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Time budget-, behavioral synchrony- and body score development of a newly released Przewalski's horse group *Equus ferus przewalskii*, in the Great Gobi B strictly protected area in SW Mongolia

Anne-Camille Souris [a,1], Petra Kaczensky [b,c,1,*], Romain Julliard [d], Christian Walzer [b,1]

[a] *University of Pierre and Marie CURIE, Paris, France*
[b] *Research Institute of Wildlife Ecology, University of Veterinary Medicine, Vienna, Austria*
[c] *Department of Wildlife Ecology and Management, University of Freiburg, Freiburg, Germany*
[d] *CRBPO, UMR 5173, CNRS-MNHN, Conservation des espèces, restauration et suivi des populations, Paris, France*

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Abstract

The Przewalski's horse (*Equus ferus przewalskii*) became extinct in the wild in the 1960s, but survived as a species due to captive breeding. There have been several initiatives to re-introduce the species in central Asia, but until now only two projects in Mongolia establish free-ranging populations. Data on basic ecology and behavior of the species prior to extinction are largely lacking and thus a good documentation of the re-introduction process is essential. Between 13 May and 2 September 2003 we documented the time budget-, behavioral synchrony- and body score development of a newly released Przewalski's horse group in the Gobi area of SW Mongolia.

Contrary to our expectations, the newly released Przewalski's horses did not show the expected succession of an exploration-, acclimatization-, and established phase. Grazing activity was very high after the release, decreased to a minimum in July and increased again towards the end of the study in September. Resting activity followed the opposite trend, whereas moving activity was more or less constant over the entire observation period. Behavioral synchronization of the group was high throughout the study

* Corresponding author at: Research Institute of Wildlife Ecology, University of Veterinary Medicine, Vienna, Austria; c/o Department of Wildlife Ecology and Management, Institute of Forest Zoology, University of Freiburg Tennenbacher Strasse 4, D-79085 Freiburg, Germany. Tel.: +49 761 203 3799; fax: +49 761 203 3667.
E-mail address: petra.kaczensky@wildlife.uni-freiburg.de (P. Kaczensky).
[1] International Takhi Group.

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period and immigration or emigration of members did not result in a de-synchronization of the group. The body score index never dropped, but rather increased for all group members.

Our data suggests that captive bred Przewalski's horses experience little behavioral and nutritional stress when being released into the desert steppe of the Gobi regions after 1 year in an adaptation enclosure.

Keywords: Adaptation; Activity pattern; *Equus ferus przewalskii*; Mongolia; Przewalski's horse; Reintroduction

1. Introduction

The Przewalski's horse (*Equus ferus przewalskii*) – or "Takh" in Mongolian – is classified by the IUCN as extinct in the wild (EW). Among the seven recent equid species, the Przewalski's horse is the only true species of wild horse in the world (Wakefield et al., 2002). The last free-ranging individual was seen in 1969 in the Dzungarian Gobi area, in SW Mongolia (Sokolov and Orlov, 1986; Bouman and Bouman, 1994). The reason for the species decline and extinction in the wild are generally seen as a combination of factors, namely competition with livestock, hunting, capture of foals for zoological collections, military activities, and very harsh winters recorded in 1945, 1948 and 1956 (Bouman and Bouman, 1994; Van Dierendonck and Wallies de Vries, 1996).

As a species the Przewalski's horse survived due to captive breeding, based on a carefully managed founder population of only 13 animals (Volf, 1996; Mohr and Volf, 1984). With the captive population increasing, interest arose to re-establish the species onto its native range in Mongolia and China (Wakefield et al., 2002). In Mongolia two re-introduction projects were launched in 1992 and by 2005 have resulted in small populations of free-ranging Przewalski's horses, 85 animals in the Great Gobi B SPA in SW Mongolia (Kaczensky, Ganbaatar and Walzer, unpublished data, December 2005), and 177 animals in Hustai NP in central Mongolia (Bandi unpublished data, December 2005). A third initiative was started in 2004 in Khomin Tal in NW Mongolia, where the captive population numbered 22 animals (Zimmermann, 2005). Several other re-introduction programs were attempted in China, Kazakhstan and Uzbekistan, but so far none were able to establish free-ranging populations (Zimmermann, 2005). However, further re-introduction initiatives are presently being discussed (Kaczensky, 2005) or in the planning stage (e.g. Kalameili reserve, Xinjang province, China; Zimmermann, 2005).

In the past re-introduction programs and methods were often poorly documented and reasons for success and failure are not easily accessible (Stanley Price, 1991). Any re-introduction is a challenge and the outcome could provide important lessons for basic ecology and management alike (Sarrazin and Barbault, 1996; Van Dierendonck and Wallies de Vries, 1996). For a species like the Przewalski's horse a good documentation of all stages of a re-introduction program is especially critical because almost no data exists on its behavior or basic ecology prior to extinction in the wild (Wakefield et al., 2002).

The biological rhythm of an individual is linked to its nutritional condition, its social status and its stress condition (Berger et al., 1999; Scheibe et al., 1999; Kaczensky et al., 2006). Thus the study of time budgets and activity patterns of re-introduced individuals can provide important information about their well-being and adaptation status (Boyd and Bandi, 2002). Studies carried out on captive and free-ranging Przewalski's horses in summer, show that the time devoted to grazing is lowest and the time devoted to resting is highest in the middle of the day (Boyd, 1988, 1998; Boyd et al., 1988; Van Dierendonck et al., 1996; Berger et al., 1999; Boyd and Bandi,