

Re-introduction of the ‘extinct in the wild’ Przewalski’s horse to the Mongolian Gobi

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Introduction

The Przewalski’s horse (*Equus ferus przewalskii*), *takhi* in Mongolian, became extinct in the wild during the 1960s. The reasons for the extinction of Przewalski’s horse are seen in the combined effects of pasture competition with livestock and overhunting. The last confirmed sighting of a Przewalski’s horse in the wild occurred in the Dzungarian Gobi of SW Mongolia in 1969. The entire captive population is based on 13 founders and led to the establishment of the Przewalski’s horse studbook at Prague Zoo and the initiation of a European Endangered Species Programme (EEP). By the mid 1980s the captive population had grown to over 1,000 individuals. With Mongolian independence in 1990, the “Takhin Tal” project in the Dzungarian Gobi was initiated. In 1992 the first captive born animals arrived at the adaptation enclosures and in 1997 the first harem group was released into the wild. In total 89 Przewalski’s horses on 10 transports were airlifted from Europe to Takhin Tal. By 2009 the Takhin Tal population was entirely free-ranging and had grown to 138



Przewalski horse harem group © Kaczensky

animals. In 2010 a winter disaster (*Dzud*) struck and while Mongolia lost millions of livestock, the Przewalski's horse population crashed to 49 animals.

Goals

- Goal 1: To re-establish a self-sustaining and free-ranging population of Przewalski's horses in the Dzungarian Gobi.
- Goal 2: To protect the integrity of the Dzungarian Gobi ecosystem as habitat for re-introduced Przewalski's horse and other rare and endangered plants and animals.
- Goal 3: To study the behavior and ecology of Przewalski's horses in their native environment.
- Goal 4: To manage the Great Gobi B Strictly Protected Area and its buffer zone in the spirit of the man and biosphere concept, acknowledging the millennium old presence of semi-nomadic herders in the region.
- Goal 5: To raise awareness and support for sustainable use of natural resources, biodiversity conservation and protected area management by improving the socio-economic situation of the local population and providing information.

Success Indicators

- Indicator 1: Number of free-ranging Przewalski's horses >140, distributed throughout suitable habitats within the 9,000 Great Gobi B Strictly Protected Area (SPA) in the Dzungarian Gobi.
- Indicator 2: Efficiency of the park management measured by overall budget, number of staff, technical equipment and working facilities on the one side and number and severity of conflicts on the other side.
- Indicator 3: Number of peer-reviewed publications, PostDoc, PhD, Master and Bachelor thesis on Przewalski's horses, other wildlife or the habitat.



Releasing Przewalski horses in enclosure

© Kaczensky

- Indicator 4: Formalized land use agreements between local people and the SPA administration.
- Indicator 5: Low conflict levels and number of people earning money from alternative income projects that are in line with sustainable use of natural resources.

Project Summary

Feasibility: The Mongolian Gobi in Central Asia constitutes a vast, largely intact and continuous stretch of non-equilibrium dry land which

is home to several endangered or critically endangered large migratory ungulates and a millennium old semi-nomadic livestock herding culture. A major challenge of Przewalski's horse re-introduction lies in the fact that the species only survived due to captive breeding and that little behavioral or ecological data had been collected prior to their extinction in the wild. Consequently there was little experience to draw from and it was generally assumed that Przewalski's horses would have similar habitat requirements and show a similar social organization as feral horses or plains zebras.

The Przewalski's horses likely went extinct due to the combined effect of pasture competition with livestock and overhunting. However, since the eradication of the Przewalski's horse Mongolia's human and livestock population have increased, thus the original cause of the species demise is still present. Furthermore, Przewalski's horses and domestic horses are closely related, can interbreed and produce fertile hybrids. In order to conserve the Przewalski's horse as a distinct species, the gene pools of the two species need to be separated. The Great Gobi B SPA is and always has been used by semi-nomadic herders and their livestock. When the SPA was established, local people were granted the right to continue to use their traditional winter camps at the southern edge of the SPA and cross during spring and fall migration. About 100 families with c. 60,000 livestock (5.5% domestic horses) use the park for grazing, predominantly in winter. Local economy is heavily based on livestock, with cashmere generating the main income of local herders. Recently the protected area's integrity has been compromised by illegal pacer mining activities.

Implementation: The Takhin Tal research station is 1,500 km straight line distant from the capital Ulaanbaatar. The camp is located at the NE corner of the Great Gobi B SPA and is surrounded by five separate former adaptation enclosures with a total of 2,600 ha. In each enclosure a stable provides thermal protection and the Bij river provides drinking water. In the past Przewalski's horses in the enclosures were fed hay one to two times a day, depending on available natural forage and body condition. In the initial phase of the project mortalities were high and the project received much international criticism. However, management changes were implemented in 1999/2000 and veterinary care was vastly improved and local infrastructure upgraded. Equine piroplasmiasis, a tick-transmitted disease caused by *Babesia caballi* or *Theileria equi*, which is endemic in Takhin Tal was identified as an important mortality factor in naive introduced Przewalski's horses. Subsequently, all newly arrived animals were treated with a subtherapeutic dose of Imidocarb (Carbesia®, Schering-Plough, France) while under control in the adaptation enclosure.

Because the Przewalski's horse are very conservative in their range use and tend to stay in the vicinity of the release facilities, the last harem group which arrived in 2004 was transported 120 km to the west after having spent one year in the adaptation enclosure in Takhin Tal. To familiarize the horses with the new environment, they were kept in a temporary enclosure, delineated by electric fencing at the new release site. This soft release approach was very successful as the new group indeed settled in and around the new release site.



Ranger monitoring © Ganbaatar

Post-release monitoring:

Przewalski's horse groups are been checked by park rangers 1 - 2 times a week. Individual animals are identified based on overall appearance. An additional 15 Przewalski's horses were tracked by satellite telemetry between 2001 and 2008.

Comparison between telemetry data and ranger monitoring showed that the latter is sufficient to document spatial organization of the different groups and

distribution range development. Since 2002 - 2003 the Przewalski's horse population finally started to show positive population growth, independent of released animals. By the end of 2009 the population had reached 138 animals, than the 2009 - 2010 the *dzud* winter hit and the population crashed to 49. However, the catastrophic winter allowed for lush spring vegetation and summer rains further improved grazing conditions. The winter 2010 - 2011 was normal and we expect high foaling rates for this year.

To speed up population recovery we are presently looking into the possibilities to receiving additional Przewalski's horses from the breeding center in Jimsar, Xinjiang province, China. Horses would already be pre-adapted to the climate and equine piroplasmiasis. Transporting Przewalski's horses from China to Mongolia will also strengthen cross-country cooperation in nature conservation. The border strip between China and Mongolia in the Dzungarian Gobi is sparsely populated and could potentially connect the two Great Gobi A & B SPAs (together 53,000 km²) in Mongolia with the Kaamaili reserve (18,300 km²) in China, where there are presently also initiatives to re-introduce Przewalski's horses. If managed in common the area could potentially house a large trans-boundary Przewalski's horse population.

Major difficulties faced

- Initially the project was plagued by shortcoming in infrastructure and training which resulted in rather high mortality rates of introduced Przewalski's horses.
- Not before routine veterinary procedures and post-mortem pathologic examination were introduced in 1999 was equine piroplasmiasis as a mortality factor discovered and management changed accordingly.
- Initial project focus was only on the Przewalski's horses and the immediate release area surrounding Takhin Tal research station. The spatial requirements of a self-sustaining population and the interactions with wildlife and local people were initially largely ignored or underestimated.

- The logistical challenges of running a long-term project in a remote and difficult to reach location were underestimated: animal transports are very expensive, recruitment of scientific personnel is difficult, and communication and mobility are major cost factors.
- To secure funding for measures accompanying the re-introduction of the Przewalski's horse which need a long term perspective – monitoring and socioeconomic projects - are much harder to sell than spectacular transports or exciting science projects.

Major lessons learned

- Identification of equine piroplasmiasis as an important mortality factor in naïve Przewalski's horses re-introduced from Europe, high-lightened the importance of state-of-the-art post mortem analysis and allowed us to improve the adaptation process.
- Upgrading the infrastructure and in particular investment into communication and mobility (vehicles and a gas station) was a prerequisite to enabling efficient and year-round patrolling, monitoring, and scientific work at Takhin Tal.
- Broadening the focus from a species to an ecosystem conservation project allowed for a holistic approach incorporating the habitat, other wildlife and local people. The Przewalski's horse turned out to be an ideal flagship species to promote the conservation of the Dzungarian Gobi ecosystem and less charismatic species, e.g. the endangered Asiatic wild ass (*Equus hemionus*).
- Bi-weekly ranger observations and the use of radiotelemetry in combination with intensive habitat mapping allowed us to understand Przewalski's habitat use and helped to identify a suitable new release site in order to speed up population expansion and reduce the vulnerability of the population to localized catastrophic events.

Success of project

Highly Successful	Successful	Partially Successful	Failure
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Reason(s) for success/failure:

- We are dealing with a small population with limited spatial extent in a non-equilibrium dry land prone to extreme weather events – it is too early to make a final success or failure statement.
- The population showed the potential for re-adaptation to a harsh environment and population growth in normal years.
- Very good and efficient ranger monitoring has been implemented and linked to the collection of additional ecological data from multiple accompanying research projects (other wildlife, plant community mapping on the landscape scale, socioeconomic data)
- The highly liked (locally, nationally & internationally) and charismatic Przewalski's horse is an excellent vehicle to promote biodiversity protection in the Dzungarian Gobi.

- Environmental and funding stochasticity, the lack of formalized land use agreements and increasing poverty hinders the progress of alternative income projects and still results in conflicts over sustainable resource use (illegal collection of firewood, grazing, illegal mining, poaching); however, due to the remoteness of the area and the poor infrastructure the problems are rather minor when compared to other areas of Mongolia.

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