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The world's last truly wild horse is making a comeback

Most of the horses we think of as "wild" are just domestic horses gone feral. There is only one type of horse that remains utterly wild



By Jane Palmer

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In the majestic Mongolian landscape, where the vast grasslands meet the endless dunes, herds of horses rove. Neither tethered nor constrained by fencing, they run and graze on the arid, windswept steppes.

The very sight of wild horses symbolises freedom, but these Mongol horses are not truly wild. They are descended from domesticated horses, possibly from the same ones tamed by the armies of Genghis Khan in the 13th century.

But for all the skills and passion of these "Hell's Horsemen," there remained one horse they never tamed: Przewalski's horse. These horses are now the only truly wild horses anywhere in the world. After being driven to the brink of extinction, they are now making a slow recovery – but their future is far from guaranteed.

When the Russian explorer Nikolai Przewalski visited China at the end of the 19th century, he was presented with the skull and hide of a horse shot on the Chinese-Russian border. A zoological examination determined that the remains were of a wild horse, and Przewalski's horse received its official name. It's pronounced "sha-val-skee".



They are the only wild horses on Earth, and they behave like it

However, Mongolians had always named the horses "takhi", which means "spirit" or "spiritual". They regarded Przewalski's horses as man's messengers to the gods.

"They are sacred and symbolic to the local people," says Claudia Feh, director of the [Association for the Przewalski's horse \(TAKH\)](#). "It is taboo to kill them."

The horses are short and muscular. They are smaller than most domesticated horses, reaching about 13 hands high at the shoulder, or a little more than 4ft (1.2m).

Their coat ranges from brown to dun, with a pale underbelly and muzzle. A dark dorsal stripe runs from the mane, down the spine, to a black-ish tail. Unlike domestic horses, their mane is short and stands upward, like a mohawk.

"They are wild and spirited," says Feh. "They are the only wild horses on Earth, and they behave like it."

It is unclear if they should be described as a separate species, distinct from domestic horses. But certainly the two are not completely alike. In October 2015, [Ludovic Orlando of the University of Copenhagen in Denmark](#) and his colleagues published a study showing that Przewalski's and domesticated horses have [significant differences in genes that govern metabolism, muscle contraction, reproduction and behaviour](#).



Scientists saw the last wild Przewalski's horse in 1969

Orlando's team sequenced the genomes of 11 living Przewalski's horses, representing all of the founding lineages, and five historical specimens dating from 1878 to 1929. They also obtained a tooth from the skull given to Przewalski.

Although the Przewalski's horse genomes differed from those of domesticated horses, the two groups only diverged 45,000 years ago. "That represents a relatively short stretch in evolutionary time," Orlando says.

If Przewalski's horses do represent a true species, they are a young one. But for many decades it seemed that their story was going to be a short one.

In the late 18th century, herds of Przewalski's horses ranged from the Russian Steppes east to Kazakhstan, Mongolia and northern China. But their numbers declined rapidly over the next few decades, due to a combination of hunting, harsh winters and increasing land use by humans.

Scientists saw the last wild Przewalski's horse in 1969, in Mongolia's Dzungarian Gobi Desert. Elderly herders have reported seeing the horses later. "But by the late 1970s they had totally disappeared," Feh says.



"It is quite a harsh environment there, and I look on it as a sort of training camp"

As a result, the International Union for Conservation of Nature (IUCN) listed the Przewalski's horse as "**extinct in the wild**".

The only remaining Przewalski's horses lived in zoos. In 1950 there were just 12. But an ambitious breeding program brought those numbers up to around 1,500 by the early 1990s.

With the survival of the species assured, scientists turned their attention toward returning them to freedom.

In 1994, they tried two reintroductions: in the Takhin Tal Nature Reserve in the Dzungarian Gobi Desert and at **Hustai National Park** in Mongolia. More recently, the horses have been reintroduced to other regions of Mongolia as well as Kazakhstan, Russia, Hungary and China.

Feh was among the scientists convinced that Przewalski's horses could return to the wild. As a teenager, she was inspired by seeing 17,000-year-old paintings along the walls of the Lascaux Caves in south-west France, in which Przewalski's horse look-a-likes prance and bound amid a throng of cattle, bison, stags and bears.



You have this impression that the sky is inside your head. It's a place to be wild

Struck by the freedom and abundance of ancient European wildlife, Feh began studying semi-wild horses. "I wasn't just impressed with the beauty of the horses, but all the other animals that existed at the same time in our world that have now disappeared," she says. "That just touched me."

In 1992 she established TAKH, an organization dedicated to returning Przewalski's horses to the wild and allowing them to flourish independently.

Having studied the horses' behaviour, Feh believed that their ability to form cohesive family groups that stayed together would be critical to their survival. So instead of taking horses directly from captivity to Mongolia, she spent a decade raising them on a 400-hectare tract of land on the remote Causse Méjean plateau in southern France.

"It is quite a harsh environment there, and I look on it as a sort of training camp because they learned how to survive," Feh says. As expected, the horses formed small family groups.

At the same time, Feh scouted out relocation sites.

In 1996, she settled on the remote region of Khomiin Tal, a 2,500 sq km tract of land in western Mongolia. "You go there and you can just breathe," Feh says. "You have this impression that the sky is inside your head. It's a place to be wild."



You just have to learn some of them are going to not make it

In preparation for the horses' arrival, TAKH built a fence around a 135 sq km release site to allow the vegetation to grow. They also negotiated with local herders, to ensure they would keep their domestic horses out of the reintroduction site.

In 2004, after ten years of preparation, TAKH reintroduced four groups of horses to Khomiin Tal. Upon arrival, the horses formed their family groups and successfully kept wolves at bay.

But threats to the horses abound.

"There is a certain amount of risk involved in reintroducing these animals," says **Chris Walzer of the University of Veterinary Medicine, Vienna in Austria**. "You just have to learn some of them are going to not make it."



They could hybridise themselves out of existence by mating with domestic horses

In 2009, Mongolia experienced a brutal winter or "zud", in which temperatures dropped as low as -47 °C. Despite the efforts of the scientists and local herders, more than half the Przewalski's horses in Takhin Tal perished, due to cold and lack of food.

Feh's site had enough forage and not one horse died. Nevertheless, the 2009 zud cast doubt on whether the horses can successfully survive in a country with such extreme weather – especially if man-made climate change makes it even more extreme.

However, the biggest challenge to the Przewalski's horses may come from within: from their DNA.

Although Przewalski's horses have 66 chromosomes and domestic horses have only 64, the two can mate and produce fertile offspring. That means they could hybridise themselves out of existence by mating with domestic horses.



There's no reason to believe that there's not enough diversity in the Przewalskis for them to survive

This process has already begun. When the first foals were bought over to zoos in the 19th century, they were accompanied by domestic Mongolian mares that provided milk. Many people believed that

one of the most famous Przewalski's horses, Theodore, was sired from one such domestic mare and a Przewalski stallion.

"We tested the genome of Theodore and found it to be a mix," Orlando says. Along with other genetic tests, this shows that the two populations have been interbreeding, even after humans domesticated the horse about 5,500 years ago.

"But the tests that we've done showed that they were probably not mixed so much as people have previously thought," Orlando says. Only some of the living Przewalski's horses are mixed.

The other big problem for Przewalski's horses is that the current population derives solely from 12 individuals. That means they are all rather genetically similar, perhaps too similar to survive.

The scientists compared the levels of genetic diversity within the current Przewalski's horse population with the levels of diversity in other horse populations, such as Icelandic horses. Overall, the Przewalski's horses are less genetically diverse.



They will need monitoring and indirect assistance from human beings for a long time

"But at the same time, their diversity is fairly comparable to some breeds that are not endangered," Orlando says. "There's no reason to believe that there's not enough diversity in the Przewalskis for them to survive."

The risk is that the horses have had to mate with close relatives, which would mean they each carried multiple copies of harmful genes and thus became more prone to genetic illnesses. "If you're inbred, you might have some copies of the same gene that will be deleterious," Orlando says.

He found that all the horses are inbred, but some are "really, really heavily inbred" while others are far less so.

These two pieces of information could prove vital. "You could start informing the conservation biologists about which one to pick and which one not to pick to breed out for the next generation of those horses," Orlando says.

Currently, the reintroduction sites in Mongolia are home to 350 horses between them. "Starting from zero individuals 25 years ago, this is success," Feh says. "But they will need monitoring and indirect assistance from human beings for a long time." In particular, they rely on help from local herders.



The goal of this project is to have as many Przewalski's horses as possible

Feh's goal for Mongolia is to reach three populations of 1500 horses, enough to be robust. Already, the reintroductions have been successful enough for the IUCN to reclassify the horses from "extinct in the wild" to "**endangered**".

"When we started, I knew each and every horse by its name, where it came from, where it was born. And each and every one that died was a sort of minor catastrophe," Walzer says. "Now we really are looking at it on a population level."

Feh hopes to hand her project over to a local non-governmental organization within the next year. Hustai and Takhin Tal are already being run by Mongolians. With their long history of caring for horses and deep knowledge of their landscape, it seems likely they will prove to be the best possible carers.

"The goal of this project is to have as many Przewalski's horses as possible," says Feh. "We want them to survive for the next 3 million years."

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