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China / Science

Panda conservation seen in US-China efforts helping other species thrive, scientists say

Expanded protected areas and use of similarly effective techniques with animals living alongside the vulnerable bears seen as key to success

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Giant panda cub Katyusha (left) and her mother Ding Ding at the Moscow Zoo in Russia in August. Pandas have long symbolised animal conservation efforts.
Photo: Xinhua

Decades of global conservation efforts for giant pandas have not only borne fruit for the iconic black-and-white bear but also helped their neighbours in the wild thrive.

As the National Zoo in Washington prepares to welcome two pandas later this year, scientists said a wider array of species was benefiting from America's collaborations with China thanks to the expansion of protected areas and use of similarly effective techniques with other animals.

Bill McShea of the Smithsonian Conservation Biology Institute said panda reserves had reduced poaching, human impacts and deforestation, conserving both forests and pandas' neighbours.

"They are benefiting because the pandas have very specific habitat requirements [that] bring a lot of other animals along for the ride," the wildlife ecologist said.

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As evidence of habitat recovery, McShea pointed to animals like takins, golden snub-nosed monkeys, migratory geese and cranes that are readily observable in China's Giant Panda National Park, which is home to another 8,000 animal and plant species.

"The reserve staff could say, 'Look, these animals are here,'" he said. "It worked because of that initial seed around the giant pandas."

McShea was among the first wave of foreign scientists travelling to China in the late 1990s to focus on protecting wild pandas.

He began by training mainland students to go beyond mere observations and instead collect field data through radio tracking, camera traps and habitat measurements.

Now, McShea as an adjunct professor at Peking University equips students with statistical analysis skills to understand how animals move across landscapes.

The training led to universities, government advisory committees and conservation organisations around the world being filled with skilled Chinese professionals passionate about animals, he said.



Golden snub-nosed monkeys such as the one seen here have benefited from panda conservation efforts. Photo: Smithsonian's National Zoo and Conservation Biology Institute

“A Westerner is never going to save the giant pandas. We do not have the connections, the power to make that happen. If giant pandas and any wildlife is going to be saved in China, it is going to be done by Chinese researchers, wildlife managers and bureaucrats.”

“They say, ‘Give us the techniques, tell us what is the right way to do things and then we will do it and we will turn things around,’” McShea added.

Ecologist Liu Jianguo of Michigan State University believed on-the-ground experience of those working in the area and technologies American scientists brought to China in the 1990s like satellite remote sensing, GPS and analysis tools were pivotal.

The collaborations “introduced advanced technologies into China’s conservation efforts”, Liu said. “Images from US satellites, for example, showed how forests and habitats changed over time on a large scale.”

Liu has transferred techniques originally applied in his nearly three-decade-old panda research projects with collaborators at the Chinese Academy of Sciences and Wolong Nature Reserve to track tigers in [Nepal](#).

Managing the relationship between humans and animals was paramount, he said, noting that his research had expanded to cover birds in Michigan and threatened black bears in Texas.

“Taking the lessons learned from protecting pandas, we can apply the insights and methods to many other animals.”



Giant panda Xiao Qi Ji hangs upside down from a tree in his enclosure at the Smithsonian's National Zoo in Washington on November 7, 2023. Two new pandas are slated to arrive at the zoo this year. Photo: AFP

As Liu sees it, animal conservation can only be achieved by simultaneously improving the livelihoods of locals around wildlife habitats and mitigating the impacts of [climate change](#) caused by human activities.

“Protecting animal habitats goes hand in hand with helping the local communities,” he explained. “If people have no other livelihood options, they must depend on firewood and local resources from forests, damaging natural habitats.”

He further said it was important to consider how humans interact with nature locally, nearby and faraway.

“For example, consumption activities far from the panda habitats could drive up carbon emissions and intensify climate change, which in turn affect panda habitats.”

When it comes to US–China panda collaborations, the focus now is on understanding and adapting to the threat of climate change, according to Melissa Songer, who leads international conservation projects at the Smithsonian Conservation Biology Institute.

“A lot of our work is focused on capacity building. But growing out of that ... we began to build into monitoring, especially for wildlife, giant pandas, climate and vegetation in many of the protected areas,” Songer said.



Wild panda populations depend on a bountiful supply of bamboo for their survival. Photo: Shutterstock

Songer described a joint project testing how bamboo growth and survival would change in response to higher temperature through greenhouses set up in protected areas and later in other regions.

The project is being carried out alongside a former Smithsonian postdoctoral fellow who has since joined the Chinese Academy of Sciences.

Changes in bamboo “are going to be a really important key to figuring out impacts of climate change”, she said, in addition to modelling analysis.

Songer, a conservation biologist, said many scientists and animal keepers trained initially for the panda programme go on to work on other species.

Annual training has proved popular. More than 600 Chinese protected-area staff have taken part over the last 15 years, she said. Students from mainland universities intern in labs in the US for six to 12 months or work as postdoctoral fellows.

“We get the political will, the scientific will and the funding to be able to focus on pandas. But there is no reason why it could not happen for other species as well,” said Songer.



Smithsonian’s Melissa Songer (right) and Tsinghua University professor Liu Xuehua observe giant panda droppings at Foping Nature Reserve in Shaanxi province. Photo: Smithsonian’s National Zoo and Conservation Biology Institute

By the Smithsonian’s National Zoo and Conservation Biology Institute’s tally, its scientists have trained more than 1,500 Chinese wildlife professionals and students, with many of them leading panda conservation programmes on the mainland.

Not surprisingly, the improved situation of pandas has been hailed as an international conservation success. In 2016, the bears were upgraded from endangered to vulnerable.

The population of wild giant pandas surged from 1,100 in the 1980s to about 1,900, according to data released this year by China’s national forestry and grassland administration. In 2021, Giant Panda National Park was set up.

China started establishing panda nature reserves in the 1960s and launched a plan aiming to include panda habitats within protected areas in the 1990s. Such areas have almost doubled to nearly 2.6 million hectares compared with 2012.

Apart from local conservation efforts, the Chinese agency credited global scientific collaborations with helping advance research in panda breeding, disease prevention and control as well as reintroduction into the wild.

“Some 1,000 professionals have been trained through international projects on endangered wild animal protection, including pandas,” said Zhang Yue, a wildlife conservation officer at the agency, in January.

“Panda conservation also drives the overall level of global protection of animals and plants.”

Pandas, long adored for their appearance and mannerisms, were chosen as a flagship species to promote conservation efforts. And they are an umbrella species in that they provide refuge for animals sharing their habitat.



A newborn panda cub born at the Berlin Zoo in Germany on August 27. Photo: Zoo-Berlin via AP

A team of Chinese scientists found that pandas were partially successful as a surrogate for protecting species living in the same ecosystem, according to a paper published in the peer-reviewed *Journal of Environmental Management* in February.

An analysis of five of six mountain ranges inhabited by pandas determined that the number of large and medium-sized herbivores increased significantly from 2001 to 2011, as did that of medium-sized carnivores.

However, the number of large carnivores including grey wolves, dholes and leopards declined significantly over the same decade.

“While our study highlights the overall success of the conservation strategy centred around the giant panda as a flagship umbrella species, it also highlights its ineffectiveness in protecting large carnivores,” the scientists wrote.

“This implied the inadequacy of the current panda-centric conservation strategy in preserving ecosystem functionality comprehensively.”

Jennifer McGowan of the University of Queensland said the broader ecological role of an animal which is both a flagship and an umbrella species meant a greater potential for conservation success.

“Oftentimes, the criticism from science is that by focusing so much on these iconic species, we are really missing out on the broader effort of habitat conservation and maintaining ecological integrity,” the research scientist said.



A golden takin cub stays with its mother at the Jinan Zoo in Shandong province in 2016. The cub was the first of the endangered goat-antelope species native to China to be bred in a zoo. Photo: Xinhua

McGowan and her team in a paper published in the peer-reviewed journal Nature Communications in 2020 proposed an approach to resolve “the flagship species conundrum”: turning more animals into stars.

They took the example of Hengduan Shan Conifer Forest in southwestern China, home to pandas, and identified other potential flagship species from the region including takins, golden snub-nosed monkeys, snow leopards and the Chinese softshell turtle.

“Multiple flagships found in a single place provide flexible options for organisations to select species that best reflect their conservation strategies, donor preferences and local conservation interventions,” they wrote.

McGowan said expanding the definition of flagship beyond being cute and cuddly to a broader spectrum of characteristics – such as colourfulness in birds and an interesting appearance in reptiles – would mean additional mascots for conservation fundraising.

“What we are tasked with now is a bigger focus on biodiversity representation, sustaining a safe and healthy liveable planet for all of humanity,” she added.

“To do that, we have to focus on preserving intact ecosystems, regenerating and creating uplift on converted ecosystems and focusing on ecosystem services more.”