

# Human behaviors influence fragmentation and degradation of Panda habitat in Wolong Nature Reserve, China



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## habitat in Wolong Nature Reserve, China

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### Abstract

The Wolong Nature Reserve is a nature reserve set especially for the preservation of pandas. However, in recent years timber harvesting reduced the quantity and quality of forest land in Wolong Nature Reserve. Fuelwood collection is one significant factor to cause habitat fragmentation and deforestation, especially in developing countries. The number of local residents in the reserve increased from 2560 in 1975, to 4260 in 1995.<sup>(5)</sup> The timber harvesting sites were becoming closer to a suitable panda habitat. The absence of giant panda in 913 field plots was evaluated. The frequency of panda absence in newly harvested forests was 3%, while frequency in unharvested forests was 36%.<sup>(2)</sup> The fragmentation and deforestation of Panda habitats caused a decrease wild pandas' population, from 145 in 1974, to 72 in 1986.<sup>(4)</sup> Results indicates that fuelwood collection and timber harvesting had a significant influence on the Panda habitat. Although, habitat connectivity had a slight increase because of the introduction of the Natural Forest Conservation Program in China, the regeneration of forests in Wolong nature reserve still face the challenges of human behavior and climate change. More studies are needed to determine how the deforestation caused by human behaviors, habitats, and increasing human population, will affect the population of giant pandas.

### Introduction

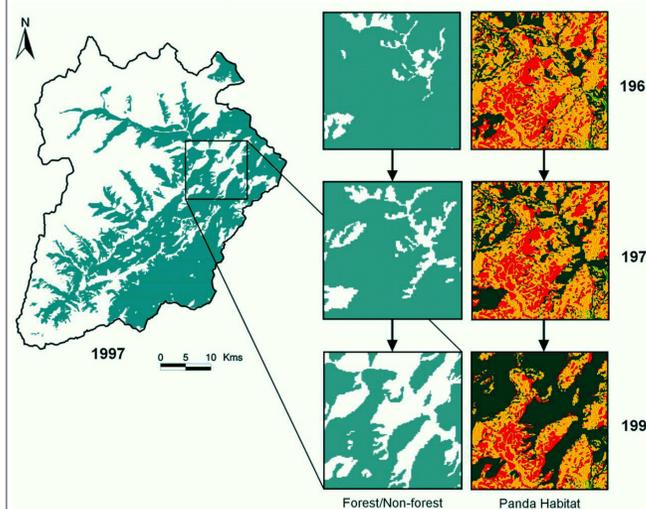


A mom and a cub in Wolong reserve, China  
PHOTOGRAPH BY AMI VITALE, NATIONAL GEOGRAPHIC CREATIVE

Giant panda (*Ailuropoda melanoleuca*) is native to China. The diet of the giant panda is over about 99% of bamboo.<sup>(3)</sup> As a result of timber harvesting and farming, the natural habitats for the giant panda are facing degradation.<sup>(5)</sup>



The Wolong Nature Reserve, China was mainly set up to protect the giant panda in 1963 with about 20000 hectares of land, and in 1975 the reserve was further expanded.<sup>(10)</sup> The reserve is also a home for about 5000 residents and more than 6000 species.<sup>(8)</sup> Based on the data of China's 3rd national giant panda survey, about 150 wild pandas are living in the Wolong Nature Reserve.<sup>(6)</sup> However, the reserve is facing the challenge of deforestation. In order to protect the forestss and habitats for animals, China introduced the Natural Forest Conservation Program in 1998.<sup>(11)</sup>

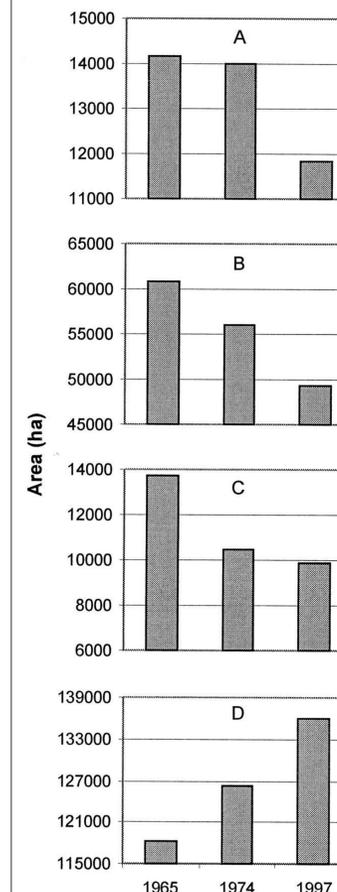
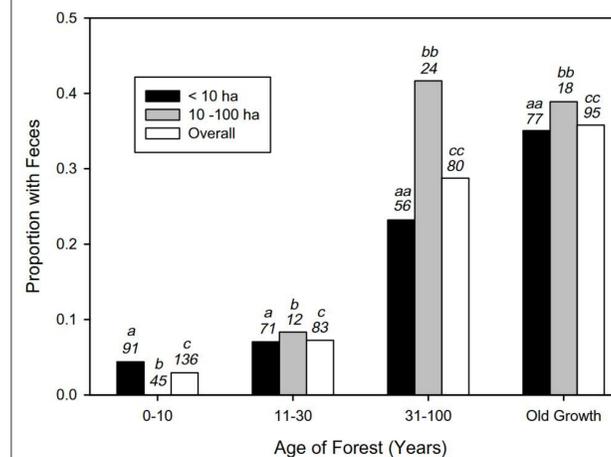


The time series of forests cover in Wolong Nature Reserve  
Modified from figure in "Ecological Degradation in Protected Areas: The Case of Wolong Nature Reserve for Giant Pandas"

Wood collecting is not rare in the reserve and the number fluctuates from 7000 to 9400 m<sup>2</sup> each year. Habitat connectivity is diminished both inside the reserve and outside the reserve.<sup>(9)</sup>

### Methods

In order to determine whether deforestation has an impact on habitat use of wild giant panda, the method of sample unit of faces groups was used to study feeding behaviors of giant pandas. Whenever the faces presented in a 30·30 plot, all the units in the plot's neighborhood were added to the sample.



The figure above shows propotion of plot sites with face of giant panda in areas with varing forest-sizes and ages. Symbols(a,aa,b,bb,c,cc) on the bars represent specific groupings in the proportion of plots with faces of pandas by time class for each size. This was done by binomial proportion test.<sup>4</sup>

The figure on the left indicates the changing of panda habitat in the Wolong Nature Reserve. (A): highly suitable habitat, (B): suitable habitat, (C): marginally suitable habitat, (D): unsuitable habitat.<sup>2</sup>

### Conclusions and Discussions

As a result of increasing human behaviors, the habitat of giant pandas in Wolong Nature Reserve was degraded or lost. The study about pandas' using of harvested areas indicates that the activities of pandas decrease in the newly harvested areas and surrounding forests. The reservation of the giant panda is faced with a great challenge because even a flagship nature reserve such as Wolong couldn't effectively prevent timber collecting and farming behaviors in panda's habitat. Although Natural Forest Conservation Program was introduced, more policies and actions are needed to protect habitats in the Wolong Nature Reserve.



A giant panda cub is feeded in the Bifengxia Giant Panda Breeding and Research Center in Sichuan Province, China  
PHOTOGRAPH BY AMI VITALE, NATIONAL GEOGRAPHIC CREATIVE

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