan Nature Reserve at Erlangba.

3. Avifauna and conservation status of threatened species

In the virgin forest of Laojunshan Nature Reserve, we surveyed the density and richness of bird species using plot method and belt transect method nearly every moring from April to June 2007. Six trails was censused over 3-mo period spanning the breeding season. The cooperative venture entailed ≈ 18 person-months of effort. Conventional spot-mapping was the principal method used, but several additional methods were required to estimate the numbers of non-territorial and group-living species: direct counts of the nembers of mixed flocks, mist-netting, opportunistic visual registrations at fruiting trees, play back, etc. For some unfamiliar and similar birds, we recorded their calls and songs and playback for identificaiton. If necessary, we sampled blood of some species for later DNA analysis. While taking the census, we particularly focused on habitat requirement and breeding ecology of the threatened bird speices: Sichuan Partridge and Omei Shan Liocichla. We used playback method to census their density.

The team doing field work at Laojunshan.

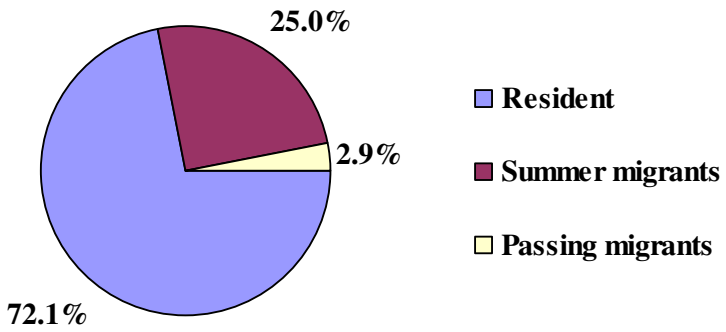

Fig.1. Avian community structure of virgin subtropical forest in Laojunshan Nature Reserve. Sixty-eight species recorded in April-June 2007.

Forty-nine resident species were found to hold territories in the plots. Seventeen additional species were detected as summer migrants and two species as passing migrants. Among these bird species, sixty-six are summer breeders, 54.4% are only located in the Oriental Realm and 45.6% are widely distributed in both Oriental and Palearctic realms. The Shannon-wiener index (H) is 3.0996, species evenness (E) is 0.7133, and C index is 0.1160. One species (Sichuan patridge) and four species (Temminck's tragopan, Silver pheasant, Wedge-tailed green pidgeon, Oriental scops owl) belong to the first-class and second-class of National Protected, respecitively.

There are nine Chinese endemic bird species in the project area and three have restricted-range: Sichuan partridge (EN); Omei shan liocichla (VU) and Emei leaf-warbler (LC). Twenty-four species in Timaliidae family, among which six are Chinese endemic, cover 44.4% of Passeriformes order (54 species recorded). Five species are in *Garrulax* genus, while three are Chinese endemic. High percent of endemic species in Timaliidae family, especially *Garrulax* Genus, means this are is the evolution center or origin of this family.

Table 1. Population data for 68 species recorded in Laojunshan Nature Reserve from April to June 2007.

1). Density grade was divided by the percent of one species in the total number of birds recorded, +++ means its percent over 10%, ++ means its percent between 1% and 10%, + means its percent is lower than 1%. 2). Microhabitat are classified as arboreal forest (**A**), shrub (**S**), bamboo thickets (**B**). 3). Social unit are classified as single (**I**), pair (**D**), group (**G**, more than two individuals). 4). **O** means this species only located in Oriental realm, **W** means this species widely distributed in Oriental and Palearctic realms. 5). □□□ means the first and second grade of national protected animal. 6). The line below one species means that it is Chinese endemic. 7□Residence type: R, S, P means residents, summer migrants and passing migrnats, respectively.

Species	Density grade	Micro-habitat	Social unit	Realm	Residence type
□.Galliformes					
(1). Phasianidae					
1.Sichuan patridge *Arborophila rufipectus*	++	A, S, B	I, D	O	R,□
2.Chinese bamboo patridge *Bambusicola thoracica*	+	B	D	O	R
3.Temminck's tragopan *Tragopan temminckii*	+	S, B	I, D	W	R,□
4. Silver pheasant *Lophura nycthemera*	+	A	I	O	R,□
□.Columbiformes					
(2).Columbidae					
5. Wedge-tailed green pidgeon *Treron sphenura*	++	A	I, D	O	R, □
□.Cuculiformes					
(3).Cuculidae					
6. Large hawk cuckoo *Hierococcyx sparverioides*	++	A	I	W	S
7. Oriental cuckoo *Cuculus saturatus*	+	A	I	O	S
8. Asian koel *Eudynamys scolopacea*	++	A	I	W	S
□.Upupiformes					
(4).Upupidae					
9. Eurasian hoopoe *Upupa epops*	+	S	I	W	S
□.Piciformes					
(5).Picidae					
10. Crimson-breasted woodpecker *Dendrocopos cathpharius*	+	A	I	O	R
11. Speckled piculet *Picumnus innominatus*	+	A	I	O	R
12. Bay woodpecker *Blythipicus pyrrhotis*	+	A	I, D	O	R
□.Apodiformes					
(6).Apodidae					
13. Fox-tailed swift *Apus pacificus*	+	A	G	W	S
□.Psittaciformes					
(7).Strigidae					

14. Oriental scops owl *Otus sunia*	+	A	I	W	R, □
□.Passeriformes					
(8).Corvidae					
15. Red-billed blue magpie *Urocissa erythrorhyncha*	+	A	G	W	R
16. Green treepie *Dendrocitta formosae*	+	A	I	O	R
(9).Muscicapidae					
17. Chestnut-bellied rock thrush *Monticola rufiventris*	+	A	I	O	R
18. Snowy-browed flycatcher *Ficedula hyperythra*	+	A	I	W	S
19. Slaty-backed flycatcher *Ficedula hodgsonii*	++	A	I	O	S
20. Rufous-bellied niltava *Niltava vivida*	+	A	I	O	S
21. Blue-throated flycatcher *Cyornis rubeculoides*	++	A, S	I, D	O	S
22. Grey-headed canary flycatcher *Culicicapa ceylonensis*	+	A	I	O	S
(10).Paridae					
23. Green-backed tit *Parus monticolus*	++	A, S	I, D, G	W	R
24. Yellow-cheeked tit *Parus spilonotus*	+	A	I	O	R
(11). Aegithalidae					
25. Black-throated tit *Aegithalos concinnus*	+	A, B	I, D	W	R
(12).Pycnonotidae					
26. Mountain bulbul *Hypsipetes mcclellandii*	++	A	I, D	O	R
(13).Zosteropidae					
27.Chestnut-flanked white-eye *Zosterops erythropleurus*	+	A	I	W	P
(14). Sylviidae					
28.Chestnut-headed tesia *Tesia castaneocoronata*	+	B	I	W	R
29.Brownish-flanked bush warbler *Cettia fortipes*	+++	A, S, B	I, D	W	R
30.Chestnut-crowned bush warbler *Cettia major*	+	A	I, D	W	R
31.Brown bush warbler *Bradypterus luteoventris*	+	S	I	W	R
32. Large-billed leaf warbler *Phylloscopus magnirostris*	++	A	I	W	S
33. Emei leaf warbler *Phylloscopus emeiensis*	+	A	D	O	R
34. Lemon-rumped warbler *Phylloscopus chloronotus*	+	A	D	W	S
35. *Seicercus soror*	++	A, B	I, D	O	S
36. *Seicercus tephrocephalus*	++	A	I, D	O	S
37. Chestnut-crowned warbler *Seicercus castaniceps*	+	A	I	W	S
(15).Timaliidae					
38. White-throated laughingthrush *Garrulax albogularis*	++	A	I, D, G	W	R
39. Red-faced liocichla *Garrulax formosus*	++	A	I, D	O	R
40. Rusty laughingthrush *Garrulax poecilorhynchus*	++	A	I, D, G	O	R
41. Elliot's laughingthrush *Garrulax elliotii*	+	B	I	W	R
42. Spotted laughingthrush *Garrulax ocellatus*	+	A	I	O	R
43. Streak-breasted scimitar babbler *Pomatorhinus ruficollis*	++	A, S, B	I, D	O	R
44. Rusty-cheeked scimitar babbler *Pomatorhinus erythrogenys*	+	A, S	I	W	R
45. Rufous-capped babbler *Stachyris ruficeps*	++	A, S	I, D	O	R
46. Red-billed leiothrix *Leiothrix lutea*	+++	A, S, B	I, D, G	W	R

47. Emei shan liocichla *Liocichla omeiensis*	++	S, B	I, D	O	R
48. White-browed shrike babbler *Pteruthius flaviscapis*	+	A	I, D	O	R
49. Blue-winged minla *Minla cyanouroptera*	++	A, S, B	I, D	O	R
50. Chestnut-tailed minla *Minla strigula*	+	S	I	W	R
51. Red-tailed minla *Minla ignotincta*	+	A	I	O	R
52. Golden-breasted fulvetta *Alcippe chrysotis*	++	A, S, B	I, D	O	R
53. Spectacled fulvetta *Alcippe ruficapilla*	+	S	D	W	R
54. Rusty-capped fulvetta *Alcippe dubia*	+	A	I	O	R
55. Dusty fulvetta *Alcippe brunnea*	+	S	D	O	R
56. Grey-cheed fulvetta *Alcippe morrisonia*	+	S, B	I, D	O	R
57. Black-headed sibia *Heterophasia melanoleuca*	+	A	D	O	R
58. Stripe-throated yuhina *Yuhina gularis*	+	S	D	W	R
59. White-collared yuhina *Yuhina diademata*	+	A, S	I, D, G	W	R
60. Striated yuhina *Yuhina castaniceps*	+	A	I	O	R
61. Pygmy wren babbler Pnoepyga pusilla	+	S	I	O	R
(16).Paradoxornithidae					
62. Grey-headed parrotbill *Paradoxornis gularis*	++	A, B	I, D	O	R
63. Golden parrotbill *Paradoxornis verreauxi*	++	S, B	I, G	W	R
(17).Nectariniidae					
64. Mrs Gould's sunbird *Aethopyga gouldiae*	++	A, S	I, D	W	R
(18). Motacillidae					
65. Grey wagtail *Motacilla cinerea*	+	B	I	W	P
66. Upland pipit *Anthus sylvanus*	+	B	I	O	R
(19). Fringillidae					
67. Common rosefinch *Carpodacus erythrinus*	+	A	I	W	S
68. Yellow-throated bunting *Emberiza elegans*	+	A	I	W	S

The most abundant species are Brownish-flanked bush warbler and Red-billed leiothrix. Densities of Sichuan partridge were estimated 3.5□5.5 males per square kilometre. The first two nests of this species were reported in 1992 and no report about its breeding ecology was available since then. On 8th May 2007, we discovered a nest of Sichuan partridge in Laojunshan Nature Reserve. The nest was built on the ground, inside the bamboo thickets, which appeared after the logging of broadleaf forest. The male was preyed near the nest and the female abandoned its nest. Five eggs were found in the nest and the study of embryo development showed they had been incubated at least ten days. This nest site indicated that Sichuan partridge might breed in the secondary and replanted forest in areas that was affected by logging.

Fig 2. Roosting site, nest site and nest of Sichuan patridge *Arborophila rufipectus* in Laojunshan Nature Reserve.

The Emei Shan liocichla was common in the shrub and bamboo thickets of the virgin forest at Laojunshan. No data of its breeding was available. On 9th May, we found one nest on a small shrub, with a clutch size of three. Unfortunately, the nest was preyed 15 days later.

The Emei Shan liocichla.

Fig 2. Nest site and nest of Emei shan liocichla *Liocichla omeiensis* in Laojunshan Nature Reserve.

We also found nests of Stripe-throated yuhina, Grey-headed parrotbill, Black-throated tit, Red-winged laughingthrush and studied their breeding ecology primarily.

Fig 3. Nest and fledglings of Stripe-throated yuhina *Yuhina gularis.*

Fig 4. Nest of Grey-headed parrotbill *Paradoxornis gularis.*

Fig 5. Nest of Black-throated tit *Aegithalos concinnus.*

Fig 6. Nest of Red-winged laughingthrush *Garrulax formosus.*

4. Habitat analysis

The main vegetation type is virgin subtropical deciduous broadleaf forest, mixed with shrub thickets, which covers over half area of the reserve. Other types include evergreen broadleaf shrub, coniferous forest, team farm, etc. Because of the suitable water and heat, vegetation could easily rehabitate, so secondary forests and replanted forest grow excellently. Because the reserve spans large altitude and is very steeply, vegetation changed evidently from the bottom to the up of the mountain. Both forest cover and shrub cover are over 40% in summer. Soil are over 10 centimeters thick.

Virgin subtropical broadleaf forest, mixed with bamboo thickets.

Bamboo thickets

Deciduous broadleaf shrub

Secondary forest, mainly made up of bamboo.

Team farms around the nature reserve.

5. Eccological assessment and community education

In the last century, conversion of forest to agriculture land and exploitation of forest for timber, fodder and fuel wood were the main threats to biodiversity in this region, thus most natural forest especially in lower altitude has already been cleared or degraded, the remaining virgin forest are only along the steepy ridge of the mountains and relatively accessible, still under pressure.

Most of the local people are extremely poor. The annual income of some farmers are lower than 120 US$ because many villages have no road and few water conservancy. No villagers live in the core area of the reserve. Farmers around the reserve depend much on the forest resources. From May to October each year, many of them enter into core areas of the reserve to collect medicine materials, edible bamboo shoots, mushroom and wild vegetable. These activities seriously disturb the breeding of many birds and decrease the plants resources. Moreover, some nationalities, such as the Yi nationality, have the hunting traditions. Local villagers have the custom of pilgrimage to the mountain summit. Even though the ceremony only happens on three days each year. It brings much pollution and fire alarms to the reserve.

The old women was collecting bamboo shoots in October 2007.

Fortunately, road construction would mainly be outside the reserve. Leaders of the

county have plans to develop tourism, such as hotel construction.

We conducted community activities in local villages and schools, such as bird watching, introduce knowledge of birds in primary schools, eg. game and stories, painting etc. The stickers, posters and T-shirts were donated to participants, especially teachers.

We also communicate with local institutions and organizations, such as tourism

companies, forestry agencies. For the rangers of the reserve, we invited them to attend our census and train them with ornithology research.

To the reserve office, we offered our conservation suggestions, such as building green corridors between two core districts of the reserve, wholly close the reserve in the breeding season of Sichuan patridge, scientific bird watching, planting logoes of animal protection, etc.

6. Outputs

Reports and Papers:

Until now, we have published two short papers in the Chinese Journal of Zoology with Conservation Leadership Programme been acknowledged:

1. Ji T., He Q. Q., Jiang Y.X., Li J.L., Feng Sh.L., Ling Zh.W. (2007) A short note on the nest of the Sichuan Partridge at Laojunshan Nature Reserve, Sichuan, China. Chinese Journal of Zoology 42 (4): 88. (In Chinese with English summary)
2. Jiang Y.X., Sun Y.H., Ji T., Li J.L., He Q.Q., Feng Sh.L., Ling Zh.W. (2007) A nest note of the Emei Shan Liocichla (Liocichla omeiensis) at Laojunshan Natural Reserve, Sichuan, China. Chinese Journal of Zoology 42 (5): 130. (In Chinese with English summary, and two photos)

A report in Chinese has been sent to Laojunshan Nature Reserve, which giving information suggestions for making more appropriate policy.

Benefits to local communities: Through the project conducting and the interviewing with the local peoples, the environment conservation has been publicized, and some potentiality and managing policy of rational Eco-tourism and Eco-exploring will be decided in the future.

Conservation awareness and Education/Training: In the project conducting, extensive presentation and posters of environment protection and avian knowledge have been carried to students of local primary schools. Many rangers and managers have been participated into surveying and been trained with methods of scientific research

Some pictures: As following.

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