

Snow Leopard Conservation Grant Cover Page

Title: Assessing snow leopard status in northwest Yunnan, China

Paul Buzzard has submitted to Snow Leopard Network

Date: March 11, 2014

Snow Leopard Network Update

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.

China has the largest amount of potential snow leopard (*Uncia uncia*) habitat and the most snow leopards. However, in many areas of China the status of snow leopards has still not been well investigated, and this is true for Yunnan province. Northwest Yunnan is at the edge of the snow leopard range, and there is much potential snow leopard habitat in the Three Parallel Rivers world heritage site. At this site the Yangtze, Mekong and Salween rivers cut deep valleys through the Hengduan Mountains of the eastern Himalayas producing much potential snow leopard habitat. Snow leopards have been reported from the Meilixueshan Reserve between the Mekong and Salween rivers, but in most areas of northwest Yunnan snow leopard status is unknown. Our goals were to first document the presence of snow leopards and important prey items such as blue sheep (*Pseudois nayaur*), Chinese goral (*Naemorhedus griseus*) and alpine musk deer (*Moschus chrysogaster*) with camera trapping at two study sites: (1) in and near the Baimaxuehan Nature Reserve between the Yangtze and Mekong rivers and (2) near Langdu village east of the Yangtze River. We also planned to estimate the population size for prey items and the number of snow leopards in each area and assess the level of human-wildlife conflict from snow leopard predation and threat of snow leopard poaching by interviewing herders at each study site.

At Baimaxuehan we had 9 camera traps at 18 unique locations from January - October 2013, and near Langdu we had 6 camera traps at 6 unique locations from June-December 2013. There have been no pictures of snow leopards yet, but 15 camera traps have still not been collected yet due to adverse weather conditions around Baimaxueshan, and we plan to collect them in April 2014. In the north part of Baimaxueshan we collected a likely snow leopard scat, though. In the same area we also found the skulls of three blue sheep rams at 4300m elevation. The rams appeared to be in the prime of their lives and were likely killed by carnivores such as snow leopards.

Herders claimed that snow leopards were present at both study sites but they were not implicated in any livestock killings. There was, thus, no human-wildlife conflict between the herders and snow leopards, and no evidence of snow leopard poaching. It seems that if snow leopards are present at the study sites they are at low densities. There is much potential snow leopard habitat, however, for range expansion. For example, we found large numbers of blue sheep the primary prey for snow leopards in both study areas as well as large numbers of alpine musk deer at Langdu and goral at Baimaxueshan. We were unable to conduct dung transects for estimation of potential prey densities, and it is necessary to develop methods for determining prey density using camera trap captures.

There is currently intensive copper mining near Langdu, and this has potentially disturbed snow leopards. It would be useful to investigate other areas of Baimaxueshan, and we also heard reports of snow leopards from other areas of northwest Yunnan such as Balagezong Nature Reserve, which should also be investigated in the future.

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 the following three objectives:

- 1) Document the presence of snow leopards and prey items such as blue sheep and alpine musk deer at the two study sites in northwest Yunnan
- 2) Estimate the population size for prey items and the number of snow leopards in each area.
- 3) Assess the level of human-wildlife conflict from snow leopard predation and threat of snow leopard poaching in each area.

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

To meet the objectives Paul Buzzard and Li Xueyou of the Kunming Institute of Zoology, used camera trapping and interviews from December 2012-December 2013. Much of the previous research on snow leopards and other big cats set the traps in pairs to identify individuals (e.g. Silver et al. 2004). For this initial assessment, we did not set the traps in paired arrangements so as to cover more territory. At the north of Baimaxueshan near Yeri village we set nine camera traps (Bushnell Trophy CamTM) from December 2012-May 2013 at 3,988-4,532m in potential snow leopard habitat. Then from June - October 2013 we reset eight of these traps at 2641-3033m elevation. October 2013 we set 9 camera traps as well as 6 traps belonging to the Nature Reserve; we will collect those traps in April 2014. We set four additional traps from this proposal in potential snow leopard habitat to the west of Baimaxueshan near the CERS Tibetan mastiff kennel at Guji village (~N28° 27' E98° 57', www.cers.org.hk). This area is approximately 15km east of Degen between the Mekong and Yangtze rivers at altitudes between 4500-5000 m. We will check these traps in April 2014. At Langdu we set six camera traps from June-December 2013 at 4579-4815m elevation.

We also interviewed local herders at each study site to assess human-wildlife conflict from snow leopard predation of livestock as well as snow leopard poaching. At Baimaxueshan there is a compensation program to reimburse herders for livestock losses because of predation (Li et al 2013). The interviews determined how much predation can be attributed to snow leopards. We will interviewed to see if the herders knew of any instances of snow leopard predation in the area or have seen snow leopard skins used in local Tibetan formal clothing.

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.

1) Baimaxueshan Nature Reserve

In the northern area of Baimaxueshan Nature Reserve we set 9 camera traps from December 2012-May 2013 at elevations 3988-4532m for a total of 1054 camera trap days. We captured photographs of potential snow leopard prey including 104 pictures of blue sheep and 2 pictures of goral. We also captured pictures of other carnivores including 2 black bears (*Ursus thibetana*), 1 wolf (*Canis lupus*), 10 red fox (*Vulpes vulpes*) and 1 Yellow-throated marten (*Martes flavigula*). From June-October 2013 we reset the traps in 8 unique locations from 2641-3033m elevation for 730 camera trap days. We captured 262 goral, 356 blue sheep as well as 2 black bears, 1 masked palm civet (*Paguma larvata*) and 1 Leopard cat (*Prionailurus bengalensis*).

In October 2013 we set 15 camera traps (including 6 belonging to the Baimaxueshan Nature Reserve Management); we will check these traps in April 2014. We set 4 traps in July 2013-adjacent to Baimaxueshan near the CERS Tibetan mastiff kennel at Guji, and we will collect these traps in April 2014.

At Yeri village in the northern area of Baimaxueshan the interviews indicated snow leopard presence but no snow leopard predation of livestock and no evidence of snow leopard poaching.

We found likely snow leopard scat and the skulls and skeletons of 3 Blue sheep rams at ~4300m altitude. These rams were in the prime of life and likely killed by predators such as snow leopards.

2) Langdu

Near Langdu village we set 6 camera traps at elevations of 4579-4815m from June-December 2013 for 822.3 camera trap days. We captured 14 independent pictures of blue sheep and a total of at least 40 individuals. We also obtained 9 independent pictures of at least 9 alpine musk deer, 2 unidentified game birds, 1 marmot and a leopard cat.

Herders mentioned snow leopards in interviews but no human-wildlife conflict.

3) Other areas

We heard reports of snow leopards at the Balagezong Nature Reserve south of the Baimaxueshan Reserve between the Yantgae and Mekong Rivers.

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?

We did not obtain any pictures of snow leopards yet but more camera traps still need to be collected in April 2014 from promising areas with blue sheep sign. Interviews with herders indicate that snow leopards are present or recently were present but there were no indications of human wildlife conflict with snow leopards. We also found likely snow leopard scat and potential prey items, but snow leopard sign was rare so if snow leopards exist at the study sites it likely they are rare.

We obtained many pictures of potential snow leopard prey such as blue sheep, goral and alpine musk deer, but we were not able to conduct dung transects in the mountains as planned because it was logistically too difficult. It is necessary to explore and develop other possibilities for determining the densities of alpine ungulates such as using camera trap models using ranging parameters as done by Rowcliffe et al. (2008).

Northwest Yunnan is the edge of snow leopard distribution but if snow leopard populations rise in other areas there is much potential snow leopard habitat in northwest Yunnan given the large numbers of prey populations. Near Langdu there has been a recent expansion of copper mining and this has possibly disturbed snow leopard populations there. Efforts should be made in the future to limit mining in potential snow leopard habitat.

It would be useful to survey other areas of the northern Baimaxueahan Reserve as well as the Balagezong Nature Reserve where we heard credible reports of snow leopards.

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.



Potential snow leopard scat found in northern Baimaxueshan Reserve



Bushnell

068°F



06-30-2013 19:40

Goral in the northern part of the Baimaxueshan Reserve



Bushnell

036°F



08-21-2013 07:57:55

Herd of blue sheep by Langdu village and above Meixiang yak cheese factory



Bushnell

037°F



07-28-2013 07:51:43

Alpine musk deer near Langdu and Meixiang