

RESTRAINT OF PRZEWALSKI'S HORSES *Equus caballus przewalskii* FOR REPRODUCTIVE STUDIES AT THE NATIONAL ZOO'S CONSERVATION AND RESEARCH CENTER

Mark MacNamara¹ and Linwood R. Williamson²

Affiliation: ¹Fauna Research, Inc. 8 Bard Ave. Red Hook, NY 12571 and Curator of Mammals, SI-NZP, CRC, Center for Species Survival, Front Royal, VA

Reproductive studies provide critical information and are the basis for most successful breeding programmes in zoological collections. Crucial to this is a well designed animal management and handling facility, utilising amongst other things, appropriate manual restraint equipment. Closely aligned to this, and fundamental to obtaining meaningful results, is staff training as well as the conditioning of the animals to the study procedures.

One such study is the Przewalski's horses at National Zoological Park – Conservation and Research Centre (NZP-CRC) which have been the subject of reproductive studies for over 3 years. From 2006, 9 different horses have been restrained 443 times using a hydraulic TAMER. The facilities (Fig 1), restraint equipment (Figs 2 and 3), and the training procedures used in these studies are described here. The results of the studies are reported elsewhere.

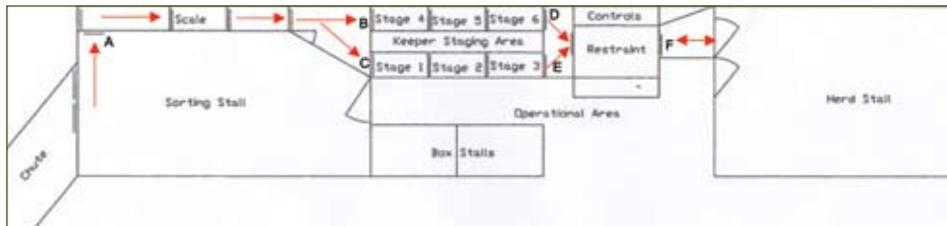


Fig1. Layout of the restraint area and chutes at NZP-CRC

Facilities

The handling facilities are located in a barn situated between two pastures and consist of a large sorting stall, an alleyway 11.5 m long with a built in electronic scale, 6 staging stalls. The upper portion of the staging stalls sides are vertical bars spaced 8 cm apart providing good visibility for the horses and keepers. There is also a protected keeper space between the staging stalls. This space allows keepers to encourage the horses to move towards the hydraulic TAMER. An observation stall at the exit of the TAMER allows animals to be held for observation after restraint and before being released to the larger herd stall and finally out to pasture. The substrate in the stalls is clay and bluestone dust is used for the alleyways. There is a 2 cm thick rubber stall mat as flooring within the restraint. Animal flow is generally left to right, although horses can enter the TAMER in either direction.

Animal Flow

Horses are brought into the Sorting Stall from the chute and enter the alleyway via gate A, proceeding across the scales and entering the staging stalls via gate B or C. Animals are then moved into the TAMER via gates D or E. When all work is completed, they move through the TAMER and into the observation stall before finally being allowed into the herd stall via gate F. From the herd stall they are either released directly to pasture 2, or, reversed back through the TAMER and staging stalls to return to Pasture 1. Restraint equipment comprises:

- The Hydraulic TAMER which is a hydraulically operated restraint device for large exotic hoofstock.
- There is a 1.2 m wide catwalk on each side of the restraint for animal handlers.
- 4 steel sliding doors and 4 smaller swing doors provide easy access to restrained horses.
- 10 cm thick high density foam pads with heavy-duty, rip-stop vinyl covers provide a secure and comfortable restraint.
- Hydraulic controls mounted on the unit with adjustable pressure control and an easy to read pressure gauge allow for firm, but gentle restraint.
- The padded sides open up to 183 cm wide and have a 61 cm lift capacity.
- The sides are controlled by 9 hydraulic cylinders for squeeze and lift movements.

Preparation for reproductive studies

In order to collect data (Table 1.) for reproductive studies each horse needed to be conditioned allowing it to be separated from the herd and eventually held in the TAMER and restrained for the various procedures. This was accomplished by incorporating the conditioning into their daily routine. Initially the horses were run through the facility with all doors and stops open so they could move through unobstructed. Once completely through the facility, the horses were rewarded by being given access to green pasture. As the process continued, additional rewards were added at strategic points such as food rewards (apples and fibre biscuits). Over time, doors were closed and horses were stalled individually for a few seconds before being allowed to proceed to the next stage. Again the reward was food and/or access to green pasture.

Table 1. Procedures carried out.

1	Female reproductive exam – rectal palpation, ultrasound exam, monitoring ovarian activity, pregnancy detection, hormone injections and artificial insemination after inducing standing sedation.
2	Minor veterinary procedures – injection of anaesthetics for artificial insemination; treatment of cuts and abrasions

Discussion

Well designed animal holding and management facilities that incorporate manual restraint equipment such as the TAMER line of products are essential for the proper care and welfare of captive animals. The facilities at CRC and the conditioning of Przewalski's horses helped provide a non stressful environment for the horses. These facilities provided researchers the tools required to develop a research programme investigating the reproductive biology of the Przewalski's horses and to develop an artificial insemination programme for the genetic management of this endangered species.

Acknowledgements

We thank Dolores Reed, David Shiflett, Greg Peterson, Shannon Hunter, and Jessica Kordell, Mammal Keepers; Ken Lang, Mammal Supervisor; Budhan Pukazhenti, Ungulate Biologist; Wynne Collins, Principal Investigator and Lisa Ware who provided the photographs.



Fig1. Hydraulic TAMER unit (© Lisa Ware).



Fig2. Injecting Przewalski's horse restrained in TAMER (© Lisa Ware).