Snow Leopard Conservation Grants, Snow Leopard Network

FINAL REPORTS FOR 2015 PROJECTS

DUE: 15 FEBRUARY 2016

Please submit your final report by the due date above. We would appreciate it if you could follow the suggested format below. Additionally, please send us copies of any detailed technical report(s), papers, and other output arising from this work. Please refer to your original proposal for items such as objectives, methods, etc. unless those were substantially altered during the course of the work. If so, please explain why.

1. Executive Summary: No more than 750 words. Please describe the original goals and the final results of your project. This may be used in press releases and other publicity material about the Grants Program, so please write it for the general public who may not have scientific background.

Our primary goal of this project was to document the presence and estimate the population density of snow leopards and ibex at the Ili Valley, Western Tien Shan, Xinjiang China. We also hoped to update information for snow leopards at the Aksu Area of Muzat and document dispersal between Aksu and Ili. Unfortunately, our objectives for Ili in the western Tien Shan have been delayed because snow prevented prompt camera retrieval. We were also unable to collect leopard scats and calculate ibex density at Ili. However, we were able to expand our project into the central and eastern Tien Shan and study snow leopards and their prey in areas near Urumqi, Wusu and Jinghe. In all three areas we recorded large numbers of ibex and multiple snow leopards. There was a clear difference in the presence of snow leopards in different valleys of Wusu and this was likely from increased human presence in some valleys acting as a deterrent to snow leopards. For example, Maolugou valley, in particular, had large numbers of ibex and much snow leopard sign with photos of multiple leopards. In fact, in November 2015 when returning down the mountain after setting camera traps we observed fresh leopard tracks on the snowy highway that were at most 20 minutes old.

Six, five and three cameras are still set in Urumqi, Wusu and Jinghe, respectively, and data will be collected from these cameras in April 2016. With these data we will try to individually identify more leopards and calculate capture rates (pictures/100 camera-nights). There is a robust estimate of ibex density near Urumqi (Wu et al. submitted), and in a future publication we will use estimates of ibex kilograms to estimate kilograms of snow leopards and thus snow leopard density using the relationship of Carbone and Gittleman (2002). In addition, when all the data are analyzed we will provide density estimates in the east, central, and western Tien Shan and use occupancy modelling to determine snow leopard site-use patterns following Alexander et al. (2015).

We were only able to conduct limited herder interviews, but our initial assessments of leopard conflict show that there were big differences among study sites. The killing of leopards in retribution for livestock predation may be extreme at Jinghe where it was claimed that 5 leopards were killed per year, and there is much potential for future work to reduce this leopard-herder conflict.

We were able to identify several important areas for snow leopards in the Tien Shan, and with the help of our data the Hami provincial level protected area has been upgraded to a national protected area. We have also applied for the establishment of six additional protected areas. When data from the western Tien Shan are analyzed we will apply for additional protected areas in the west.

2. Objectives: What was the purpose of the project? How was it expected to contribute to the knowledge or conservation of snow leopards, their prey, or habitat?

We had four primary objectives: 1) to document the presence and estimate the population density of snow leopards at the Ili Valley, Western Tien Shan, Xinjiang China; 2) to update information for snow leopards at the Aksu Area of Muzat, Western Tien Shan, Xinjiang China and document dispersal between Aksu and Ili; 3) to document the presence and estimate the population density of potential snow leopard prey (ibex and argali) at Ili; and 4) to assess human-attitudes toward leopards around Ili in terms of snow leopard predation of livestock and the threat of poaching.

3. Methods: Describe the methods you used in detail, so that someone else could repeat the work, or, avoid the problems that you encountered.

In this project we used infrared camera traps (Bushnell and Reconyx) to document the presence of snow leopards and potential prey such as ibex. We set the cameras in ravines and along ridgelines that were judged to be preferentially used by snow leopards based on snow leopard sign and prior experience. In most cases we set the cameras at least 500m apart or in different valleys.

We used spot patterns when possible to determine individual leopards, and we considered independent captures as those that occurred at least 1 hour apart. We then calculated the number of independent captures per 100 camera trap-nights.

To assess herder attitudes towards snow leopards we conducted semi-structured interviews about conflict by leopards predating on livestock and retribution by herders.

4. Results: Please describe in detail the results of your project. Please illustrate clearly how your stated goals and objectives could be met. You may wish to include tables or graphs in this section if appropriate. This section will be very important to explain the value of these grants to funders of the Snow Leopard Conservation Grant Program. Please be clear, concise, and thorough.

We had originally planned to document leopard presence and estimate density only in the Western Tien Shan near Ili and Muzat. Because of deep snow we could not promptly retrieve cameras from near Ili and those data are still being analyzed. But we were able to expand our work to three additional areas of the Central and Eastern Tien Shan. From east to west we studied snow leopards at four sites: Urumqi, Wusu, Jinghe, and near Ili (Fig. 1).

Figure 1 The black stars indicate the approximate locations of our 4 study sites in Xinjiang Province, NW China. From east to west our study sites were Urumqi, Wusu, Jinghe, and Ili.

Results for each study site:

1) Urumqi: We placed 4 camera traps over 50 km south of Urumqi city and obtained 13 snow leopard captures in 195 camera trap nights (6.7 captures/100 trap-nights); there were at least 3 individual leopards. Cameras also showed many pictures of ibex, domestic sheep and small mammals as well as one image of a red deer. One camera also showed a leopard visiting a vulture nest, but there were no young vultures in the nest.

2) Wusu: We placed 12 cameras in four valleys south of Wusu and obtained 10 independent images of snow leopard in 1201 camera trap-nights (0.83 images /100 trap-nights). The valleys had very different levels of snow leopard presence (Table 1). At Maolugou, there were at least two individual leopards because two appeared in the same picture. At all valleys there were many images of ibex, and ibex were frequently observed while setting the cameras. There were also images of red deer, wild boar and wolves.

Table 1. Camera trapping results from four valleys near Wusu, Xinjiang

Valley	*Cameras*	*# of Snow leopard images*	*Trap nights*	*Images/100 trap-nights*
Maolugou	3	9	530	1.7
Bayinggou	2	1	221	0.45
Toudagou	3	0	192	0
Dianzhangou	4	0	258	0

3) Jinghe: At Jinghe we set eight cameras and obtained 24 independent pictures of snow leopards in 519.5 camera trap nights (4.6 pictures/100 trap-nights). There were at least two individual leopards. We also obtained many pictures of ibex and domestic sheep/goats.

4) Ili: At the farthest west study site near Ili we set 15 cameras. Deep snow prevented timely collection of the cameras but colleagues indicate that there are many pictures of snow leopards; the data have not been analyzed yet.

In collaboration with the State Forestry Administration, we have used our camera trap data to upgrade the Hami protected area from provincial to national status, and we are applying for 6 protected areas in the Tianshan Mountains (Table 2).

Table 2. Locations of protected areas applied for with our camera trap data.

Name of Protected Area	*Location*	*Area (ha)*	*Class*
Hami	E 93°-94°; N 43°-44°	990,000	National
Yilianhabiergashan	----	----	National
Wulan Nur	E 84°-84° 30’ N 43° 45’- 44°	45,000	Provincial
Dalonggou	----	----	Provincial
Wusu	----	----	Provincial
Zhaobishan	E 87° 17’ – 87° 24’; N 43° 10’ - 43° 24’	750	National
Toutunhe	E 86° 45’ – 87°; N 43° 16’ – 43° 31’	1410	National

We interviewed two to three herders near Urumqi, Jinghe and Ili, and these interviews indicated that there were great differences in the reactions to snow leopard predation of sheep. At Urumqi herders accepted occasional snow leopard predation of sheep and goats while at Jinghe it was claimed that at least 5

leopards were killed per year in retribution for livestock predation. At Ili a leopard had recently been killed but the herder was penalized and there was more respect for penalties against killing snow leopards.

5. Discussion: Please evaluate your own work. What did you learn that could help others wishing to do similar projects? How do you see the results being applied to conservation? What additional work is now needed based on your findings?

Unfortunately, our objectives for Ili in the western Tien Shan have been delayed because snow prevented prompt camera retrieval. We were also unable to collect leopard scats and calculate ibex density in the west. However, we were able to expand our project into the Eastern Tien Shan at areas near Urumqi, Wusu and Jinghe. In all three areas we recorded large numbers of ibex and multiple snow leopards. There was a clear difference in the presence of snow leopards in different valleys of Wusu and this was likely from increased human presence in some valleys acting as a deterrent to snow leopards. For example, Maolugou valley near Wusu, in particular, had large numbers of ibex and much snow leopard sign with photos of multiple leopards. In fact, when setting cameras in November 2016 fresh leopard tracks were observed on the snowy highway as we returned back down.

Six, five and three cameras are still set in Urumqi, Wuwu and Jinghe, respectively, and data will be collected from these cameras in April 2016. With these data we will try to individually identify more leopards and calculate capture rates (pictures/100 camera-nights). There is a robust estimate of ibex density near Urumqi (Wu et al. submitted), and in a future publication we will also use estimates of ibex kilograms to estimate kilograms of snow leopards and thus snow leopard density using the relationship of Carbone and Gittleman (2002). When all the data are analyzed we will provide density estimates in the east, central, and western Tien Shan and use occupancy modelling to determine snow leopard site-use patterns following Alexander et al. (2015).

We were only able to conduct limited herder interviews, but our initial assessments of leopard conflict show that there were big differences among study sites. The killing of leopards in retribution for livestock predation may be extreme at Jinghe where it was claimed that 5 leopards were killed per year, and there is much potential for future work to reduce this leopard-herder conflict.

We found many important areas for snow leopards and with the help of our data the Hami provincial level protected area has been upgraded to a national protected area. We have also applied for the establishment of six additional protected areas. When data from the western Tien Shan are analyzed we will apply for additional protected areas in the west. Our project demonstrates the importance of having local and government collaborators supporting the work.

6. Photographs: If you have good photographic (preferably digital) images of your project that we could use to advertise the Grants Program, please submit them at this time. Please be sure to include a brief description of the photo and provide the credits for the photographer.

If you have any questions on the format or other aspects of your final report, please contact us at grants@snowleopardnetwork.org.

Final reports and digital images should be emailed to grants@snowleopardnetwork.org.