Przewalski horses, wolves and khulans in Mongolia

Report July 2004, by Petra Kaczensky and Chris Walzer

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website: www.takhi.or or alternate site: www.wildvet.at

1 The Przewalski's horse population

Status of the population

The past winter proved to be a good one, rather mild and with not too much snow. All takhis were in good or very good condition in spring 2004 and no takhi died during the winter months. Due to SARS no takhi transport could be organized in 2003, but this year in June, 12 takhis, all mares, arrived from Europe (Table 1). On June 10 the takhis left Zürich, Switzerland, on board of a Russian transport plane (IL 76; Atlant Soyus Airlines) with the final destination of Khovd in western Mongolia. In Khovd the takhis were reloaded into a smaller Mongolian transport plane (AN 24; MIAT) and flown directly to Takhin Tal. All 12 takhis arrived in good health and condition after the 12 hour trip and were immediately released into the adaptation enclosure (Fig. 1).

The good body condition after the winter was also reflected in a high reproduction rate. Twenty four (80%) of all adult mares (≥ 4 years of age and not transported) gave birth to foals. Three foals died within the first few days of their live: one was killed by the harem stallion, one was found dead with a broken lower jaw and one was very weak and unable to stand up (necropsy results still pending). Thus in total there are 92 takhis (71 takhis ≥ 1 year and 21 foals) in 7 groups in Takhin Tal (Table 1, Fig. 2).

Fig. 1: Release of the new mares into the adaptation enclosure on 11 June 2004 in Takhin Tal, SW Mongolia.

Table 1: Most recent group composition and fate of the takhis in Takhin Tal, Great Gobi B Strictly Protected Area (SPA) (27 July 2004).

Name	Sex	Birthdate	Age	Origin	Arrival	ZB-Nr.	Dam	Sire
Pas group - 15 adults and 6 foals								
Khowch	stallion	24.04.89	15	Askania Nova		1818	548	896
Tschandaga	mare	11.05.91	13	Askania Nova		2130	600	1159
Shagai	mare	15.06.91	13	Askania Nova		2141	966	1008
Uugan	mare	02.09.92	12	Tachin Tal		2398	1831	?
Bulga	mare	07.05.95	9	Langenberg		2787	2018	1374
Michid	mare	13.05.96	8	Tierpark Berlin		2921	744	2041
Toot	mare	11.05.97	7	Zoo Berlin		3072	1813	1618
Oodon	mare	30.07.99	5	Whipsnade/London	14.06.02	3332	1718	2521
Nomkhon	mare	07.05.02	2	Gobi B		T602	2141	1818
Telmen	mare	15.05.02	2	Gobi B		T604	3072	1818
Javkhan	mare	20.05.02	2	Gobi B		T605	2130	1818
Bosoo	stallion	21.05.02	2	Gobi B		T600	2398	1818
Dolgoon	stallion	02.06.03	1	Gobi B		?	2141	1818
Tsast	stallion	12.06.03	1	Gobi B		?	2398	1818
Yruu	mare	23.06.03	1	Gobi B	01.05.04	?	2130	1818
Oodon foal	stallion	25.05.04	0	Gobi B		?	3332	1818
Shagais foal	mare	06.06.04	0	Gobi B		?	2141	1818
Uugan foal	mare	16.06.04	0	Gobi B		?	2398	1818
Bulgas foal	mare	25.06.04	0	Gobi B		?	2787	1818
Tschandaga foal	?	14.07.04	0	Gobi B		?	2130	1818
Michid foal	stallion	24.07.04	0	Gobi B		?	2921	1818
Mundol group - 10 adults and 3 foals								
Mondol	stallion	10.05.97	7	Tachin Tal		3069	2130	1818
Imj	mare	02.08.94	10	Schwerin		2748	1436	1236
Tsgaadai	mare	06.06.96	8	Tachin Tal		2940	1297	1772
Soir	mare	31.03.97	7	Langenberg		3045	2018	1374
Misheel	mare	28.05.97	7	Tachin Tal		3084	1977	1159
Dorothee	mare	06.06.99	5	Tachin Tal		3230	3035	2503
Orkhon	mare	15.07.00	4	Tachin Tal		3430	2645	2363
Zagal	stallion	10.05.02	2	Gobi B		T603	3035	2866
Mandal	mare	26.05.02	2	Gobi B		T608	2940	2866
Kharaatsai	stallion	06.06.03	1	Gobi B		?	3230	3069
Soir foal	mare	02.05.04	0	Gobi B		?	3045	3069
Misheels foal	mare	17.05.04	0	Gobi B		?	3084	3069?
Tsgaadai foal	stallion	28.05.04	0	Gobi B		?	2940	3069
Dorothees foal[1]	mare	08.06.04	0	Gobi B		?	3230	3069
[1] *died of broken jaw - accident?*								
Tuulai group - 9 adults and 4 foals								
Tuulai	stallion	07.05.96	8	Tachin Tal		2911	1825	1159
Yyl	mare	17.04.94	10	Oberwil		2712	486	1772
Khokhoo	mare	19.11.96	7	Langenberg		2984	1359	1374
Erdene	mare	19.02.98	6	Rotterdam	14.06.02	3040	1633	1429
Tagtaa	mare	05.05.98	6	Winterthur		3143	2483	1742
Maral	mare	23.05.00	4	Tachin Tal		3387	3038	2363
Kherlen	mare	26.05.00	4	Tachin Tal		3391	3035	2363
Oroo[2]	mare	24.05.02	2	Gobi B		T607	2787	1818
Kheren	mare	28.07.02	2	Gobi B		T611	2712	2866
Yyl foal	stallion	15.05.04	0	Gobi B		?	2712	2911
Erdene foal[1]	mare	31.05.04	0	Gobi B		?	3040	2911 or 3066
Tagtaa foal	mare	02.06.04	0	Gobi B		?	3143	2911
Maral foal	stallion	13.06.04	0	Gobi B		?	3387	2911
Kherlen foal	stallion	02.07.04	0	Gobi B		?	3391	2911
[1] *killed by stallion Tuulai*								
[2] *changed from Pas to Tuulai group in early June 2004*								
Tayan group - 6 adults and 4 foals								
Tayan	stallion	24.04.97	7	Tierpark Berlin		3066	1431	2041
Mondor	mare	17.06.98	6	Springe	14.06.02	3194	2187	1118
Mongon	mare	06.05.99	5	Winterthur	14.06.02	3273	2483	1742
Tsakir	mare	02.06.99	5	Chemnitz	14.06.02	3298	2502	806
Zogii	mare	15.05.00	4	Winterthur	14.06.02	3375	1897	1742
Zorgol	mare	20.05.00	4	Winterthur	14.06.02	3383	1892	1742
Mondors foal	stallion	29.04.04	0	Gobi B		noch keine	3194	3066?
Mongon foal	mare	20.05.04	0	Gobi B		noch keine	3273	3066
Zogii foal	stallion	27.05.04	0	Gobi B		noch keine	3375	3066
Tsakir foal[1]	stallion	08.06.04	0	Gobi B		noch keine	3298	3066
Zorgol foal	mare	13.06.04	0	Gobi B		noch keine	3383	3066
[1] *died (was not able to stand)*								

Bachlor group - 8 adults								
Hubsugul	stallion	21.05.97	7	Langenberg		3233	1320	1374
Zandan	stallion	28.05.98	6	Tachin Tal		3166	2398	1818
Khuchit	stallion	16.06.99	5	Langenberg	14.06.02	3320	2254	1374
Moogii	stallion	08.10.99	5	Neusiedl/Wien	14.06.02	3342	1386	2444
Myangan	stallion	01.05.00	4	Tachin Tal		3361	1669	2866
Magnai	stallion	02.07.00	4	Rotterdam	14.06.02	3426	2671	2040
Selenge	stallion	28.08.00	4	Marvel Zoo	14.06.02	3441	1497	2507
Zuun	stallion	01.05.01	3	Tachin Tal		3362	2786	2363
Jiguur group - 11 adults and 4 foals								
Jiguur	stallion	12.06.92	12	Langenberg		2363	486	1772
Khaliunaa	mare	16.03.88	16	Australien, Monarto		1669	954	982
Sogoo	mare	01.12.92	11	Australien, Dubbo		2586	974	787
Od	mare	23.04.94	10	Prag		2645	1847	1135
Gurguul	mare	07.05.95	9	Winterthur		2786	1879	1742
Khongoroo	mare	10.05.95	9	Tachin Tal		3038	1972	1159
Sonja	mare	13.06.00	4	Salzburg	14.06.02	3415	2017	1433
Osama	stallion	11.09.02	2	Tachin Tal		T612	2586	2363 or 1818
Shijee	stallion	03.04.03	1	Tachin Tal		noch keine	2786	2363
Saran	mare	09.04.03	1	Tachin Tal		noch keine	2645	2363
Avarga	stallion	21.05.03	1	Tachin Tal		noch keine	1669	2363
Gurguuls foal	mare	28.04.04	0	Tachin Tal		noch keine	2786	2363
Ods foal	stallion	02.05.04	0	Tachin Tal		noch keine	2645	2363
Sogoo foal	stallion	12.05.04	0	Tachin Tal		noch keine	2586	2363
Khaliunaa foal	stallion	07.07.04	0	Tachin Tal		noch keine	1669	2363
Mare group - 12 adults								
Itgel	mare	12.06.96	8	Köln/WPL	10.06.04	2948	1557	1118
Beltes	mare	07.05.98	6	Ahaus/WPL	10.06.04	3145	2318	1118
Zur	mare	06.06.99	5	Köln/WPL	10.06.04	3301	1022	1852
Shandas	mare	11.06.99	5	Ahaus/WPL	10.06.04	3312	3312	1852
Nergui	mare	26.04.02	2	WPL	10.06.04	T337	2018	2805
Mandhai	mare	13.05.02	2	Winterthur	10.06.04	T325	1897	1742
Udam	mare	15.05.02	2	Wien	10.06.04	T330	1386	2444
Zuram	mare	02.06.02	2	Karlsruhe	10.06.04	T203	2638	2397
Orgio	mare	04.06.02	2	Winterthur	10.06.04	T326	2483	1742
Ners	mare	10.06.02	2	Karlsruhe	10.06.04	T204	1648	2397
Tolbo	mare	30.06.02	2	Wien	10.06.04	T332	2173	2444
Zolboo	mare	19.10.02	2	Stuttgart	10.06.04	T202	1767	2480

Fig. 2: Twenty-four foals were born in Takhin Tal, of which 21 are alive as of 28 July 2004.

Monitoring of the free-roaming groups with GPS/ARGOS transmitters

Of the three horses monitored in December, two are still sending data via ARGOS uplink: UUGAN (*Pas group*) and MONDOR (*Tayan group*)(Fig. 3). The collar of SOIR (*Mundol group*) expired in January after 1.25 years and therefore this collar actually was operational for 3 months longer than expected. The *Tayan group* shows a very conservative range use and always remains in the vicinity of the mountain range Serun Baran and drinks from the Bij river. Contrary to previous groups, the *Tayan group* never attempted to return to the adaptation enclosure. *Pas-*, *Mundol-* and *Tuulai* group generally show the same movement patterns as the previous two years (Fig. 3).

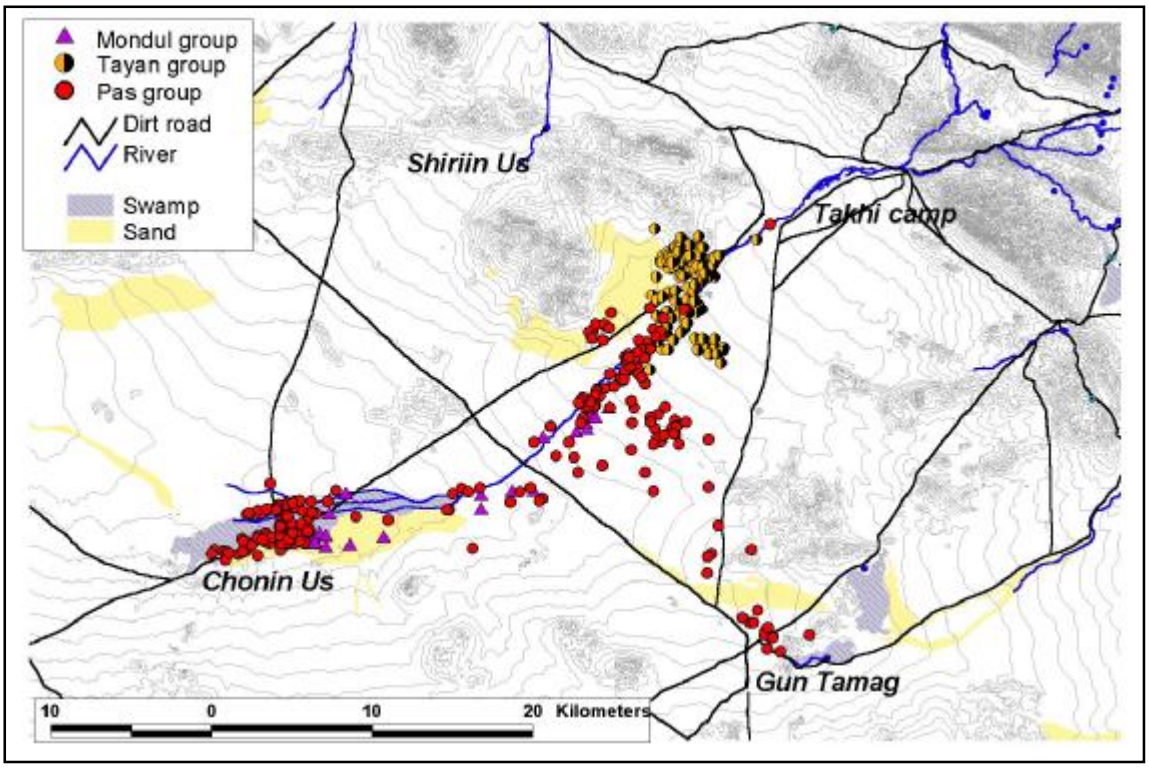

Fig. 3: Locations of the three Takhi groups monitored with GPS / ARGOS telemetry from January until July 2004.

Monitoring of the free-ranging takhis by the park rangers is in accordance with the satellite data (Fig. 4). Although the ranger data does not provide the same spatial accuracy, it is sufficient to demonstrate spatial organization and range extension of the wild Takhi groups. In the future only groups released into new areas of the park will be monitored by satellite telemetry.

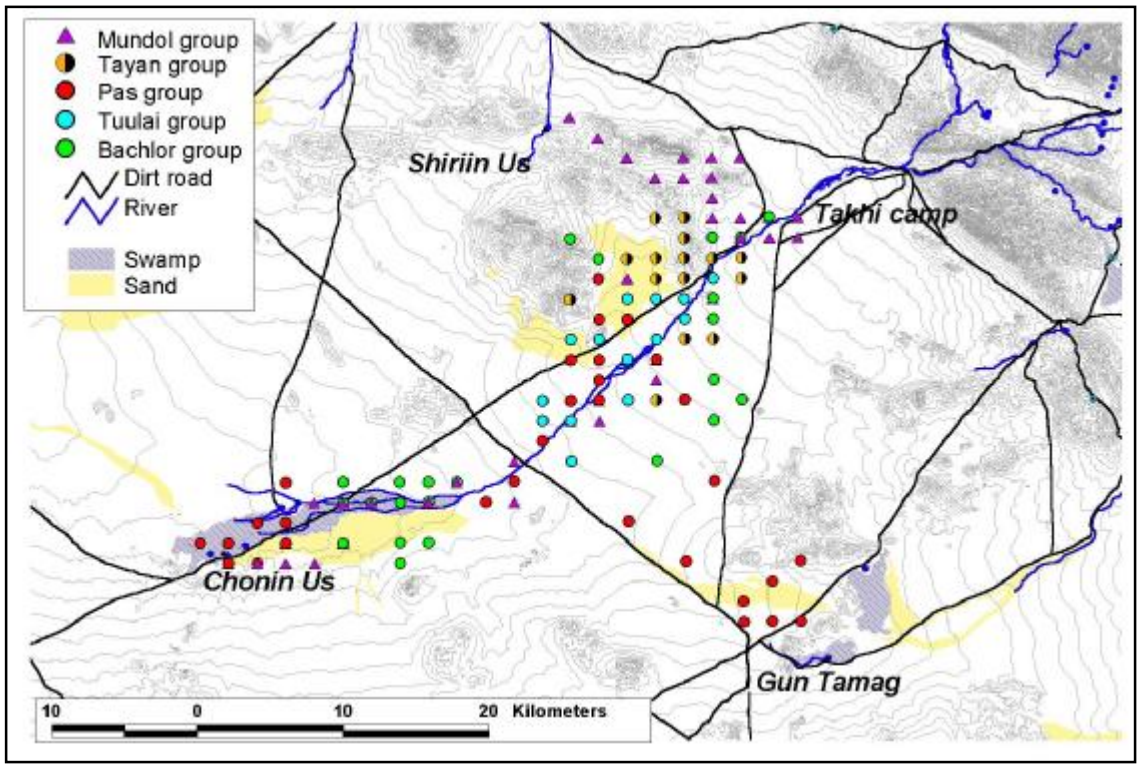

Fig. 4: Takhi observations by park rangers January – July 2004 based on a raster map with 2 x 2 km edge length.

2nd International Workshop on the re-introduction of the Przewalski's horse

We were pleased to host the 2nd International Workshop on the re-introduction of the Przewalski's horse from 12-17 June in Takhin Tal. Thirty-six people from 8 countries attended: Austria, France, Germany, Mongolia, Switzerland, Tanzania, The Netherlands, and USA (Fig. 5). We had 22 talks on various aspects of takhi re-introduction and conservation in Mongolia. All talks were of excellent quality and provided interesting and important information and insights for the final discussion round (see www.takhi.org; alternate site: www.wildvet.at to download abstracts). The workshop was especially fruitful as representatives, from the two ongoing re-introduction projects (Hustain Nuruu and Takhin Tal) and a third projected re-introduction project (Khomin Tal), were present.

Fig. 5: Participants of the 2nd International Workshop on the re-introduction of the Przewalski's horse looking for Asiatic wild ass and gazelles during the post-conference field trip.

2 Wolf population status and feeding ecology

Wolf harvest

From September 2003 until February 2004 wolf harvest in and near the eastern part of the park was 52 wolves, which was a 70% increase of the 2002/03 harvest of 37 wolves. Twelve wolves were killed within the home range of F1 (see Fig. 7). The mild winter and favourable snow conditions for chasing wolves by jeep and a heightend demand of wolf meat and wolf parts in China seems to be responsible for this high harvest level. In spring 2004 up to 50 US$ (the average monthly wage of most rural people) were apparently paid for a frozen wolf carcass, a strong incentive for illegal cross-border trade into China (Ganbaatar pers. comm.).

Wolf signs

From 5-18 March 2004 we systematically searched for signs of wolf presence with 2-3 jeeps on 12 days within a 2,000 km² area in the eastern part of the park. The home range of the collared wolf *Booro* was mostly excluded from the search area. Tracking conditions in March 2004 were favourable, as a 10-20 cm layer of fresh snow covered 80-90% of the area and average ambient temperatures were around –10°C.

During the 12 days of snow tracking by jeep we saw or tracked wolves only on 5 occasions: (1) a single wolf track in the western part, (2) the track, observation and capture of M1 in the south, (3)+(4) tracks and observations of two wolves in the east, (5) tracks and observation of one wolf in the east (Fig. 7). On three occasions when we searched the area near the GPS location of F1 from the previous day, we found tracks of a single wolf twice and tracks of 3 wolves once. It appears that the high hunting pressure actually resulted in a severe reduction of the wolf population in the eastern part of the Great Gobi B SPA and we believe that the park is essentially acting as a sink habitat for wolves.

Wolf monitoring

One wolf was captured after darting it from a jeep (Fig. 6). The wolf was chased for 22 minutes at moderate speed. The animal was cooled down by packing it into the snow and by applying a rectal cold water enema. The captured wolf was an adult male in prime condition, weighing 37 kg (Fig. 6). He was baptized *Tzimtzik*, after the small mountain range close to his capture site. Like the female *Boroo* he was equipped with a GPS / ARGOS collar (Telonics, Mesa, USA).

Tzimtzik covered an area of 4,947 km² (100% MCP) between March and June 2004 (n=198). However, we suspect that we captured this wolf on an exploratory trip or during dispersal as he did not return to the capture area. Since 19 March he seemed to have settled down in an 2,165 km² (100% MCP, n=172) area on the southern tip of the Altai mountain range (Fig. 7).

The wolf *Boroo* is still transmitting locational data on a regular basis. From May 2003 until July 2004 she covered an area of 599 km² (95% MCP, n=737). She remains mainly in the small mountain ranges and when venturing into the steppe area does so largely at night. From this years locational data it appears that *Booro* does not have puppies – she is always on the move and did not return to the same small area in May and June as in 2003.

From this years locationl data it does not look like *Booro* has puppies – she is always on the move and did not return to the same small area in May and June like in 2003.

Fig. 6: Wolf live capture by jeep is a cold exercise (right). Newly collared wolf Tzimtzik wakes up.

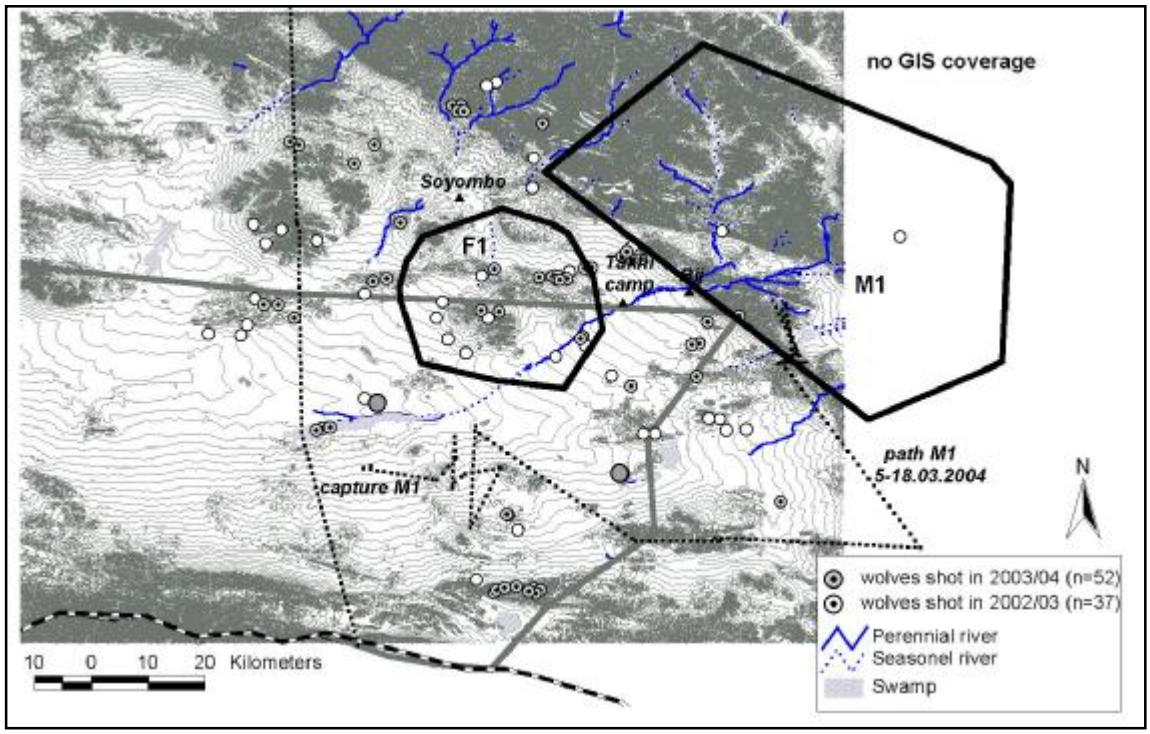

Fig. 7: Home ranges of the collared wolves Booro and Tzimtzik and the location of wolves killed in the eastern part of the Great Gobi B SPA from fall 2002 until spring 2004.

3 Khulan movements and habitat use

Radiotracking of khulans

Mid April the khulan *Khaltar* lost his radiocollar – one screw became unscrewed, and the other was ripped away. Thus we are presently monitoring 5 radiocollared animals, 2 mares and 3 stallions. Movement patterns were in accordance with those from last year: in winter and spring the animals stayed mainly in the western part of the SPA, whereas in summer they shifted to the eastern part (Fig. 8). As last year, the animals made use of almost the entire area of the SPA, with exception of the high mountain ranges in the south. The animals hardly ever ventured out of the SPA.

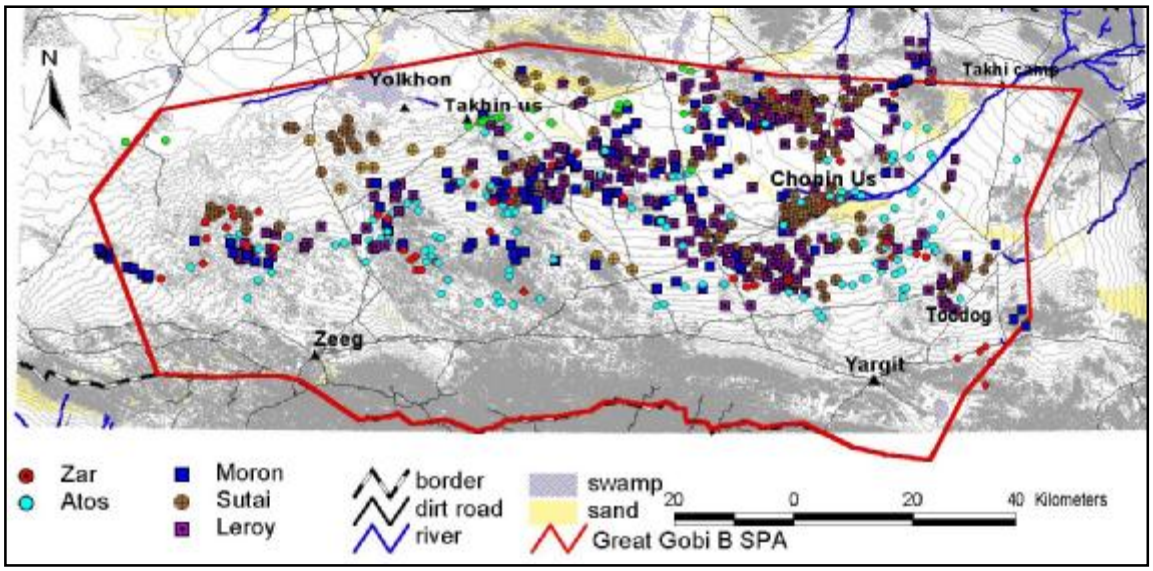

Fig. 8: Locations of 7 khulans monitored in the Gobi B National Park from July-November 2003.

At Toodog water point (Fig. 9) khulan activity and behaviour is being closely monitored since June by a French-Mongolian student team: Anne-Camille Souris (Marie-Curie University, Paris, France) and Jauchva (National University of Mongolia, Ulaan Baatar). In addition, Jauchva will interview approximately 50 herder households to evaluate their attitude towards khulan and khulan management in the Great Gobi B SPA.

Fig. 9: Khulans at Toodog water point in July 2004.

4 Wildlife monitoring

Another whole-park wildlife count was conducted in April 2004. Herders were just about to move from the winter camps to the spring and summer camps and therefore a significant amount of livestock was encountered. Khulan observations were largely restricted to the western part, which was in accordance with the behaviour of the collared animals. Gazelles seem to follow a different pattern than the khulan and similar to last year, were mostly seen in the eastern part (Fig. 10).

In order to facilitate data entry and analysis, Thomas Lipp came in July to test the cybertracker software in combination with a palmtop and a GPS unit. The technique was mainly developed for wildlife surveys in Africa and the beauty is that handling is very easy and no manual data entry is needed. However, data transfer from the palm top to a base computer and data management still remains a challenge. Thomas was supported by the Vienna Zoo (see www.zoovienna.at) and his report will be available on the website (www.takhi.org, alternate website: www.wildvet.at)

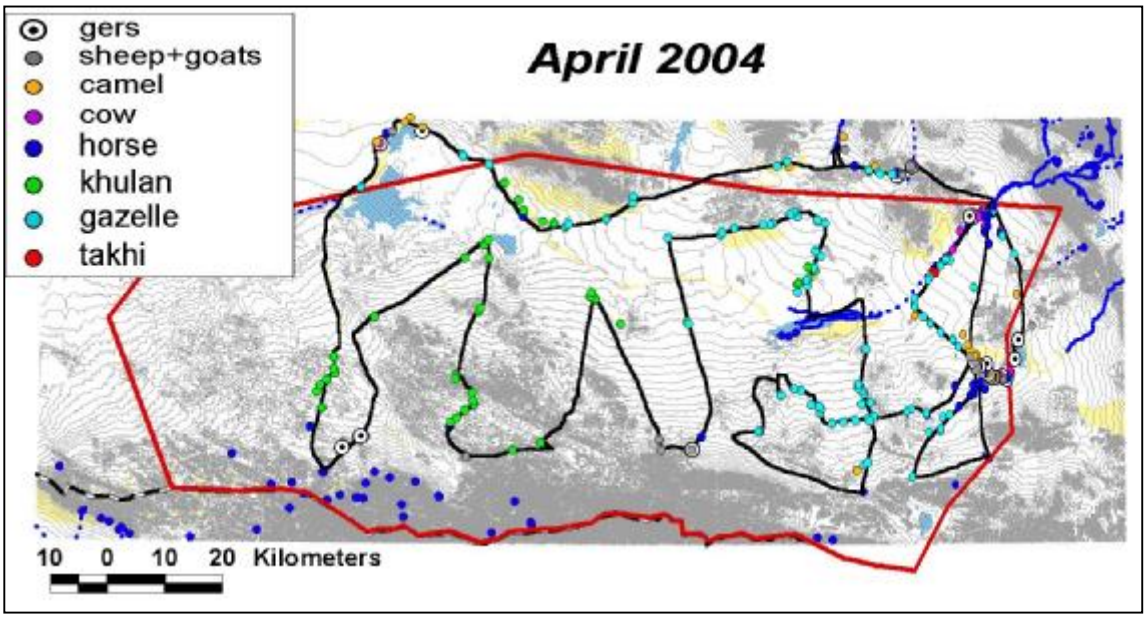

Fig. 10: Wild- and domestic ungulate observations on the wildlife count driven in April 2004.

6 Other activities

- Simon Ruegg, University of Zürich, collected ticks and Jochen Lenger, University of Vienna, came for a second round of plant and equid scat collection to Takhin Tal. Both will present detailed analysis by the end of the year .
- D. Lkhagvasuren finished his work on small mammal communities in the dry valley of Bij-gol and received his masters at the National University of Mongolia (see English summary in the appendix). He will be studying the bat community of the Great Gobi B SPA this

summer (see www.takhi.org; alternate site: www.wildvet.at for download of English summary or Mongolian thesis)
- H. von Wehrden, Philipps University of Marburg, Germany and R. Tungalag, National University of Ulaan Bataar, Mongolia, finished their plant work and were able to produce a vegetation Map of the Great Gobi National park „B" based on intensive ground mapping in 2003 in combination with remote sensing techniques (see www.takhi.org; alternate site: www.wildvet.at for download of English report).
- N. Enksaikhaan, National University of Mongolia, received a DAAD grant for the International Master of Science Program in Sustainable Resource Management at the Technische Universität München, Germany. He left for Germany in April and is presently in Mannheim, Germany for language training.

7 Publication

The following publication has been accepted for publication in the October issue of the Journal of Wildlife management

SLOTTA-BACHMAYR, L., R. BOEGEL, P. KACZENSKY, C. STAUFFER, C. WALZER

Use of population viability analysis to identify management priorities and success in reintroducing Przewalski's horses to Southwestern Mongolia.

Abstract: The Przewalski's horse (*Equus caballus przewalskii*) became extinct in the wild in the 1960s. Since 1997, captive-bred horses have been released into the Gobi-B Strictly Protected Area (SPA) in southwestern Mongolia, and successful reproduction in the wild started in 1999. In 2002, the population formed 3 harem groups and 1 bachelor group (total 38) in the wild, and 3 harem groups (24) awaited release in summer 2003 within acclimatization enclosures, totaling 62 individuals. We used the stochastic population simulation model VORTEX to: (1) identify key variables and their threshold values in population dynamics, (2) predict extinction risk, and (3) optimize project management and release regime by comparing model parameters with our population data. Maximum age of reproduction, foal mortality, and fecundity rates were key factors in population dynamics, while number of released animals, release interval, and duration of supplementation played lesser roles. The severity level of natural catastrophes had the greatest influence on extinction risk and population size according to VORTEX. Assuming a maximum reproductive age of 16 years, an initial population of >140 horses is necessary to achieve a 95% probability of survival over 100 years under the low-severity level of catastrophes scenario. The corresponding extinction risk for high-severity level of catastrophes is 37%, even for initial population sizes >500. The low natural growth rate of the Przewalski's horse may have been the essential prerequisite for extinction in this remote area of Mongolia. However, uncertainty of results was high and limits the predictive value of the model. Comparisons between model parameters with observed population characteristics over the past 10 years reveal some discrepancies that may require readjustment of the model if present trends continue. While our model currently underestimates reproductive rate and foal survival, adult mortality tends to be higher than estimated in the model. We believe adult survival can be improved in the wild and that the reintroduction program has a realistic chance of success. We stress the importance of an intensive monitoring program of the Przewalski's horse

population and consecutive modeling exercises to re-evaluate success of this reintroduction program.

8 Acknowledgements and Funding

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