

Current Status of the Przewalski's Horse Populations Reintroduced to Mongolia

Amarkhuu Enkhtur

Department of Zoology, Faculty of Biology, National University of Mongolia, Ulaanbaatar 210646, Mongolia

Abstract

In 1992 the reintroduction program of the Przewalski's horses in Mongolia was initiated, and totally 84 individuals of Przewalski's horses were brought to the Hustai National Park between 1992 and 2000. At the same time another reintroduction program of the Przewalski's horses was started, and 87 individuals were released in the Tahiin Tal (Bijiin Gol) area in the semi-desert ecosystem of Southwestern Mongolia. Recently, in the Khomyn Tal area of Western Mongolia transferred 24 individuals of Przewalski's horses from zoos (the reintroduction program was started in 2004). All captive Przewalski's horses were released into the wild (in 1994 in Hustai, and 1996 in Tahiin Tal), and the populations of horses are gradually increasing in both sites. In this work, the results of analyses on the population dynamics of Przewalski's horses, reintroduced in these two sites are discussed.

Key words: *Equus przewalskii*, reintroduction, population, Mongolia

Introduction

The Przewalski's horse (*Equus przewalskii* Poljakov, 1881) is an endangered species and is extinct in the wild. Only captive breeding in zoos and national parks has saved this wild horse from the brink of total extinction. The size of the captive population has grown to the point where sufficient individuals are available for reintroduction into the wild. The Przewalski's horse is one of the first wildlife species to return to their native habitats after 10-14 generations in captivity (Bouman, 1998). The reintroduction of the Przewalski's horse can be considered as an important conservation measure to restore and protect the natural ecosystem and other endangered species.

A reintroduction of captive bred animals into the wild always was and still is one of the ambitious goals of the modern zoos, because a successful reintroduction is the key argument to justify captive breeding programs. The process of acclimation to the wild requires going through a stressful period for a captive born Przewalski's horse and only the strongest will pass this bottleneck on the way back to nature (Zimmermann, 2004).

The reintroduction program of the Przewalski's horses in Mongolia is initiated with the support of

various international sponsors. In 1992 the first groups of captive born horses were airlifted to the Hustai National Park in Central Mongolia, which represents the typical forest-steppe landscape, and the Tahiin Tal (Bijiin Gol) area in Southwestern Mongolia in the semi-desert ecosystem.

To date, a total of 84 individuals of Przewalski's horses have been transported to the Hustai National Park, and 87 horses to the Tahiin Tal area. Besides of these, a third reintroduction program was started recently (in 2004) in the Khomyn Tal area of Western Mongolia, and 24 individuals of Przewalski's horses have been transferred there from different zoos.

The harem groups of Przewalski's horses were released into the wild from the adaptation enclosures (in 1994 in Hustai and 1996 in Bijiin Gol), and in both sites the populations of horses are successfully raised in the wild.

Currently (by the end of 2008), 219 free ranging individuals of Przewalski's horses live in Hustai National Park, 136 individuals in the Tahiin Tal area and 27 individuals in the Khomyn Tal area. Among them, 87.2% (191 individuals) of all Przewalski's horses in the Hustai National Park, and 75.7% (103 individuals) of all horses in Tahiin Tal area are composed of individuals born in Mongolia. Patterns of population dynamics of Przewalski's horses in these two sites will be discussed hereunder.

Materials and Methods

As a field biologist, I continuously observed the Przewalski's horses in the Hustai National Park between 1992 and 2005, and the data from this observation are used. Also, the database and research reports of reintroduction programs at the two sites, as well as the *General Studbook of the Przewalski's horse* are used for the analysis.

Analyses of average, standard deviation, standard error, variation and correlation coefficients were made using the software MS Excel.

Results

On June 5, 1992 the first 16 Przewalski's horses were brought to the Hustai National Park, Central Mongolia from the Askaniya Nova Nature Reserve (Ukraine) and the Foundation Reserves for the Przewalski's Horse (Netherlands). In addition, the other 84 Przewalski's horses were arrived in the same park, which has been transported in 1994, 1996, 1998 and 2000. Each Przewalski's horse arriving in Hustai National Park was branded with a number, description of its appearance (coat color, marking etc.) with studbook number, ancestry and a name that accompanied each individual horse.

The Przewalski's horse population in Hustai National Park currently (as for the end of

2008) consists of 219 free ranging individuals (Usukhjargal, 2008).

Another site was also chosen for reintroduction in Mongolia: Tahiin Tal area (or Bijiin Gol area) in the Great Gobi Strictly Protected Area in the south-western part of Mongolia. The first five horses were brought on June 6, 1992 in Tahiin Tal area, and afterwards 87 individuals have been transported to this reintroduction site in the years of 1993, 1995-2000, 2002 and 2004. This Przewalski's horse population is currently (as for the end of 2008) composed of 136 individuals (Ganbaatar, personal communication).

The reintroduced populations of Przewalski's horses have grown at the both reintroduction sites through births, as well as newly imported individuals (Figure 1).

As shown in the figure 1, a first foal was born in 1993 in the Hustai National Park. Then the number of Przewalski's horses was grown due to the addition of newly brought individuals between 1994 and 2000, as well as newly born foals in Mongolia. The percentage of the newly born individuals in Mongolia in the total population of Przewalski's horses is raised since 2001 (50%). As for the end of 2008, 87.2% of the total population of Przewalski's horses in Hustai National Park consists of individuals, which have been born in Mongolia.

In the Tahiin Tal area, the second reintroduction

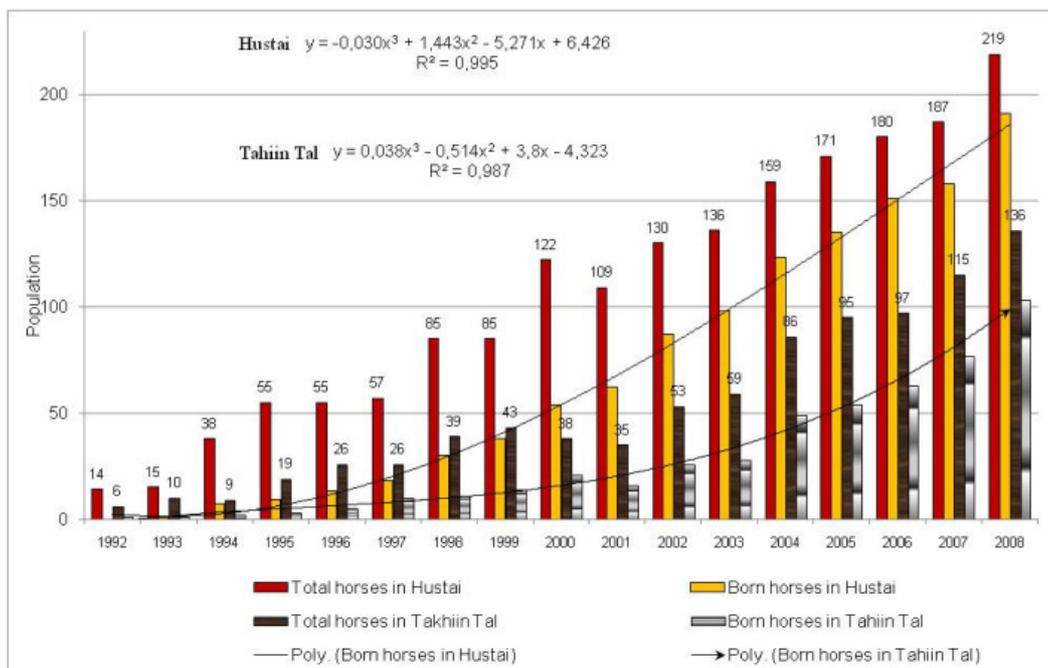


Figure 1. Growth of Przewalski's horse populations at Hustai National Park and Tahiin tal.

site, the population of Przewalski's horses has also been gradually growing since 1992 because of the addition of newly imported or individuals born in Mongolia. The percentage of the newly born individuals in Mongolia in the total population of Przewalski's horses is raised since 2004 (from 57% for 2004 up to 75.7% for 2008). However, the population growth of Przewalski's horses in Tahiin Tal area was relatively slower than that of Hustai National Park. The reason might be explained because of the most of the Przewalski's horses brought in the Tahiin Tal area were composed of individuals originated from different zoos, which has low adaptive potentiality in the wild rather than those individuals from semi-wild nature reserve, such as Askaniya Nova, hence the mortality was higher.

In both the reintroduction sites the populations of Przewalski's horses decreased in 2001, because of the harsh winter conditions that occurred in the winter of 2000. Thus, in Tahiin Tal area the number of Przewalski's horses decreased down to 35, while the population number in Hustai National Park is also reduced by 23 individuals. The weather condition was very hard at both sites, where the monthly minimum air temperature fluctuates between -26.4°C and -35.3°C , and the monthly average temperature was lower ($0.2-2.6^{\circ}\text{C}$) than that of the previous years. Moreover, the continuation of the cold days was much longer than the previous years, and the amount of the snow fall was greater. The depth of snow was 20-40 cm in the plain area, but it has more than 80 cm deep in the meadow or mountain areas (Adiya & Enhkhuyag, 2001).

Since 2002, the populations of Przewalski's horses in both reintroduction sites have significantly increased, although there was still some mortality due to different factors.

It might be connected with three different factors. First, the founder individuals of the Przewalski's horses, reintroduced to the Hustai National Park were originated from the previously adapted individuals in the semi-wild condition of Europe; second, relatively large number of horse has been

brought in the Hustai National Park by a few transports, and most of them (especially females) were survived; third, ecological conditions of the Hustai National Park, such as climatic condition, food supply were much suitable for the survival or adaptation for Przewalski's horses than those of the semi-desert habitats in Tahiin Tal area.

Therefore, the reproductive rate of mares in reproductive age and growth or survival of foals in Hustai National Park was about 2 to 3 times greater than those in the Tahiin Tal area. Thus, in 1994 all 9 mares in the Hustai National Park have been successfully produced offspring, while only 2 of 7 mares in Tahiin Tal area given offspring. As for the end of 2008, there are 74 and 38 adult mares in the Hustai National Park and Tahiin Tal area, respectively. Also the foal numbers in the two sites are different, as 36 individuals in Hustai National Park, and 24 in Tahiin Tal area as for end of 2008.

The transportation of Przewalski's horses from foreign zoos and nature reserves was ended in 2000 for Hustai National Park, and 2004 for Tahiin Tal area. Since then the growth of the reintroduced Przewalski's horse populations in two areas made up by the natural births of foals. Table 2 shows the growth rate of Przewalski's horse populations in these two sites, between 2002 and 2008.

In case of Hustai National Park, the growth rate of Przewalski's horse populations was relatively higher in 2002, 2004, 2006 and 2008 than other years. Survival of the foals born has fluctuated from year to year. In spite of this, reproductive rate of mares was also different in each year depending on the weather conditions and food resources, and therefore the total population size of Przewalski's horses also shows a dynamic pattern. However, the amplitude of these dynamics is significantly decreased and almost disappeared after 2004 in Hustai and 2006 in Tahiin Tal.

Average growth rate of the Przewalski's horse population in Hustai National Park is equal to 10.7%, while this value being relatively higher in the Tahiin Tal area (15.6%). It should be noted that the survival of horses born in Mongolia

Table 2. Growth rate of the Przewalski's horse populations between 2002 and 2008 (in percentages)

Reintroduction sites	2002*	2003	2004*	2005	2006*	2007	2008*	Average
Hustai	19.2	3.8	17.8	7.5	8.2	1.1	17.1	10.7
Tahiin Tal	17.1	11.3	32.1	10.4	4.2	14.1	20.3	15.6

Explanation: *years with an overall increase in horse numbers

tended to be higher than imported animals. As for the mortality of horses, the main death is caused by babesiosis (a thick-borne blood disease), which particularly affected newly released horses, and most others are deaths of foals, predation by wolves and reproduction-related mortality.

Discussion

Our estimation based upon the "General Studbook of the Przewalski's Horse, 1997" shows that in mid-1950s the total number of Przewalski's horses in the different zoos and nature reserves of the world consisted only by 32 individuals. However, due to effective conservation and breeding measurements, the population of Przewalski's horses is raised up to 59 for the beginning of 1960s, 161 for 1970, 388 for 1988, 723 for 1987, more than 800 for 1989, 1450 for 1999, 1540 for 2000, about 1800 for 2005, and 1931 by the end of 2007, including individuals born in Mongolia (Klimov, 1982, 1990; Bouman, 2000; Zimmerman pers. comm.; Usukhjargal, pers. comm.). Between 2005 and 2007, the total world population of Przewalski's horses was increased only by more than 100 individuals, but if we exclude the 235 foals born in Mongolia during the time of reintroduction, the rest of the world population can be considered as decreased.

Before the reintroduction of Przewalski's horses into the homeland, Mongolia the highest rate of the world population occurred between 1975 and 1990. For instance, the annual growth rate of the Przewalski's horses was 5% in 1975, 7.5% in 1976, 10.3% in 1977, 13.3% in 1978, 12.9% in 1979, and 8.5% in 1980 (Klimov, 1982). Miller (1988), Sokolov and Orlov (1988) declared that the average annual growth rate of the Przewalski's horses in different zoos is fluctuated between 5 and 10%.

As shown above that the size of both populations of the Przewalski's horses reintroduced in the Hustai National Park and Tahiin Tal area are increased gradually. At both reintroduction sites, the value of the correlation between the real and theoretically estimated numbers of horses becoming identical to each other, and the populations of Przewalski's horses gained more a stable pattern with significant increase of the individuals.

The average annual growth rate of the Przewalski's horse population in both Hustai

National Park (10.7%) and Tahiin Tal area (15.6%) has significantly higher value as compared to the growth rate of horses, which are kept in different zoos (data between 1975 and 1990).

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Хураангуй

Анх 1992 онд дэлхийн янз бүрийн оронд байрлах амьтны хүрээлэн, тусгай хамгаалалттай газруудаас тахийг авчран Монголд сэргээн нутагшуулж эхэлсэн бөгөөд 1992-2000 онуудад 84 тахийг Монгол орны төв

хэсэгт байрлах Хустайн Байгалийн Цогцолбор Газарт, 87 тахийг тус орны баруун өмнөд хэсэгт байрлах Тахийн Талд, 2004 онд тус орны баруун хэсэгт байрлах Хомын Талд 24 тахийг тус тус нутагшуулж эхэлсэн юм. Хустайн Байгалийн Цогцолбор Газарт нутагшуулж буй тахийг 1994 онд, Тахийн талд нутагшуулж буй тахийг 1996 онд тус тус хамгааллын хашаанаас суллаж байгалийн нөхцөлд нь зэрлэгшүүлэхээр тавьсан бөгөөд түүнээс хойш дээрх 2 бүс нутаг дахь тахийн тоо толгой жилээс жилд нэмэгдэж байна. Энэхүү бүтээлд дээрх 2 бүс нутагт сэргээн нутагшуулж буй тахийн тоо толгойн хөдлөл зүйн мэдээнд хийсэн дүн шилжилгээг авч үзэв.

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