

## How to come together best? - Studies on integration processes of Przewalski horses into new groups (*Equus ferus przewalskii*)

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Conservation of endangered species in zoos and other protected areas has saved several species from extinction. The Przewalski horse (*Equus ferus przewalskii*) is one of that species and, being an attractive large ungulate, it is a "flagship species" for conservation projects. Reintroduction into its former habitat is accompanied by many difficulties and is a great challenge.

Semireserves have been defined as enclosures large enough to maintain groups of Przewalski horses throughout all seasons of the year without any supplemental provisioning. The animals are kept isolated from external human influences as far as possible, except for necessary interventions such as veterinary care. Hence, the purpose is not limited to preparing animals for survival under natural conditions, but is equally related to the need to gain experience in establishment of free-ranging populations.

Naturally, horses live in groups in which all individuals are long-term acquainted with each other and a stable hierarchical system is established. In conservation management an integration of horses into strange groups is often needed but at the same time implies social fights, stress and risks for the animals.

We investigated the integration process of 4 Przewalski horses from Zoo Leipzig into the herd of 5 Przewalski horses in the semireserve Liebethal (Brandenburg, Germany). Before transportation the social structure was determined in both the herd in Zoo Leipzig and in Liebethal. After transportation the social hierarchy and the individual dominance indices were determined by daily observation. Continuous records of activity and feeding were taken from several individuals using the ETHOSYS-storage telemetry system. The automatically recorded behaviours were analysed for daily and ultradian rhythms and used for stress detection by calculating a value (DFC) representative for regularity and stability of rhythmic structures.

In zoo conditions, the behaviour was very regular and the daily pattern nearly identical from day to day

as expressed by DFC's near of 100%. After transportation, the behaviour became much less regular, DFC's dropped significantly, recovered slowly and stabilised on values typically for semireserve conditions. Social bindings and dominances of the former two herds were mainly retained.

As an important result, long lasting and stepwise transition from zoo to natural habitats with special training using new observing techniques can be strongly recommended.

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