

1. Project Number	PSF 2007/004
2. Project Title	Leopard Conservation in Pakistan
3. Project Executants	Mr. Ashiq Ahmad Khan & Mr. Muhammad Waseem
3.1 Report compiled by	Muhammad Waseem, Research Officer
4. Project Duration	18 Months July, 2007 – November, 2008
4.1 Progress Report for the period	July, 2007 to November, 2008

5. Project Brief

Common leopard has become extremely uncommon in Pakistan, mainly due to retaliatory killings by herders and habitat fragmentation. However, it has increased in number in certain areas in response to better implementation of the leopard protection rules; availability of natural and other prey; and safe refuges for breeding purposes. A few such sites are located in the moist temperate forest zone of the North West Frontier Province of Pakistan.

An important leopard site is situated in, and around, Ayubia National Park, District Abbottabad which is not only a summer resort, being visited by tourists from all over Pakistan in big numbers but is also a source of fuel wood and fodder collection for the local communities. There are about 12 villages around the National Park with around 5000 households. Mostly women collect such commodities, a practice that has become tradition of the area.

Although the leopards were never loved by the communities, their occasional stealing of the poultry or killing of goats and sheep were tolerated since quite sometime. The situation, however, got changed when a leopard killed 6 women in June 2005 in different parts of this area. Because of this, the local communities turned against leopards, demanding their total elimination from the area. They were joined and supported by local politicians.

The culprit leopard was killed in July, 2005 and so were a few more innocent leopards that were either trapped alive by the wildlife department or poisoned to death by local community. The implementation of leopard's protection rules has gone tougher since then. It appears that the leopards may vanish altogether from this important habitat if corrective measures were not adopted or identified.

In order to normalize the existing situation and to gain the public support for the protection of leopards; find ways to compensate for livestock damages on sustainable basis, educate and train women on the adaptation of protective and precautionary measures when in the leopard habitat, conduct scientific research for use in improved management and awareness programs, this project was launched in July 2007 with the following objectives.

6. Project Objective

Objective - 1: Determine occurrence, density and prey species of common leopard in the coniferous zone of District Abbottabad

Objective - 2: Evolve/develop methods that would minimize risks to the survival of common leopard in the target zone

Objective - 3: Develop a long term plan for the conservation of common leopard in Pakistan

7. Project Methodology

Specific questionnaires and data sheets were designed to collect data on leopard population, occurrence, predation and damages to life and property. Five union councils were selected on the basis of the severity of the problem and surveys conducted in target areas. GPS was used to record crucial sites and GIS used as a tool to present information on map. Guidance was sought from literature and various experts on social and biological aspects of the project. Efforts were also undertaken to seek support for the solution of the problem through indigenous knowledge. Trainings, print and electronic media and local forums were used as tools to share the information about leopard's ecology, behavior and importance for the ecosystem.

8. Results and their significance

The results revealed that sensitivity of human-leopard conflict was a potential threat for the survival of leopard as also of the biodiversity. A total of 264 leopard sighting locations were documented. Significant information was obtained about the species population and sex status from the regular monitoring of the fixed monitoring tracks. Eleven leopards were identified over 115.27km² study area. Mean encounter rates of different variables like pugmarks, scats, livestock and people use of the habitat was calculated and developed as baseline for future studies. Ten prey species were identified after the microscopic analysis of the hairs present in the scats. GIS-based habitat modelling of leopard was also started. The social attitude of women towards leopard conservation was also assessed during the reporting period.

The Project launched community-based livestock insurance on pilot scale to overcome the economic losses of farmers due to leopard attack on livestock. Membership of the scheme reached up to 163 from 33 livestock owners within couple of months while 31 livestock owners were compensated. This scheme provides a tangible benefit to the local communities and supports leopard conservation and find ways to live in harmony with leopards. Fifteen "Mitigating measures trainings to reduce the chances of leopard attacks on livestock and human beings" were conducted in the problem zone.

Objective - 1: Determine occurrence, density and prey species of common leopard in the coniferous zone of District Abbottabad

Major Activities and Progress made so far/outcomes.

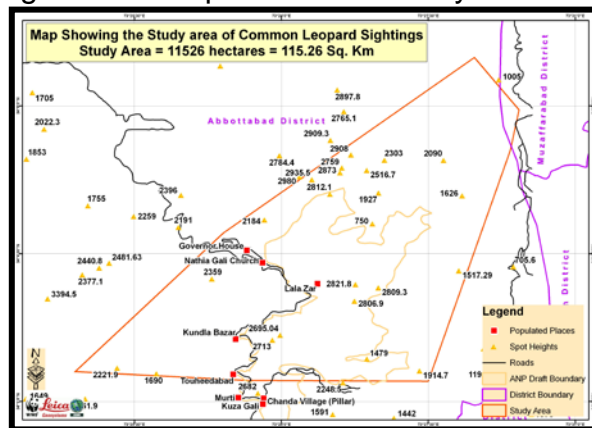
1. Collect sighting record of leopards through GPS readings

Information was collected through a questionnaire on the size of the leopard, sighting date and time, geographical location of the sighting, and other evidences of the presence of leopard in the area. Based on that, surveys were conducted to confirm the claims and reports (A copy of the questionnaire is attached as annex-1).

1. i. Leopard sighting surveys initiated

During the reporting period, 115.27 Km² area was surveyed (including the protected area and the villages). Interviews and meetings were conducted with the communities in the project area. It was observed that from June, 2005 to date, leopards have been sighted in 264 places in the study area.

In 2005, leopards were sighted in 31 places, in 2006, in 94 places, in 2007, in 70 places and in 2008 in 69 different places. Information related to various aspects of leopard sighting was also collected. The number of sightings were higher in May (50), June (37), July (23) and August (17) compared to rest of the months.



Study Area of the Project

It was observed that the number of sightings inside the villages (157) were higher than the sighting inside the forests (107). About 30% sightings were near the water sources of the study area. Of the total sightings, 41% were sighted in morning, 21% in the afternoon and 38% in the evening. About 70% sighting records were obtained from local women, who usually visit the forests daily for the fuelwood and fodder collection.

In 2005, one cub was sighted without mother at Ratti Mitti, two cubs in 2006 at four different locations (Kalabagh, Namlimera, Jandarpara, Bagnakkar) and in 2007, only once a leopard with cubs was sighted near the green spot of the union council, Nathiagali. While In 2008, three times leopard with cubs was sighted in different locations (Governor House, Lahurkus, and Ayubia).

1. ii. Pugmark survey

Based on the sighting records and local people knowledge, the project team identified and mapped ten fixed monitoring tracks of the leopard showing the territorial marking of the leopard in the study area. All the tracks were

monitored on regular basis during the reporting period. A special datasheet was designed to collect relevant information from the tracks, containing footprints, feces, and other sign-related information. Details of the monitoring tracks are provided in the Table.1

Table.1 Details of the Monitoring Tracks

Track Code	Track Name (Distance covered during the monitoring)
T1.	Pipeline Track, (12Km)
T2.	Chakhanapani Track, (08Km)
T3.	Darwazakus Track, (11.5Km)
T4.	Mallach&Pasalla village Track, (15Km)
T5.	Diar Sari Track, (08Km)
T6.	Ratri Track, (32Km)
T7.	GH, Lassan, Kalapani Track, (08Km)
T8.	Lahurkus& Gulbaba Ziarat Track, (13Km)
T9.	Sajangali Track, (34Km)
T10.	Lalazar Track, (10Km)

a. Encounter Rate Results of the Pugmark Survey

Based on the results of two surveys, encounter rate of the scats and footprints, livestock and people use of different tracks was calculated. First survey was conducted in August-September 2007 and second was conducted in April-May 2008. The calculated mean encounter rate will be used as (indices) baseline in future to assess the trend of the use of habitat by the leopard, livestock and people:

Mean encounter rate calculated for the leopards' footprints was 0.0972, for scat 0.0657, for livestock 1.7581, and for the people, it was 2.5143 in August-September 2007. In 2008, survey was again conducted in April-May, and a great variation in the results was observed. Mean encounter rate for the leopard footprints was 1.133, for scat 0.111, for livestock was 1.7925, and for the people, it was 3.15946. The comparison of results of both the surveys shows that all the tracks were used more frequently in April-May compared to August-September by all the four parameters. It is therefore suggested that April and May were better for the surveys, compared to August-September. To understand the whole year use of the tracks by the leopards, regular monitoring of the area is highly desirable.

b. Pugmark Tracing Technique

All the leopard trails pass through the forests or grassy areas where it is impossible to get a suitable pugmark impression. To know about their movements in such areas and to be able to record pugmark tracing or make a plaster cast, Paw Impression Pads (PIP's) with soft soil were required. PIP's of 3m length and 1m width were placed along the identified leopard trails with due regard to the overall topography of the study area. During the reporting period, more than 83 footprints were traced and after careful analysis of data only eleven (11) tracks were identified as individual

leopards. Standard method was used to analyze the traced pugmarks. Individual leopards were distinguished from each other and their localities were monitored regularly throughout the study, to get additional information about the leopard behavior. Places for camera traps installation and for regular monitoring of leopards inside the national park, were identified.

Table.2 Details of the identified individual leopards

Track Code	Length (cm)	Width (cm)	Sex	Foot
T1	10.1	8.6	Female	HF
	9.3	8.9	Male	HF
T2	9.3	9.7	Male	HF
T3	11.0	9.0	Female	HF
T4	9.0	8.1	Female	HF
T5	9.9	9.9	Male	HF
T6	8.4	8.4	Male	HF
T7	8.4	7.2	Female	FF
T8	8.5	7.9	Female	HF
T9	9.3	7.9	Female	HF
T10	7.9	6.6	Female	HF
Total	07Females & 04Males			

Based on the above data, it is clear that the study area has a minimum of 11 leopards over 115.27km² area. During the last two years, four leopards were killed by the local communities in the study area. Three were females (one in Khunkalan and two in Lahurkus), while one adult was killed in Kundla, whose status was not known.

c. Preservation of tracks (Footprints), pugmark tracing

Preservation of tracks (footprints) is a useful tool to keep the field record for measurement and comparison with other tracks, as well as for the exhibition and educational purposes. This technique was also used additionally to get more information about the leopard population and other relevant aspects with the sighting record collection & pugmark tracing techniques. A total of 21 pugmarks were preserved during the reporting period. Plaster of Paris was used to preserve the tracks. This method is not only more costly compared to the pugmark tracing, its results are also not useful for further analysis to reach population estimates.

Results & Conclusion for the leopard Population Estimate

Based on the sighting records in about 11,500hac (115Km²), 10 tracks were identified, being used by 11 leopards (4males and 7females) till September, 2008). 14 leopards were removed from their original habitats (11killed, 3trapped from July, 2005 to September, 2008). While assuming that the lost leopards were replaced through natural dispersal from the adjoining areas, and extrapolating figures of the same sampled area, the entire Gallies Forests have about 23-25leopards in 23,785hac.

Field survey from the ***Machiara National Park*** was conducted recently but results were not compiled so far (Will be provided at the end of December, 2008). Leopards pugmark survey, livestock depredation related information was collected through questionnaire, interviews, and pugmark survey from the area.

d. Scat analysis (prey species identification)

Feces collection and analysis helps determine the food habits/foraging pattern of the animal. Knowing the importance of feces, the researcher collected 100 scats from different locations during the study and analyzed. Prey species were identified based on the microscopic hair analysis and the presence of bone fragments, teeth, nail and other hard parts as described by Grobler & Wilson (1972) and Mukharjee et.al (1994). Based on the analysis of 40 scats, great diversity was found and ten prey items were recorded and their percentage worked out.

The diet of a carnivore reflects both the availability of its potential prey, as well as a suite of morphological, behavioral and physiological adaptations that allow the individual to locate, capture, ingest and digest a variety of prey taxa (Kok *et al.* 2004).

This study is the pioneering effort in Pakistan to know the prey species of the leopard. The diameter of the scats after drying, were measured in mm, around the thickest part with the help of Vernier caliper. Result showed that about 63% scats were in the range of around 21-27mm and about 37% between 17-20 mm. The oven-dried weight of all the scats was measured. About 59% of the scats weighed within 40gm, 27% ranged from 41-45gm and 14% weighed within 46-50gm.

Macro-analysis of leopard scats was done and it was observed that all of them contained hair remains, about 3% had bones, 4% had claws and about 3 % had grasses. Prey species were identified during the microanalysis of the hair. 68.2% were domestic prey, and 31.8 % was wild prey. Among the domestic prey, goats contributed 40%, dogs 18.1%, cows 4.5%, and buffalo 4.5%. Among the wild prey, monkeys were the major contributors with 22.7% share, rodents were 9% while others contributed in minor quantities.

e. GIS based habitat modeling of leopard land cover study

During the reporting period, a student was facilitated for a GIS-based habitat modeling of leopard land cover study. Study results though useful, but require covering some more aspects. Study draft report is available as annex-2.

f. Common Leopard, its Killing and the Aftermath study

During the project; the project team noticed few specific things related to the leopard territorial behavior and designed a questionnaire to test a

hypothesis. The hypothesis was that; *the older/native leopard is less harmful than the new comer*. The territorial behavior of the leopards indicates that, they having good enough knowledge of the area as compare to other wildlife species. For example, they avoid setting on the tracks/move inside the village/ at day time. Even they try to avoid setting at those places, where usually local women go for fuel wood and fodder collection at the day time or early morning. Leopards know about the villagers who usually use the same tracks which they use at night, they never make any problem for them. But after the killing or trapping of the native one, a new comer occupies the same territory, his knowledge about the area is limited and that makes him/her problematic for the villagers.

A total of six sites were selected in the study area, where leopards were killed or trapped by the local communities in last two years. Two approaches were adopted to test the hypothesis; one was questionnaire survey, and the second was to document the leopard attack incidence on human beings & livestock besides the regular track monitoring. The draft results of the questionnaire given in the annex-3; The results of this study provides basis for designing a comprehensive awareness program for the conservation of the common leopard specifically to reduce the retaliatory killings of the leopard not only in the Galliat but also for the entire range of the species.

Objective - 2: Evolve/develop methods that would minimize risks to the survival of common leopard in the target zone

Major Activities and Progress made so far/ outcomes.

2. Assessed the extent of damages to livestock

A specific questionnaire was developed to collect information on various aspects of livestock damages, including the attacking site, date/time, habitat condition, and geographical location where damage did occur. Field evidences of leopard attack on livestock were also collected.

2. i Livestock depredation survey conducted

Livestock depredation survey was conducted over 115.27km² throughout the project where needful information was collected for the year 2005, 2006, and 2007 and up to July 2008. Efforts were also made to validate predation incidences by examining the freshly killed livestock. Geographical coordinates of different attack sites were recorded and plotted on the map through Geographical Information System (GIS). More than 500 affected families were interviewed. Main reason of livestock depredation was the careless herding practices by the local communities. The farmers/livestock owners usually leave their animals in nearby forests and herd them back in the evening without any guard. Second is the poor construction of the pens for night stay of the livestock. Detailed report is available as annex-4.

2.ii Test economic and social viability and acceptability of various options through consultation

During the livestock depredation survey, information about an indigenous compensation mechanism was also collected. Whenever a farmer loses livestock (for whatever reason) villagers support the affected family with cash to reduce his economic loss. That system was an informal and non-obligatory. For the last ten years, this system is no more working well due to villager's migration to cities, and change in lifestyle. Still, in some remote parts of the study area, it exists. So, the project team took this system as foundation and started dialogue to formalize it in the form of *livestock insurance scheme*. And the communities were briefed accordingly. A local NGO named "Garain Welfare Society" was identified and selected to launch this scheme. A formal mechanism was developed for the implementation of the scheme with the mutual consent of the local communities that bound them to insure their livestock under the scheme through a lifetime registration fee of PkRs.100 (\$1.66). They were further required to pay an annual premium of PkRs.130 (\$2.16) per goat, to the committee. Moreover, they were also bound to inform and register all the goats with the livestock insurance scheme committee. A committee of seven members constituted for taking decisions regarding the compensation, including the representatives of local government, religious leaders, member of WWF-Pakistan and the governing body members of the NGO. We provide technical input to initiate the process besides a donation of an amount of PkRs. 20, 000 (\$333) as seed money (it's a life time contribution). The local NGO provided PkRs.7,000 (\$117) as their contribution. Initially, 33 livestock owners deposited an annual premium of PkRs. 29,000 (\$483).

Gradually, the schemes popularity increased and its membership increased day by day reached to 151 from 33. The scheme compensated 31 livestock owners and distributed PkRs.38,300 (\$638) as compensation against livestock depredation by leopards. The scheme is running smoothly and working under the direct supervision of the local NGO. The government also showed interest to support the initiative. The "Garain Welfare Society" skill has also been built to run the scheme more comfortably in the area.

The Project team believes that in Galliat region, women are mostly responsible for the livestock rearing besides other household activities. If women are engaged in such kind of schemes, the sustainability will be ensured.

2.iii Safety measures training for communities to reduce the chances of leopard attacks on human and livestock

During the reporting period, various reasons of leopard attacks on human beings and livestock were identified by consulting the literature, meetings with the local communities, incident reporting and with the guidance of the experts. A social survey was conducted to "Assess the women attitude towards the leopard conservation" in the project area (report is attached

as annex-5. The survey recommended a need of training for women to protect themselves from leopard, while out in the forests and found women receptive in getting such training. As such, fifteen trainings were conducted on “Mitigating measures to reduce leopard attack chances on livestock and human” in five union councils of the project area. More than 250 women participated in these trainings so far.

Efforts were made to share that knowledge with the communities of the whole region through media (electronic and print) and other local forums. Leopard’s importance for the ecosystem was highlighted and information about the man-eater leopard was shared with all the target groups (university students, media personal, religious leaders, school children, teachers, local communities, tourists and people who are involved in leopard conservation), to gain support for the conservation of the species in the region.

2. iv An Environmental Education program for schools

An environmental education and awareness training with special focus on leopard conservation was organised for the local school teachers in April 2008. Fifteen teachers from ten different schools participated in the training. Impacts of leopard killing, mitigating measures to reduce leopard attack chances on human life and property were shared with the teachers and the role of the carnivore species especially the common leopard in food chain and web was highlighted in with the help of lectures, and discussion and role play. Ten Nature clubs were established in different schools as a result of the training. 150 students were registered as club members for the year 2008 and ten lectures and one field visit was organised for five schools students in the leopard habitat.

Objective - 3: Develop a long term plan for the conservation of common leopard in Pakistan

Draft copy of the key issues, causes and the proposed actions are available as annex-6. But we want to share it with the wildlife department and National Council for Conservation of Wildlife. So after their consensus we will produce a final version of that document. Hopefully it will be finalised in the next month.

4. Targets not achieved and reasons thereof

Though all the aspects of planned study for the reporting period were touched, but due to lack of resources (financial & time limitation), awareness activities were mostly concentrated around the Ayubia National Park. Due to limited financial support we couldn’t extend the livestock insurance scheme to other parts, although three more communities were interested to launch that scheme in their respective villages.

5. General Comments (if any)

The women are more scared of leopards as compared to men, which has affected the prevailing social norms in the problem zone. Local community is hard to convince on the need for leopard conservation, especially when they observed none availability of compensation for the loss of livestock and human injuries because of leopards.

6. Others (additional progress)

1. An abstract titled "Community-based livestock Insurance Scheme; a solution to resolve human-leopard conflict in northern Pakistan" was submitted for International conference on Field Biology and Conservation Conference, September 2007. (published)
2. An abstract titled " Human-leopard conflict management in Western Himalayan Eco-region of Pakistan" was submitted for the World Biodiversity Conference, Thailand (accepted)
3. Developed two proposals (one for Camera trap study and second for awareness program).
4. Delivered two presentations on Leopard conservation in Pakistan to the Board of Directors of the WWF-Pakistan (one in Wetland program office, Islamabad in December 2007 and second at field office in June, 2008)
5. A brief meeting was arranged with relevant wildlife staff and other wildlife experts to seek their views and guidance on the project.
6. Conducted regular meetings with the communities of the problem zone to highlight the importance of carnivores (Common leopard) in the ecosystem. Discussions with religious leaders were also held to seek their support for leopards.
7. Media meetings were held and reports published to minimize the current conflict
8. In addition to the regular project activities, a close watch was provided and timely information gathered and shared with colleagues on all trappings of leopards or leopards attack in livestock or human being.
9. Isotopic hair analysis study is under process in order to investigate the dietary preference of the man-eater leopard of the study area with the collaboration of California University, USA
10. Few national students also joined the project team for field surveys with in the study area voluntarily
11. One M. Sc thesis was sponsored and technically supervised
12. Two students completed their internship with the project
13. One article was published in the Daily dawn, Newspaper on the current situation of the species in the Pakistan
14. A presentation was given to the Faculty members of the Earth sciences Department, California University

15. A Presentation was given to the students of the AJ&K university, Pakistan, Malakand University, NWFP, and Comsats Institute of Information Technology, Abbottabad
16. During the project, research officer Muhammad Waseem, rescued two leopards, when they were poisoned by the local communities' photographs are available.

7. Conclusion/lessons

- Retaliatory killings could be substantially reduced if the livestock owners are compensated for their losses
- Attitudes could be more positively changed if awareness is based on field research and its findings are shared with local communities rather frequently
- Leopards population in the study area have apparently sustained the current losses
- Attacks on humans and their livestock have enhanced as compare to previous years (reasons are under investigation)

8. Recommendations/future needs

- Research and monitoring related to leopard issue must continue for better understanding of the conflict and its resolution to an acceptable limit.
- Replication of insurance scheme in other areas of leopard occurrence may help leopards to survive better
- Designing and implementing an awareness program on the basis of research and more frequent interaction with the community could yield better results for the conservation of leopards

9. Summary of Results

Objective	Major Activity	Results	Recommendation
<p>1. Determine occurrence, density and prey species of common leopard in the coniferous zone of District Abbottabad</p>	<p>-Collect sighting record</p> <p>-Additional Activities other than project proposal like; pugmark survey, pugmark tracing and preservation, and prey species identification were also conducted, GIS based habitat modeling and human-leopard conflict assessment study from the Machiara National Park, AJ&K</p>	<p>-Sighting record for the Y2005, Y2006, Y2007 and Y2008 (up to July) was collected and plotted on GIS map</p> <p>Baseline information was developed for the area by the calculation of mean encounter rate of the scats, footprints, livestock and people's use of the habitat</p> <p>-About 11 leopards were identified through the regular monitoring of the 10 leopard tracks and pugmark analysis. ten prey items were identified through scat analysis</p> <p>- Leopard tracks were preserved with the help of plaster of paris</p> <p>-Field survey was conducted in the Machiara National Park, AJ&K results will be shared after the compilation at</p>	<p>Sighting record information provide useful information, it should remain continued in the area</p> <p>Camera trap study is highly recommended to know the leopard density in the area</p> <p>Mean encounter rate for the scats, pugmarks, livestock and people need to collect on regular basis from the area for the whole year</p> <p>Pugmark census is also require to conduct on regular basis in the area through out the year</p> <p>scats from other parts should be analyzed in order to identify the available prey base of the species</p> <p>Preserved tracks should be used as an education purpose for children and need to display</p>

		the end of December,08	at information centre
2.Evolve/develop methods that would minimize risks to the survival of common leopard in the target zone	<ul style="list-style-type: none"> -Assess the extent of damages to livestock -Test economic and social viability and acceptability of various options through consultation -Develop training module for communities 	<ul style="list-style-type: none"> -Livestock depredation surveys were conducted and their GPS readings were recorded and plotted on the map for the Y2005, 2006 2007 and July, 2008 -With consultation of local communities a community based livestock insurance scheme was launched in the area in order to reduce economic losses of farmers due to livestock depredation -A training manual was prepared Fifteen trainings were conducted on “mitigating measures to reduce leopard attack chances on human and property” -Electronic and print media was used as source to 	<ul style="list-style-type: none"> -Livestock depredation information should also need to collect in future -Insurance scheme idea need to extend to other parts of the Galliat also. In launching the insurance scheme, women involvement should be consider. -Financial assistance from government is also required to extend this scheme to other parts as well -A comprehensive awareness program for the leopard conservation is highly important for the region.

		<p>share the leopard attacks chances on human</p> <p>-Information was shared with local communities regularly through different forums</p>	
3.Develop a conservation action plan	<p>-A draft copy of the identified key issues, their causes and proposed actions is here attached as annex-6(but the final version of the document will be prepared shared very soon, once it is finalized)</p>		

Details of the Retaliatory killing sites of the leopards in District Abbottabad

S. No	Sex	Date of incident	Killed by(Poisoned (P), Shoot (S))	Village (Union Council)
1.	Male	11 July, 2005	Wildlife Department (S)	Singal Kot (Bakot)
2.	Male	17 July, 2005	Wildlife Department(S)	Aliabad (Bakot)
3.	Female	10 April, 2006	Local community(S)	Lahurkus (Berot)
4.	Female	28 May, 2006	Local community (S)	Khunkalan (Bakot)
5.	Male	30 August, 2006	Local community(S)	Turnai (Qalandarabad)
6.	Male	27 October, 2006	Local community(S)	Dhaki Kheter (Namli Mera)
7.	Female	10 November, 2006	Local community(P)	Lahurkus (Berot)
8.	Cub	01 January, 2007	Unknown	Darwaza Changla (Palak)
9.	Unknown	24 April, 2007	Local community(P)	Kundla (Nathiagali)
10.	Male	24 May, 2007	Local community(P)	Ziaratmasoon (Seer)
11.	Male	07 June, 2007	Local community(P)	Kalsura (Seer)
12.	Female	16 May, 2007	Local community(P)	Jafran (Barmigali)
13.	Female	04 Dec, 2007	Local community (P)	Najafpur (Khan pur Dam)
14.	Female	06 Dec, 2007	Local community (P)	Najafpur (Khan pur Dam)
15.	Male	07 Jan, 2008	Local community (S)	Kaghan (Mansehra Div)
16.	Male	26 Feb, 2008	Local community (P)	Kakul, Abbottabad
17.	Female	March, 2008	Snow fall (under the Glacier)	Khateri, Ratri, Khun kalan
18.	Male	Oct, 2008	Local community (P)	Sangrari, Ayubia National Park Rich bari
19.	Female	Nov, 2008	Local community (P)	Shankiyari, Mansehra Div
20.	Female	Nov, 2008	Local community (S)	

Annex-1 Questionnaire for Leopards sighting /Census

Village: _____

Nearest forest compartment _____

Union Council: _____

District: _____

Leopard sighting information

- Name of respondent: _____
- Age: _____ Sex: _____
- Profession: _____
- When did you see a leopard in your area?
- Month: _____ Year: _____
- Nearest land mark of the sighting Place:
 - Thick vegetation Open land Nullah /stream bed
- GPS reading (sighting place): _____
- #. of leopards sighted in whole of your life: _____
- Full grown: _____ Young: _____
- Activity of the leopard when sighted:
 - Walking Resting Eating/attacking
- Is same leopard was seen earlier also? Y / N
- If yes, can it be seen easily? _____
- If yes, how many times? _____
- Is the number of leopard increasing or decreasing?
- Any reason?

Annex-6:- **Leopard Conservation Action Plan**

S. No	Key Issues	Causes	Proposed actions
1.	Retaliatory killings of Common leopard by livestock owners	<ul style="list-style-type: none"> • Lack of compensation scheme • Lack of needful skill and capacity to protect livestock depredation • Poisonous chemicals are easily available in the local market • 	<ul style="list-style-type: none"> • Depredation hotspots shall be identified throughout the natural occurrence zone of the leopard • Demonstration models shall be established in the high depredation areas; <ul style="list-style-type: none"> ○ Herders would be trained ○ Advantages of the leopards shall be shared ○ Reasonable livestock insurance scheme shall be introduced • Successful models would be replicated to other areas • Women would be motivated to play their potential due and role in the conservation of leopards • The sale of poisonous chemicals in local markets shall be controlled
2.	Killing of leopard for its pelt and other body parts	<ul style="list-style-type: none"> • Communities are mostly unaware of the issue and have no interest in it • non availability of 	<ul style="list-style-type: none"> • information shall be gathered about all the important pelt markets and routes of pelt trade and shared with relevant agencies • functional checkpost shall be

		<ul style="list-style-type: none"> check posts traders are not identified or punished 	<ul style="list-style-type: none"> established incentives shall be provided to the staff who is actively involved in the control of pelt amount of fine for pelt trade shall be increased
3.	Loss of prey species of common leopard	<ul style="list-style-type: none"> Uncontrolled hunting Excessive and uncontrolled grazing 	<ul style="list-style-type: none"> Illegal hunting of wildlife species will be controlled in important leopard occurrence zones Livestock grazing will be regulated according to the health of the pastures Species recovery program shall be developed and implemented
4.	Insufficient number and size of Protected areas	<ul style="list-style-type: none"> resistance from local communities for creation and extension of PA Conflict between the Forest and Wildlife depart Govt. have insufficient capacity to manage the existing PAs 	<ul style="list-style-type: none"> Potential important hotspots of the leopard shall be identified The validity and effectiveness of the existing PA shall be assessed in the context of the requirements of leopards for space and food Extension in their areas shall be considered in consultation with the local communities
5.	Fragmentation of the habitat	<ul style="list-style-type: none"> important/significant habitats of the leopard have not been identified and notified as PAs haphazard 	<ul style="list-style-type: none"> all potential/crucial habitats shall be identified and mapped demand for EIA shall be seen as a major tool to avoid negative impacts of the development in important leopard habitats and its prey species

		development of infrastructure	
6.	Lack of Awareness	<ul style="list-style-type: none"> • lack of appropriate information about the leopard ecology, and behavior • lack of awareness program on the agenda of relevant organizations • insufficient institutional support to accommodate the awareness program for new generation 	<ul style="list-style-type: none"> • information would be collected from the herders and through field surveys to be used for awareness raising among the concerned communities • awareness plan would be developed and would be implemented • plan would be developed for a wide range of audiences • print and electronic media would be involved in awareness program
7.	Lack of Networking and coordination	<ul style="list-style-type: none"> • partners are not known • coordination is not existent 	<ul style="list-style-type: none"> • Partners shall be identified at regional level and responsibilities be shared • WWF-Pakistan in association with IUCN cat specialist group shall provide the coordination support till other appropriate arrangements are in place • A system shall be jointly worked out for holding periodic meetings and collection and dissemination of information
8.	Weak implementation of the existing rules regarding the protection of common leopard, its prey and habitat	<ul style="list-style-type: none"> • existing rules have certain loopholes and weaknesses • lack of wildlife staff 	<ul style="list-style-type: none"> • Publicize and update the existing rules • Possibility of posting community watchers for sustainable economic and social incentives shall be assessed

		<ul style="list-style-type: none"> communities are not motivated, trained and sufficiently involved to play an effective advisory role 	<ul style="list-style-type: none"> The network of community managed conservation areas should be strengthened and expanded
9.	Lack of capacity of relevant departments to collect needful information on common leopard	<ul style="list-style-type: none"> lack of regular training program insufficient resources unavailability of funding to support the trainees 	<ul style="list-style-type: none"> launch a comprehensive training program develop a proposal to obtain a long term funding to cover the cost involved in such trainings
10.	Lack of scientific research	<ul style="list-style-type: none"> lack of resources for wildlife research in universities un-familiarity of researchers about the research opportunities on common leopard in Pakistan non availability of research grants programs 	<ul style="list-style-type: none"> identify various research areas crucial to survival of the leopard, whereby support could be extended to various conservation organization and individual researchers to work on agreed topics Research areas when identified should be circulated widely for encouraging students and researchers to undertake needful studies

