



Final Report on



Snow Leopard Occurrence in Mankial Valley, Swat

to

The International Snow Leopard Trust

Ahmad Khan

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Executive Summary

Mankial is a sub-valley of the Swat Kohistan. Temperate ecosystem of the valley is intact to a greater extent, which provides habitat to a variety of species of plants, animals and birds. Snow leopard is reported from the valley. To confirm its occurrence, the HUIRA (Holistic Understanding for Justified Research and Action), conducted the study titled “Snow Leopard Survey in Mankial Valley, district Swat, NWFP”. The author provided technical support, while ISLT (The International Snow Leopard Trust) funded the project under its small grants program. The World Wide Fund for Nature-Pakistan (WWF-Pakistan) and the Mankial Community Organization (MCO) facilitated surveys under the project. Surveys revealed that Snow leopard visits parts of the Mankial valley in winter months. Information from the local community shows that Snow leopard remains in the Serai (an off-shoot of the Mankial Valley) from early winter to early spring.

Intensive surveys of the prime snow leopard winter habitat in the valley found several snow leopard signs including pugmarks, feces, and scrapes. The study also found occurrence of prey species through indirect evidence though. However, information from the local community confirmed that in the recent past there was a good population of markhor in the valley, which is now reduced to less than 50, mostly due to hunting and habitat disturbance.

Hunting is part of the local culture and lifestyle. During winter months hunting pressure is low, as most of the local community migrates to warmer plain areas than Mankial Valley. However, those who live in the area lop oak branches for feeding their livestock and cut trees for burning, in addition to hunting prey species of snow leopard. This has resulted in stunted oak vegetation in most of the lower reaches of the valley and decline of the markhor population.

Introduction

Located at a distance of around 75 km to the north from Mingora in Behrain tehsil of the district Swat, the Mankial Valley with geographical location of $35^{\circ} 12' 24''\text{N}$ and $72^{\circ} 32' 15''\text{E}$ has great altitudinal variation. Its elevation varies from 1430m at Mankial village to 5726m at Koh-i-Shaheen (Sooko Sar) at 5726 m. The peak of Koh-i-Shaheen is second highest in the Hindu Raj Mountains, after Falak Ser (Ahmad 2002). The valley, with an area of around 32200 acres has two sub-valleys

of Serai and Jabba. The Serai River draining Serai Sub-valley and Mankial River draining Jabba and Mashkoon Sub-valleys, join at Badai to form the Mankial River that ultimately joins the Swat River at Mankial Village. This bifurcation of the Mankial Valley into Serai and Jabba Valley also marks residencies of the two major ethnic groups of the local community, the Torwal and the Gujars. The former live in the main Mankial valley to Badai and owns left branch of the valley to Jabba. The later occupies the Seria Valley and lives in Badai and onward.

The estimated population of 4,500 is divided into 67% Torwals 33% Gujars. The former ethnic group owns around 12,000 acres of land, while the later around 20,000 acres. The land cover is composed of barren and broken mountains with snow covered peaks, alpine and sub-alpine pastures, glaciated tracts, forested slopes, valley floor with irrigated terraced agricultural fields, river Mankial and its tributaries that contains waterfalls, and settlements of the local community. This diversity in land use and zoning not only adorns the valley's landscape but also makes it diverse in its ecosystems.

The forests could be divided into pure stands of oak, mixed broad-leaved with conifers and, pure stands of deodar and blue pine, and mixed forests of conifers. The broken mountains with steep terrain supports population of the high altitude ungulate species like Markhor and predators like the Snow leopard. The forests are habitat not only to birds like Monal and koklass pheasants but also a large variety of songbirds. The cold waters of the river Mankial is home to the introduced trout fish, which is famous for its taste. The agricultural land is bloodline of the local economy. Fertile land of the valley produces off-season vegetables on commercial scale. The local community subsidizes their income with livestock and livestock products.

The two ethnic groups live completely different lifestyles. The Torwal is resident to the area and remains here throughout the year, while most of the Gujar community migrates to lower NWFP and Punjab during the winter months. They return to the valley along with their livestock in late April and early May and remains here until the end of September. Within their locality in Mankial, the community moves around in a cycle to use their pastures and fields. Estimate based on information from the local community of Serai suggests that around two third of the population migrates, while one third stays in the valley during winter months. The winter residents puts pressure on ungulate population by collecting oak branches to feed their livestock that is stalled in corrals during winter

months. This collection of oak branches is made from far away oak forests, which is considered to be utilized by markhor population during winter.

The valley provides habitat to a variety of wildlife including musk deer, markhor, black bear, snow leopard among mammals and monal pheasant, koklass pheasant, snow cock, chukor partridge, and a variety of small song birds. To confirm occurrence of the snow leopard in the valley, the HUIRA, a local non-governmental organization proposed a project to the ISLT's small grants program with the following objectives:

- Gather information from the Mankial Valley about snow leopard, its prey species and habitat;
- Build capacity of the community wildlife watchers (guards) working for MCO;
- Gather information from the valley that can be used in database regarding snow leopard; and
- Identify conservation issues with snow leopard, its prey species and habitat in the Mankial Valley and make recommendations accordingly.

Methodology

To know occurrence of Snow leopard in the Mankial Valley, the following methodology was adopted:

1. Training in snow leopard survey techniques

A three-day training was imparted to the community wildlife watchers of Mankial Community Organization and local wildlife watchers of the NWFP Wildlife Department to teach them the following techniques:

- Snow leopard appearance and differentiation from common leopard
- Survey techniques implied for snow leopard
- Identifying, searching and recording snow leopard signs

- Filling snow leopard survey forms and writing field notes

2. Informal interviews with the local community

Informal interviews were held with members of the local community, local wildlife field staff and accompanying guides. Also surveys were conducted on the lifestyle of the local community to understand the management and pattern of pastures in the area. Based on the information intensive search of the area for Snow leopard signs was decided.

3. Snow leopard surveys

The methodology described by the Snow Leopard Information and Management System (SLIMS) was implemented with modification for the snow leopard surveys by laying four transects in a small area. But based on the snow covering, dispersed open patches from snow and habitat diversity in small area, number of transects was increased to intensify search effort. This provided opportunity to cover more area for searching Snow leopard signs. Transects were laid in different habitat types represented in the locality. Another survey was conducted on snow leopard occurrence in accordance with the SLIMS techniques. Transects of the winter study were repeated but no signs were found on these.

4. Survey Forms

The modified survey forms were filled out for each transect. However prey species forms could only be filled from signs for prey species like ungulates. No direct sighting of the markhor and musk deer was made.

5. Birds survey

To enlist bird species diversity of the area a bird survey with bird watching and call listening was conducted.

6. Botanical survey of Mankial Valley

A survey of chokail pasture was conducted in July of 2003 through facilitating a visit of the students of the botany department to the valley. The students collected plants from the valley for identification and preservation. The results of the survey are still awaited.

Activities of the Project and Findings

1. Training Workshop

A training workshop was conducted for wildlife watchers in the locality from the Mankial Community Organization and the NWFP Wildlife Department. Also wildlife staff from Kalam participated in it. Eight wildlife watchers were trained. Report of the workshop is annexed at the end (Appendix- I)

2. Snow leopard occurrence in Mankial Valley

According to information from the local community, snow leopard visits the area from December to April. Bacha Khan, from Serai village claimed that he sighted two snow leopards in January in Chokail area. This was probably a pair during mating season. The local guide “Ayub Khan” saw pugmarks of snow leopard in December of 2002 in Chokail. Information collected from the local community suggests that snow leopard has been visiting the valley regularly for the last five years. Before that it was not a regular visitor to the area.

In spite of heavy snow in the valley, we found old and fresh snow leopard signs in the opened areas. The signs included pugmarks and feces. In Kamar Khwa, our base camp with 2.5 feet deep snow, we found old feces and pugmarks by a big standing rock. By the snow leopard track, we also found track of a fox, which suggests that it might have followed snow leopard in expectation of finding food. In Kamar Khwa we laid four transects searching around 3000 meters. The search resulted in finding one fresh feces, one fresh scrap, one fresh pugmark, and seven old feces, one old scrap and one old pugmark. This also included a fresh track of snow leopard at Chokail pass (see figure 1 at the end of this section). The Snow leopard crossed the pass to move from Kamar Khawa valley to the valley below Chokail pastures. The pass has altitude of 3300 meters and had a snow cover of more than 8 feet deep. The rest of the signs were located between 2500 and 3000 m elevation. Of the signs seven were located in the valley bottom, two in the riverbed, one on the ridgeline and one (the track) on a pass or gorge (see the table 1 for details).

Table 1: Snow leopard signs found in the Mankial Valley

Transact #	Habitat	Length (m)	Feces		Pugmarks		Scrapes		Geographical Attributes				
			O	F	O	F	O		Lat	Long	Alt	Ap	Slope
1	VB	800	3	1	1	0	1	1	35 21 53 to 35 21 52	72 41 21 to 72 41 20	2640	0	10
2	RB	400	2	0	0	0	0	0			2600		
3	RL	1500	2	0	0	1	0	0	35 22 13 to 35 22 02	72 40 44 to 72 40 13	2870 to 3300	E	40 deg
Total			7	1	1	1	1	1					

Another snow leopard survey was conducted in July by repeating transacts laid in the previous winter. But the survey fetched no results. Also some of the Chokail pastures and above it was searched for snow leopard signs but none were found.

Figure 1: Track of snow leopard at 3300 m elevation in eight feet deep snow



3. Markhor population in the Serai Valley during winter

Mr. Ferogh Shah, a resident of Sorey Badai claimed that a few years ago he had counted sixty markhors in Kamar Khwa. Mr. Ayub Khan, our local guide and Mr. Fazal Rabbi, community wildlife watcher had sighted twenty-three markhors in Takai Banda in November 2002. According to Ferogh Shah, thirty years ago, rump hairs of an old markhor caught snow while passing an avalanche. The hair was long enough to catch an iceball that became larger with dragging in snow and became very heavy to carry. It stuck in the avalanche near Takai area and local people axed the markhor.

During the survey we found fresh and old foot prints and droppings of markhors. Estimates based on these signs suggest that there was a group of seven to ten markhors in the area below Pajja Banda. Population size of the group was estimated from different sizes of footprint. This group had two young.

4. Bird fauna of Mankial Valley

During surveys of the study we sighted a Himalayan snow cock in the Kamar Khawa area. However heard several in and around. Heard several Monal and Koklass pheasants. Birds constitute an important part of the diet of snow leopard in the area as population of markhor has decreased. While searching the area for snow leopard signs, found droppings of Himalayan snow cock and Monal pheasant at various places. A list of birds watched during surveys at Mankial, Badai, Serai, Kamar Khwa, Nadi Nullah and Chokail is presented (see Appendix -II for details on birds observed in the Mankial Valley)

5. Other Prey Species of Snow leopard in Mankial Valley

Various other species including musk deer, rhesus monkey, hare are found in the valley that might constitute a part of the snow leopard diet during winter months.

6. Habitat Status at Serai (Mankial)

Snow leopard occurs in sub-alpine and alpine habitat of the Mankial valley, where local gujar community migrates to pastures for grazing their livestock in summer. The high alpine pastures are leased out to nomads, who bring large herds of goats and sheep here. They remain here for around

three months. The local community of Serai has around two thousand goats, one thousand sheep, five hundred cows and one hundred buffaloes.

Mass movement of livestock in the valley results in deforestation, soil compaction and detachment of soil particles with subsequent soil erosion. The nomads use pastures for maximizing their benefits of lease and thus exploit its floral and faunal resources, particularly trapping musk deer for its musk and hunting markhor, and snow cock for meat, and monal pheasant for its head crest and meat. They also collect a variety of medicinal plants for sale to local traders on their return.

The local community, who opts to remain in Serai during winter months, cuts branches of oak trees to feed their livestock. Every day several people go out to bring these branches. The oak trees at lower altitudes are converted to spiny bushes, so they go near to alpine pasture in search of soft leaves of oak. This has direct impact on markhor population in the area, as this not only causes disturbance to markhor, but reduces food base for them.

7. Pastures in Serai and its traditional use

The local community of Serai can be divided into three clans of Gujar sub-tribe, the Habib Khel, Inam Khel and Suleman Khel. All except a few families of Suleman Khel live in Badai and its hamlets. All of the Habib Khel and Inam Khel live in Serai and its hamlets. Six families of Inam Khel are also living in Badai. All the pastures are divided among these clans except Chokail, which is a common property of all.

Around two third of the local community migrates to plains of NWFP and Punjab to spend winter there. Around one third of the local people live in Badai and Serai villages during winter. In mid April all shift to their ancestral houses in Badai and Serai, where they plough their fields and sow various off-season vegetables and maize crop. The off-season vegetables include green peas, French beans, turnip and cabbage. They spend April to mid May (around a month) in their villages and then shift to their mid pastures. Each clan has its pasture. Most of the Habib Khel shift to pastures of Bagnoo, Bela and Ukar Beg. While a few families have rights to use pastures in Jabba area. Inam Khel shift to the pastures of Banr and Kamar Khwa. A few families of Suleman Khel have rights to use pastures in Serai and they shift to the pasture of Birna. There is no specific day to shift to these

mid pastures. Everybody does it on his/her convenience. Here in these pastures they plough their fields for small scale agriculture and grow maize and some vegetables. The local community also grazes their livestock in forests surrounding the area. They collect oak branches and leaves from higher elevations for feeding livestock, as fodder species are not yet grown fully to meet needs of the livestock.

While in mid-pastures, the local community appoints watchers “called Kakhey” to guard Chokail pastures. This guarding is important, as they want to prevent any grazing in the pasture. Four persons are hired for guarding the pasture during daytime. They are from the local community and they hike to the pasture at dawn and climb down at dusk. They take bread of maize and onion for their lunch. Every family pays Rs.50/= to these guards for 25 days of guarding. After spending around a month in these pastures, all the people fix a date to shift to the Chokail pasture. This date is agreed among all the families. This is considered important to prevent inequality in use of the pasture’s resources on one hand and misuse of pasture area allotted to clans on the other. No regard is paid to number of livestock owned by a family. While in pasture, they only graze livestock, gossip and milk their livestock.

Chokail pasture is divided into hamlets, which are Poly Sar, Mainz banda, Danna sar, Dinki Bek. Habib Khel use Poly Sar and Mainz Banda, Suleman Khel use Danna Sar, and Inam Khel graze their livestock in the vicinity of Dinki Bek. The local community brings around hundred buffaloes, five hundred cows, thousand sheep and two thousand goats to Chokail pasture. They live here from twenty-five days to a month. Then they shift to high altitude pastures of Pajja, Charoona and Tres. There is no fixed date to shift from Chokail pasture to the high altitude pastures. Inam Khel graze their livestock in Pajja, Charoona (right), Charoona (left) and Tres, Habib khel in Bar Takai, Bela and Ramooso Takai, while Suleman Khel remains in Chokail. Only 16 families of Inam Khel can use Pajja and Charoona (right). This was allotted to them during an internal settlement. Any family of Inam Khel can shift to other pastures owned by them. After shifting to these pastures between July 7 and 10, they remain here for around 15 to 20 days. After this period all of the families migrate to their mid-pastures of Kamar Khwa, Birna, Bagnoo, Banr and Bela on a date fixed and agreed mutually. During their stay in higher pastures, guards are appointed to protect mid-pastures from grazing. The date fixed is between August 01 and 10. At their return fodder species are grown up and livestock is freed to graze on it. The people not only cut their crops but also grass. They dry

and store grass for use in future. This is called “pashkaley”. After a stay of 10 to 15 days they migrate to Serai. Where they start cutting maize crop, which is ripe for it. After cutting crops, 75% of them, head back for plain areas of NWFP and Punjab. The cycle is completed (see figure in appendix-III for cycle of pasture grazing in Mankial).

Some pastures in Mankial valley are located at very high altitude. The local community does not use these for their-self, but lease out these to nomads. The local community gets around 90,000.00 Pakistani rupees (\$1500) for use over a season. Usually one person leases the pastures and then sublet it to individual herders. The herders usually do not follow a gentleman agreement between them and the local community, which restricts herders to only graze their livestock and damage no other resources of the pastures. This is not strictly observed. The herders with minimal monitoring if not none, avails any of the opportunity that pays cash. They cut and uproot medicinal plants, cut and debark birch forests, hunt and trap wildlife. This inflicts huge amount of damage on pastoral habitat and resources in addition to disturbance and consuming palatable plant species that may provide food for wild ungulates. Training on improved management of pastures in the valley was arranged for the local community with the objectives to minimize damage to flora of the pastures and practice even distribution of livestock with grazing in appropriate season. Pasture management specialist Dr. Inam-Ur-Rahim, Land Use Planner Shaukat Ali Sharar and Snow leopard Field Biologist with WWF-Pakistan Ahmad Said imparted the training.

Recommendations

The Mankial valley has great potential for supporting **eco-tourism** due to its rich faunal, floral and scenic resources. Also the local community is supportive of such ideas, wherein they can get involvement in alternative income generation activities. There should be efforts to take up the following:

- Train local community members in conducting guided tours of trekkers, mountaineers, hikers, bird watchers and markhor viewers.
- Train local community members in organized porter service, nature camping and facilitating picnic

The valley offers great potential for **research** on its floral and faunal diversity in addition to its social life. There should be efforts to study the local sociology in relation to use of natural resources, pressure, threats and possible remedies.

The local community comes from least literate areas. There is high need for raising their awareness through formal and informal education techniques. There should be an organized **conservation education program** focused on raising awareness of adults and children.

One of the important income generation activities is leasing out “Qalang” high altitude pastures to nomads. The nomads having no relationship with pastures, try to maximize their benefits. This maximization of benefits include harvesting medicinal plants, collecting black mushroom, trapping musk deer for its musk and some times trapping bear cubs also. To get maximum benefit of the pastures they spray salt here, which may have negative impacts besides any positive impacts. This needs to be studied along developing a **check and balance** system for nomads to prevent them from detrimental activities.

Wool is a product from sheep raised in the area, both by the local community and by nomads. There is no organized marketing system for wool and wool products. Middleman is involved in marketing wool and its products like “namad or lamsey”. There is need for facilitating local community in **Direct marketing** of their wool and wool products to maximize their benefits.

Swat in general is located far-flung and remote not only geographically but socially and ecologically also. This affects the local community’s economy and they mostly live in poverty. The communities living in higher mountainous areas, mostly live below poverty line and therefore go through great stresses to maintain themselves at edge. There is high need for studying the link between resource depletion, poverty and lifestandard in the area.

The remote nature of Swat takes into account access to resource centers like libraries and literature sources. Realizing this fact, the HUIRA (Holistic Understanding for Justified Research and Action), a local non-profit organization has launched efforts to establish a **regional resource center**. This center would collect information on subjects of interest and would disseminate it to researchers and

individuals. Also it would house researchers and students to take benefit of it. Given availability of resources, the HJRA may establish a **Snow Leopard Resource Unit** within its Regional Resource Center for services in research and education on snow leopard.

To investigate snow leopard occurrence and ecology in greater depth, a **snow leopard conservation program** may be launched in the area. HJRA could be an appropriate local organization to help in establishing such a program under collaboration of the ISLT and WWF-Pakistan.

Appendix-I: Bird Recorded in Mankial valley during Snow Leopard Survey

Sl. #	Common name	Scientific name	Local name (Kohistani)	Local name (Gojri)
1.	Babbler (?)			
2.	Black bird	<i>Turdus merula</i>		
3.	Black redstart	<i>Phoenicurus ochruros</i>		
4.	Black throated thrush	<i>Turdus ruficollis</i>		
5.	Black tit			
6.	Blue chat	<i>Ficedula tricolor?</i>		
7.	Blue jay	<i>Garulus glandarius?</i>		
8.	Blue rock pigeon	<i>Columba levia</i>	Golai	Kameeri
9.	Brown dipper	<i>Cinclus pallasii</i>		
10.	Crested black tit	<i>Parus melanolophus</i>	Angeer	Angeer
11.	Crested bunting (?)	<i>Melophus lathami</i>		
12.	Dark gray bush chat	<i>Sexicola ferrea?</i>		
13.	Ferruginous flycatcher			
14.	Green leaf warbler	<i>Phylloscopus trochiloides</i>		
15.	Grey or Ash drongo	<i>Dicurus leaucophaes</i>		
16.	Himalayan tree creeper	<i>Certhia himalayana</i>		
17.	Himalyan Griffon vulture		Madoom	Tash
18.	Hodgson's mountain finch			
19.	House sparrow	<i>Paser domesticus</i>		
20.	Jungle crow		Kag	Kag
21.	Kestrel	<i>Falco tinnunculus</i>		
22.	Koklass pheasant	<i>Pucrasia macrolupha</i>	Bhego (m), Bhegai (f)	Bhegra (m), Bhegar (f)
23.	Lamergier	<i>Gypaetus barbatus</i>	Madoom	Tash
24.	Little forktail			
25.	Little pied flycatcher			
26.	Long-tailed minivet	<i>Pericrocotus ethologus</i>	Humayun (m), Bibi (f)	
27.	Monal Pheasant	<i>Lophophorus impejanus</i>	Lait (m), Sham (f)	Lait (m), Sham (f)
28.	Nutcracker	<i>Necifraga caryocatactes</i>		
29.	Pied woodpecker	<i>Dendrocopus himalayensis</i>	Dahd	Tatoka
30.	Plumbeous redstart		Lomarloo	Lomarloo
31.	Rock bunting	<i>Emberiza cia</i>		
32.	Rose finch	<i>Carpodacus ertythrinus</i>		
33.	Rufous breasted accentor			
34.	Scalybellied green woodpecker			
35.	Snow cock	<i>Tetraogallus himalayensis</i>		
36.	Snow partridge	<i>Lerwa lerwa</i>	Pathan gor	
37.	Snow pigeon	<i>Columba leuconota</i>	Koontar	Goolai
38.	Stone chat			
39.	Tree sparrow	<i>Passer montainus</i>		
40.	Turtle dove			
41.	White bellied minivet (?)			
42.	White capped redstart	<i>Chamarronis leuconota</i>	Teekana	Teeko
43.	White cheeked nuthatch	<i>Sitta leucopsis</i>		
44.	White wagtail		Chenchinak	Dab Keedor
45.	Yellow browed leaf warbler			
46.	Yellow wagtail		Chenchinak	Dab Keedor

Appendix-II : Cycle of nomadism and grazing of pastures in Serai (Mankial)

