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CHAPTER 9

THE EFFECTIVE MANAGEMENT OF RESERVES FOR THE CONSERVATION OF THE GIANT PANDA

By

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ABSTRACT

The Giant Panda (*Ailuropoda melanoleuca*), endemic to China, is the most famous flagship species for the conservation of biodiversity in the world. For the conservation of the Giant Panda, the Chinese government has set up more than 50 natural reserves, within which more than 60% of Giant Pandas live. Panda reserves have been playing a main role in conservation efforts. The main problems facing panda reserves include their isolation and habitat degradation and fragmentation. The upsurge of tourism has become a big threat to some panda reserves, as well as loss of critical habitat in river-stream areas. Wildlife poaching is still threatening to the Giant Panda within and outside reserves. Poor local communities whose living relies on natural resources put a significant pressure on the effective management of panda reserves. Poor equipment and facilities for protection, such as patrolling and poor capacity for conservation, are the main constraints for the effective management of the panda reserves. Reserve networking, habitat restoration, community-based conservation, monitoring and patrolling, and capacity-building are the key actions for the effective management of the panda reserves.

Key Words: conservation, flagship species, Giant Panda, reserve

INTRODUCTION

The Giant Panda (*Ailuropoda melanoleuca*), endemic to China, is the most famous flagship species for the conservation of biodiversity in the world. The giant panda occupies the Bashan-Qinling and Minshan-Qionglai eco-regions in the forest of the upper Yangtse River,

which the Worldwide Fund for Nature (WWF) has recognized as a global conservation priority (Olson & Dinerstein 1998; Bo *et al.* 2006), and which holds some of the richest biodiversity in the world. The Giant Panda was listed in the first category for protection by the Chinese central government in 1962, and the first four protected areas specifically for the protection of the Giant Panda were created in 1963.

The first national panda survey was conducted by the Chinese government during 1974 to 1977, and it reported that there were about 2462 pandas in the wild (Hu 2001). During 1985 to 1988, the Forestry Ministry of the People's Republic of China and WWF cooperatively conducted the second national survey of the giant panda and developed the "National Conservation Management Plan for Giant Panda and its Habitat". It estimated that there were about 1114 pandas in the wild (Ministry of Forestry & WWF 1989). The estimated figure at that time might be lower than the real population because some areas under logging were not surveyed. The most recent national panda survey, finalized in 2003, reported that there where about 1596 pandas in the wild within a habitat area of 2,304,991 ha (State Forestry Administration 2003). Logging and poaching are the main threats to the survival of the Giant Panda, but the Chinese government has been enforcing the anti-poaching law since 1980 so cases of panda poaching are not as bad as before. Habitat degradation and fragmentation remain the main threats to the survival of the Giant Panda.

Since 1980, WWF has been involved in the efforts for the conservation of the Giant Panda. I joined WWF in 1997 and became the Panda Conservation Program Coordinator in 2000. Establishing and managing panda reserves is the main approach for the conservation of the Giant Panda in China, and is also the focus of WWF's Panda Conservation Program. It is recognized that there is a crucial need to evaluate the existing panda reserve system to guide future decisions and effective management. The objectives are to: (1) provide information on the conservation status of the existing panda reserves; (2) examine problems that threaten or limit the implementation of conservation goals; and (3) establish priority actions for the effective management of panda reserves. The data sources are mainly from the third national panda survey and from my direct data collection. The third national panda survey was cooperatively conducted by State of Forestry Administration and WWF, and I was the project coordinator on behalf of WWF.

The Giant Panda is distributed in the Minshan Mountains in Sichuan and Gansu Province, Qionglai Mountains in Sichuan Province, Qinling Mountains in Shanxi Province, Liangshan Mountains and Xiangling Mountains in Sichuan Province. The Minshan mountains support the largest sub-population. The second largest sub-population is in Qionglai where Wolong Reserve is located (State Forestry Administration 2003). Since the setting up of the first four panda reserves in 1963, 51 panda reserves had been established (Table 1) by 2005, with 66.7% of the reserves established after 1990, and 35.3% established after the 1999 logging ban (Fig. 1). The population of the Giant Panda within reserves and the panda habitat area within reserves were about 64% and 49% of the total. Since the logging ban, all other panda habitat outside panda reserves has been under protection as Natural Forest Protection Areas.

Liangshan used to support the third largest sub-population. According to the Second National Panda Survey, there were 155 pandas in Liangshan (Ministry of Forestry & WWF, 1989), about 14% of the total. The recent estimate of the panda population in Liangshan was only 115, about 7% of the total (State Forestry Administration 2003). In contrast to other mountains such as Minshan, where about 72% of the pandas and 64% of the panda habitat were within reserves, there were only 23% of the pandas and 30% of the panda habitat within reserves in Liangshan.

Table 1. Basic Information on Panda Reserves

Mountains	**Reserve No[a].**	**Reserve Area(Hm^2)**	**Habitat area(Hm^2)**	**Panda No.**	**Administration[b]**
Qinling[c]	N. 4	171864	86631	160	SFA & PF 1; PF 2; LF.1
(352914,	P. 6	97671	42978	12	LF 6
275)	L. 1	12611	12557	28	LF & PF 1
Minshan[c]	N. 6	411494	251527	179	SFA & PF 1; LG 1; PF & LF 3; PF 1
(960313,					
708)	P. 15	557836	323168	316	PF & LF 11; LG 1; LF 3
	L. 2	170848	39242	13	LF 2
Qionglai[c]	N. 2	239039	145524	181	SFA 1; PF & LF 1
(610122,	P. 4	129061	90904	68	PF & LF 4
437)	L. 1	160732	3825	3	LG 1
Xiangling[c]	N. 1	406900	1519	2	PF & LF 1
(161230,61)	P. 3	101685	64850	26	PF & LF 3
Liangshan[c]	N. 2	46114	33526	16	PF & LF 2
(220412,115)	P. 4	131326	33126	11	PF & LF 3; PE & LG 1
Total	**N. 15**	**1275411**	**518727**	**538**	**SFA 1; SFA & PF 2; PF &.LF 7; PF 3; LG 1; LF 1**
	P. 32	**1017579**	**555026**	**433**	**PF & LF 21; PE & LG 1; PF 9; LG 1**
	L. 4	**344191**	**55624**	**44**	**PF & LF 1; LG 1; LF 2**
Sum	**51**	**2637181**	**1129377**	**1015**	**SFA 1; SFA & PF 2; PF 3; PF & LF 29; LF 12; PE & LG 1; LG 3**

a: N. means national level; P. means provincial level, L. means local level.

b: No. of reserves governed by State Forestry Administration (SFA), or provincial forestry department (PF), or local forestry sector (LF), or local government (LG), or provincial environmental sector (PE).

c: (panda habitat area, panda number)

There were four milestones for the setting-up of the panda reserves (Fig. 1.). One was in 1963 just after the promulgation of the statute that listed the Giant Panda for the first category of protection. The second was during 1978-1979 just after the first national panda survey, when eight panda reserves were set up. The third was in 1993 just after the National Conservation Project for the Giant Panda and Its Habitat launched in 1992; 12 panda reserves were ratified

in 1993. The fourth was during 2001-2005 after the Natural Forestry Protection Project was launched in 2000; 17 panda reserves were ratified. The later reserves were established, the less the panda habitat area and panda numbers they contained, which meant that further habitat degradation occurred outside panda reserves as time passed. On average, there was one panda for every 1000 ha habitat area within reserves set up before 1991, 0.77 pandas within reserves set up after 1990, and only 0.41 pandas within reserves set up after the logging ban. Although the area of the reserves set up after the logging ban was 31.1% of the total reserve areas, the panda habitat area within the reserves set up after the ban was just 20.9% of the total panda habitat area within all the reserves, and the panda number was only 9.6% of the total pandas within all the reserves.

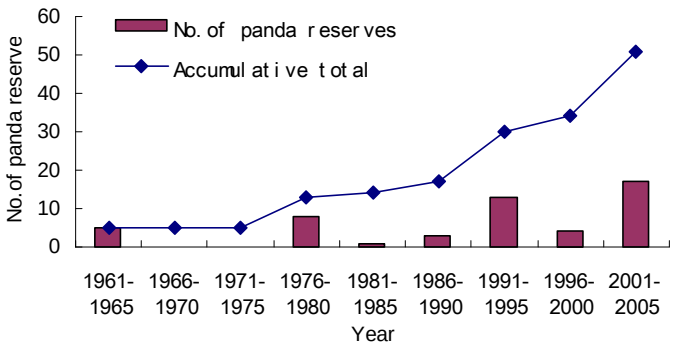

Figure 1. Panda reserves set up in different years

PROBLEM ANALYSIS OF THE PANDA RESERVE SYSTEM

The National Conservation Project for the Giant Panda and Its Habitat According to the Statute of Protected Areas called for no logging, grazing, herb medicine harvesting or other economic activities for local people, which meant that such kinds of activities had to move to the area surrounding the reserve. This situation led to the isolation of the reserve and increased habitat fragmentation because of the over harvesting and exploitation in the area surrounding the reserve. In addition, before moving out of a reserve, logging would often be badly conducted within the newly established reserve.

The establishment of a reserve was usually over-emphasized, while the effective management of the reserve was often neglected. For example, Xiaohegou Reserve was ratified as a provincial panda reserve in 1993. But no protection activities were taken in the reserve, and it was still managed by a logging enterprise for logging. It became a “paper reserve” for ten years. In fact, many reserves set up in 1993 became paper reserves for many years while logging continued.

Some key areas were not under effective conservation just because they contained fewer pandas. The setting-up of a panda reserve was usually panda-oriented. More pandas mean higher priority for panda reserve establishment. Some critical areas for the survival of the Giant Panda were neglected, such as the areas along roads, which were usually constructed along rivers. In many cases, such key areas were further degraded because of the infrastructure for reserve establishment.

he impact of logging remained one of the main problems and would last for many years. Habitat degradation and habitat loss because of logging, particularly for the reserves

established after 1990, and the isolation because of the surrounding degradation, were the main impacts. Baixiongping (the name means “White Panda Ground”) in Tangjiahe used to be good habitat for the Giant Panda. After several years of logging before setting up the reserve, only bamboo was left and the panda occasionally came for grazing. A flood in 1992 ruined the remaining bamboo and the panda habitat has completely disappeared since then. More than half of the habitat areas were badly logged in the reserves set up after 1990, and only bamboo was left in many logged areas, especially in the reserves set up after logging ban. Habitat loss would continue to occur in such logged areas like that in Baixiongping.

After the logging ban, tourism became one of the main alternatives in the panda range. More than half the panda reserves were ratified as National Scenery Areas or National Forest Parks for tourism. Jiuzhaishan was a famous model for tourism. More than 1 million tourists came to the reserve every year, and over 20 thousand tourists came per day during midseason. According to the estimate in the second time national survey, there were seven pandas in Jiuzhaigou Reserve (Ministry of Forestry and WWF 1989). In the recent panda survey, it was estimated there were only two pandas at most.

As a world famous reserve and the model of panda reserves, Wolong Reserve also faced tourism as one of its main management issues. The tourism road from Wolong to Sigunianshan had separated Wolong Reserve into two parts. This road was established along the Pitiao River, the main river through the reserve. According to the reserve zoning, the area along the road was to be utilized as an experimental zone and buffer zone, and tourism mainly occurred in this area and then expanded to the surrounding areas. A similar situation has occurred in most panda reserves: roads were established along rivers and streams; and the road-river areas were designated as experiment zones or buffer zones which faced the highest pressure from human activities. The river system was the critical corridor area for the giant panda, but the road-river system separated areas for the giant panda and led to habitat loss and habitat fragmentation. Although the relative intensity of the overall impact on landscape structure, the forest cover, was lowest along roads compared to other human disturbance (Zeng *et al.* 2005), roads did be the outstanding threat to panda reserves because they were the hard obstacles for pandas’ interaction and accessing to stream habitats. Afforestation might increase the forest cover along road, but it replaced the primary habitat and was unsuitable for the Giant Panda.

Poor local communities whose living relies on natural resources put a big pressure on the effective management of panda reserves. After the logging ban, the pressure grew even larger. More human activities were carried out in panda habitat for collecting mushrooms and medicinal herbs, grazing, poaching, mining, and so on. Although poaching did not threaten to the Giant Panda so badly as before, poaching for wildlife was still a big threat to Giant Pandas. Li. *et al.* (2000) reports that there were 52 panda skins confiscated from illegal trade during 1987-1998. In fact, the real figure was much higher than that, particularly during 1980s and the early years of 1990s when the international “panda heat” drew more and more attention. Take Pingwu county for example, at least 20 pandas were poached during 1985-1989, and there were 48 cases of panda illegal trade during 1990-1993 (Yu 1998). Poaching was usually

aimed at other wildlife such as takins, serows and musk deer, but pandas would sometimes become the victims. Because it was very difficult to find wildlife outside reserves, reserves became the focal areas for poaching. The upsurge of tourism in recent years stimulated the markets for wildlife products. During 1999-2004, there were 20 panda skins confiscated in China among which 6-10pandas were poached in the wild (Table 2). In 2003, one 6 years old panda was shot near Wolong Reserve just for its "bear's paw". Because the Giant Panda is very rare, poaching would increase the extinction possibility (Yu 1998; Li 2003).

Table 2. Numbers of the Giant Panda skins confiscated in China during 1999-2004

Year	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**
Pandas	10	1[a]	5	2	2	1

a: a panda dead of snare found in the wild

The disadvantage of the current reserve investment system was another problem for the effective management of panda reserves. Most of the funds for panda conservation were invested in "Model reserves" such as Wolong and to infrastructure. National reserves could get substantial funds for infrastructural investment, but little or no management funds were available for most of the panda reserves including most of the national panda reserves. Infrastructure-oriented investment strategies led to more and more buildings but less relevant conservation activities. Most of the panda reserves had relatively very good buildings but very poor equipment and facilities for direct protection activities such as patrolling.

Lack of sound monitoring and evaluation system would confuse or mislead the goal for panda reserve management. Lü *et al.* (2003) develops a framework for evaluating the effectiveness of protected areas and uses the framework for a case study of Wolong Reserve. The methodology is based on a questionnaire survey among human communities living in the reserve. The main conclusions include that the protection of Giant Pandas is the most effective, infrastructure for environmental education is least effective, the basis for scientific research is the poorest one. But the real situation was that it was really hard to say the protection of Giant Panda in the wild was effective although the captive breeding was "the most effective". WWF had support Wolong for panda monitoring and patrolling during 1999-2002 and the results stated that poaching and habitat degradation were badly threatening the Giant Panda. Other research also states that the habitat in Wolong is degraded (Liu *et al.* 2001). As for the infrastructure for education and the basis for scientific research, Wolong was in fact the richest reserve in China. Every visitor would be impressed by the well-invested infrastructure and research basis. The misleading results meant that the questionnaire survey was of uncertainty and of subjectivity.

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15 corridors were planed in the "National Conservation Management Plan for Giant Panda and its Habitat", but the corridor plan was not implemented and most of the corridor areas were concentrated with roads, infrastructures, settlements, and other human activities (Gong & Yu 2003). The destruction of the corridor area led to the fragmentation and isolation among habitats and reserves.

CONCLUSIONS AND RECOMMENDATIONS

As one main component of the Natural Forest Protection Project by the Chinese government, the logging ban has been practically implemented in the whole panda range since 1999. It removes the biggest threat, logging, from panda habitat. In fact, the biggest contribution to the conservation of the Giant Panda is the logging ban, not the establishment of reserves. More than half the panda reserves are set up or launched from paper reserves after the logging ban. Through more than 40 years development, panda reserves have occupied the core areas and covered about half of the panda habitat. About 64% of the wild giant panda live in reserves. The effective management of panda reserves is crucial for the conservation of the Giant Panda.

One important issue for the effective management of panda reserves is how to scale up the conservation from a collection of separate reserves to an integrated landscape managed to benefit the giant panda. Reserve networking, both structural networking and functional networking, is the key. A structural network should include linking different reserves through corridors, buffer zones and Natural Forest Protected Areas. Management should include the coordination and integration of the conservation activities among different reserves, such as the collaboration and integration of anti-poaching, panda monitoring and patrolling. Such a Structural & Functional Reserve Network demands the effective integration of panda reserves with Natural Forest Protection Areas where more than half the panda habitat and potential habitat are located. Meanwhile, the network also needs to be integrated into the local and regional land-use planning and sustainable management. Separate management means fragmentation and isolation.

Habitat restoration is another important issue, particularly in the reserves set up after the logging ban and in the areas along rivers and streams that are usually the corridor and key areas for the survival of pandas and other wildlife. The river-stream system plays a critical role for ecosystem integration and ecological processes. But the importance of the river-stream system is neglected and is exposed to the human activities with the most negative impacts on pandas, such as roads, tourism, dams and so on. Tree plantations are usually not the most suitable method for habitat restoration, but would often lead to further destruction because of the clear-cutting strategy for tree growth. Removing the threats to pandas should be the priority for habitat restoration.

It is a big challenge to alleviate the conflict between conservation and development and identify the alternatives for sustainable development. Eco-tourism is one tool for community-based conservation and sustainable development. The current situation is that too many tourists are coming to some famous reserves such as Jiuzhaigou, Huanglong and Wolong, and the benefits for the local people are very small. Sustainable eco-tourism should be strategically planned and the benefits should go to the local communities by encouraging the participation of the local people. Participatory patrolling and monitoring should become routine work for the effective management of panda reserves.

The investment for panda conservation should be equalized and preferentially go to some poor but very important panda reserves such as those in the Liangshan landscape, and to relevant conservation activities such as patrolling and monitoring, capacity building, reserve networking, habitat restoration and community-based conservation.

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