

## The road home for Przewalski's horse in China

In March 2022, the Chinese government announced that it will continue to carry out the rewilding of 15 rare and threatened wildlife species, including Przewalski's horse *Equus ferus*, as part of China's 14th 5-Year Plan (2021–2025). The population of this species in China now exceeds 700, accounting for approximately one-third of the global population. Formerly categorized as Critically Endangered, this species was recategorized as Endangered in 2015.

Przewalski's horse was first identified in 1880, and was formerly distributed across Kazakhstan, western Mongolia and north-western China. The species was negatively affected by hunting, military activities, climate change, competition with livestock, and increasing land-use pressure, and was categorized as Extinct in the Wild in 1969. In 1985, China began the Wild Horse Returning Home project, with two breeding centres, in Jimsar County, Xinjiang, and Wuwei City, Gansu. From 1985 to 2005, the Xinjiang Breeding Centre received five groups of Przewalski's horses, from zoos in Germany, the UK and USA. During 1989–1994, the Gansu Breeding Centre received three groups, from Germany and the USA. Following successful reproduction, more than 300 Przewalski's horses have been released in the Kalamaili Nature Reserve in Xinjiang, Dunhuang Xihu National Nature Reserve in Gansu, and Daqingshan National Nature Reserve in Inner Mongolia.

However, Przewalski's horse still faces multiple threats in China. All individuals are descended from 15 founders, resulting in relatively low genetic diversity, and anthropogenic threats and developments such as roads, mining, competition with livestock for grazing, and hybridization with domestic horses affect the species, even in nature reserves. The reintroduced horses continue to rely on supplementary fodder and water to survive the harsh winters.

In response to these pressures, China sent four male Przewalski's horses to Mongolia to increase genetic diversity in 2012. In 2015, the Chinese government closed mining enterprises in the Kalamaili Nature Reserve and later carried out ecological restoration in the former mining zones, and in 2020 Kalamaili was upgraded from Provincial Nature Reserve to National Nature Reserve (National Nature Reserves have the highest level of protection and the strictest management measures). In addition, through education and free coal for heating, local herdsmen have received compensation for their loss of access to grazing in the core zone of the Reserve. To ensure a self-sustaining population of Przewalski's horse, these measures need to be combined with the release of additional individuals and strict limits on the number of domestic livestock, especially horses, in the release areas.

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## Protecting Przewalski's gazelle

Przewalski's gazelle *Procapra przewalskii* is a flagship species and a Category I National Protected Wild Animal Species in China, has a restricted distribution and is endemic to the Qinghai Lake region. In the 1990s, there were < 300 individuals (Jiang et al., 2000, *Oryx*, 34, 129–135), but the wild population has gradually recovered (Li et al., 2012, *Oryx*, 46, 145–153) through the timely implementation of rescue projects. In 2008, Przewalski's gazelle was recategorized from Critically Endangered to Endangered on the IUCN Red List, and in May 2022, according to the Qinghai Forestry and Grassland Bureau, the total population exceeded 2,800 mature individuals.

In August 2020, January and August 2021, and January 2022, we conducted a survey of the conservation status of and potential threats to the gazelle, supported by the Second Tibetan Plateau Scientific Expedition and Research Programme (Grant No. 2019QZKK0501). We found, as reported by the government, that the gazelle population is recovering and that poaching, one of the main causes of the earlier declines, is practically non-existent. However, habitat fragmentation is still severe and new problems are emerging, arising from human activities and environmental change. A railway, highway and grassland paddock fencing are the main causes of habitat fragmentation, and the fences also impair the gazelles' ability to evade predators. Competition with livestock is known to result in seasonal food shortage (Li et al., 2008, *The Journal of Wildlife Management*, 72, 944–948), and this problem has not been effectively alleviated. Pathogens and diseases from livestock also pose a potential threat to the gazelle, and plastic waste generated by herdsmen could result in indigestion, poor health and even death if eaten by gazelles. In addition to human activities, in dry winters water scarcity is also a potential threat. The population growth of Przewalski's gazelle varies greatly among habitat patches and some populations are still at risk of decline.

To improve habitat for Przewalski's gazelle, restore landscape connectivity and promote gene exchange between subpopulations, the ubiquitous fences need to be partly

dismantled, drinking water points established, rubbish sorting and collection stations provided, and habitat corridors developed. In the short term, supplementary forage should be provided in winter, but to avoid any dependence of the gazelle there needs to be a reduction of domestic animals in its habitat. Disease prevention and surveillance of livestock should also be carried out in the gazelle's range. In view of the variation in numbers between isolated populations, the genetic diversity of Przewalski's gazelle needs to be assessed, to guide the establishment of priority conservation areas and to avoid gene loss. Herdsmen, as key stakeholders, need to be involved in the development and implementation of any programme to protect the gazelle.

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## Using the precautionary principle to halt mining and save the Endangered Andean cat in Chile

Mining provides economic opportunities but can also lead to biodiversity loss as a result of the modification of native habitats. The ecosystems of the Andes mountains are threatened by the discovery of significant reservoirs of metal ores, including iron, gold and copper. Mining pits and associated infrastructure have reduced and degraded pristine Andean habitats, resulted in increased road kills, the introduction of invasive species such as domestic dogs, pollution and overuse of water, and negatively affected the survival of multiple Andean species, including the elusive and low-density Endangered Andean cat *Leopardus jacobita*. As the mining industry continues to expand across the Andes, short-term environmental assessments may have limited effect in preventing biodiversity loss. Scientific knowledge may, however, provide complementary information for making precautionary decisions.

In March 2022, the Chilean Environmental Supreme Tribunal promulgated the first verdict to halt mining

activities to protect the Andean cat and its habitat. The decision was made according to the precautionary principle of the 1992 Rio Declaration on Environment and Development. This principle states: 'In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.'

The complaint raised before the Chilean Environmental Supreme Tribunal was presented by local NGOs with the support of a local carnivore specialist group, Seeking the Andean Cat, against the multinational Canadian mega-mining company Vizcachitas. The complaint was based on the widespread presence of the main prey of the Andean cat, the vizcacha *Lagidium viscacia*, and the previously confirmed presence of the Andean cat in the mining area (Silva et al., 2021, *Oryx*, 51, 331). Seeking the Andean Cat analysed rocky outcrops, the main habitat of the Andean cat and the vizcacha, using the kernel method for examining the density of vizcacha latrines as a proxy of its presence around the mining project. The rocky outcrop habitat in the Andes mountains is used by both species for reproduction, feeding and as a refuge. These ecological concepts are recognized by Chilean law, and this verdict lays the groundwork to prevent impacts on biodiversity by using scientific knowledge and precautionary principles.

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