

Pheasants in sacred and other forests in western Sichuan: their cultural conservation

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Abstract Buddhism and local cultural traditions have long protected wildlife species and their habitats in Tibetan-dominated areas of western Sichuan. In Daocheng County, the White Eared-pheasant (*Crossoptilon crossoptilon*) has been afforded special protection by local people because it is conspicuous and white, a color with special symbolism for Buddhists. This and other cultural reasons have led to pheasants and forests benefiting in some areas. Pheasants were found during surveys between January 2003 and June 2004 in forests with varying degrees of local (non-formal) protection. However, there were significant signs that these traditional attitudes were changing in the face of three particular pressures brought to bear by better roads, improving access to and from the rest of China. The first was the development of a significant local demand for the Chinese caterpillar fungus (*Cordyceps sinensis*), which is much sought after throughout East Asia and mushrooms. Second, and more recent, is a dramatic increase in tourism from major Chinese cities, bringing non-Tibetan values into Daocheng County and changing the local attitudes to all animals. And then, there is a rise in income of the local population, resulting in a higher timber demand for building big houses, which impact all wildlife in the forest, but local attitudes to sacred forests have been retained so far in spite of this increased timber demand. Lessons should be learnt from the impact that unregulated tourism at Chonggu monastery, the most visited area in the county, has on the surrounding forests so that other sacred and non-sacred forests can best be protected for the long term. The alternative is that several Tibetan Plateau Galliformes, currently considered non-threatened because of their extensive distribution in a remote area, cannot be guaranteed such a healthy future.

Keywords cultural conservation, Tibetan, Buddhism, wildlife, White Eared-pheasant, *Crossoptilon crossoptilon*

Introduction

There are about 300 species of Galliformes in the world of which 25% are threatened with extinction (IUCN,

2011). About 20% of the global Galliformes have been recorded in China, which is home to more pheasant and threatened pheasant species than any other country (Fuller and Garson, 2000) and thus ensuring the survival of species there is a global priority.

The habitat of most Chinese pheasants consists of forest and shrub of various types (Cheng, 1978), which have suffered substantially throughout many parts of

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the country because of degradation and deforestation. Although much conservation attention on this group of birds has, understandably, concentrated on the species that are found on the IUCN Red List (Fuller and Garson, 2000; BirdLife International, 2001; IUCN, 2011), the loss and degradation of forested habitats is likely to have resulted in the fragmentation of populations of many non-threatened species as well. Some species in non-forest habitats are also likely to have suffered habitat loss because of increasing human activities, such as livestock grazing. Some pheasant populations in habitats close to farmland are also thought to have declined because of increased use of pesticides in areas where they forage (Zhang et al., 2003). Hunting is another significant reason for the decline in pheasant populations (Zheng and Wang, 1998). They have been hunted, along with other wildlife species, in most areas of China because of their big size and colorful feathers.

Within China there are several regions that are especially important for threatened pheasants, concentrated in south-west and central China (Ding and Zheng, 2000). These include the Tibetan plateau and the adjacent Hengduan mountains, which contain major portions of the geographical range of several threatened species (Ding and Zheng, 2000). In the western part of this region, on the high plateau, the human population is predominantly Tibetan. They practise Buddhism and, therefore, do not kill birds, fish or mammals, apart from livestock; killing and eating animals is a sin in their culture (Sang, 2003). In some areas, even eating eggs is not allowed in local cultural traditions (Nan, 2001). Furthermore, many Tibetans feed the wildlife that occurs around their habitation and prohibit hunting activities (Sang, 2003). The consequence is that the wildlife is deliberately conserved through these beliefs and traditions. In the area around some monasteries and in other areas where local culture is strong, even logging may be forbidden so that forests, as well as the wild animals, are well conserved (Nan, 2001). Numerous areas within this landscape are considered “sacred” by the indigenous Tibetans and Hindoos of this region, who interact with these sites in ways potentially beneficial to conservation (Alemmeren et al., 2003; Ashalata et al., 2005; Jan et al., 2007). The sacred sites are found in habitats with

greater species richness, diversity and endemism than randomly selected non-sacred sites (Sang et al., 2003; Danica et al., 2005; Jan et al., 2007). However, times are changing and increasing access to many previously remote areas has opened up new opportunities for travel and business. In western Sichuan (and other areas in this part of China), this appears to be producing two new types of pressure. As with many developing sites in China, the increased wealth in urban areas and access to overseas markets is affecting rural traditions. First, improved access to these high elevation areas allows greater access to their natural resources and in China, as well as other parts of eastern Asia, medicinal and other health-promoting products are especially sought after. Second, increasing disposable income in towns and cities is leading to much greater domestic tourism to many destinations that were previously rarely visited by outsiders.

Against this background of ever declining habitat and pheasant populations and new and increasing pressures, a better understanding of the relationship between pheasants, forests and the impact of local traditions may offer insights into their long-term survival prospects. As such, it may suggest ways of conserving pheasants and other wildlife and their habitats without formal legal protection, if this information is gathered and acted upon quickly. The aim of this study was, therefore, to provide background information on the current status of pheasants in a part of Ganzi Prefecture, western Sichuan by: a) surveying forests, including those that are protected by local people, to determine the presence of pheasants; b) assessing the protection status of the forests and describing pressures on the pheasants and their habitats and c) identifying changes in the traditional way of life of the local population.

Methods

Study area

Fieldwork was carried out in Daocheng County, Ganzi Prefecture, which lies in the high plateau of western Sichuan Province, southwestern China. Given the dramatic topography, solar radiation varies substantially

according to aspect and slope of mountainsides. These features, together with elevation, also determine the vegetation present. The sites surveyed were between 3100–5100 m in elevation. Between 3100–3700 m, the forest is dominated by alpine pine (*Pinus densata*) on both north-facing and south-facing slopes. At elevations between 3700–4300 m, the forests are dominated by hollyleaf-like oak (*Quercus aquifolioides*) on south-facing slopes and rhododendron (*Rhododendron fastigiatum*), Balfour spruce (*Picea likiangensis*) and Chinese larch (*Larix potaninii*) on north-facing slopes. Above 4300 m, the area is dominated by meadows, subalpine shrubs and scree. Since the rural population in Daocheng County has traditionally cut trees for their own needs and then allowed regeneration, the forests are of different secondary successional stages. In some cases, the topography resulted in poor forest regeneration and so now there is grassland below the tree-line, whereas naturally it would only occur in alpine areas. There are some untouched primary areas far away from human habitation, which have long been just too remote to suffer human impact.

In 2002, there were 5656 families and 28413 people living in Daocheng County, of which 93.81% are ethnic Tibetans (Daocheng County Government, 2004). The income of Tibetan families arises mainly from stock-rearing, producing milk and collecting Chinese caterpillar fungi (*Cordyceps sinensis*) and other mushrooms. In recent years, some have started to earn money from manual labor, such as building roads and through starting their own businesses, but their proportion is very low. Now, Daocheng is becoming well known throughout China because of an increasingly popular tourist destination, Yading, in the south of the county. This is a Buddhist pilgrimage site (Rock, 1931) that has now become a recreation park and is also a national nature reserve. Each year, more and more tourists are attracted to Daocheng when visiting Yading.

Field survey method

Determining pheasant presence

Thirteen sites were surveyed in Daocheng County

between January 2003 and June 2004 (Table 1; Fig. 1). These sites were selected as reportedly suitable for pheasants and some of them benefited from various forms of traditional protection. Taken together, the suite of sites was designed to allow description of all levels of protection afforded to forests that still contained pheasants. Five of them were forest sites close to monasteries and of these, three were actively protected by monks (Zhujie, Zhalang and Xiongde), one was considered by local people to be sacred and hence also little disturbed (Chonggu, which is in Yading) and one, not considered special, was not afforded any cultural protection (Benbo). A further three were considered by local people to be sacred and so disturbance was minimal (Suochong, Sangdui and a site east of Daocheng). Four other forests did not benefit from any special cultural consideration (Shengmu, Xiepo, Julong and Gewa) and neither did the final site (Wumingshan), a subalpine meadow-shrub site.

Two sites were surveyed in the summer and the others in winter (Table 1). Transect length varied according to the size of the habitat patch and as well as with accessibility. During both seasons surveys were carried out each day along existing forest trails and by walking through the habitat between 08:00 and 19:00 hours. The trails that were walked were small forest paths and so had not altered the habitat significantly. When walking along each trail, all calls, sightings, dropped feathers, recognizable droppings or evidence of kill were recorded.

Gathering information on local livelihoods and recent changes

A total of 12 months was spent living in Daocheng during the 18 months of the study, based at Zhujie Monastery (Wang, 2005) and living with local people. This afforded the opportunity to learn in detail about their traditions, sources and level of income and how these changed. In addition, information was gathered on changes in lifestyles, the pressures on pheasant species and their habitats and their protection. Additional information was gathered during the field surveys when interviews with people working in their fields and di-

Table 1 Dates of survey at each site in Daocheng County, Ganzi Prefecture, Sichuan Province, southwestern China

Site No. ^a	Site name	Survey period
1	Zhujie Monastery	Jan.–Mar. 2003
2	Suochong	Jan.–Mar. 2003
3	Zhalang Monastery	Nov.–Dec. 2003
4	Xiongdeng Monastery	Nov.–Dec. 2003
5	Benbo Monastery	Nov.–Dec. 2003
6	Chonggu Monastery	Jun. 2004
7	Sangdui	Nov.–Dec. 2003
8 (N)	Shengmu (N)	Nov.–Dec. 2003
8 (S)	Shengmu (S)	Nov.–Dec. 2003
9	East of Daocheng City	Nov.–Dec. 2003
10	Xiepo	Nov.–Dec. 2003
11 (N)	Julong (N)	Nov.–Dec. 2003
11 (S)	Julong (S)	Nov.–Dec. 2003
12	Gewa	Nov.–Dec. 2003
13	Wumingshan	Jun. 2004

^a N: north-facing mountain; S: south-facing mountain. This also applies to Tables 2 and 3.

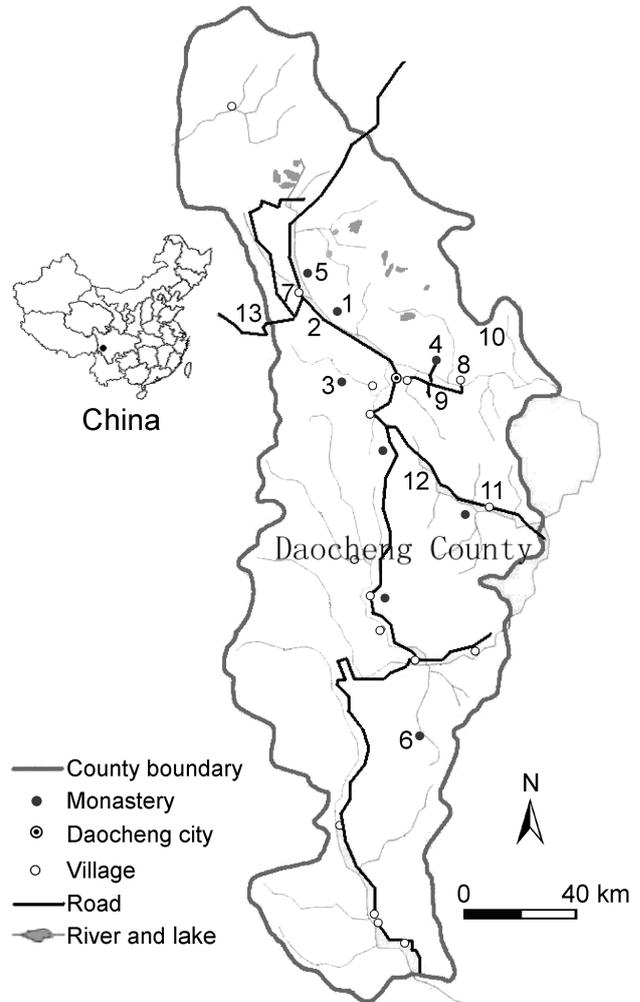
rect observations gave further insight into pressures on pheasants and other wildlife, their habitat and the protection accorded them.

Current and potential impacts of tourism were briefly assessed by direct observation and by interviewing tourists, local people and local government officials. About 200 local people, 80 tourists and 20 officials of the Daocheng Forestry Bureau and the Daocheng government were interviewed. The information of local traditions on wildlife conservation, sources and level of income, changes in lifestyles and pressures on pheasants, as well as the attitudes of tourists on local culture and wildlife, were selected for a brief assessment.

Results

Pheasant species present

Eight species of pheasant and partridge were recorded: the White Eared-pheasant (*Crossoptilon crossoptilon*), the Blood Pheasant (*Ithaginis cruentus*), the Buff-throated Partridge (*Tetraophasis szechenyii*), the Koklass

**Fig. 1** Map of survey sites. Numbers refer to sites listed in Table 1.

(*Pucrasia macrolopha*), the Tibetan Snowcock (*Tetraogallus tibetanus*), the Tibetan Partridge (*Perdix hodgsoniae*), the Chinese Grouse (*Tetrastes sewerzowi*) and the Common Pheasant (*Phasianus colchicus*). All eight were recorded during line transect surveys (Table 2). The seventh, the Chinese Grouse, was recorded in Suochong outside the transect area. The White Eared-pheasant and Blood Pheasant were found at 11 sites in oak and conifer forests above 3500 m, with the White Eared-pheasant recorded most frequently. The Buff-throated Partridge, the Tibetan Partridge and the Chinese Grouse appeared in the forest at an elevation of 3700 m, i.e., above the pine forest. The Koklass and Common Pheasant were only observed in the pine forest close to

cultivation below 3700 m. The Tibetan Snowcock was only heard at about 5000 m in the subalpine shrub-meadow site. Of note were about 500 White Eared-pheasants recorded on farmland, adjacent to forests in Suochong and about 80 observed in similar situations at Shengmu. Groups of Blood Pheasants were also seen in farmland at Suochong. Local people reported up to 1000 White Eared-pheasants in the farmland of Xiepo, although such large groups were not recorded during our transect surveys.

Local attitudes to pheasants and forests

In Daocheng County, the conservation of wildlife is mainly focused on the White Eared-pheasant because of its special place in Buddhism. This special affinity is because the bird is large and showy and also because it is white, which has a special meaning for Buddhists. It symbolizes life and is witnessed in the snow-capped mountains, glaciers, clouds, sheep, milk, butter and elsewhere, all of which are seen as good things. In addition, after an avalanche, Tibetans especially worship white. In other words, the essence of nature is seen in white, a color symbolizing righteousness, goodness, nobility and holiness (Xiama, 2002).

Some of the sites surveyed are considered sacred forests and are protected by monasteries or through local culture of a nearby village (Table 3). In these areas, pheasants lived in the forest without disturbance. Local people believe that killing the White Eared-pheasant is a sin and that the bird may bring them good luck. The local people at all sites visited, where these birds are found, gave them food and prohibited all hunting activity (i.e., including other pheasants and other wildlife). Although some tree stumps were seen in Benbo and Sangdui, in the sacred forests (Zhujie, Zhalang, Xiongdeng, Benbo, Chonggu, Sangdui and east of Daocheng City), all close to villages and monasteries, logging was prohibited, which provided the pheasants with undisturbed habitats. Compared to the White Eared-pheasant, the local people paid little attention to other pheasant species, which also meant that there was no negative effect.

In Daocheng, the Tibetans do not use pesticide to in-

crease production, considering that killing life, including pests and mice, is sinful. They allow White Eared-pheasant and other pheasants to forage on farmland except during the crop sowing period. As a result farmland near forests attracted large groups of White Eared-pheasant and Blood Pheasants.

Pressures on pheasants

The collection of plants and mushrooms for medicinal and culinary purposes has increased markedly over the last 10 years. There are two specialties from this area: the Chinese caterpillar fungus and mushrooms (*Tricholoma matsutake*). Both occur on the ground and hence the villagers search the forest floor for them.

The Chinese caterpillar fungus is one of the most valuable medicinal fungi in East Asia. It is well known as an important, nourishing tonic that has been used as a treatment for many ailments for hundreds of years. In China, it occurs in Sichuan, Qinghai, Tibet and Gansu provinces, where it is found between 3000–5100 m elevation (Guo et al., 2003). It is composed of a parasitic fungus and its host, the larva of *Hepialus armoricanus*. It develops by parasitizing caterpillars, kills the caterpillars in the autumn and then forms hypha that mature outside the caterpillar the following spring (Guo et al., 2003).

The Chinese caterpillar fungus is collected by local people from late April to the beginning of June, i.e., the period when female White Eared-pheasants are nesting. By this time, the villagers had sown their crops and so some members of each family had free time to collect the fungus. They say that they spend entire days collecting the fungus or even several days at a stretch, staying overnight in the forest. Collection is concentrated in conifer forests, shrubs and meadows between 3700–4800 m and results in nests of pheasants being disturbed. When nests are found, the females leave them and although the people do not collect the eggs, nest predators such as crows are attracted to the nest by the people moving about.

Mushroom collection takes place in oak forests from July when chicks of White Eared-pheasant are present. As with the collection of the Chinese caterpillar fungus,

Table 2 Rates of encounter of pheasants at each site (number of birds per km).

Species	Detection method	Site No. ^a														
		1 (39.1 km)	2 (36.4 km)	3 (8.4 km)	4 (3.8 km)	5 (9.7 km)	6 (13.6 km)	7 (3.2 km)	8 (N) (16.2 km)	8 (S) (6.9 km)	9 (6.4 km)	10 (4.3 km)	11 (N) (21.8 km)	11 (S) (19.1 km)	12 (22.5 km)	13 (7.9 km)
White Eared-pheasant	Sightings	5.06	3.90	5.34	8.14	8.14	0.59	20.94	7.65	0.43	1.88	0.23				
	Feathers	40.10	3.92	5.11	3.61				2.90	0.87	1.41	0.70	0.37			
	Calls						0.37	0.94				0.47	0.05	0.05		0.04
	Kills									0.14	0.16					
Blood Pheasant	Sightings	2.17	1.59			1.55		6.88	0.49					0.31		3.33
	Feathers					0.10	0.07					0.37				
	Kills					0.10			0.06							
	Calls						0.29							0.05		
Buff-throated Partridge	Droppings	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Sightings					0.31	0.29			1.45		0.50			0.13	
	Feathers					0.31	0.07			0.72					0.09	
	Calls						0.07		0.06							
Koklass	Kills		0.03											0.05		
	Sightings													0.09		0.04
Common Pheasant	Sightings													0.21		0.18
	Calls															
Tibet Snowcock	Calls															0.13
Tibet Partridge	Sightings	0.26	0.05	1.43	0.53					0.43						

^a Below the site number is the transect length at each site, placed in brackets. ✓: appeared.

Table 3 Habitat type, pheasant species and types of pressure on pheasants at each site

Site No.	Name of area	Type of forest	Size (km ²)	Elevation range (m)	Source of protection	Pheasant species recorded	Pressure
1	Zhujiu Monastery	Oak and shrub	10	3900–4400	Monastery	White Eared-pheasant, Blood Pheasant, Buff-throated Partridge, Tibetan Partridge	Disturbance of nesting females by pigs, logging in adjacent non-conserved oak shrub
2	Suochong	Spruce, larch, rhododendron	5	3850–4400	Local culture	White Eared-pheasant, Blood Pheasant, Buff-throated Partridge, Tibetan Partridge, Chinese Grouse	Disturbance of nesting females by Chinese caterpillar fungus collectors, logging
3	Zhalang Monastery	Larch forest	1	3900–4400	Monastery	White Eared-pheasant, Blood Pheasant, Tibetan Partridge	None
4	Xiongdeng Monastery	Oak shrub	2	4000–4400	Monastery	Tibetan Partridge	None
5	Benbo Monastery	Oak, spruce forest	>20 (continuous forest)	4100–4400	Monastery	White Eared-pheasant, Blood Pheasant, Buff-throated Partridge	Disturbance of nesting females by pigs
6	Chonggu Monastery	Virgin spruce, oak forest	>20 (continuous forest)	3900–4400	Local culture	White Eared-pheasant, Blood Pheasant, Buff-throated Partridge	Tourism
7	Sangdui	Oak forest	>20 (continuous forest)	4100–4400	Local culture	White Eared-pheasant, Blood pheasant	None
8 (N)	Shengmu (N)	Spruce, larch forest	>20 (continuous forest)	3700–4400	None	White Eared-pheasant, Blood Pheasant, Buff-throated Partridge	Disturbance of nesting females by Chinese caterpillar fungus collectors, logging
8 (S)	Shengmu (S)	Oak and shrub	1	3800–4400	None	White Eared-pheasant, Buff-throated Partridge, Tibetan Partridge	Disturbance of pheasant habitat by logging
9	East of Daocheng City	Larch	3	3800–4400	Local culture	White Eared-pheasant, Blood Pheasant	Disturbance of nesting females by Chinese caterpillar fungus collectors
10	Xiepo	Virgin spruce	>20 (continuous forest)	3700–4300	None	White Eared-pheasant, Blood Pheasant	Disturbance of nesting females by Chinese caterpillar fungus collectors, logging
11 (N)	Julong (N)	Pine, spruce, larch, rhododendron, oak	>20 (continuous forest)	3100–4200	None	White Eared-pheasant, Blood Pheasant, Buff-throated Partridge, Koklass	Disturbance of pheasant habitat by logging and forest fires
11 (S)	Julong (S)	Pine and oak	>20 (continuous forest)	3100–3700	None	White Eared-pheasant, Blood Pheasant, Common Pheasant	Disturbance of pheasant habitat by logging and forest fires
12	Gewa	Oak and spruce	>20 (continuous forest)	3500–4400	None	White Eared-pheasant, Blood Pheasant, Buff-throated Partridge, Koklass, Common Pheasant	Disturbance of pheasant habitat by logging and forest fires
13	Wumingshan	Subalpine shrub and meadow		4700–5200	None	Tibetan Snowcock	Disturbance of pheasant habitat by yak browsing

members of each family spend a long time searching the forest floor for mushrooms. It appears to affect brood rearing of pheasants much less than the collection of Chinese caterpillar fungus affects nesting. When villagers encounter pheasants they try to avoid disturbing them.

Although some forests close to monasteries and villages in Daocheng County are well conserved because of religious sentiment, tree-felling does take place in large areas of forests that are not protected by any such sentiment. The felled trees are used for house building, decorating rooms, heating and cooking. The size and level of decoration of houses is increasing as more families become wealthy because of the sale of caterpillar fungi and other mushrooms.

Previously, logging of the oak forest for charcoal was a serious issue. Now, this activity has ceased because of legislation by the local government. Logging for fuelwood now occurs mainly in shrubs and forests close to villages and pastures, not protected by cultural traditions. Trees are used for house building and are mostly from forests with relatively big trees and which are far removed from areas under management by the local government. The trees selected for house building and interior decoration are spruce and larch. Loggers always make a fire to warm themselves in the forest and cook on it in the wild; villagers report that this has resulted in many forest fires during the last 50 years.

In Daocheng, livestock, such as sheep, yak and pigs, browse in all available forests, which is permitted, even in forests that are protected by local traditions. The livestock also grazes in shrub patches and grassland below 5000 m. When the yak move around they soften the soil, which attracts pheasants to feed at the forest edge near pastures during the winter when the livestock has been removed. However, livestock, mostly pigs, also may cause the destruction of nests of the White Eared-pheasant. In addition, there may be significant disturbance to the pheasants by livestock which occupy all of their habitats at some time or other during the year. When grazing their animals far away from the villages, the local people make fires for warmth and cooking. Occasionally this leads to forest fires.

The Chonggu Monastery lies in one of the most

important cultural areas of Daocheng, i.e., Yading and contains a large area of virgin forests. This has been designated a forest park seven years ago. The Chonggu Monastery reportedly attracted White Eared-pheasants in previous years, but now they are only found far from paths. More than 50000 tourists visit the park and monastery each year.

Changing local livelihood

With the development of the economy in Daocheng County, traditional land use is changing (Table 4). Previously, the income of each family was derived mainly from yak herding and particularly the sale of milk products and, to a lesser extent, some animals. The income was low and so most local people lived in houses that were more than 40 years old. Few families had large houses. In the past 10 years or so, the income of the local population has increased mainly through the collection of the Chinese caterpillar fungus and mushrooms and from undertaking manual work in developed areas. At the same time, logging for timber to build new houses and for fuel wood has increased considerably.

During the past 10 years, the price of the Chinese caterpillar fungus has increased dramatically, causing the people of Daocheng to search for and collect them. Local traders say that the Chinese caterpillar fungus is mainly sold to the eastern provinces of China, such as Beijing and Guangdong. Mushroom collection has also appealed to local people over the past 10 years. The mushrooms are mainly exported to Japan at high prices. Now, the collection of Chinese caterpillar fungi and mushrooms has become the main income-generating activity of the local people from late April to August which is the breeding season for pheasants.

As the income from fungus and mushroom collection has increased, tractors have become more common in pastures. This allows farmers to have larger production of livestock for sale at markets and, as a result, they have more time to devote to increase the production of milk from their yaks. The result is that yaks are now found in all subalpine shrub and grassland areas except the steepest slopes.

Tourism is the big change in land use at all sites with

Table 4 Changes of local land-use of each site since the 1990s

Site code	Site name	Traditional land-use	Changes in the use of land
1	Zhujie Monastery	Protected land, some livestock grazing,	Tourism, mushroom collection
2	Suochong	Some livestock grazing,	Increased logging for house building, Chinese caterpillar fungus collection
3	Zhalang Monastery	Protected land	Tourism
4	Xiongdeng Monastery	Protected land, some livestock grazing,	Tourism
5	Benbo Monastery	Some livestock grazing,	Tourism, increased logging for house building, mushroom collection
6	Chonggu Monastery	Protected land	Tourism, Chinese caterpillar fungus/mushroom collection
7	Sangdui	Protected land	Mushroom collection
8 (N)	Shengmu (N)	Some livestock grazing	Increased logging for house building Chinese caterpillar fungus collection
8 (S)	Shengmu (S)	Some livestock grazing	Increased logging for fuelwood
9	East of Daocheng city	Protected land, some livestock grazing	Chinese caterpillar fungus collection
10	Xiepo	Some livestock grazing	Increased logging for house building, Chinese caterpillar fungus collection
11 (N)	Julong (N)		Increased logging for house building and fuel wood
11 (S)	Julong (S)		Increased logging for house building and fuel wood
12	Gewa		Increased logging for house building and fuel wood, mushroom collection
13	Wumingshan	Some livestock grazing	Increasing livestock, Chinese caterpillar fungus collection

protection and all the sites without tourism are the ones without protection (Tables 3 and 4). In more recent years, Daocheng has become famous for its Buddhist pilgrimage site at Yading. In the past, the habitat of the nature reserve was preserved by local people because of their admiration of the three snow-capped mountains and much primary forests remain in the area. The Chonggu Monastery, located in a tourist area, is surrounded by undisturbed forests, dominated by spruce and larch. Local people report that previously the white eared-pheasant always used to visit the monastery, but are now not seen at all.

The travel industry is well-developed in Yading and large numbers of tourists visit the monastery every day, especially in May (the May holiday) and October (the national holiday). During our survey of the forests close to the monastery and along the tourist route in June,

we did not record a single White Eared-pheasant. They were found only 1 km away from the monastery, where six were seen in a virgin forest close to the tree line. During our survey along the tourist route, White Eared-pheasant calls were heard from the forests far away and two were seen about 500 m from the path. This contrasted sharply with the close proximity of birds at other monasteries.

The travel industry is starting to become established in all of the monasteries surveyed. However, few people visit these monasteries, apart from the Chonggu Monastery, because of bad roads and hence, serious disturbance from tourism has not yet affected these monasteries and their surrounding habitats.

Previously, the Tibetans here saw the killing of fish, birds and wild animals as a sin; nobody was allowed to catch and eat them, even those that were domesticated.

More recently, local people in tourist destinations and Daocheng City have started to accept the lifestyle of tourists and others from non-Tibetan areas. Although they still practise Buddhism, they accept that animals are the food of tourists. In Daocheng City and the villages close to Yading, the local people, apart from elderly villagers, accept the consumption of fish, chicken and rabbits. Some of them also eat animals themselves and some local youths catch fish for food or for selling to restaurants. In contrast in some villages, far away from travel sites such as Sangdui and Suochong, local people maintain their tradition of conserving wild animals and stop the catching of fish and the killing of wild animals. The monks in Zhujie monastery do not even eat eggs, considering it to be the killing of chicks.

In Daocheng County, most of the restaurants are managed by non-Tibetans. Tourists are the main customers in the restaurants, especially during the holidays in May and October. In order to accommodate the taste of the tourists, fish, chicken and rabbits are often used to attract them, regardless of the consumption of the animals being considered a sin in the local Buddhist culture. Reportedly, all of the fish for sale in restaurants is caught in the rivers of Daocheng and nearby counties by fishermen using nets and poison. Rabbits and chickens, sold in restaurants, are domestic.

Discussions with tourists revealed that most of them did not know the Tibetan philosophy towards wildlife conservation. They tended to taste the local food made from the animals and do not share the consciousness that Tibetans see killing birds, fish and wild animals as a sin. Those involved in tourism do not tell and local people say that they do not mention this since they wish to appear friendly to the tourists.

Large skins of leopards and otters now often appear as dress items, compared with the small pieces of skin previously used as decoration on clothing. Interestingly, the local people do not make the connection between skin and the killing of animals and so, having such decorative pelts, is not a problem for them. Animal skins for clothing is one of the main items of expenditure by local people and tourists always seem to enjoy the spectacle of clothes made from skins. This has resulted in local people becoming proud of showing their clothes.

In Daocheng City, ten leopard skins were reported to have been on sale to local people in 2004 (Zouping Yuan pers. comm.).

Discussions with the officers of local government revealed that they were of both Tibetan and Han nationality. Most of them follow the 'modern' way of life and are losing the traditional lifestyle. They eat fish, rabbits and chicken in restaurants and some of them were disposed towards hunting before it became illegal. They said that their emphasis was now to make tourism the mainstay of the local economy and are prepared to meet all the demands of tourists in order to attract them to Daocheng. They accept the changes in the local culture towards wildlife conservation.

Discussion

Status of pheasants

Of the pheasants we recorded in Daocheng County all, except the Tibetan Snowcock, primarily inhabited forests and their adjacent areas below 4700 m (Cheng, 1978). Information from elsewhere suggests that while none are globally threatened species (the White Eared-pheasant and Chinese Grouse are Near-threatened: IUCN, 2011), they are of the highest national conservation concern, with a general lack of detailed information on which to determine precisely their up-to-date conservation status. There is little information on the population status of these species or the pressures that may affect their long-term survival on the Tibetan Plateau and in the Hengduan mountains. Indeed, surveys in southwestern China are considered a high priority in the 2000–2004 IUCN/WPA *Pheasant Action Plan* (Fuller and Garson, 2000).

The very recent and ongoing changes in the cultural conservation of these species and their habitats in the Tibetan areas of western Sichuan may indicate a significant change in their conservation prospects both locally and more widely.

The White Eared-pheasant is native to the southeast Tibetan Plateau and Hengduan mountains (Cheng, 1978). It has been listed in Appendix I of CITES and the Second Class of State Protected Animals of China

(Zheng and Wang, 1998). From elsewhere, there is information on its habitat use and breeding biology (Li et al., 1965; Li et al., 1976; Jiang, 1979; Gema et al., 1999; Jia et al., 2004; Jia et al., 2005a, 2005b, 2005c; Tang et al., 1996; Wang et al., 2005a, b). The Blood Pheasant is listed in the *China Red Data Book of Endangered Animals* as Vulnerable and as a National Second Class Protected Species (Zheng and Wang, 1998). The Buff-throated Partridge is listed in the *China Red Data Book of Endangered Animals* as Vulnerable (Zheng and Wang, 1998) and is native to the Hengduan mountains (Cheng, 1978). The Chinese Grouse is listed in the *China Red Data Book of Endangered Animals* as an Endangered species and as a National First Class Protected Species (Zheng and Wang, 1998). Some work has been conducted on its status (Sun, 2000), natural history (Sun, 1997) and habitat selection (Li et al., 2005). The Koklass, in contrast, has a substantial global distribution extending from Afghanistan in the west, along the Himalayas and into China, where it is widespread (Cheng, 1978; Lu, 1991). The Common Pheasant is also a widely spread species in Asia, extending to southeastern Europe (Cheng, 1978; Lu, 1991). The Tibetan Partridge occurs along the Himalayas and on the Tibetan Plateau (Cheng, 1978). There is little known about its ecology in detail apart from descriptions of its habitats (Cheng, 1978; Lu, 1991). The Tibetan Snowcock is listed in the *China Red Data Book of Endangered Animals* as the National Second Class Protected Species (Zheng and Wang, 1998). It is endemic in the Tibetan Plateau and Hengduan mountains, where it occurs at elevations between 3000 and 6000 m (Cheng, 1978). There is some information on its habitats and breeding ecology (Li, 1965; Cheng, 1978; Zheng and Pi, 1979; Huang et al., 1990; Liu and Wang, 1990; Lu, 1991; Ma et al., 1991).

The White Eared-pheasant has a special position in local culture because of its white color and size and is the favored bird among the local population. Other pheasants were encountered less frequently than the White Eared-pheasant during our survey and local people did not show interest in them as they were not thought to be colorful. The religious and cultural sentiment is the main reason why the regions inhabited by Tibetan people have large animal populations and

high animal diversities (Ma, 2004). Hence, local culture is the umbrella under which pheasants and other wildlife are being conserved in Daocheng. In eastern China, the use of pesticides on farmland decreased the population of wildlife including some pheasant species in nearby areas (Wang et al., 2004; Zhang et al., 2003). Traditional agriculture in Daocheng does not allow the use of pesticide to increase production. Hence, farmland provides a compatible foraging habitat for the White Eared-pheasants and other pheasants living in the adjacent forest, especially in the winter.

Pressures on forests and pheasants

The traditional way of life of the people of Daocheng County led to few, if any, pressures on wild animals. In Daocheng County, before laws were introduced to promote wildlife conservation, local culture was well matched to achieve it. Increased wealth from business, mainly the commercial exploitation of caterpillar fungi and mushroom has benefited many people in Daocheng. With increasing wealth has come a desire for a higher standard of living, as evidenced from bigger houses and more animal skins in their clothing. Although local people conserve White Eared-pheasant directly through feeding and by forbidding hunting, they do not take a holistic view of its conservation. Logging was observed in large patches of forests that are not under local cultural protection. In Daocheng, the traditional house style of Tibetan families is a two-story building, made of stone and wood. In recent years, the need for timber increased as the income of local people has risen and they are seeking to build larger houses; when they become wealthy, the first thing they want to do is to have a big house. A traditional house was about 20 m × 20 m and its size tends to become larger with increased family income. The supports and roof of a house are made of wood, which come from felled trees. At the same time, big houses also results in many trees and shrubs being cut for fuel wood and forest fires.

Changes in the way of life of local people

The traditional way of life of the people of Daocheng County led to few, if any, pressures on wild animals.

In Daocheng County, before laws were introduced to promote wildlife conservation, local culture was well matched to achieve it. However, there was some hunting, mainly by non-Tibetans who carried out business or were office workers in county towns. Increased wealth from business, mainly the commercial exploitation of caterpillar fungi and mushrooms has benefited many people in Daocheng. With increasing wealth has come a desire for a higher standard of living, as evidenced from bigger houses and more animal skins in their clothing.

With the improvement of roads into the county, Daocheng has been opened up to the people from other cultures and this is eroding the traditional way of life. Local government policy is to increase tourism into this area and this speeds up the loss of local values as the tastes and preferences of visitors are catered to. At present most of this is evident in Chonggu Monastery and nearby areas where tourists come in large numbers. Although the impact from tourism has not yet affected the habitat and wildlife in other monasteries yet, improved traffic conditions by local people will attract more and more tourists to the monasteries. The challenge now is to learn lessons from Chonggu quickly so that the forests and wildlife surrounding other monasteries may retain their cultural protection.

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四川西部神山中的雉类：当地传统文化对雉类的保护

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摘要: 在四川西部藏族地区, 佛教和当地传统文化长期以来保护了当地的野生动物及其栖息地。在稻城县, 由于白色在佛教中具有特殊的象征意义, 白马鸡 (*Crossoptilon crossoptilon*) 也因此受到当地人的重点保护。由于类似的文化因素, 当地的雉类以及一些森林得到了保护。2003年至2004年, 我们在稻城县境内一些受到不同程度保护的地区对雉类开展了调查。调查发现, 由于公路改善, 当地与外界的交通变得畅通, 与此同时保护野生动物的传统正在面临3个方面的压力。首先, 当地采挖虫草和松茸量大幅增加, 它们主要销往中国东部地区。第二, 近年来旅游业蓬勃发展, 游客主要来自东部大中城市, 他们将外来价值观引入稻城, 改变了当地人对所有动物的态度。第三, 由于当地居民收入增加, 他们消费更多木材用于建造大房屋, 这严重影响了当地野生动物赖以生存的森林环境, 但是当地人对于神山的崇拜却很好地保护了其中的森林。冲古寺位于稻城县吸引人的旅游区内, 周围为森林环境, 无序的旅游业对它的影响较为严重, 而其他未开发旅游的神山和非神山地区长期以来却未收到这种影响。很多分布于青藏高原的雉类, 由于主要分布在偏远地区, 濒危程度较低, 但随着这一地区的社会 and 经济发展, 将来的保护形势可能会变得严峻。

关键词: 文化保护, 藏族, 佛教, 野生动物, 白马鸡, *Crossoptilon crossoptilon*