POLICY FORUM: ECOLOGY

Giant Pandas in a Changing Landscape

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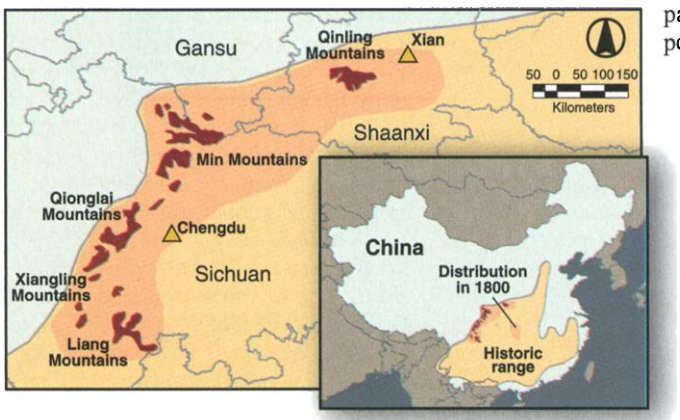
The giant panda (*Ailuropoda melanoleuca*) should be a conservation success story as the world's most widely recognized conservation icon, with a protected area network of 33 nature reserves, and an improved captive breeding program. Yet, habitat loss and fragmentation continue to threaten its future. China's estimated 1100 wild giant pandas survive in only a fraction of their historic range (see the figure) (*1*, *2*). Human land use has restricted the species to approximately 24 montane forest populations at the edge of the Tibetan Plateau (*3*). The pandas' future in China's forests depends on increased protection and restoration of corridors among remaining forest fragments and increased habitat protection. The Chinese government has recently instituted policies that could have profound positive or negative effects on the forests that pandas need to survive.



Historic distribution of giant pandas (inset map) and present-day distribution (red). [Adapted from (*16*)]

In the Wolong Nature Reserve, the three subpopulations of 30 to 45 pandas have more than a 10-fold chance of extinction by 2100 if they remain isolated from each other (*4*). Most of China's 24 fragmented panda populations have fewer than 50 individuals, too few to be viable over the long term (*3*). Thus, if habitat loss and fragmentation confine pandas to existing nature reserves, many populations will face extinction through inbreeding depression and demographic inviability.

More than 50% of the remaining panda habitat is protected. A large proportion was gazetted during the implementation of the (1989) panda management plan (*5*). Although a recent analysis of Wolong Nature Reserve (*6*) suggested that China's protected areas are failing to conserve panda habitat, Wolong is atypical (*7*–*9*). The more urgent issue is conservation of remaining habitat outside of the existing reserve system. Pingwu County in the Min Mountains, for example, has the highest density of pandas. Yet of the 2700 km^2 of habitat, less than 20% is protected in three unconnected reserves. A landscape-scale analysis of pandas in the Qinling Mountains found that increased protection and linkage of fragmented mid-elevation habitat, much of it outside of existing reserves, is necessary to meet habitat requirements of panda populations (*10*). Given proper habitat protection, wild panda populations will rebound and grow (*11*, *12*).

The Chinese government has recently increased its commitment to environmental protection. In the wake of 1998's extensive flooding, China began implementing the Natural Forest Conservation Program (NFCP). This initiative aims to increase forest cover in the upper Yangtze, Yellow, and Songhuajiang river basins to prevent a repeat of the 1998 floods that affected approximately 21 million hectares (*13*). This policy bans logging in natural forests, strengthens protection of existing forests, implements afforestation, and resettles unemployed forestry workers (*14*). It will be implemented over 11 years and will provide strict protection to all the remaining forests throughout the panda's range. A drawback of the logging ban is China's increased demand for forest products from other countries (*15*).

The NFCP is complemented by the Grain-to-Green policy, which aims to restore hillside agricultural lands into forest or grasslands over the next 5 to 8 years (*13*). In Sichuan, where a majority of pandas live, this covers 770,000 hectares of land. The Grain-to-Green policy calls for local communities to receive grain subsidies and seedlings for planting plantation and natural forests. Farmers will also receive a cash subsidy proportional to the amount of land converted (*13*). Unfortunately, panda habitat conservation remains poorly integrated into these policies. However, a third national survey, slated for publication in 2002, may help by providing information on the panda's distribution, habitat, and potential dispersal patterns.

Although panda conservation activities in China are receiving unprecedented support, development goals can be incompatible with conservation. China recently initiated the Western China Development Program, which calls for substantial infrastructure development, hydropower generation, ecotourism development, and economic incentives to encourage domestic and international investment. This initiative will draw additional Chinese citizens into the region, and tax an already burdened land. Integrating conservation needs into development policies will be an important challenge. The NFCP and the Grain-to-Green policy provide a historic opportunity to move panda conservation from individual reserves to habitat conservation across landscapes.

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