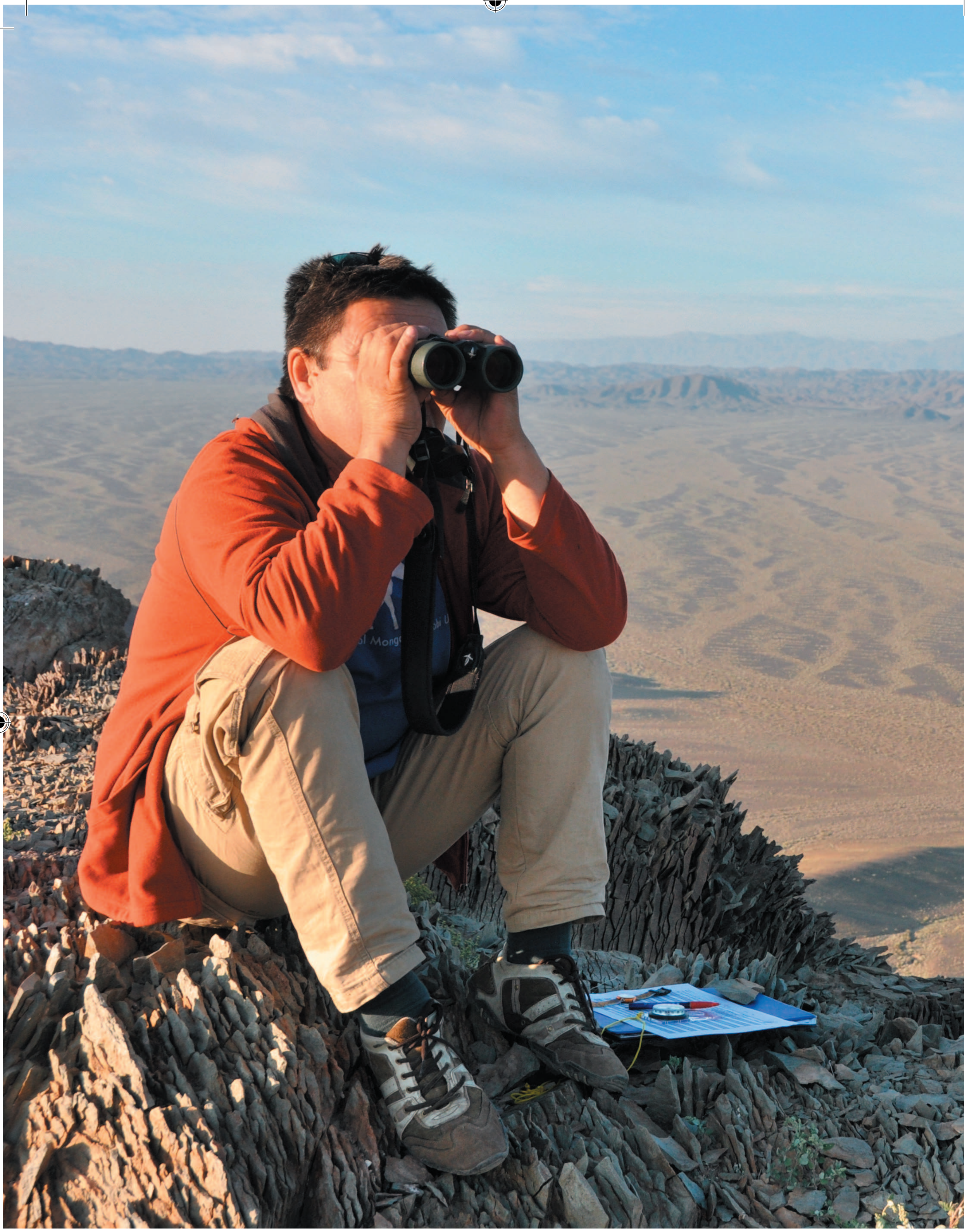


Photo: P. Kaczensky

Simultaneous ground count of the Asiatic wild ass in the Great Gobi B Strictly Protected Area

PETRA KACZENSKY[1], JASON, I. RANSOM[2],
O. GANBAATAR[3,4,5], N. ALTANSUKH[3]

[1] Research Institute of Wildlife Ecology, University of Veterinary Medicine, Vienna, Austria
[2] U.S. Geological Survey (USGS), Colorado, USA
[3] Great Gobi B Strictly Protected Area, Mongolia
[4] International Takhi Group, Switzerland
[5] Institute of Biology, National University of Mongolia

INTRODUCTION

The Mongolian Gobi is the last stronghold of the Asiatic wild ass (*Equus hemionus*; Reading et al. 2001). Anecdotal evidence suggests that the species may have lost as much as 70% of its range since the 19th century due to direct persecution and competition with humans and their livestock over water and pasture use (Kaczensky et al. 2011). Although fully protected, wild asses are actively chased away or illegally killed by people and the mere presence of people and their livestock at water points can limit or block access for Asiatic wild asses (Kaczensky et al. 2006). Accurately estimating abundance of Asiatic wild ass is an essential step towards implementing a species conservation plan and to managing human-wildlife conflicts in the region (Kaczensky et al. 2006, Kaczensky et al. 2007).

Assessment of the wild ass population trends is challenged by the huge expanse of the distribution range (~250,000 km²), large-scale movements, long flight distances, uneven distribution, and large variations in-group sizes. Abundance estimation by researchers and managers is complicated by the unavailability of suitable fixed-winged aircraft. Past population estimates either lacked statistical rigor (Lhagvasuren 2007) or plagued by a high variance of the estimate (Reading et al. 2001, Kaczensky et al. in prep., B. Lkhagvasuren & S. Strindberg unpubl. data).

Visibility of ungulates can vary tremendously from survey to survey depending on transect spacing and sighting factors such as snow cover, group size, activity of the animals, vegetation cover, and experience of the observers. Population estimation methods that employ statistical sampling theory and models in an attempt to correct for sighting biases fall into three categories: sightability bias correction models, line-transect distance sampling, and mark-recapture sampling. All of these methods have inherent limitations and assumptions that can often not be met in a real-world application, but combining methods can have a synergistic effect providing a more powerful tool for estimating animal abundance (Lubow and Ransom 2009).

SURVEY DESIGN

We used a simultaneous distance sampling double observer point count approach (Thomas et al. 2010). The premise behind this approach was that 1) groups closer to the survey point are more likely detected, and 2) highly visible groups are easily seen by both observers, but more difficult to detect groups are often only seen by one observer. Additional covariate data collected may then be used to build a sightability model that reflects which observation conditions may influence the ability of observers to see or miss groups.

We selected 50 elevated points, more or less evenly distributed over the entire Great Gobi B SPA. During the first session we surveyed the eastern part of the park and during the second session the western part of the park. Assuming wild ass can be detected up to a distance of 5 km, we covered ≤33% of the park (Fig. 1).

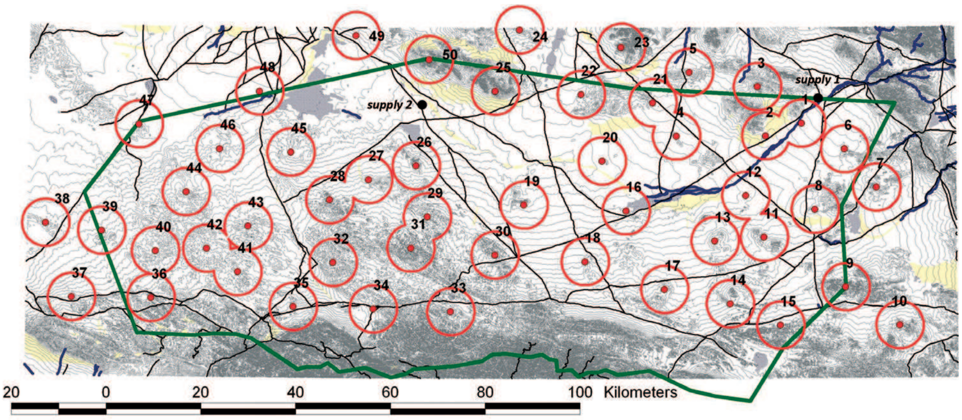


Fig. 1: Survey points for the simultaneous point count of wild asses in the Great Gobi B SPA in August 2010. The orange circles mark the two supply points (supply 1 = Takhin Tal camp, supply 2 = Takhin us).

Our approach involved 50 people for the actual counting. It was necessary to supply them with sufficient water and food, as well as transport them to and from their respective survey point. The entire survey was performed over a 5 day period, followed by a celebration on the 6th day:

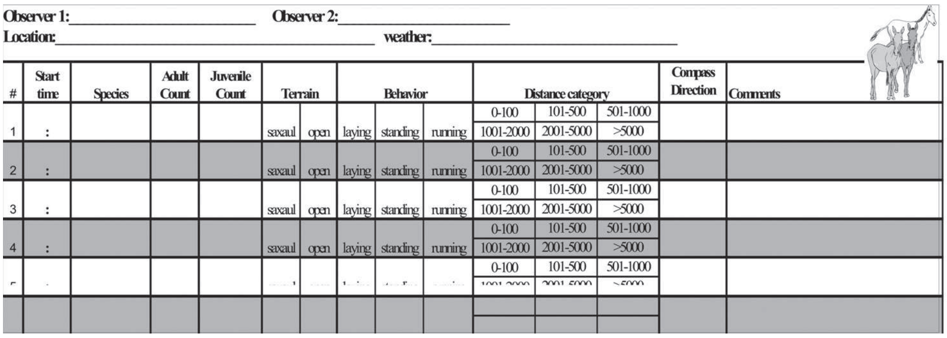
- **4 August:** training (PowerPoint on background and past efforts; field training on how to use a compass, fill in data sheets and use the range finder)
- **5 August:** distribution to points, evening count at 20:00
- **6 August:** count at 7:00, 9:00, 11:00, 13:00, 15:00 and transfer to Takhi us supply point
- **7 August:** distribution to points, evening count at 20:00
- **8 August:** count at 7:00, 9:00, 11:00, 13:00, 15:00 and transfer to Takhi us supply point
- **9 August:** chorchog celebration at Takhi us and subsequent debriefing at Takhin Tal camp

For the survey, we (4 people) recruited people from the Great Gobi B SPA staff (7 people), the Shargin Gobi Saiga Reserve (3 people), the local communities (24 people), and a Mongolian-German student excursion organized by the Senkenberg Museum Görlitz and the National University of Mongolia (12 people). The 50 people of the survey crew were organized in 6 teams of 6 to 12 people (Fig. 2). In addition, we hired a supply team of 3 cooks and 2 truck drivers.

Fig. 2: The 6 survey teams. From top left bottom right: Bus 1-, Bus 2-, Aagii-, Saiga-, Space- and Takhi team.

We equipped every pair of observers with 8 x 30 binoculars, a simple rangefinder with horse outlines (for distances of 100m, 500m, 1000m and 2000m), a digital watch, a pencil and a plastic folder. Furthermore, people received water and food supplies for dinner, breakfast and lunch. People that did not have bedding material were supplied with sleeping bags.

People were asked to record the following variables on a standardized farm: species, group size, distance and direction from observer, vegetation type (saxaul bush steppe or open grassland), animal behaviour (laying, standing, running), time of day, and terrain type (Fig. 3). We provided training based on 1) a PowerPoint presentation explaining the background, past efforts, the goal of this survey and 2) field training on how to use a compass, fill in data sheets and use the customized range finder (Ransom 2011).


Observer 1:______________________ Observer 2:____________________

Location:_______________________________________ weather:_____________________________

#	Start time	Species	Adult Count	Juvenile Count	Terrain		Behavior			Distance category			Compass Direction	Comments
										0-100	101-500	501-1000		
1	:				saxaul	open	laying	standing	running	1001-2000	2001-5000	>5000		
										0-100	101-500	501-1000		
2	:				saxaul	open	laying	standing	running	1001-2000	2001-5000	>5000		
										0-100	101-500	501-1000		
3	:				saxaul	open	laying	standing	running	1001-2000	2001-5000	>5000		
										0-100	101-500	501-1000		
4	:				saxaul	open	laying	standing	running	1001-2000	2001-5000	>5000		
										0-100	101-500	501-1000		

Fig. 3: English version of the survey datasheet.

PRELIMINARY RESULTS & DISCUSSION

Data screening and statistical analysis is still ongoing (Ransom et al. in prep.) and thus the preliminary data presented here only provide some qualitative feedback to the many motivated people involved in this count. **The raw data does <u>not</u> allow for population estimates because it contains double counts within the teams as well as among teams and among counts and does not take into account any covariates** (e.g. terrain, actual visibility from an observation point, animal behaviour, group size etc.).

In total 25 groups of two people each counted all wildlife and domestic animals during two sessions consisting of six counts. Only four teams missed 1 count each at the start (1 team) or end (3 teams) of the second count. Thus out of 300 potential count events we realized 296; making for ~588 individual counts (some teams did not count independently but rather together).

Without accounting for repeatedly counting the same animals, double counts within groups and among groups, all individual observers together observed 1,239 groups, summing up to 14,255 animals. Wild asses were the most frequently observed species (Tab. 2). Wild assess were primarily seen at long-distances from the observation points. The ability to detect the much smaller gazelles seemed to decrease from distances of 2,000m onwards. During the jeep pick-up, people from several observation points that had not seen any gazelles, saw jeep-aroused gazelles previously invisible to the observers.

Species	Groups	Total
khulan	632	10,520
camel	62	1,833
gazelle	198	910
sheep/goat	4	800
takhi	23	163
cattle	2	44
argali	11	43
domestic horse	2	16
ibex	3	13
fox	3	9
wolf	4	4
total	**1,239**	**14,355**

Tab. 2: All observations during the ~588 individual count events.

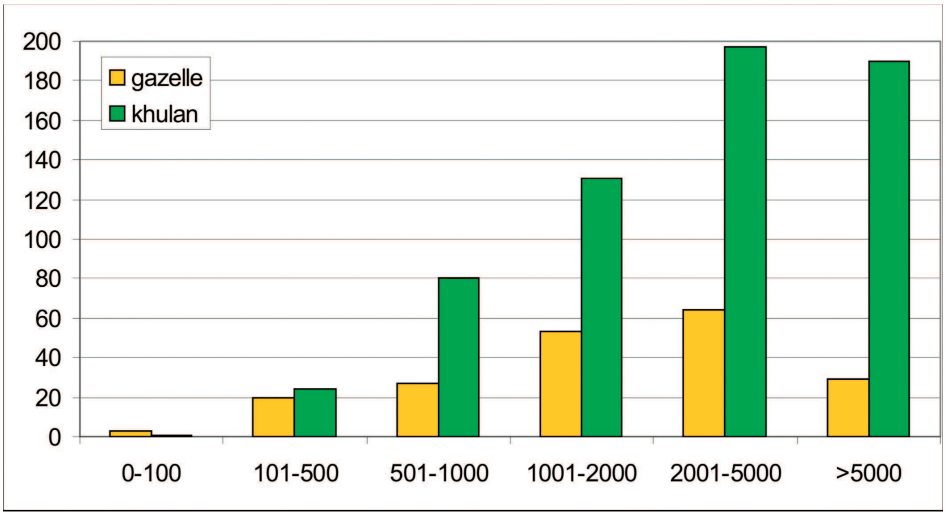


Fig. 4: Distance intervals of individual observations of the two key species of the survey: wild asses and goitered gazelles.

As usual wildlife was not evenly distributed throughout Great Gobi B SPA and while some people were busy counting, others had a rather quiet time. Most wild asses were seen by people at observation points in the central part of the park NW of Chonin us and Takhin us oasis (Fig. 5).

Total costs of the survey of the 2010 survey amounted to only 6,700 EURO which was largely due to the voluntary participation of rangers, students and international experts. However, these 6,700 EURO included 3,400 EURO spend on binoculars and camping equipment purchased for 20 people which can be re-used in further surveys. Without the expenses for material, but paying local wages for all 50 participants and the supply team and rent for all vehicles over 5 days, the survey would have cost around ~5000 EURO (57% for wages, 17% food, 16% petrol, 10% car rental & ger rental).

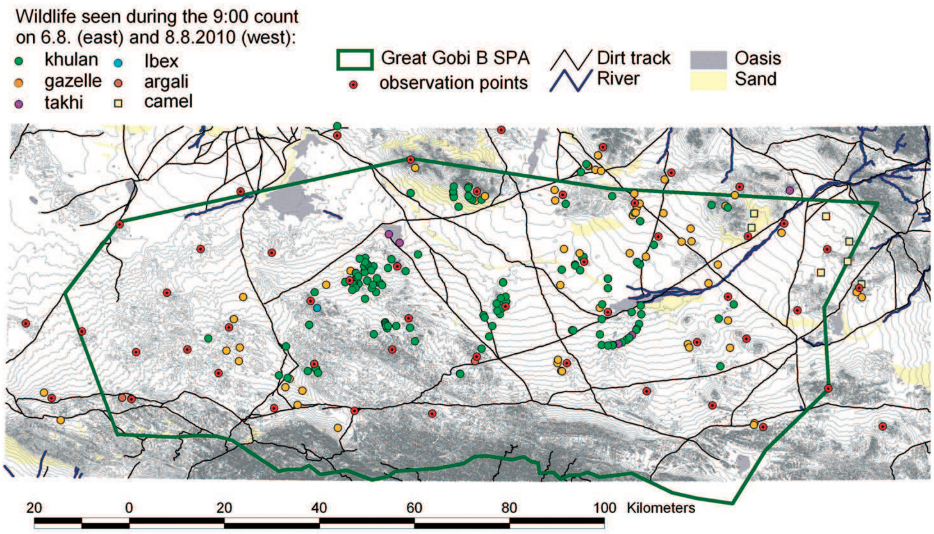


Fig. 5: Distribution of individual observations during the 9:00 count on 6 August 2010 in the eastern part of the park (point 1-25 see Fig. 1) and on 8 August 2010 in the western part of the park (points 26-50).

One of the major advantages of this point count survey was that animals could be detected without triggering flight reactions as has largely been the case during line transect surveys. Consequently, animals could be reliably assigned to the correct distance categories.

The integration of local residents into this effort directly engaged the local community with the science process and provided a foundation for on-going and subsequent conservation efforts and management.

The development of a low cost customizing a rangefinder (Ransom 2011) greatly helped to standardize distance estimates which was particularly helpful because we employed a large number of people with minimal formal training.

We hope that our approach will further strengthen the cooperation of the park with local communities and that it will help raise awareness for the conservation of wildlife in Great Gobi B SPA.

Wild asses. Photo: P. Kaczensky

ACKNOWLEDGEMENTS

Thus survey has been made possible with the financial support of the International Takhi Group, the Research Institute of Wildlife Ecology (FIWI) of the University of Veterinary Medicine in Vienna, Colorado State University's Centre for Collaborative Conservation grant program and the USGS, as well as the Instituto OIKOS and the Regione Lombardia, Italy. We are also very grateful for the logistical and manpower support provided by the German-Mongolian summer school organized by the Senkenberg Museum Görlitz, Germany and the Institute of Biology of the National University of Mongolia (NUM) which was financed by the Deutscher Akademischer Austauschdienst (DAAD) Summer Schools Deutscher Hochschulen im Ausland 2010 "Gobi University".

This survey would not have been possible without the fantastic support by the Great Gobi B SPA staff, the rangers of Great Gobi B SPA and the Shargin Gobi Saiga Reserve and the local people from Bij, Bugat, Altansoyombo, Darvi and Altai of Khovd. We are also very thankful for Prof. R. Samjaa, D. Lkhagvasuren and their students of NUM as well as their German counterparts Hermann Ansorge, Willi Xylander, Margit Hanelt, and Sebastian Moll of the Senkenberg Museum in Görlitz, Germany. And last but not least we want to thank the supply team for their truly herculean task to feed and water 50 people in the middle of the Gobi for 5 days!

REFERENCES

KACZENSKY, P., SHEEHY, D.P., WALZER, C., JOHNSON, D.E., LHKAGVASUREN, SHEEHY C.M., 2006: Room to roam? The threat to khulan (wild ass) from human intrusion. Mongolia Discussion Papers, East Asia and Pacific Environment and Social Development Department, Washington D.C., World Bank.

KACZENSKY, P., N. ENKHSAIKHAN, O. GANBAATAR, WALZER C., 2007: Identification of herder-wild equid conflicts in the Great Gobi B Strictly Protected Area in SW Mongolia. Exploration into the Biological Resources of Mongolia, 10:99-116.

KACZENSKY, P., R. KUEHN, B. LHAGVASUREN, S. PIETSCH, W. YANG, WALZER C.: 2011. Connectivity of the Asiatic wild ass population in the Mongolian Gobi. Biological Conservation, 144:920–929.

LHAGVASUREN, B., 2007: Population assessment of khulan (Equus hemionus) in Mongolia. Exploration into the Biological Resources of Mongolia, 10:45-48.

LUBOW, B.C., RANSOM, J.I., 2009: Validating aerial photographic mark-recapture for naturally marked feral horses. Journal of Wildlife Management 73:1420–1429.

RANSOM, J.I., 2011 : Customizing a rangefinder for community-based wildlife conservation initiatives. Biodiversity Conservation, 20:1603–1609

READING, R. P., H. M. MIX, B. LHAGVASUREN, C. FEH, D. P. KANE, S. DULAMTSEREN, ENKHBOLD, S., 2001: Status and distribution of khulan (*Equus hemionus*) in Mongolia. Journal of Zoology, London, 254:381-389.

THOMAS, L., T. S.T. BUCKLAND, E.A. REXSTAD1, J.L. LAAKE, S. STRINDBERG, S.L. HEDLEY, J. R.B., BISHOP, T.A. MARQUES, BURNHAM, K.P., 2010: Distance software: design and analysis of distance sampling surveys for estimating population size. Journal of Applied Ecology, 47: 5–14