Winter disaster in the Dzungarian Gobi – crash of the Przewalski's horse population in Takhin Tal 2009/2010

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Photo:Altansukh

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Background: In the Great Gobi B Strictly Protected Area in SW Mongolia Przewalski's horses have been re-introduced since 1992. Since 2001 the population development was positive and the population numbered 137 free-ranging individuals, by the end of December 2009. However, the winter 2009/2010 was to become one of the worst winters in the memory of Dzungarian Gobi local people. Very cold temperatures and frequent snow storms resulted in a massive die-off of all domestic livestock, with local herders loosing between 50-100% of their animals. The small re-introduced Przewalski's horse population was also almost eradicated. Whereas there were 137 Przewalski's horses by the end of December 2009, after the severe "dzud" conditions in late winter only 48 wild horses were left (Fig. 1).

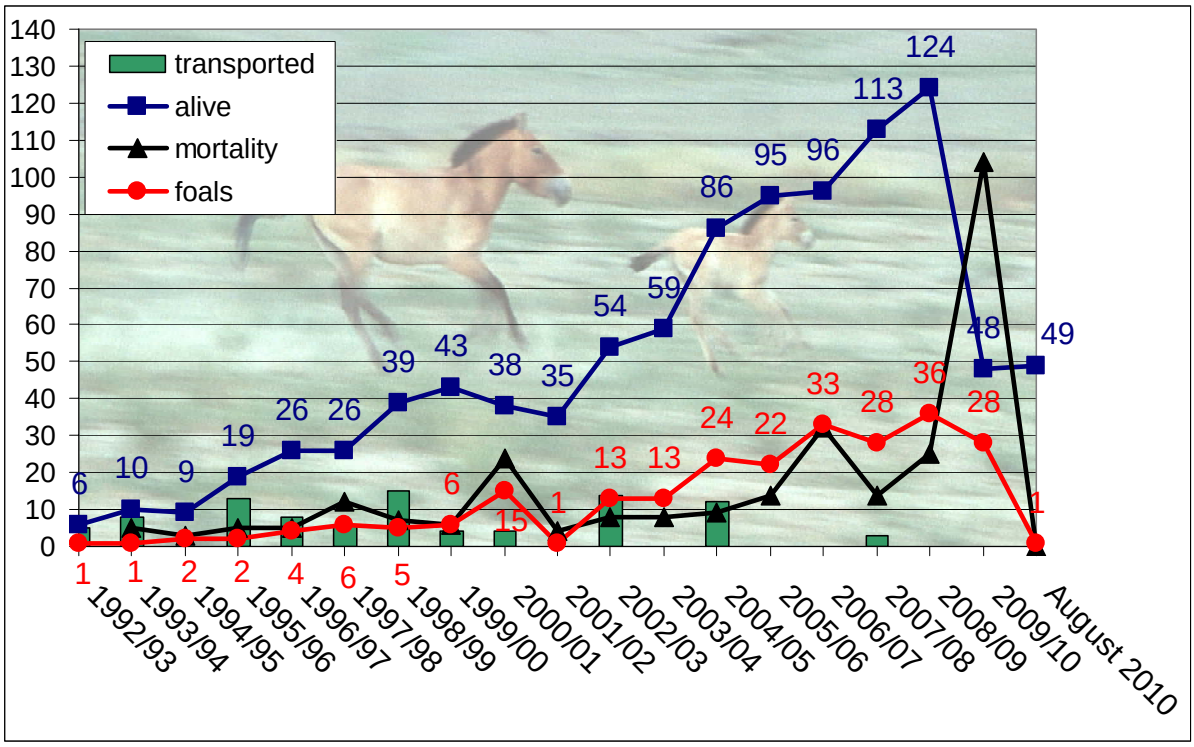

Fig. 1: Population development of the re-introduced Przewalski's horse population in the Dzungarian Gobi in SW Mongolia.
Years represent "horse years" starting 1 May and ending 30 April the next year. The blue line shows the population size by the end of April of the following year (e.g. 2009/10 is the status in April 2010; that is after all mortality occurred.

1. Weather conditions during the winter 2009/2010

The very first snow fell on 7 October 2009 and made all local herders leave the high mountains. Until 20 December 2009 the winter conditions were quite normal. However, on 22 December 2009 the first very heavy snow storm occurred. Continuously from the 29 December 2009 until 7 January 2010 a further snow storm struck and dumped snow up to people's hips over the entire Gobi. This was followed on the 17-20 January with another heavy snow storm dumping even more snow and packed down the previous snow. In February at least another 5 periods of heavy snow storms each with 2-3 day duration occurred (Fig. 2). From 6 March until 8 March 2010 the final severe snowstorm of this winter hit and temperatures stayed low until mid March (Fig. 3).

Fig. 2: Snow conditions in and around Takhin Tal in February and March 2010 (Photos: Gnabaatar/Altansukh/Nisehhuu).

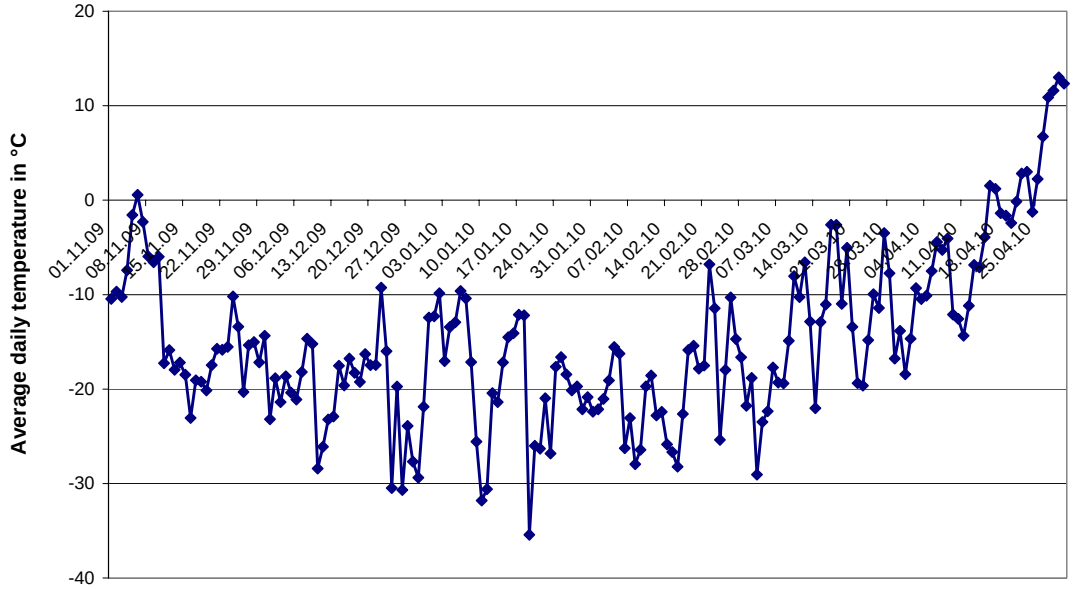

Fig. 3: Average daily temperatures during the winter 2009/2010.

2. Fate of Przewalski's horses in the winter 2009/2010

2.1. Takhis near Takhin Tal research station

On first November 2009 Hustai-Arslan group (3 takhis), and the stallion Jiguur and mare Yyl came to Takhin Tal camp and broke the fence behind which 10 truck-loads (~1,500 kg) of old hay were stored. Subsequently, rangers brought another 10 truck-loads of fresh hay for these horses to feed from.

By the end of November bachelor stallion Arslan and two other stallions joined the 5 takhis feeding at the hay storage. At the end of December the Shijee group (9 takhis) also arrived at the Takhin Tal hay storage. However, by than the stored hay was finished and rangers started to bring daily hay rations to the takhis by jeep until the end of February.

Unfortunately feeding was impossible during several of the snow storms for 2-3 days because rangers and their families were actually snowed in and had great difficulties to even get out of their gers. By the end of February another 1,500 kg of fresh hay had been fed to the takhis and all hay reserves were finished. On 7 March another 2,500kg of hay were transported from Khovd to Takhin Tal camp to feed the remaining takhis until the end of March. Despite the feeding Jiguur died in December, Yyl in January, and 2 of the 3 bachelors and 8 of the 9 takhis in Shijee group died in February during one of the many snow storms (Fig. 4).

Fig. 4: Dead takhis at the Takhin Tal research camp in February 2010 (Photos: Nisehhuu).

2.1. Takhis in and around Chonin us

The majority of the Przewalski's horses (~100) stayed in and around Chonin us from November on. Individual harem groups were often seen in close proximity to each other (Fig. 5).

Fig. 5: Takhis at Chonin us on 7 December 2009 (Photos: Altansukh).

By the end of February 2010 only 32 takhis could still be confirmed in Chonin us. Since the winter weather still continued, it was decided to try feeding the remaining takhis. On 6 March, 4,200 kg of hay were brought from Khovd, requiring hours and hours of snow shovelling during freezing cold weather (Fig. 6).

Fig. 6: Hay transport from Khovd (Photos: Nisehhuu)

On 7 March a ger was set up next to the hay storage place at Chonin us and takhis were provided with hay daily except for a few days when snow storms made all outdoor work impossible (Fig. 7).

Fig. 7: Hay supply camp at Chonin us (Photos: Gnabaatar/Altansukh).

The Chonin us camp was run from 10 March until 10 April 2010. The mare Tschandaga was individually fed with 10 packs of hay (170 kg) until 8 April 2010, when she disappeared. On 11 March 2010 there were 32 P-horses in Chonin us – 16 in the NW and 16 in the SW.

Between 10 March and 1 April 2010 the weather was bad with 2-3 snow storms and thus some days went without feeding the P-horses. On 18 March 2010 the snow started to melt in Chonin us. On 24 March 2010 the rangers pushed out the remaining 10 P-horses from Chonin us, to prevent horses from getting stuck in the ever increasing mud flats. However 2 stallions stayed and 2 mares returned. Of about 100 takhis that had stayed in and around Chonin us, 77 died – most before the feeding started (Fig. 8).

Fig. 8: Dead takhis at Chonin us (Photos: Gnabaatar/Altansukh).

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2.1. Takhis at Takhi us

Snow depth decreased considerably towards the west of Chonin us and snow was less packed in the western part of the Great Gobi B SPA. Contrary to the severe losses of takhis at Takhin Tal camp and in Chonin us, the harem group at Takhi us had not lost any member by the end of February. To prevent any late winter losses this group was also provided with 1,700 kg of hay from Khovd from 6-31 March 2010. Only one mare, which had been in bad body condition died, all other group members survived the winter.

In total 89 takhis died this winter due to the extreame "dzud" conditions from January until April with the majority of takhis being killed during the sever and repeated snow storms in February (Fig. 9). An additional 15 takhis, mostly foals of the year, had died previous to the harsh winter making for a total loss of 104 takhis for the "horse year" 2009/1010 (note: a "horse year" starts in May and ends by the end of April the following year, thus encompassing one reproductive cycle starting with the birth of foals).

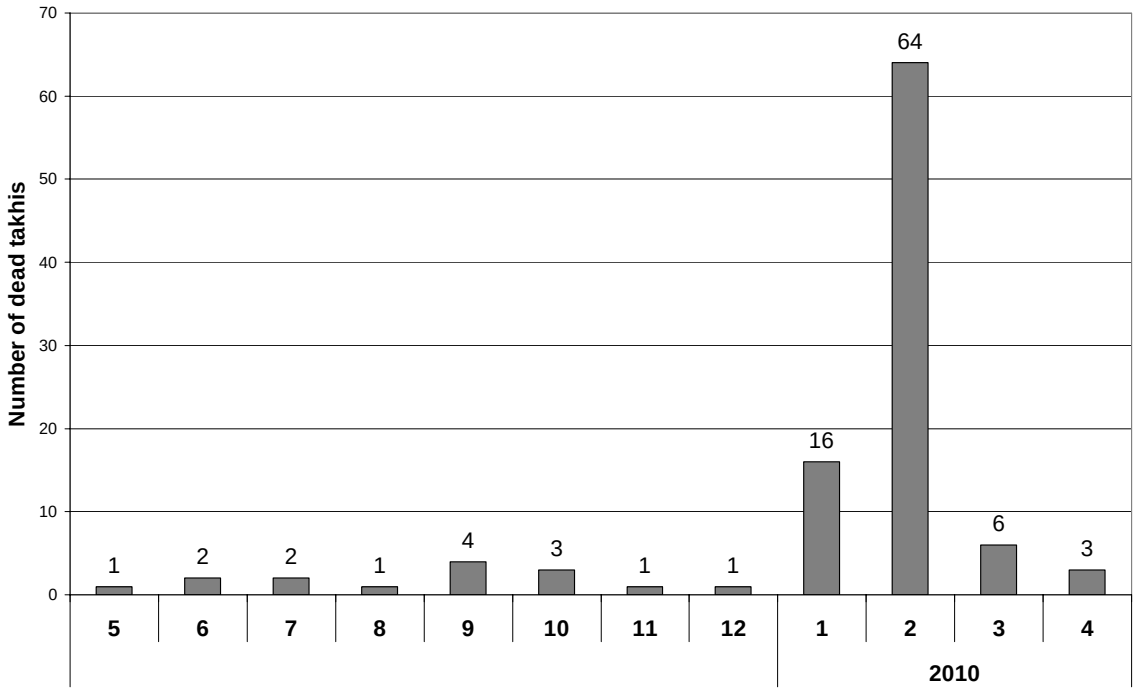

Fig. 9: Occurrence of Przewalski's horse deaths during the horse year 2009/2010.

By 20 April 2010 all snow had gone in and around Takhin Tal and Chonin us. On 24/25 April the body condition of the surviving takhis was excellent and all had already shed their long winter hair.

Of the surviving horses, 30 have been born in the Gobi, 10 came from various zoos in Europe and 8 had been born in the once fenced breeding group at Takhin Tal camp. The sex ratio of the surviving takhis is skewed towards mares and we presently have 33 mares and 15 stallions organized in 6 harem groups and 4 bachelor stallions (Tab. 1).

The large amounts of snow coupled with early rains in June 2010 have resulted in an unusual lush pasture and the surviving takhis are all in excellent body condition (Fig. 10). On 14 August the only foal observed so far has been born in the Kharaatsai group.

Fig. 10: Takhis around Takhin Tal camp (top) and Hubsgul group at Takhi us (bottom)(Photos: Kaczensky).

Tab. 1: Surviving takhis in the Great Gobi B SPA as of July 2010. For several of the young takhis a final confirmation of their identity is still pending.

Nr.	Sex	Name	ZB-Nr.	Birth date	Origin	Dam	Sire
Azaa group							
187	stallion	Azaa	4529	21.05.05	Gobi B	3230	3069
151	mare	Udam	3734	15.05.02	Wien (A)	1386	2444
170	mare	Huvhar	4383	06.06.04	Gobi B	2141	1818
175	mare	Tsovoo	4398	16.06.04	Gobi B	2398	1818
Bundan group							
177	stallion	Bundan	4404	02.07.04	Gobi B	3391	2911
79	mare	Dorothee	3230	06.06.99	Tachin Tal	3035	2503
208	mare	Khatan	4751	21.05.06	Gobi B	3230	3069
Erhes (?) group							
238	stallion	Erhes ?	4932	03.05.07	Tachin Tal	2786	2363
73	mare	Od	2645	23.04.94	Prag	1847	1135
242	stallion	Mogoi	4961	11.05.07	Tachin Tal	2586	2363
275	mare	Setgel	5148	20.05.08	Gobi B	2948	2363
Kharaatsai group							
137	stallion	Kharaatsai	3881	06.06.03	Gobi B	3230	3069
61	mare	Imj	2748	02.08.94	Schwerin	1436	1236
87	mare	Maral	3387	23.05.00	Tachin Tal	3038	2363
88	mare	Kherlen	3391	26.05.00	Tachin Tal	3035	2363
101	mare	Orkhon	3430	15.07.00	Tachin Tal	2645	2363
111	mare	Oroo	3755	24.05.02	Gobi B	2787	1818
132	mare	Saran	3823	09.04.03	Tachin Tal	2645	2363
183	mare	Buman	4503	29.04.05	Gobi B	2748	3069
246	mare	Erhsaran	5017	03.06.07	Gobi B	3084	3166
Nomkhon group							
106	stallion	Nomkhon	3717	07.05.02	Gobi B	2141	1818
112	mare	Mandal	3758	26.05.02	Gobi B	2940	2866
197	mare	Holog	4561	30.06.05	Gobi B	2398	1818
247	mare	Taniya	5018	30.07.07	Gobi B	4234	3361
250	mare	Otgonbor	5038	15.06.07	Gobi B	2398	1818
269	stallion	Ugalz	5120	05.05.08	Gobi B	3758	3750
Bachelor stallions							
165	stallion	Zegst	4352	25.05.04	Gobi B	3332	1818
202	stallion	Sooton	4593	08.10.05	Tachin Tal	2948	3233
166	stallion	Doroo	4356	27.05.04	Gobi B	3375	3066
185	stallion	Bars	4511	09.05.05	Gobi B	3430	3069
Hubsugul group							
81	stallion	Hubsugul	3233	21.05.97	Langenberg	1320	1374
144	mare	Zur	3301	06.06.99	Köln (D)/WPL	1022	1852
146	mare	Shandas	3312	11.06.99	Ahaus (D)/WPL	2948	1852
147	mare	Beltes	3047	15.04.97	Ahaus (D)/WPL	1987	1118
152	mare	Tolbo	3807	30.06.02	Wien (A)	2173	2444
153	mare	Nergui	3708	26.04.02	WPL	2018	2805
154	mare	Mandhai	3730	13.05.02	Winterthur (CH)	1897	1742
203	mare	Audi	4688	09.04.06	Gobi B	3047	3233
204	mare	Altai	4690	16.04.06	Gobi B	3312	3233
211	mare	Suvd	4778	30.05.06	Gobi B	3807	3233
228	mare	Ynzagahan	4855	25.08.06	Gobi B	3811	3233
229	stallion	Shandast	4856	01.09.06	Gobi B	3301	3233
253	stallion	Khaan	5054	25.06.07	Gobi B	3312	3233
254	mare	Shuudan	5055	25.06.07	Gobi B	3807	3233
281	stallion	Aptek	5161	01.06.08	Gobi B	3047	3233
292	mare	Surguuli	5190	01.07.08	Gobi B	3708	3233
299	mare	Altaisayan	5201	15.07.08	Gobi B	3807	3233
316	mare	Angarag		21.05.09	Gobi B	3708	3233

3. Other wildlife and livestock

3.1. Other wildlife

We only found 2 carcasses of wild asses from the last winter (Fig. 11). Rangers did not see any wild asses in the eastern part of the park during the winter with the first animals arriving in mid March. It appears that wild asses were able to make it through this “dzud” winter without heavy losses by moving out of the hardest hit area in the NE of the park. However, observed wild ass foaling rates seem very low this year.

Fig. 11: Mostly likely a khulan that succumbed to the harsh winter conditions (Photo: Kaczensky).

We found a few scattered gazelle carcasses of animals that most likely died during the winter. However, we did not find any concentrations of carcasses and reproduction does not seem to be unusually low as many females with twin fawns were observed.

3.2. Livestock

Livestock losses this winter were immense, with people in the NE part of the park loosing between 80-100% of their livestock. Towards the south and west, losses were somewhat less but nevertheless averaged 50-70%. In the vicinity of Takhin Tal camp and Chonin Us a few camps lost as many as 2,000-3,000 sheep and goats (Fig. 12). In addition, virtually all cows and domestic horses that were at Chonin us died.

Fig. 12: Winter camp that lost several thousand sheep and goats, as well as its horses in February 2010 (Photos: Kaczensky).

4. Perspectives

Locating Przewalski's horse carcasses that succumbed to the "dzud" disaster was greatly hindered by the adverse weather. First, frequent snow storms and the accumulated high snow masses greatly restricted vehicle access of the Gobi. Subsequently, snow melt basically transformed large parts of the Gobi into mud flats, again greatly restricting mobility. In addition, with the ground thawing, wildlife and domestic animal carcasses at Chonin us quickly started to sink into the many mudholes. As a consequence of this situation only 45 of 89 Przewalski's horses that disappeared during the "dzud" period January until April 2010 could be located. Of these 45 carcasses 33 were still in good enough condition to collect various tissue samples. These samples will arrive in Europe shortly and thorough pathologic, virologic and bacteriologic investigations will be performed.

With a total size of only 49 animals the wild horse population in Great Gobi B SPA has again become very vulnerable to stochastic effects and it will take quite some time before they will reach the anticipated minimum viable population of 200-300. Consequently, the International Takhi Group (ITG) is presently looking into the possibility of bringing in additional Przewalski's horses, ideally from the nearby population in Hustain Nuruu, Mongolia or the breeding facility in Jimsar, China.

The "dzud" disaster in the Dzungarian Gobi showed a clear severity gradient with the area most severely affected being located in the NE part of the Great Gobi B SPA. Unfortunately, this was exactly the area where the majority of Przewalski's horses range in the winter months. The harem group further west on the other hand, was hardly affected at all. The spatial pattern of the "dzud" disaster highlightens how important it is to make sure the distribution range of Przewalski's horses becomes as widespread as possible. Thus efforts will be made to strengthen the Przewalski's horse population in the western part of the Great Gobi B SPA.

Acknowledgements

We are extremely grateful for the huge effort everybody at Takhin Tal did to save as many Przewalski's horses as possible. It was very hard work in the worst weather conditions – THANK YOU SO MUCH!

Fig. 12: Part of the ranger team with Przewalski's horses in January 2010 (Photo: Antansukh).