

**Chemical immobilization of two snow leopards (*Panthera uncia*)
in Wakhan, Afghanistan
May & June 2012**

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Cover Photograph:

From right to left: Drs. Ali Madad Rajabi, Stephane Ostrowski and Hafizullah Noori with the first anesthetized snow leopard in Sarkand Valley.

Introduction

The snow leopard *Panthera uncia* is a moderately large species of wild cat. Typically it occupies alpine and subalpine habitats between 3,000 and 6,500 meters asl in the mountain ranges of Central Asia. It is also known to occur at lower elevations in drier habitats. In Afghanistan it is found across the eastern part of the Hindu Kush mountain range and in Pamirs, Wakhan District, Badakhshan. Snow leopards are threatened across their distribution range. Overhunting of their natural prey, retaliation by angry shepherds losing livestock because of depredation, poaching for their pelts, and the capture of live animals for the illegal pet trade have all been documented as threatening factors and have resulted in conservation initiatives to protect the species.

As part of a scientific study to document the range use and movements of snow leopards in the Hindu Kush Mountains of Wakhan District, the Wildlife Conservation Society with support from USAID successfully radio-collared two snow leopards in May and June 2012. The work was largely funded by the National Geographic Society (NGS), who took the opportunity of this operation to film, for the first time ever in Afghanistan, the capture and chemical immobilization of this rare and elusive species by a team of experts from WCS. Here we report on the veterinary aspects of this mission.

Anesthesia of the first snow leopard

Capture and darting

On 27 May in late afternoon, J. Goodrich (WCS), B. Smith (NGS), Hussain Ali (WCS) and three rangers (Karmal, Ayan Beg and M. Amin) installed the first of a series of 12 snare-traps in Sarkand Valley before returning to the mountain camp. The rest of the team stayed at WCS guesthouse in Qila-e Panja in the Wakhan Valley. Although only one trap was deployed and it was the very first night of the mission, making the probability of any capture very low, we prepared the capture/tranquillization/monitoring equipment, and got ready for any needed intervention.

At 00:15 am the same night (28 May) we were informed that the trap-site transmitter had triggered and that the team on site had left to check the trap. Ten minutes later this advance team informed us that a snow leopard was

successfully snared. Within 10 minutes we left Qila-e Panja and drove quickly to Sarkand Village where we left the car and walked to the trap site. The animal was an adult, relatively calm and snared by the left front-foot. We estimated its body mass at 35-40 kg. The topography was reasonably good, darts were prepared with 150 mg Zoletil (ie. a combination of tiletamine and zolazepam) or c. 4 mg/kg. We missed the first two shots but succeeded the third shot in the right thigh, from a distance of 6 meters, at 1:52 am.

We moved away from the leopard for 7 minutes, checked from far that it was recumbent and properly positioned, waited an additional 2 minutes and approached it again. It was fully anesthetized and the snare was removed from the left front leg. The animal was breathing normally and was carried to a flat area located about 45 meters downhill.

Monitoring and recovery

The anesthesia went smoothly and was uneventful. Physiological parameters were within normal range for the species with a deep and regular respiration decreasing in frequency from 30/min at the beginning to 18/min by the end of the procedure. The heart rate was high at the beginning of the tranquilization, at 154 beats/min, yet it decreased to 120 beats/min by the end of the procedure. The body temperature decreased from 38.8°C to 36.9°C. Because of this relatively sharp drop we covered the animal with a jacket and put a sleeping mattress underneath to decrease conductive heat loss to the ground. Oxygen saturation of hemoglobin (SpO₂) remained stable around 87-89%. At the end of the anesthesia the animal presented copious salivation (common with cyclohexane drugs) that we did not try to stop with parasympatholytic drugs because the animal was already recovering.

During the anesthesia we collected hair samples and blood on FTA cards for future DNA analysis. We also carefully examined the animal. It had lost all claws on the right front foot. We believe the animal lost three claws when struggling with the snare, but two claws seemed to be missing for a longer period and toe 1 had an old consolidated injury. There was a minor injury due to the snare on the left front foot. All teeth were in good condition, no periodontal disease was noticed and the animal age was estimated at 3-4 year-old. Eyes and ears presented no lesions or abnormalities and both testicles were present. We could not find any ectoparasites (or their feces). We inserted subcutaneously a microchip (#000699574F) in the right side of the neck and cleaned the eyes with normal saline on two occasions.

We observed the first signs of recovery after 72 minutes when the animal start moving its tongue in and out of its mouth, tail and ears were still immobile. Soon after the animal moved the neck. 80-90 minutes after knock-down the animal could move its neck and was trying to sustain sternal recumbency. We relocated it a dozen meters in a place where we could direct it away from the nearby stream. It was already daylight (c. 3:45 am) when the radio-tagged leopard start moving away from the recovery site and we could monitor it continuously with two telescopes. On one occasion it stumbled downhill but stood up immediately and succeeded to reach the crest line over the darting site within the following hour.



Plate 1: The first snow leopard, named “Pahlawan” recovering from anesthesia. It was captured on May 28, 2012 in Sarkand Valley, Wakhan District, Badakhshan Province, Afghanistan. Credit: Dr John Goodrich

Anesthesia of the second snow leopard

Capture and darting

On 9 June at 04:00 am, the same trap-site transmitter as for the first animal was triggered. Because this snare was located very near the camp and it was already day-time, we could check visually with binoculars and telescopes that a snow leopard was captured. At 04:30 all the capture team swiftly moved toward the snare site. The body mass of this second animal was estimated at 38-40 kg. We prepared two darts. We examined the cat at a distance of 40 meters, it was an adult, alert but calm, again snared by the left

front leg. The animal was more mobile than the first one and it took some time before we could have a good darting angle. At 05:11 the animal was darted from a distance of six meters (two bar pressure) in the right shoulder muscles. We immediately moved out of sight of the animal.

After 8 minutes we approached again and found it recumbent and immobile. He was not reacting to stimulations. It was a male. We collected the dart, removed the snare and blindfolded him before moving him to a flat and safe area where we would better monitor it during the recovery phase.

Monitoring and recovery

As for the first cat the anesthesia went smoothly and was uneventful. Physiological parameters we monitored during the anesthesia were within normal range for the species with a deep and regular respiration ranging in frequency between 18/min and 24/min. The heart rate was high at the beginning of the tranquilization, at 134 beats/min, yet it decreased to 113 beats/min by the end of the procedure. The body temperature decreased from 37.9°C to 37.0°C. We covered the animal with a blanket and folded half of the blanket under the animal to decrease conductive heat loss to the ground. Oxygen saturation of hemoglobin (SpO₂) remained stable within 88-93%. During the anesthesia we collected hair samples and blood on FTA cards for future DNA analysis. We also carefully examined the animal. It had lost all claws on the right front foot, most probably when struggling with the snare. There was a minor injury on the left snared front foot that we disinfected with 70% ethanol. There were also old scars of superficial injuries. All teeth were in good condition, no periodontal disease was noticed and the animal age was estimated at 4-5 year-old. Eyes and ears presented no lesions or abnormalities and both testicles were present and normal. We could not find any ectoparasites (or their feces). We inserted subcutaneously a microchip (#0006966319) in the right side of the neck and cleaned the eyes with normal saline on two occasions. The rest of the team fixed the gps/satellite collar, and measured the animal. It weighed 35 kg.

We observed the first signs of recovery at 06:10 when the animal started moving its neck and then at 06:15 it moved its tongue in and out of mouth. At 06:25 it moved the head, and was trying to reach sternal recumbency at 07:05. At 07:15 it stood-up and walked away slowly. We continued observing the animal with binoculars and telescopes.



Plate 2. The second snow leopard, named “Khani Wakhai”, captured on June 9, 2012 in Sarkand Valley, Wakhan District, Badakhshan Province, Afghanistan. Credit: Ali Madad “Rajabi”

Conclusions

WCS/NGS team successfully captured and released two adult male snow leopards on May 28 and June 9, respectively. Both individuals were measured, fitted with GPS/satellite collars, and DNA samples were taken. They were released and headed up into the Hindu Kush Mountains in good condition. The cats will be tracked for 13 months via satellite positioning to better understand their behavior and range use. As of July 17, “Pahlawan”, the first cat, and “Khani Wakhai”, the second cat, travelled at least 125 km and 153 km, respectively, in the Hindu Kush mountain range. The capture team was composed of international experts (Drs Lawson, Goodrich and Ostrowski, Mr Smith and Mr Hussain Ali) who provided intensive training to Afghan counterparts. Thanks to this expertise the Afghan team learned all aspects of wild felid capture and immobilization. We successfully applied this new capacity under limited supervision by trainers for the second leopard.

Two additional GPS/satellite collars still wait to be deployed and trapping will hopefully be resumed in September 2012 with the hope to fix them.