

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

The successful implementation of this project shall not only help in reducing the human –leopard conflict in Galliat, the name for this important leopard habitat, but shall also help minimize the impacts of such issues in other similar situations with in and outside the Pakistan.



A. Locations of Human killings by leopard

B. Leopard that was killed by Wildlife Dept.

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

The project designed specific questionnaires to address the issues related to leopards, their occurrence, predation and damages to life and property. 05 Union councils were selected on the basis of the severity of the problem and surveys arranged and conducted in study area. GPS was used to record readings of crucial sites and GIS will be used as a tool to present information on map in the next reporting period. 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 from indigenous knowledge.

8. Results and their significance

Although the final analysis will be done after the collection of needful data, the preliminary results revealed the sensitivity of the human leopard conflict as a potential threat for the survival of not only leopards but all biodiversity. The results also revealed heavy damage of livestock because of leopards that has enhanced people's resistance to efforts related to leopard conservation.

9. Major Activities and Progress made so far. (Targets for this reporting period)

A. Collect sighting record of leopards through GPS readings

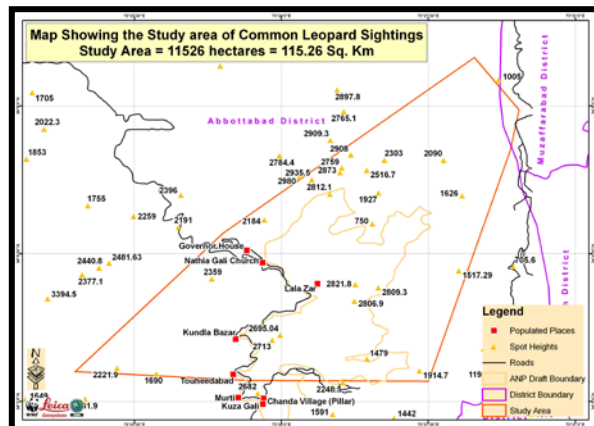
A.i. Questionnaire Developed

A questionnaire was developed and information collected on the size of the leopard, sighting date and time, habitat condition, geographical location of the sighting, and other evidences of the presence of leopard in the area. Based on the information of the questionnaires, surveys were conducted to confirm the claims and reports. (A copy of the questionnaire is attached as annex 1)

A.ii. 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 225 places in the study area. The geographical coordinates of all the sighting sites were recorded and will be plotted on the GIS map in the next reporting period. Data up to the June 2007 was analysed below so far:

In 2005, leopards were sighted in 31 places, in 2006, in 94 places, in 2007, in 70 places and in 2008 in 30 different places. Information related to various aspects of leopard sighting was also collected. The number of sightings were higher in May (30), June (27), July (12) and August (14) compared to rest of the months.



Study Area of the Project

It was observed that the number of sightings inside the villages (97) were higher than the sighting inside the forests (78). About 30% sightings were near the water sources of the study area. Of the total sightings, 43% were sighted in morning, 18% in the afternoon and 39% in the evening. About 69% 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.

A.iii. Pugmark survey (In progress)

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.iv. 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 40 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 three years, four leopards were killed by the local communities in the study area. Three females were killed (one in Khunkalan and two in Lahurkus) while one adult male was killed in Kundla village.

A.v. 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 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 84 pugmarks were preserved during the reporting period. Plaster of Paris was used to preserve the tracks in combination to other techniques to reach some reliable estimates of the animal population.

vi. 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 120 scats from different locations during the study. 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 22 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. 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. (Study is still in progress)



A.vii 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 occupy 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. Results of the study will be statistically analyzed in the next reporting period (Study is in progress). The results of this study provides basis for designing a comprehensive awareness program for the conservation of the common leopard not only in the Galliat but also for the entire range of the species.

A.viii. GIS based habitat modeling of Common leopard

During the reporting period a GIS-based habitat modeling of leopard land cover study was designed in order to investigate the preferred habitat of the species. Three students (Ms. Jawairia, Mr. Fahim and Mr. Mateen) from the NUST University, Pakistan, Islamabad were selected and assigned to conduct this study. Field work has already been completed. Study results will be shared in the next reporting period in detail.

B. Assessed the extent of damages to livestock

B. i. Questionnaire developed

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. (See questionnaire as Annex-3)

B.ii. 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, 2007 and up to April 2008. Efforts were also made to validate predation incidences by examining the freshly killed livestock. Geographical coordinates of different attack sites were recorded and will be plotted on the map through Geographical Information System (GIS) in the next reporting period.

More than 450 affected families were interviewed. A total of 598-goats, one each buffalo, ox, sheep and horse and twelve cows were killed in five union councils located in the study area.

Up to December 2007 has been analyzed; of the total depredation, 56.2% incidents were reported from the Union council Nathiagali, 35.4% from Union council Bakot, 8.1% from Union council Nagribal, 7.6% from Union council Berot and 3.9% from Union council Namlimera.

The study revealed that 70% of attacks occurred inside villages, followed by 30% in the protected area. GIS maps for 2005, 2006 of livestock depredation sites has been developed. Main reason of livestock depredation was the careless herding practices by the local communities. The farmers/livestock owners usually leavet 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.



H. Livestock Depredation by leopard in study area

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

During the reporting period several meetings were held with the communities regarding various feasible options that could help to reduce the human-leopard conflict in the project area. Although no option as such was discussed regarding the killing of human being, the community did ask for certain compensation mechanism that could reduce the extent of their economic losses. The project is in planning to launch another “Environment Friendly Livestock Insurance Scheme” on pilot basis in Bakot and Lahur kus Villages, that scheme has already been tested in one of the affected village by the project team in March, 2006. That scheme is running smoothly and working under the direct supervision of the local CBO named “Garai Welfare Society”. The government and other relevant organizations working in the same area 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. More than thirty livestock owners have been compensated so far under this scheme. The membership of the scheme reached to 150 from 33 with in two years time period.

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. Insurance Scheme will help locals to reduce the economic losses of livestock owners due to livestock killing by leopards.



I. Dialogue with the local communities regarding the livestock insurance scheme

D. 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 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. 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, ten 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 150 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.

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 two lectures and one field visit was organised for five schools students.



J. Women Training Session

10. Targets not achieved and reasons thereof

Although all aspects of planned studies for the reporting period were touched upon, but due to heavy snowfall and severe climate condition some of the information related to the sighting records and livestock depredation couldn't be recorded.

11. Targets for the next reporting period

- Conduct Leopard sighting record survey from other parts of the study area
- Complete the GIS based habitat modelling study
- Complete the Prey species identification study

- Conduct the leopard population surveys in AJ&K
- Estimate the leopards population in the study area through consultation with the technical experts
- Conduct livestock depredation survey from other union councils in Galliat
- Develop GIS based maps for the leopard sighting record, livestock depredation information interpretation
- Establish 03 livestock insurance scheme in other parts
- Arrange trainings for the local community to minimize leopard attack chances on human and livestock

12. 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.

13. Others (additional progress)

1. A brief meeting was arranged with relevant wildlife staff and other wildlife experts to seek their views and guidance on the project.
2. 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.
3. Media meetings were held and reports published to minimize the current conflict
4. 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.
5. **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
6. **An international student** Mr. Alessandro Araldi (Torino University, Italy) will join the project team as an intern in the month of August, 2008 for his Master Thesis
7. **Few national students** also joined the project team for field surveys with in the study area voluntarily

Targets and Progress Made For This Reporting Period and Future Plan for Next Reporting Period

| Major Activity | Target | Progress made | Future plan for next reporting period |
|---|--|---|---|
| 1. Collect sighting record of leopards through GPS (Study is in progress till project expiry) | 1.1 Questionnaire development 1.2 Conduct questionnaire survey 1.3 Record GPS readings of sighting spots | 1.1.A detailed questionnaire was developed and field-tested 1.2 115.27Km ² area was surveyed 1.3 Evidence of the presence of leopards were collected (pugmarks and faeces) | 1.2.ii Conduct leopard sighting record survey (More areas will be approached) |
| 2. Develop GIS map | 2.1 Develop GIS map | 2.1 GPS readings are available 2.2 Information related to sighting months are also available | 2.1.i Information will be incorporated on the GIS based map |
| 3. Assess the extent of damages to livestock (Study will be in progress till project expiry) | 3.1 Questionnaire development 3.2 Conduct questionnaire survey to document the livestock damages 3.3 Record GPS readings of attacking sites 3.4 Develop GIS map | 3.1 A detailed questionnaire was prepared and pre-tested 3.2 Four union councils of Galliat were surveyed 3.3 Available data was analysed and documented 3.4 GPS readings of attacking sites were recorded | 3.i Develop GIS based map 3.ii Monitoring of existing sites and collection of data from remaining villages/UC of the study area. |
| 4. Test economical & socially acceptable options | 4.1 Initiate dialogue with the affected communities 4.2 Document lessons learnt and success stories of different agencies and projects | 4.1.i Problem was highlighted and potential solutions were identified through discussion/consultation with communities 4.2. i Potential villages were identified for livestock insurance scheme initiative. 4.2.ii support identified villages in launching livestock insurance scheme and get support for other potential villages | 4.2.ii Develop proper mechanism to launch and make the scheme successful |
| 5. Conduct training on safety measures | 5.1 Conduct trainings | three training sessions were conducted in the problem zone | 5.3.i Conduct five trainings |
| 6. Prepare Conservation Action Plan For Leopard | | | Collect information from other provinces |

| | | | |
|--|--|--|--|
| | | | Conduct population survey at aj&k and kaghan valley Hold national workshop Prepare action plan |
|--|--|--|--|