

# Biodiversity Reconnaissance Survey In Darwaz Region, Badakhshan Province, Afghanistan

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## Acronyms

AFN: Afghanis (Afghan National Currency)

AKF: Agha Khan Foundation

ASL: Above Sea Level

AWEC: Afghanistan Wildlife Executive Committee

GEF: Global Environmental Facilities

IUCN: International Union for the Conservation of Nature

MAIL: Ministry of Agriculture, Irrigation and Livestock

NEPA: National Environment Protection Agency

NGO: Non-government Organization

NSP: National Solidarity Program

PoWPA: Program of Work on Protected Areas

SLN: Snow Leopard Network

UNDP: United Nation Development Program

USAID: United States Agency for International Development

UTM: Universal Transverse Mercator

WCS: Wildlife Conservation Society



## Introduction

Few wildlife studies have been made in recent years in Afghanistan and so current status and distribution of wild species remain largely unknown in the country. With funding support from the United States Agency for International Development (USAID), the Wildlife Conservation Society (WCS) began to work in Afghanistan in 2006 with projects in the Central, Northeastern and Eastern parts of the country.

Wildlife were said to be abundant in northern Badakhshan during the 1970s, and according to a gap analysis carried out by WCS in collaboration with the National Environment Protection Agency (NEPA) in 2009, as part of the Program of Work on Protected Areas (PoWPA), it was indeed confirmed as an area of interest for biodiversity conservation.

Habibi (2003) indicates that the region of Darwaz in the north of Badakhshan is part of the historical distribution range of the markhor (*Capra falconeri*) in Afghanistan, a species of global conservation concern. In July 2011 Moheb and Mostafawi (2011) confirmed the presence of this species in Shahr-e Buzurg District neighbouring Ragh and then Darwaz to the west. Therefore we decided to survey the area in search for the presence of markhor.

The Priority Zones Analysis conducted by WCS in 2008 with the collaboration with UNDP-GEF divided the entire country into a 50km x 50km grid. These grid cells were then allocated a score starting from 1, showing the least priority, up to a score of 10, which shows the top priority areas in the country. The final result of the Priority Zone Analysis showed that the Darwaz region had a high potential from a biodiversity standpoint. On the basis of the Priority Zone Analysis and as part of WCS's Project entitled "*Improving Livelihoods and Governance through Natural Resource Management in Afghanistan*" a biodiversity reconnaissance survey was conducted in Darwaz region, Badakhshan, bordering Tajikistan (Figure 1).

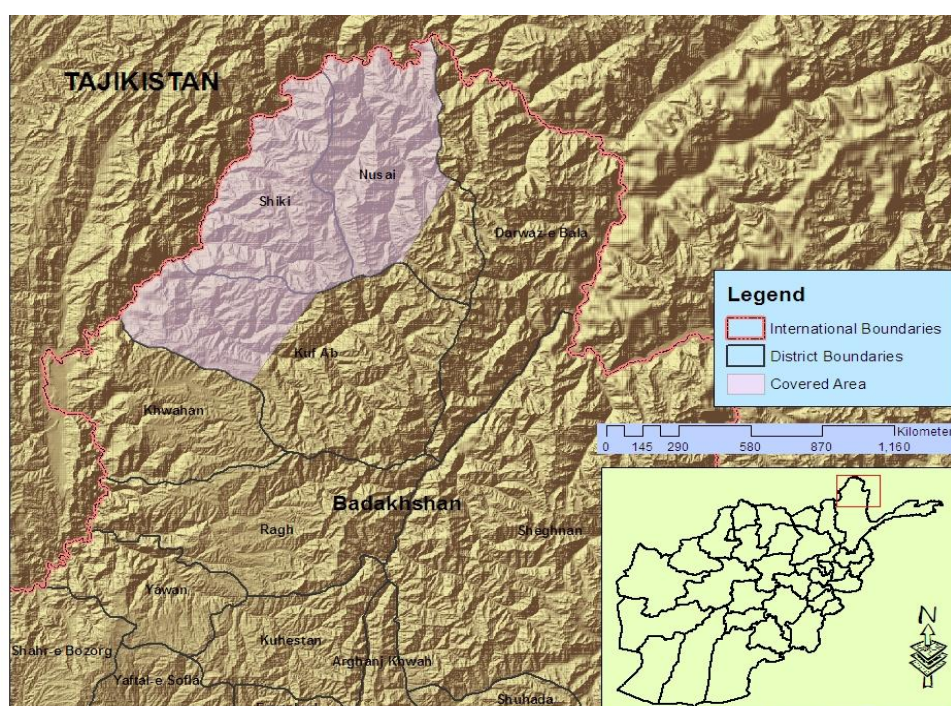


Figure 1: Map of the Darwaz region showing the study area.

## *Darwaz Region*

Darwaz region is in the north of Badakhshan and is the most northerly part of the country. The Amu Darya River runs around the boundary of Darwaz on three sides (east, north and western side), and constitutes the international border with Tajikistan. South and southeast Darwaz share borders with Raghistan and Sheghnan respectively, two districts of Badakhshan (Figure 1). The total area of Darwaz is around 4,667 square kilometres and it is located around 1,345 meters ASL. Darwaz is divided into five political districts: Khuahan, Kof Ab, Shukai, Nusai, and Maymai districts.

Darwaz is among the most remote areas of the country and is as yet largely unexplored biologically. Darwaz has stayed isolated mostly due to poor road connections that link it with the other parts of the country. There is one road, which connects Faizabad to Khuahan and Kof Ab, the two frontier districts of Darwaz, and farther on there are only walking tracks. The road remains blocked for at least 5 – 6 months in the cold seasons due to heavy snowfall.

The Darwaz region gets supplies from two main routes, the south and southwestern parts (Kof Ab and Khuahan districts) have access to Faizabad, the provincial capital of Badakhshan, whereas the northern part (mostly Nusai district) is connected with Tajikistan via a bridge that was recently built by the Agha Khan Foundation (AKF). Darwaz has little access to Afghanistan's internal markets and its inhabitants depend heavily on natural resources and agriculture. The major livelihood products coming from natural resources include pastures, fuel wood, medicinal plants, and pistachios (mostly in the western part of the region). Another major factor contributing to the economy of Darwaz is a large number of migrant labourers (from almost every household) to Iran. Working in Iran has become an accepted part of their livelihoods and for over thirty years people have gone to work there and send money back to Darwaz for their families.

The landscape in Darwaz, like other areas in Badakhshan, is mostly undulating terrain with little irrigated land. People grow rain-fed wheat ("lalmi") and usually keep sheep, goats, horses, donkeys and cattle. Oxen as well as donkeys are used for agricultural power in most of the areas. The main means of transportation in most of the Darwaz region is by motorcycle, and the use of donkeys for moving loads.

Darwaz consists of several valleys and sub-valleys with large and small streams that drain to the Amu Darya River. Despite having plentiful supplies of water, very little or no investments have been made in the field of irrigation channels and use of water in agriculture. People do, however, use the water streams to generate small hydro electricity power plants for their own use. Almost all those households who have access to the water streams have built hydropower electricity generators for themselves. In some villages the AKF with funds from the NSP (National Solidarity Program, run by the Afghan government) have built bigger electricity power plants for the entire village but in most cases people have invested their own funds for private generators.

## *Survey Area*

In this survey we covered a strip of land (UTM zone 42 0617000 to 0671000) as shown in Figure 1. This area falls under three districts of Darwaz: Kof Ab, Shukai and Nusai. Within this area we visited 38 villages, most of which are located in

valleys that drain into the Amu Darya. Topography of the area varies from steep slopes and cliffs, to undulating terrain and flat areas (Figure 2). The steep slopes and cliffs become more dominant in the landscape the further along the Amu Darya one travels from east to west; this area is mostly scrubland, occupied by a variety of shrub and tree species. To the south and southeast of our focal area the elevation increases, consisting of open grasslands and undulating terrain. The elevation changes from north to south with a significantly increase in the southern part of the area. In southern Kof Ab district there is a place named Dasht-e Aesh where Kuchi nomads graze their livestock during the summer.



Figure 2: Photos of Darwaz areas showing different topographic features, photographed by Zalmai Moheb and S. Naqibullah Mostafawi.

### *Aims and objectives*

The aim of our survey was to carry out a rapid assessment of wildlife across the Darwaz region.

The objectives were to:

1. Assess the status of mammals and birds across the area.
2. Pay particular attention to any evidence of markhor still occurring in the area.
3. Carry out villager interviews to understand local perceptions and threats to wildlife and other natural resources.
4. Gather information relevant to establishing a conservation program in the area.
5. Train counterparts, particularly the Ministry of Agriculture.







Table 1: Photos of species shown to informants.

No.	Common Name	Scientific Name	Historical range in the study area	
			Yes	No
1	Asiatic Cheetah	<i>Acinonyx jubatus</i>		√
2	Persian Leopard	<i>Panthera pardus saxicolor</i>	√	
3	Snow Leopard	<i>Panthera uncia</i>	√	
4	Jungle Cat	<i>Felis chaus</i>		√
5	Leopard Cat	<i>Prionailurus bengalensis</i>	√	
6	Pallas Cat	<i>Otocolobus manul</i>	√	
7	Wild Cat	<i>Felis lybica</i>		√
8	Eurasian Lynx	<i>Lynx lynx</i>	√	
9	Striped Hyena	<i>Hyaena hyaena</i>		√
10	Wolf	<i>Canis lupus</i>	√	
11	Jackal	<i>Canis aureus</i>		√
12	Red Fox	<i>Vulpes vulpes</i>	√	
13	Brown Bear	<i>Ursus arctos</i>	√	
14	Asiatic Black Bear	<i>Ursus thibetanus</i>		√
15	Polar Bear	<i>Ursus maritimus</i>		√
16	Siberian Ibex	<i>Capra sibirica</i>	√	
17	Markhor	<i>Capra falconeri</i>	√	
18	Urial	<i>Ovis orientalis</i>	√	
19	Long-tailed Marmot	<i>Marmota caudata</i>	√	

## Interviews

Villager interviews comprised a large portion of the overall survey. We interviewed between three and six people per village. Overall we conducted 131 interviews across 38 villages.

Based on our previous survey experiences, villagers are uncomfortable participating in formal interviews where their responses are recorded on a data sheet. This is probably because poorly educated people are unsure how their information will be used and they fear that it could create problems for them in the future. Therefore, to avoid these problems we only held informal interviews (Appendix 2) and wrote up our notes after the interview had concluded and the respondent departed. We acknowledge it is not easy to be completely consistent with this sort of interview; however, it gave us good results in a survey at Shahr-e Buzurg district (Moheb & Mostafawi 2011 unpublished report) and therefore we continued the methodology here.

## Public Awareness

Importantly, during the survey we also tried to educate the people about how they can draw benefits from conserving their wildlife. We explained about the importance of natural systems and told everybody of the successes in Wakhan district. We also informed them about conservation programs in Tajikistan and other places.

### Field surveys

This survey was the first ever visit of a WCS team to Darwaz. With no previous information and experience of the area, our field surveys were based on the information we received from people we interviewed. Whenever we were clearly told that there were wild animals in a specific area with little human activity, we visited the area. To facilitate these field surveys we hired a well-experienced hunter (or hunters) from the local community as a field guide. We then travelled to the area of interest and scanned it for wildlife (Figure 4). Survey equipment used consisted of spotting scopes, binoculars, digital camera, GPS, compass, and topographic maps.



Figure 4: Survey team scan the area in Gandamargh, Kof Ab District, photographed by Said Nusratullah.

### Results

The most common taxa we saw were birds and lizards. The most notable findings of the survey were the confirmation of the presence of markhor and Brown Bear in the area, as well as what appears to be the first ever live photographs of a lizard species, *Laudakia badakhshana*, and the first record of this species since its initial taxonomic description in 1969 (S. Anderson per comm., 2012). There was also a report that a Caspian Tiger had allegedly been shot in Darwaz about 15 years ago.

In the course of 29 days of survey we visited three districts of Darwaz where we saw markhor, red fox, unidentified voles and bats, 107 species of birds, agama lizards and *Laudakia badakhshana*. We recorded indirect field evidence of brown bear, leopard (or possibly snow leopard), ibex, porcupine, marmot, wild boar and snakes. During

the interview the informants reported the occurrence of nearly 20 mammalian species in the study area (Table 2).

In general people in Darwaz have little understandings about sustainable use of natural resources and overhunting is widely practiced in all areas we surveyed. Wild ungulates appear to be under a greater threat of extinction due to unsustainable hunting. Among birds, chukar partridges are the most intensively hunted.

Table 1: Results of interviews on the presence of mammal species in Darwaz region.

No	Animals	Number and percentages of informants recognizing the presence of a species						Type of Records
		Kof Ab		Shukai		Nusai		
		No.	%	No.	%	No.	%	
1	Wolf	36	65.4	12	85.7	51	82.3	2
2	Fox	31	56.7	12	85.7	47	75.8	1 & 2
3	Asiatic Black Bear	1	1.8	0	0.0	4	6.5	2
4	Brown Bear	20	36.4	6	42.9	41	66.1	2, 3, & 4
5	Snow Leopard	8	14.5	2	14.3	27	43.5	2 & 3
6	Persian Leopard	7	12.7	2	14.3	5	8.1	2
7	Eurasian Lynx	3	5.5	2	14.3	9	14.5	2
8	Pallas Cat	0	0.0	0	0.0	0	0.0	
9	Jungle Cat	1	1.8	0	0.0	4	6.5	2
10	Wildcat	0	0.0	0	0.0	2	3.2	2
11	Common Otter	2	3.6	0	0.0	3	4.8	2
12	Eurasian Badger	15	27.3	2	14.3	14	22.6	2
13	Stone Martin	13	23.6	3	21.4	11	17.7	2
14	Markhor	14	25.5	1	7.1	0	0.0	1, 2 & 3
15	Ibex	21	38.2	10	71.4	43	69.4	2 & 3
16	Urial	0	0.0	0	0.0	0	0.0	
17	Wild Boar	17	30.9	2	14.3	13	21.0	2 & 3
18	Long-tailed Marmot	9	16.4	1	7.1	17	27.4	2 & 3
19	Crested Porcupine	10	18.2	0	0.0	33	53.2	2 & 3
20	Cape Hare	14	25.5	1	7.1	20	32.3	2

Type of Records:  
1 = Direct observation of the animal in the field  
2 = Presence of the animal reported by the respondents  
3 = Indirect Field evidence recorded in the field  
4 = Body Parts/Products local kept in their houses

The WCS Priority Zone Analysis (Kanderian et al. 2009, WCS and ECODIT unpublished report) anticipated that the Darwaz region is an area of potential high biodiversity value (rated 7 and above) (Figure 5). Our survey results appear to support the predictions of the Priority Zone Analysis and refine them. We confirm that the area is rich in wildlife and has high conservation value. Around 20 mammal

species (Appendix 3), 107 bird species (Appendix 4) and rare, or at least poorly known reptile species, were either sighted or reported to be present in the area.

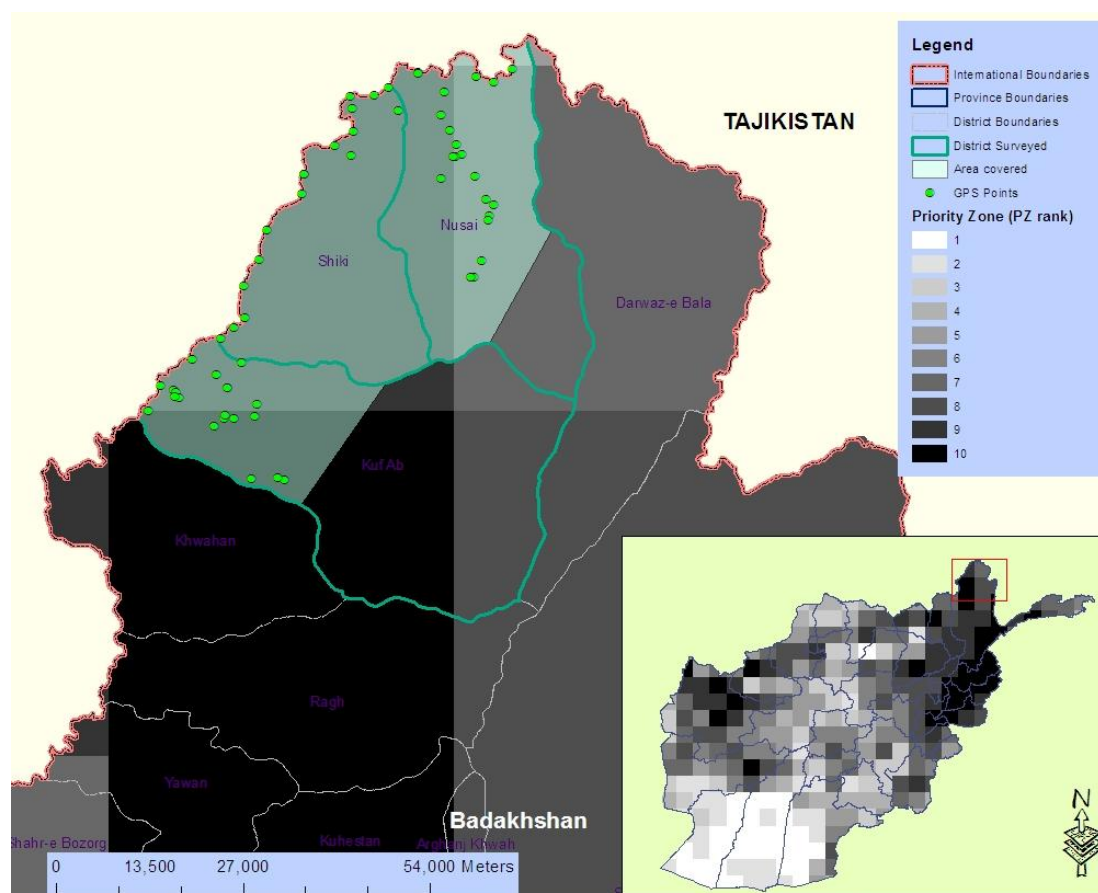


Figure 5: Map showing the study area with respect to Priority Zone scaling in the country (Kanderian et al. 2009, WCS and ECODIT unpublished report).

## Mammals

### Markhor (*Capra falconeri*)

During our field survey we observed six markhor in the area between Dahan-e Ab Kof and Leiwgard village in the Gandamargh valley (Figure 6). The direct sighting of this species is one of the most notable discoveries of this survey. Literature searches have failed to find any confirmed reports of the presence of markhor in northern Badakhshan prior to the 1970s (Moheb and Mostafawi 2011 unpublished report). The distribution map of markhor given by Hassinger (1973), who participated in the Street Expedition of 1965, include the western part of Darwaz region; Habibi (2003) and Michel (2010) mention markhor being in northern Badakhshan but they did not present any evidence of the species presence in the region.

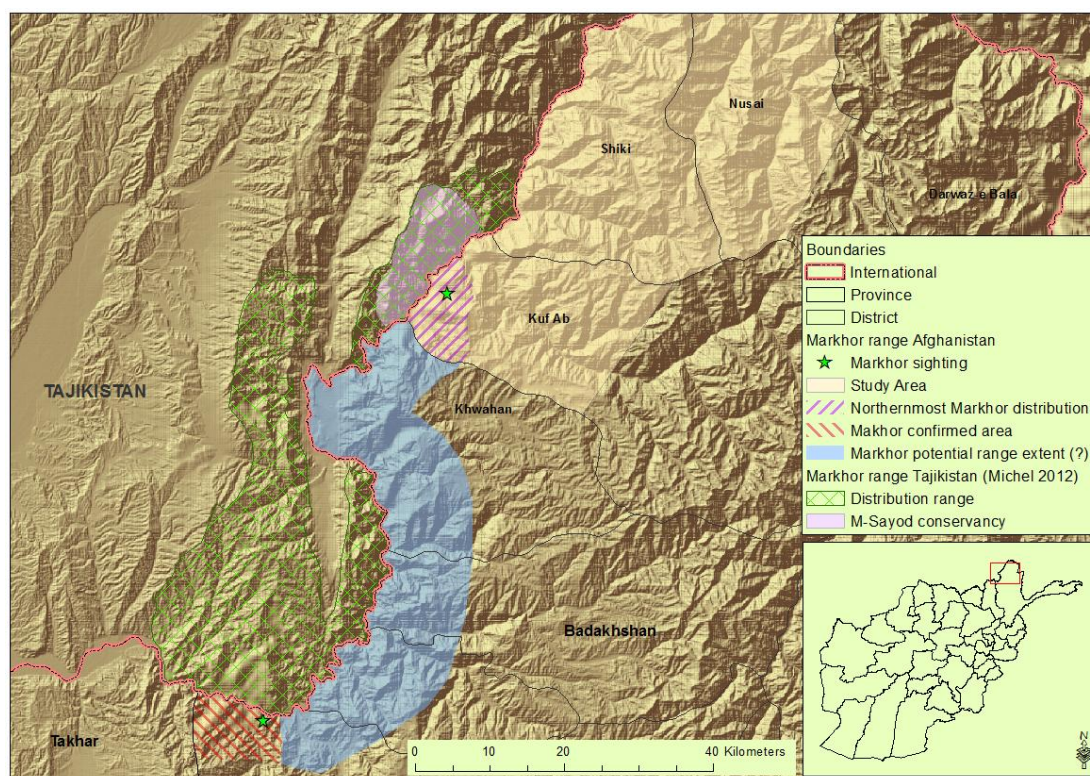
In July 2011 we documented for the first time markhor in Shahr-e Buzurg District of Badakhshan; four markhor were observed at this time. Prior to the present expedition there were to our knowledge only two documented records of the species for northern Afghanistan: (i) Hassinger (1973), and (ii) Moheb & Mostafawi (2011).



Recent surveys carried out in Tajikistan confirm that markhor populations are relatively abundant across the Amu Darya River opposite Darwaz region, and Raghistan and Shahr-e Buzurg Districts of Badakhshan (Michel, 2010; Michel, pers. comm., 2012).

The Shahr-e Buzurg survey and community interviews held in Darwaz confirmed the presence of markhor on the Afghan side. Fifteen informants, mostly from the western Kof Ab District, stated with confidence that markhor exists in the western part of their district; as a result we carried out a field visit to this area. The two-day field survey resulted in the direct sighting of 6 markhor in an area named Leiwgard. Following the recent report from Shar-e Buzurg, this sighting constitutes the second recent report of markhor in northern Badakhshan (Figure 6).

The situation of markhor at Leiwgard differs from Shahr-e Buzurg. In Shahr-e Buzurg the population is apparently only made of a few transient immigrants coming from their Tajik strongholds (Moheb & Mostafawi 2011). However, according to the informants, the population of markhor in Leiwgard seems to be mostly resident with only occasional adjuncts from the neighbouring Tajik populations (Figure 6).



**Figure 6: Markhor sighting and the distribution range in northern Badakhshan, Afghanistan as well as in Tajikistan.**

Leiwgard area is the most remote part of the Kof Ab District and lacks road connection with other parts of Badakhshan; it only has a very narrow foot track (Figure 7) connecting it to the district centre of Qala-e Kof. A small village called Leiwgard, consisting of around 30 households, is located in the middle of this remote area. The Leiwgard area borders Tajikistan, where on the Tajik side of the river there is a recently registered markhor conservancy (“M-Sayod Conservancy Ltd”) with an estimated population of 200 animals (S. Michel pers. comm. December 2011). Given that only the Amu Darya River separates the conservancy from Leiwgard area, and the river freezes during cold winters, it is possible that markhor could move between

both areas. Furthermore, the remoteness and difficulties faced in accessing Leiwgard on the Afghan side are primary reasons for markhor (and ibex) still existing in the area.

Leiwgard has different types of trees, shrubs and other vegetation coverage. We encountered people who were cutting juniper trees and saw evidence of hunting. Despite this the area seemed to be under less threat than other areas we visited during this survey, due, we believe to the access difficulties and low human population.



Figure 7: Rugged and very steep terrains used by markhor in Darwaz showing the narrow tracks connecting Leiwgard and Kof Ab district centre.

According to people we interviewed, Leiwgard is home to  $\pm 80$  markhor, as well as numerous ibex, brown bears, leopards (probably snow leopard) and other mammal species. We were not able to survey the entire Leiwgard area; we visited only the small valley of Gandamargh, and three other interesting valleys were left unexplored.

Experienced hunters, such as Mohamad Aman from Leiwgard village, stated that markhor and ibex utilize the same habitat but at different altitudinal gradients. Markhor are said to inhabit the lower elevations and prefer cliffs, while ibex utilize the higher elevations in the upper valleys (colder environments). This information was corroborated several times during interviews of people at Leiwgard.

At Leiwgard village we saw four pairs of markhor horns (Figure 8) that were allegedly shot in the area. Two pairs were quite old, one pair was undetermined, and one pair (Figure 8a) seemed relatively recent with presence of (weathered) blood around the horns.





Figure 8: Horns of markhor photographed in Leiwgard Village.

The western part of Kof Ab district, mainly the mountains section surrounding Leiwgard where we visited runs along the Amu Darya River and seemed to offer suitable habitat for markhor. It contained rugged mountains with steep cliffs and areas that were free of livestock and shepherds. The vegetation cover was an open woodland with sparse juniper trees, pistachio trees, wild almond, and many shrub species. The area is located opposite known markhor areas (Figure 6) in Tajikistan (S. Michel pers. comm.).

Markhor were not reported at Nusai and Shukai, the two northernmost districts of Darwaz. West of Kof Ab is the place where markhor exit based on what we heard during interviews across Darwaz, we believe this area is the northernmost boundary of markhor in northern Badakhshan (Figure 6). The markhor distribution continues towards Khawahan and Raghistan districts in the western side, therefore this area can be marked as a priority site for future protection. More investigation is needed to check whether the markhor distribution continues to the west up to the point (Figure 6) where we found the species in Shahr-e Buzurg district (see Moheb & Mostafawi 2011), or whether there are isolated populations across the landscape.

#### Siberian Ibex (*Capra sibirica*)

Ibex are apparently present in the surveyed area, yet fairly sparsely distributed, due to unsustainable hunting. Seventy-four people out of 131 (56.4%) we interviewed stated that ibex occurs in Darwaz. An informant from Wudab Village, Nusai District, showed us a skin and horns of two individuals. During our field surveys we found ibex horns in Gandamargh Valley. According to the respondents, the ibex populations in Shukai and Nusai districts are close to extinction because of the over hunting problem. As mentioned earlier, ibex in Darwaz shares the western part of its distribution with markhor, yet both species are more or less segregated over an elevation gradient and seem to use different ecological niches.

### Urial (*Ovis orientalis*)

During the survey we did not encounter any evidence of the presence of urial. Even though the photos (Table 1) that were shown to interviewees contained a picture of urial, none of the informants reacted to it and none were aware of the species in their area, past or present. We did, however, encounter some areas of suitable habitat in terms of topography and elevation, mostly in the southern parts of the survey area distant from the Amu Darya River.

### Wild Boar (*Sus scrofa*)

Of the people interviewed, 32 out of the 131 (24.4%) reported that wild boars occur in Darwaz. The 32 positive responses originated from the areas close to the Amu Darya River. In some areas like Shepun Village in Kof Ab District, we heard of complaints made to the district's governor that wild boars damage crops. The district authorities in turn ordered the locals to chase the pigs away from the region. In Shepun village local people showed us the crop field distraction and they claimed that wild boars do this. Wild boars appear to be common along the Amu River in Darwaz and sounders of around 25-30 animals were reported in Jowgani, Nusai District.

### Brown Bear (*Ursus arctos*)

In the course of the survey, field evidence and depredation complaints about bear were regular. Most people we interviewed identified the brown bear from the photographs shown, and could distinguish this species from the Asiatic black bear (*Ursus thibetanus*) known to be absent from northern Afghanistan. A reasonably fresh brown bear skin (Figure 9) was shown to us at Leiwgard Village, supporting the presence of the species in Darwaz and showing that people may kill this species. Out of 131 respondents, 94 (71.7%) said that the species occurs in Darwaz and only four (3%) said that the Asiatic black bear was also present in the area.

Out of 38 villages we surveyed in the Darwaz area, 17 raised complaints about brown bear depredation, most of which occurs in Shoryan Valley and its surrounding mountains in Nusai District (Figure 10). During the field survey we found on 5 occasions of fecal materials that we believe were from bear (Figure 11). There was a lot of food for bears in this area (e.g. wild grape). We were also shown a bull (Figure 12) in Washnishahr Village that was allegedly wounded in a recent Brown Bear attack.



Figure 9: Skin of a brown bear kept in a household in Leiwgard Village, Kof Ab District of Badakhshan.



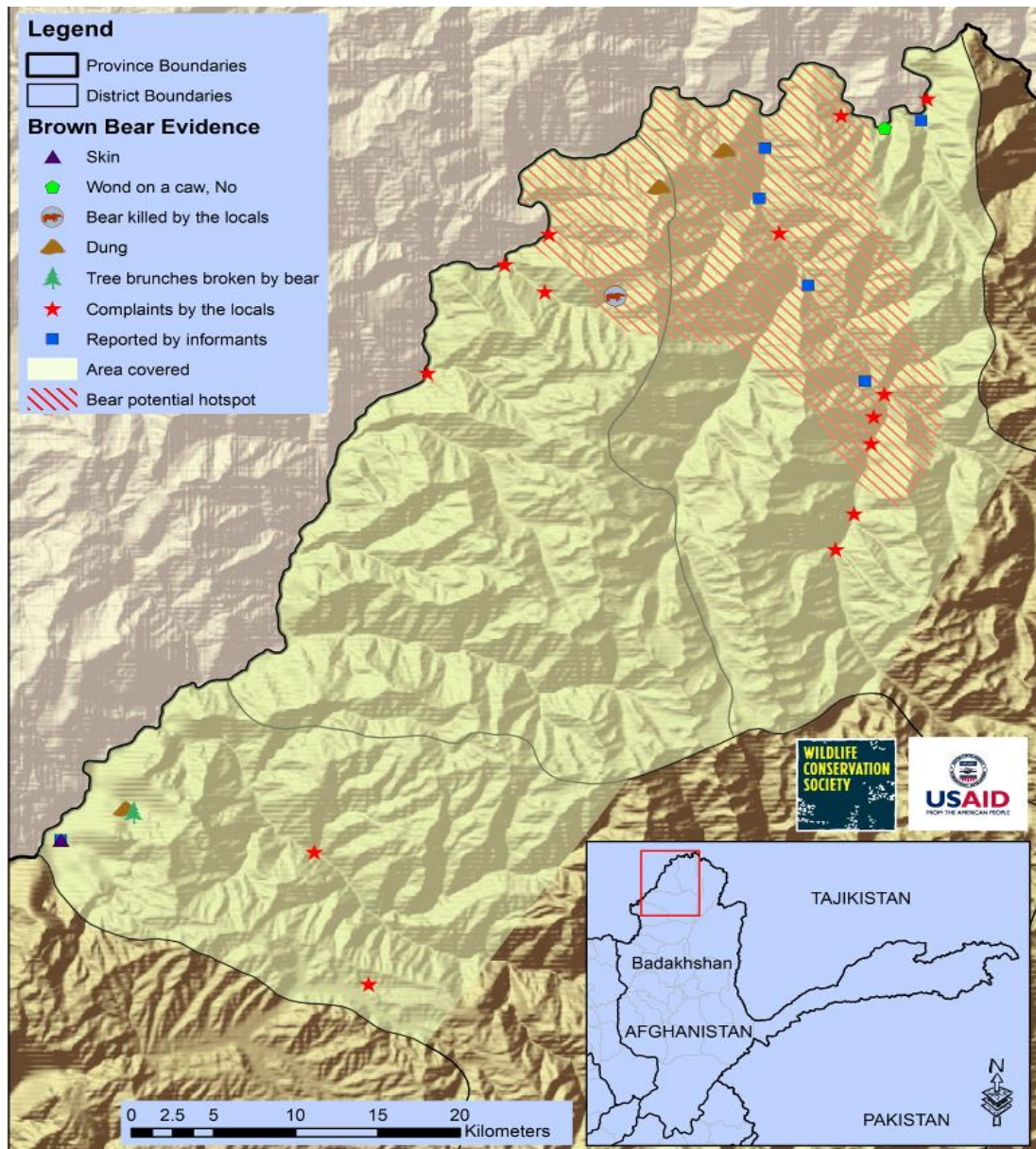


Figure 10: Locations of brown bear evidence in the study area.



Figure 11: Brown Bear fecal materials in (1) Gandamargh Valley, Kof Ab District, and (2) at Cherakh Pass, Nusai District.





Figure 12: Wounded bull allegedly attacked by a brown bear, Nusai District.

#### Leopard spp.

Only five people (3.8%) believed that the Persian leopard (*Panthera pardus*) is the only leopard species present in the area, whereas 37 (28.2%) reported that the snow leopard (*Panthera uncia*) is the leopard species occurring in the area. Nine out of 131 respondents (6.8%) believed that the Persian leopard and snow leopard may coexist in Darwaz. Four respondents agreed that leopards are present in Darwaz but could not differentiate between the two species. Seventy-six respondents did not know about leopards in Darwaz.

A respondent in Leiwgard Village stated that the previous week a “leopard” killed three of his goats a kilometre away from the village. He confidently picked the snow leopard when we handed him photos of the two species. The Arbob of Washnishaar Village in Nusai District said he had shot two leopards in his village in the late 1970s. Based on the morphological features he described to us, it seems that both animals were snow leopards.

During our field survey in Gandmargh Valley, Kof Ab District, we encountered two possible leopard scats (Figure 13).

A dead snow leopard cub was recently found at the M-Sayod Markhor Conservancy (SLN 2011) opposite Darwaz in Tajikistan. There appears to be a population of snow leopards in Tajikistan opposite Kof Ab District (Stefan Michel pers. comm.). Based



Figure 13: Scats found at Gandamargh valley, Kof Ab.

on these testimonies we believe it is very likely that the leopard species said to occur in Darwaz is the snow leopard.

#### Tiger (*Panthera tigris*)

Mr. Mohammad Aziz from Nusai District, mentioned that he had seen the skin of a carnivore whose picture we did not have in the photo gallery. Then when showing him drawings from Habibi (2003), he pointed to the Caspian Tiger. He said that four years ago he saw a tiger skin in the main town of Mimay District, which had allegedly been shot in Darwaz “around 10 years ago”. A local person put this skin in the market for sale.

#### Eurasian Lynx (*Lynx lynx*)

Only 14 out of the 131 respondents (10.7%) stated that lynx occurs in Darwaz. Most people were not familiar with this species. If lynx is present we believe it is scarce. More investigations are needed.

#### Small cats

According to the informants, Pallas cat (*Otocolobus manul*) does not occur in the region. The same result was given for wildcat (*Felis silvestris lybica*) - only 2 out of the 131 respondents (1.5%) reported the presence of this species. Five people from Nusai District (3.8%) stated that there is a small cat species, mostly resembling the jungle cat (*Felis chaus*), present in the area. However, the interviewees could not pinpoint an exact species, which casts some doubt over their claim. Unlike our Shahr-e Buzurg survey results, which suggested that small cats are fairly abundant (Moheb & Mostafawi 2011), the presence of small cats in Darwaz remains largely undocumented.

#### Wolf (*Canis lupus*)

Ninety-nine out of 131 respondents (75.5%) stated that wolves are present all over the study area. This is the highest level of certainty we received for any species during this survey, suggesting that it is widespread in Darwaz. We received reports that wolves attack and kill livestock. Respondents from Leiwgard accepted the presence of wolves and said they seldom appear, using their area only as a transit route between eastern and western Darwaz.

#### Red Fox (*Vulpes vulpes*)

After wolf, red fox is the second most abundant species recorded in this survey: ninety of the 131 respondents (68.7%) reported its presence in the area. Red foxes were said to depredate poultries and are considered vermin by local people.

#### Eurasian Badger (*Meles meles*)

During the interviews 31 people (23.6%) told us about the presence of an animal that is locally called “qashqaldagh”. After showing the people drawings in Habibi (2003) we concluded that it could be badger (*Meles meles*), although the ratel (*Mellivora capensis*) would have been a more likely species in Badakhshan according to Habibi (2003). We failed to find any artefacts to confirm the presence of this species.

### Common Otter (*Lutra lutra*)

Habibi (2003) does not include Badakhshan as part of the common otter's historical range. However, according to the respondents the species appears to be widespread along the Amu Darya River. Although the number of respondents (5 out of 131, 3.8%) that reported the presence of otter was low, the details they gave us about hunting and trade of otter skin suggest that the species is present. Based on what we were told, the species is heavily persecuted for its valuable fur and in need of protection.

### Stone Marten (*Martes foina*)

Stone marten is another predator species known for preying on poultries. Twenty-three out of the 131 respondents (17.5%) reported the stone marten in Darwaz. Based on our interviews we believe the species is present.

### Rodent spp.

This survey was mostly designed to cover the large and medium-size mammal species so we could not draw a comprehensive picture about small mammals. However, we included a picture of long-tailed marmot (*Marmota caudata*) in our photo gallery. Marmots are key prey for species such as bears, wolves and snow leopards, and play a major ecological role. Our interviews found 27 respondents (20.6%) reporting this species to be common in the area. Besides this, we also saw marmot burrows during our field surveys.

The second rodent that people mentioned was the crested porcupine (*Hystrix indica*). Forty-three out of the 131 respondents (32.8%) said that porcupines were present. Most people thought the species is new to the area, colonizing the area during the last 30 years thanks to new graded roads developed in the area. It is considered a vermin species because of the damages it causes to crops.

### Cape Hare (*Lepus capensis*)

Thirty-five out of 131 respondents (26.7%) reported the presence of hares.

### Bats

Bats were commonly encountered during the evening across the entire survey area. One specimen was observed at close range during daytime (10:25am) on September 29<sup>th</sup> 2011 (Figure 14). Bat taxonomists (B. Hayes pers. comm.) proposed this specimen to be *Hipposideros* sp.. The specimen was injured with a small wound visible on its nose.



Figure 14: *Hipposideros* sp. found in Shoryan Valley, Nusai District.



## Birds

We recorded 107 bird species (Appendix 4). Darwaz (Nusai, Shukai and Kof Ab districts) appears to host a rich and valuable birdlife assemblage. The area has diverse habitats despite its predominant aridity and local people say that it receives large flocks of migratory birds in spring and autumn. The chukar partridge (*Alectoris chukar*), the Himalayan snowcock (*Tetraogallus himalayensis*), pigeons (*Columba* spp.) and doves (*Streptopelia* spp.) are openly hunted in all their habitats and throughout the year.

Although the survey focused at recognizing the presence of terrestrial mammals, we also recorded all bird species we could identify.

The following is a list of species seen that would require conservation efforts, based on global status as reported by IUCN ([www.iucnredlist.com](http://www.iucnredlist.com)) and on our perception of overharvesting risk.

### Chukar Partridge (*Alectoris chukar*)

In Darwaz the chukar is heavily hunted, its eggs and broods are collected, and captured for pets. Throughout the region we saw the species being kept in most houses as pets and fighting birds. The local people said that hunting sites are considered personal property and can even be given away as a dowry for marriages. Most people like to hunt the chukar and hunting is widespread. Because of these reasons we believe the chukar population could be threatened by overharvesting and may face decline.

During spring people collect its eggs (eggs are sometimes incubated by domestic chickens) and during the summer the chicks are captured. The species is also hunted with shotguns and rifles.

The birds are captured or hunted using a variety of techniques:

Firstly using a local method called “buta”, which sees a tame singing chukar placed in the middle of a net trap. This “singer” attracts a conspecific into the net where it is trapped.

Another technique is called “nias”, which allows the hunter to capture large numbers of birds in one time and poses therefore an even greater threat to the overall population. During autumn, flocks of chukar come to specific places to find food and spend the cold season. During this time of migration, local hunters place mist-nets near mountain peaks and nearby rocky and wooded areas, on known chukar migration routes. When the flocks pass by these areas they avoid the rock and woodlands, entering the net where the hunter closes the trap. During our survey, it became apparent that this technique is quite well known and is used in most of the villages. One hunter in Khirsh Village, for example, said that he once captured more than 20 chukars in one time, and he also said that other hunters claim to have captured flocks larger than 50 birds in one time.

Another technique called “chader khial” or “Roba gak”, is where the hunter uses a wooden-framed cloth. The cloth is the same colour as the surrounding habitat, and in the middle of the cloth the hunter puts a hole through which he can see the birds. Using the cloth, the hunter slowly moves towards the chukar, and once the hunter gets close enough he uses a shotgun to kill the bird.

### Himalayan Snowcock (*Tetraogallus himalayensis*)

This species is abundant in Darwaz. We observed it at higher altitudes. People we interviewed said it is breeding in the area. It suffers hunting, with people killing it for subsistence. Most people we interviewed said the bird is bigger than the chukar with good meat, this being the main reason it is hunted. According to the people we spoke to, the population seems to be declining.

### White-winged Pied Woodpecker (*Dendrocopos leucopterus*)

This species was uncommon in the survey area. We observed two birds together in an old mulberry tree at Qala-e-Kof Village, central Kof Ab District on October 2011. People do not appear to hunt this bird, mainly because it is small and offers little meat. During the survey we explained the benefits of the species for agriculture and orchards.

### Saker Falcon (*Falco cherrug*)

Local people call this species “baz” or “charkh”. It is a well-known species with people coming from outside Badakhshan to capture it for export to neighbouring countries. We didn’t directly observe this bird during our survey, however, we asked about it in all interviews and people reported its presence. Dawlat Nazar from Fi village, for example, said that 10 years ago he witnessed a group of people from a different province who stopped in Dasht-e-Aesh to capture these birds. Similarly, Mohammad Jan from Safed Koh village in Dasht-e-Aesh said that around 4 years ago some people came to the area to capture falcons and he prepared food and accommodation during the time they were busy capturing in the area.

### Vultures

The Darwaz region is mountainous and offers good breeding habitat for vultures. We recorded five species of vultures and also saw a nest of Griffon vulture (*Gyps fulvus*) on 8<sup>th</sup> October 2011 on a cliff across from the Leiwgard area on the Tajikistan side (two adults were in the nest).

Cinereous vulture (*Aegypius monachus*) is classified as Near Threatened on the IUCN Red List. We saw one adult bird on 26<sup>th</sup> September 2011 in Dowab Village (0665601E / 4241611N), Nusai District.

Egyptian vulture (*Neophron percnopterus*) is another important vulture for conservation in Afghanistan, classified as Endangered on the IUCN Red List. We observed 6 individuals of the species in this survey. This species is also listed on Afghanistan’s protected species list (NEPA, AWEC, 2009).

The Griffon vulture (*Gyps fulvus*) was also observed during this survey (Figure 15). Mr. Rahman Shah from Khirch village complained that this species killed his chickens. We observed 13 individuals of this species in this survey.



Figure 15: Griffon Vulture photographed on this mission, photographed by S. Naqibullah Mostafawi.

Bearded Vulture (*Gypaetus barbatus*) is common in Darwaz region but we observed three birds in this survey. When we moved from Faizabad we observed two birds of this species in Raghistan District on 19-Sep-2011, also we observed a bird of bearded vulture in Shukai District when we moved from Jarf centre of Shukai District on 22-Sep-2011.

Himalayan Vulture (*Gyps himalayensis*): We observed one adult Himalayan vulture (*Gyps himalayensis*) in Delwakh Village Kof Ab District on 19<sup>th</sup> October 2011.

#### European Roller (*Coracias garrulous*)

This species is Near Threatened on the IUCN Red List. This bird breeds in Badakhshan as we observed many nests there while surveying the area. We observed one adult bird in Abgarad Village on 13th October 2011.

In some parts of Badakhshan this species is hunted for medicinal purposes. The people believing the European Roller's meat is good for kidney diseases. People we interviewed believed that because of this "medicinal hunting" the species is declining across Badakhshan.

#### Other bird species

The people in Darwaz capture common quail (*Coturnix coturnix*) as pets. Also people from outside of Darwaz come and capture this species with net traps. The species is said to breed in Darwaz. We observed one bird at Narghaw Village, Shukai District.

Mr. Abdul Malik, from Khurkat Village reported that four or five years ago the common myna (*Acridotheres tristis*) was unknown in his area, whereas it appears nowadays to be a resident. He thought that warmer weather conditions had allowed the species to colonize the area.

We observed an injured juvenile oriental turtle dove (*Streptopelia orientalis meena*) in Arwan village (UTM 42 0660795E / 4241281E) that had been wounded by a shotgun. Most of the people we interviewed stated that people hunt this species for meat, such as they do for chukar partridges. People also appear to hunt hill pigeon (*Columba rupestris*) and rock pigeon (*Columba livia*) across Darwaz. We saw one person near Aabgard Village who was hunting pigeons with a shotgun.

## Reptiles

During this survey we often encountered lizards while walking in the field (Figure 16 & 17). We photographed some of them and recorded the GPS locations of any animals photographed. The photos were later sent for identification to two international experts, Dr. Steven Anderson and Dr. Mark Auliya from University of the Pacific, California, USA, and TRAFFIC Southeast Asia respectively. Dr. Anderson informed us that one of the photographed lizards is a rare agama species, *Laudakia badakhshana*, which has not been recorded since it was first described in 1969, and which has never been photographed in the field. (Dr. Anderson, University of the Pacific, California, USA, personal communication).

The two specimens pictured in Figure 16 are *Laudakia badakhshana*. The specimen shown on Figure 16a was around 7-10 cm in length and was spotted; we found it at 2,440 meters ASL in the Shoryan Valley (UTM zone 42 0666560E/4229435N) in September 2011. Also, while we were travelling along the Amu Darya River at around 1,200 m ASL (UTM zone 42 0646932E/424748N) in September 2011, we encountered another individual of this species (Figure 16b). Although body pattern was the same, this animal was lighter in colour and larger than the first individual, perhaps 18-20 cm in length.

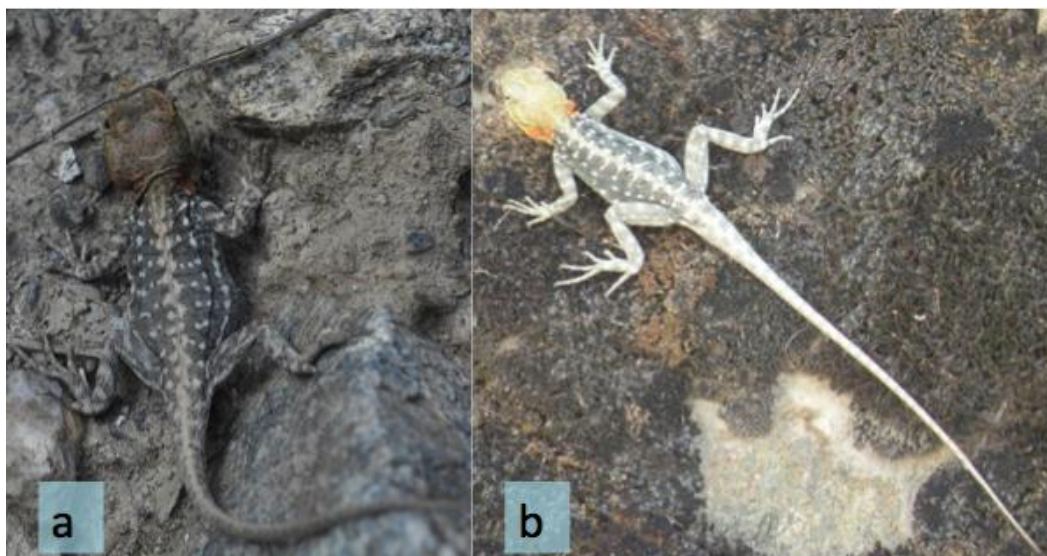


Figure 16: First ever photographs in the field of *Laudakia badakhshana*: (a) smaller in size and darker, Nusai District at 2200 m ASL on September 2011 By Zalmay Moheb (b) bigger in size and lighter, along the Amu Darya River at 1200 m ASL on September 2011 By S. Naqibullah Mostafawi.



On the way to Leiwgard, the westernmost village that belong to Kof Ab District, we saw another agama species, probably *Laudakia caucasia*, in a rocky scrubland at around 1002 m ASL (UTM zone 42 0619988E/4207629N) on October 2011. It was around 30-35 cm long, grey in colour with black in tip of the tail (Figure 17). This species was already observed in Shahr-e Buzurg District in July 2011, as part of the broader northern Badakhshan biodiversity assessment.



Figure 17: Agama species, probably *Laudakia caucasia* photographed in Kof Ab in a rocky scrubland at around 1002 m ASL (UTM zone 42 0619988E/4207629N) in October 2011.

People in Khahdara, Shukai District, mentioned that there is a place in Khahdara called “marecha”, meaning “snake nest”. They said there are many snakes there and every year people get bitten. Several victims die, and those who survive develop large wounds around the bite site such as with several *Viperidae* species. According to the respondents those victims who survive after being bitten by snake then they suffer from permanent disabilities of the bitten part. We did not go to Marecha, but it is an area of interest for the future.

### *Livestock*

Sheep in Darwaz region are relatively few compared to other districts of Badakhshan such as in Zebak and Wakhan. This is counterbalanced by the large numbers of domestic goats, especially in Nusai District. The elevation in most parts of Darwaz region is lower than in Wakhan, and as such average ambient temperatures are higher. The environment is more suitable for domestic goats since they prefer warmer climates. Table 3 illustrates the domestic stock number and composition in two districts of Darwaz.

Remoteness and lack of infrastructures imply a lack of mechanization in Darwaz, where cattle remain the main source of draft power for agriculture. Given this, there are numerous cattle in the area, second in number among livestock species. Cows are kept close to the village and are usually tended by women who milk them daily.

Males on the other hand free range in the hills and mountain areas, only being brought to the village when needed for agriculture.

Table 2: Number of domestic stock in Darwaz (courtesy of District Office, in September 2011)

No.	District	Domestic Stock				
		Sheep	Goat	Cattle	Horse	Donkey
1	Nusai	5536	22852	5344	360	2143
2	Shukai	1400	9340	3860	43	1557
3	Kof Ab	There was no formal data for the livestock				

After motorbikes, donkeys and horses are the second most commonly used transportation means in Darwaz. Despite using many donkeys during our survey, we did not encounter a single female of this species. For unknown reasons the local people believe donkeys cannot reproduce in Darwaz. Because of their strength, males, exclusively, are purchased by the Darwaz inhabitants from other provinces such as Takhar.

We did not notice any diseases in domestic stock. However, people we interviewed reported their stock suffering illnesses that resemble foot-and-mouth disease, contagious caprine pleuropneumonia, enterotoxaemia, and scabies.

Wildlife depredation rates of livestock differed from place to place. According to people we interviewed, wolves mostly prey upon small stock such as sheep and goats, whereas brown bears only attack cattle. As mentioned earlier, in some of the areas like Nusai District (Figure 10) people complained about the high predation of brown bears on their cattle. According to informants, brown bear mostly attacks free-ranging bulls. Although people said depredation by bears has always been a problem, they claim it has become a more serious issue in recent times. The headman of Kai Village said that while not every brown bear attacks cattle, once a bear starts attacking it becomes a serial cattle-killer.

## Forest

The areas we visited in Darwaz during the survey consisted of different terrains and vegetation types. We saw vast grasslands on gently undulating terrains in southern Kof Ab District. Along the Amu Darya River the steep mountains are vegetated with an assemblage of mixed tree and shrub species. The major tree species in the area consist of Junipers and, pistachios. Wild almond trees are also present, a species locally called “Bashal” and some shrubs such as wild pomegranate, grapes, *Ephedra* sp. and another species locally called “Arghawan”.

Pistachio trees were sparse in upper Darwaz (Shukai and Nusai districts). The actual “pistachio belt” starts west of Kof Ab District and runs west into neighbouring provinces. According to informants from Leiwgard Village, their pistachio trees do not produce harvestable nuts, so in this area people do not care about using this resource for their fruits.

According to local people, the government protects against cutting four tree species; the juniper, the pistachio and two other species locally called “Bashal” and “Arghawan”. There appears to be no ban on cutting other species. In Shoryan Valley, Nusai District, people have tried to graft buds of domestic almond onto wild almond trees. This has apparently proven successful. The practice has only recently been started and is not yet widely carried out.

Unlike at Shahr-e Buzurg District where forests are to some extent managed by the local people with the help of government, in Darwaz forests are not managed and receive very little protection. They are cut heavily, mostly for timber and fuel wood (Figure 18a). Even though government told us that forest cutting is prohibited, cutting is common. Perpetrators are usually families who have enough manpower and draft animals to carry out the work. We were told that one donkey-load of fuel wood costs around 500 to 700 AFN. There was, however, a modestly implemented government restriction on forest cutting in Nusai District, which nevertheless has resulted in some recovery of riparian habitats (Figure 19).

Across the entire survey area we heard of serious inter and intra village/district conflicts regarding forest cutting. It appears this is a particularly serious problem in Shukai District. There people fight over the forest, not to conserve it but to monopolize the resource for personal benefits. In Gandamargh Valley we saw people cutting juniper trees (Figure 18c). In western Kof Ab District, including Gandamargh and Leiwgard areas, there were reasonably good forest covers, probably because these areas are difficult to access and far from main human settlements.



Figure 18: Forests in Darwaz are cut for different purposes: (a) building material, (b) fuel-wood, and (c) other timber purposes.





Figure 19: A small patch of the riparian forest in Shoryan valley in Nusai District, Badakhshan Province, Afghanistan.

## Discussion

Darwaz holds some wildlife species of conservation concern, particularly markhor. There are also some important forest areas. The remoteness and access difficulties in Darwaz are believed to be the main reasons these natural resources are in relatively good condition.

The tradition, culture and social interactions of people across Badakhshan are very different, perhaps because in part due to geographical isolation. Darwaz is a good example, where the people and culture is quite unique. In this area the people subsist, depending on cropping, animal husbandry and natural resources for their livelihood. Although everyone is generally aware that government bans hunting, the practice continues. People generally feel that if the government cannot provide them with basic facilities and services, the natural resources are open for exploitation.

Most people we spoke to reported never having people coming to their community because of the wildlife, and the concept of conservation was very poorly understood. This appears largely due to a lack of environmental education. A few people had some grasp of natural resource management; they appeared to have learned about it from communities in neighbouring Tajikistan. During the survey we informed people about the importance of natural resource management.

Although knowledge of conservation is very limited, the people of Darwaz are generally very eager to support any wildlife and natural resource initiatives. As a source of hope for future conservation efforts, one of the hunters who worked with us as a field guide, Mohammad Joma from Leiwgard village, was aware of wildlife conservation efforts across the river in Tajikistan. Based on the benefits he saw across the river, in the past he has often tried to stop poachers from hunting in his area. Since finishing our survey, Mr. Joma has made four international telephone

calls to us, at his own expense, reporting markhor sightings and poaching activities. We hope this sort of enthusiasm will one day be fully harnessed for conservation.

### *Conservation values and protected areas*

In the course of the survey we came across a wide variety of geographic features, human population and wildlife species. Based on evidence collected and reports by people we interviewed, areas such as Leiwgard and Shoryan Valley hold healthy populations of wildlife.

More work is required before the entire target area of northern Badakhshan has been surveyed, so it is too early to draw final conclusions about conservation values and protected areas. However, based on areas covered during this survey, it seems that Leiwgard and Shoryan valley are of most interest.

#### Leiwgard

Leiwgard is the name of a small village containing around 30 households, located in the westernmost side of the Kof Ab district. It is an area with relatively little human activity; the closest villages to Leiwgard are at least two-days walk away as local people said. The area surrounding this village is also referred to as Leiwgard (Figure 20). This area shares borders with Khwahan district in the west, and the Amu Darya River separates it from the M-Sayod Conservancy in Tajikistan (Figure 6) opposite of which we sighted six markhor in this mission. M-Sayod Markhor Conservancy is recently been registered as a conservancy in Tajikistan and has a good population of markhor (S. Michel pers. Comm.). Markhor likely cross the border from/to Afghanistan and Tajikistan regularly; therefore this markhor conservancy in the Tajik side of the border functions as a good backup that could positively affect the markhor population in the Afghan side of the area.

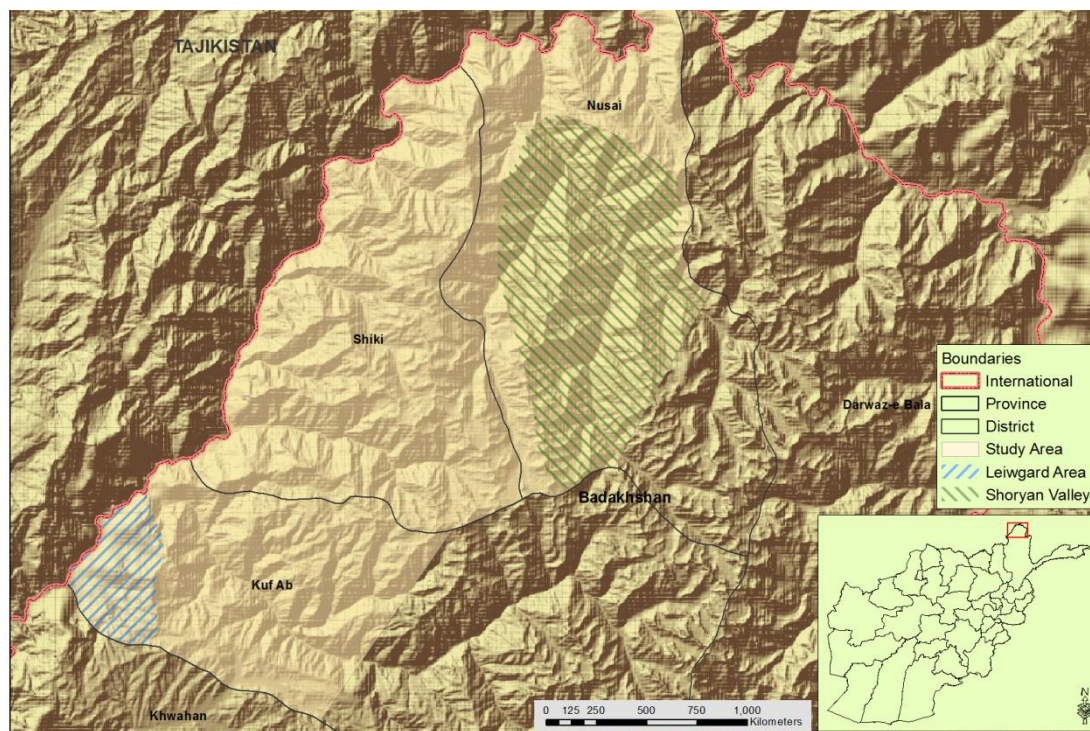


Figure 20: Location of the Leiwgard area and Shoryan Valley in respect to the other parts of the study area.

Leiwgard is an important site for a number of important species. While visiting the area we found evidence of markhor, ibex, brown bear, leopard (probably snow leopard), porcupine, red fox and many bird species. Other species such as wolves, small cat sp., badger sp. wild boar and many bird species were reported to be present by people we interviewed.

Following our survey, between November 15<sup>th</sup> to December 20<sup>th</sup> 2011, Mohamad Juma, who had spent two days with us as a field guide, reportedly sighted 24 markhor in the Leiwgard area. He encountered the animals in different places at different times while he was going about his daily activities. The fact that he was supposedly not actively looking for animals is encouraging in terms of their possible abundance.

Taking the above points in to consideration, and presence of a good population of markhor across the border with formal protection increases the value of this particular landscape in terms of conservation efforts. These two areas, M-Sayod Markhor Conservancy (Figure 6), and Leiwgard (if any protection measures happen) could act as valuable back up for each other. Little conservation efforts, international cooperation and coordination between Afghanistan and Tajikistan will protect the markhor and other wild species share the same habitat in the area. Taking all these facts into consideration, the Leiwgard area deserves further investigation as a potential protected area in Northern Badakhshan.

#### Shoryan Valley

Shoryan valley is located in Nusai district (Figure 20). Brown bears appear to be widely distributed across the district. Shoryan valley seems to be particularly important and a conflict hotspot where bears attack cattle. In response to these attacks the bears are often hunted down and killed. Therefore this area is of the conservation interest. More field-oriented investigation is needed to find out the main problems and threats brown bear faces in this area. Aside from bears and ibex, this area holds a variety of other wild animal species and is generally good from biodiversity point of view. More work is highly recommended in this area.

### *Public Opinion*

As mentioned earlier, people in most parts of Darwaz do not know about natural resource management and wildlife conservation. However, they were generally very attentive after we explained the importance of these things. Responses were generally positive and we were requested to start work in the area.

In some places, such as Qala-e Kof and Leiwgard, some people already knew about conservation due to the Tajikistan initiatives. Mohamad Juma from Leiwgard, for example, was well aware of the conservation activities and benefits happening at M-Sayod Conservancy.

A number of people said that although it is a person's God-given right to hunt wildlife, the animals are still respected as government property and the local people will fully support initiatives aimed at conservation.



## *Security*

Security in the areas we visited was very good. According to the local people, the Afghan government collected guns and weapons from all communities from 2001 on, and has good control over the area. Construction projects belonging to the NSP and others, mostly implemented by AKF, were happening in many places and were said to not be encountering security problems. The road that connects Darwaz to Faizabad, for example, passes through several districts and local people in these areas reported that there were very few security problems (such as robbery). Nonetheless, we were advised not to travel outside of Darwaz after dark.

We recommend any NGO or projects entering Darwaz to carry out full introduction procedures through the provincial authorities down to the district level, including border police checkpoints. Given that Darwaz is located along an international border and sees illegal activities happening such as opium smuggling, outsiders are still viewed with suspicion by the local people and authorities.

## *Access*

Darwaz is one of the most remote and inaccessible areas in Afghanistan. There is a road that connects the centres of the two western-most districts, Khwahan and Kof Ab, to the provincial capital Faizabad, but most of the rural areas do not have roads. The Faizabad road has been constructed in recent years and can be used only during the warmer times of the year such as from May to October. In the colder periods it is usually blocked due to snow.

There is no road connecting to Shukai and Nusai districts.

We saw road construction projects in some of the areas (Figure 21) and local communities were keen to build new roads using their own labour and funds. Construction over difficult areas such as cliffs and waterways will require donor and governmental assistance.



Figure 21: Road construction at Safid Pass in Nusai District.

In 2004 AKF built a bridge across the Amu Darya, connecting Nusai district centre to Qala-e Khumb district of Tajikistan. With the help of this bridge, Afghan and Tajik governments together with AKF have set up a shared market locally called “*Bazar-e Mushtarak*”. The shared market is opened once a week on Saturdays and is located on the Tajik side of the river. Although according to our observation, Afghans are not allowed to sell their goods in this bazaar, it has provided an opportunity for the Afghans to get access to the goods from Tajikistan, which is very helpful. This bridge also helps connect Kunduz Province to Darwaz via the Tajikistan Transit Highway. Afghan trucks from Kunduz go through the Shirkhan transit point in Tajikistan border, to Nusai district in Darwaz via the AKF built bridge over the Amu Darya.

In the very recent years PACTEC has built an airstrip in the east of Nusai district adjacent to the Amu Darya (Steven Gardner pers. comm.), providing another means to access Darwaz.

Most government officers, students, high-ranking people and NGO workers enter and leave upper Darwaz via Tajikistan. This is the safest and most time-efficient way to travel to Darwaz. The Tajik route is the only option for people travelling to Darwaz when the Faizabad road is closed during the colder months.

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## Appendices

### Appendix 1: GPS location of places visited in this survey

No.	Place name	UTM-N	UTM-E	Village	Field Site
1	Abgard	629422	4206978	√	
2	Almoni	622298	4210323		√
3	Almoni	622672	9470		√
4	Aruan	660795	4241281	√	
5	Arzishik	634359	4229568	√	
6	Bahshar	667200	4238310	√	
7	Bughaz	666563	4229439		√
8	Center of Nusai Dist.	657384	4256666	√	
9	Cherakh pass	654558	4251225		√
10	Dehkhaw	645296	4245991	√	
11	Dehn Aab	624597	4215019		√
12	Dehwori	629212	4206472	√	
13	Dowab	665601	4241611	√	
14	Dowuk	651024	4253349	√	
15	Fi	634023	4208565	√	
16	Gandamargh	622170	4209704		√
17	Gandumargh	622035	4210676		√



18	Ghumai	640589	4238993	√
19	Jarf (center of Shukai)	635445	4233901	√
20	Jugani	670996	4257178	√
21	Kai	664957	4227062	√
22	Khaghaz	661161	4253918	√
23	Khirsh	628209	422907	√
24	Khuand	647970	4248088	√
25	Khurkat	668375	4237468	√
26	Labgard	618229	4207647	√
27	Larum	628722	4218111	√
28	Magai	667618	4235228	√
29	Mahnaw	647864	4251499	√
30	Narghaw	647606	4253230	√
31	Nowabad-e-Aesh	633310	4197739	√
32	Nowazum	647739	4244663	√
33	Nusai District center	657399	4256592	√
34	Parkhikh	662799	4244489	√
35	Paryard	665768	4256073	√
36	Pasi Band Karnew	638028	4197616	√
37	Pasi Fi	633690	4206806	√
38	Qala-e-Koof	629742	4210897	√
39	Qala-e-Koof	629744	4210887	√
40	Rawan	662404	4244489	√
41	Rawanak	632196	4225687	√
42	Reptile	620032	4211207	√
43	Safed Koh	636990	4197979	√
44	Safed pass	653154	4254519	√
45	Shahri Sabz	632211	4221122	√
46	Shalmak	665429	4227040	√
47	Shipun	631735	4214568	√
48	Wajm-e-Bala	662943	4246143	√
49	Wajm-e-Payen	661926	4248229	√
50	Wargh	627784	4205390	√
51	Washnishar	668411	4255239	√
52	Wobaghun	630702	4219690	√
53	Wodab	667753	4235917	√
54	Zin	663731	4244740	√
55	Zingeria-e-Bala	640797	4242001	√
56	Zingeria-e-Payen	640797	4242001	√
57	Zughar	660785	4250527	√
Total:		47	9	

*Appendix 2:* Topics covered and questions asked during the interviews

- Wildlife presence/absence in the area.
- Status of the wildlife species in the area, past and present?
- (Showing photographs) Have you seen these animals in your area?
- Any species those were present in the past but now gone.
- Any species recently found in the area that were not present in the past.
- Do you face any threat from wildlife? If yes, which species?
- What do you think are the major threats to wildlife in your area?
- How would you conserve wildlife in your area?
- Is there any disease your livestock suffer from?
- What do you use as fuel wood for heating and cooking?

*Appendix 3:* List of mammals observed/reported during the survey

No	English name	Scientific name	Reported/ Observed
1	Markhor	<i>Capra falconeri</i>	O
2	Siberian Ibex	<i>Capra sibirica</i>	R
3	Urial	<i>Ovis orientalis</i>	R
4	Wild Boar	<i>Sus scrofa</i>	R
5	Brown Bear	<i>Ursus arctos</i>	R
6	Wolf	<i>Canis lupus</i>	R
7	Red Fox	<i>Vulpes vulpes</i>	O
8	Snow Leopard	<i>Panthera uncia</i>	R
9	Persian Leopard	<i>Panthera pardus</i>	R
10	Caspian Tiger	<i>Panthera tigris</i>	R
11	Wildcat	<i>Felis silvestris</i>	R
12	Jungle Cat	<i>Felis chaus</i>	R
13	Eurasian Lynx	<i>Lynx lynx</i>	R
14	Common Otter	<i>Lutra lutra</i>	R
15	Bats	Unknown <i>sp.</i>	O
16	Stone Marten	<i>Martes foina</i>	R
17	Eurasian Badger	<i>Meles meles</i>	R
18	Crested Porcupine	<i>Hystrix indica</i>	R
19	Long-tailed Marmot	<i>Marmota caudate</i>	R
20	Cape Hare	<i>Lepus capensis</i>	O

**Appendix 4:** List of birds observed during the survey

No.	Common name	Scientific name	Date	District	No. of individuals observed
1	Streaked Laughingthrush	<i>Trochaloxyron lineatum</i>	8-Sep-11	Kof Ab	11
2	Booted Eagle	<i>Hieraaetus pennatus</i>	10-Sep-11	Kof Ab	1
3	White-winged Snowfinch	<i>Montifringilla nivalis</i>	12-Sep-11	Kof Ab	7
4	Chukar Partridge	<i>Alectoris chukar</i>	19-Sep-11	Kof Ab	53
5	Eurasian Jackdaw	<i>Coloeus monedula</i>	19-Sep-11	Kof Ab	1
6	Carrion Crow	<i>Corvus corone</i>	19-Sep-11	Kof Ab	23
7	Long-legged Buzzard	<i>Buteo rufinus</i>	19-Sep-11	Raghistan	3
8	Bearded Vulture	<i>Gypaetus barbatus</i>	19-Sep-11	Raghistan	3
9	Horned Lark	<i>Eremophila alpestris</i>	19-Sep-11	Raghistan	24
10	Bimaculated Lark	<i>Melanocorypha bimaculata</i>	19-Sep-11	Raghistan	2
11	Golden Eagle	<i>Aquila chrysaetos</i>	20-Sep-11	Kof Ab	5
12	Griffon Vulture	<i>Gyps fulvus</i>	20-Sep-11	Kof Ab	13
13	Egyptian Vulture	<i>Neophron percnopterus</i>	20-Sep-11	Kof Ab	6
14	Common Kestrel	<i>Falco tinnunculus</i>	20-Sep-11	Kof Ab	7
15	Laughing Dove	<i>Streptopelia senegalensis</i>	20-Sep-11	Kof Ab	12
16	Common Swift	<i>Apus apus</i>	20-Sep-11	Kof Ab	30
17	Common Hoopoe	<i>Upopa epops epops</i>	20-Sep-11	Kof Ab	13
18	Crested Lark	<i>Galerida cristata</i>	20-Sep-11	Kof Ab	7
19	Hume's Sort-toed Lark	<i>Calandrella acutirostris</i>	20-Sep-11	Kof Ab	9
20	Eurasian Crag-martin	<i>Ptyonoprogne rupestris</i>	20-Sep-11	Kof Ab	20
21	Northern House-martin	<i>Delichon urbicum</i>	20-Sep-11	Kof Ab	25
22	White Wagtail	<i>Motacilla alba</i>	20-Sep-11	Kof Ab	23
23	Water Pipit	<i>Anthus spinoletta</i>	20-Sep-11	Kof Ab	2
24	Rufous-backed Long-tailed Shrike	<i>Lanius schach erythronotus</i>	20-Sep-11	Kof Ab	6
25	Desert Wheatear	<i>Oenanthe deserti deserti</i>	20-Sep-11	Kof Ab	3



26	Eastern Rock Nuthatch	<i>Sitta tephronota</i>	20-Sep-11	Kof Ab	11
27	Mongolian Finch	<i>Bucanetes mongolicus</i>	20-Sep-11	Kof Ab	45
28	House Sparrow	<i>Passer domesticus</i>	20-Sep-11	Kof Ab	30
29	Eurasian Tree Sparrow	<i>Passer montanus</i>	20-Sep-11	Kof Ab	100
30	Common Raven	<i>Corvus corax tibetanus</i>	20-Sep-11	Kof Ab	3
31	Eurasian Magpie	<i>Pica pica</i>	20-Sep-11	Kof Ab	20
32	Lesser Sand Plover	<i>Charadrius mongolus</i>	21-Sep-11	Kof Ab	3
33	Red-billed Chough	<i>Pyrrhocorax pyrrhocorax</i>	21-Sep-11	Kof Ab	100
34	Alpine Chough	<i>Pyrrhocorax graculus</i>	21-Sep-11	Kof Ab	20
35	Rock Pigeon	<i>Columba livia</i>	21-Sep-11	Shukai	100
36	Hill Pigeon	<i>Columba rupestris</i>	21-Sep-11	Shukai	100
37	Eurasian Skylark	<i>Alauda arvensis</i>	21-Sep-11	Shukai	10
38	Desert Lark	<i>Ammomanes deserti</i>	21-Sep-11	Shukai	3
39	Grey Wagtail	<i>Motacilla cinerea</i>	21-Sep-11	Shukai	2
40	Blue Rock-thrush	<i>Monticola solitarius</i>	21-Sep-11	Shukai	5
41	Black Redstart	<i>Phoenicurus ochruros</i>	21-Sep-11	Shukai	19
42	Common Stonechat	<i>Saxicola torquatus</i>	21-Sep-11	Shukai	7
43	Hume's Leaf-warbler	<i>Phylloscopus humei</i>	21-Sep-11	Shukai	14
44	Rock Bunting	<i>Emberiza cia par</i>	21-Sep-11	Shukai	32
45	Crimson-winged Finch	<i>Rhodopechys sanguineus</i>	21-Sep-11	Shukai	10
46	White-throated Dipper	<i>Cinclus cinclus</i>	22-Sep-11	Shukai	2
47	Blue Whistling-thrush	<i>Myophonus caeruleus</i>	22-Sep-11	Shukai	2
48	Isabelline Wheatear	<i>Oenanthe isabellina</i>	22-Sep-11	Shukai	7
49	Variable Wheatear	<i>Oenanthe picata</i>	22-Sep-11	Shukai	2
50	Pied Wheatear	<i>Oenanthe pleschanka</i>	22-Sep-11	Shukai	3
51	Wallcreeper	<i>Tichodroma muraria</i>	22-Sep-11	Shukai	1
52	Common Starling	<i>Sturnus vulgaris</i>	22-Sep-11	Shukai	2
53	Barn Swallow	<i>Hirundo rustica</i>	25-Sep-11	Nusai	50

54	Red-rumped Swallow	<i>Hirundo daurica</i>	25-Sep-11	Nusai	5
55	Common Myna	<i>Acridotheres tristis</i>	25-Sep-11	Nusai	50
56	Cinereous Vulture	<i>Aegypius monachus</i>	26-Sep-11	Nusai	1
57	Rufous Shrike	<i>Lanius phoenicuroides</i>	26-Sep-11	Nusai	2
58	Brown Dipper	<i>Cinclus pallasii</i>	26-Sep-11	Nusai	11
59	White-capped Redstart	<i>Chaimarrornis leucocephalus</i>	26-Sep-11	Nusai	17
60	Spotted Great Rosefinch	<i>Carpodacus severtzovi</i>	26-Sep-11	Nusai	5
61	White-winged Grosbeak	<i>Mycerobas carripes</i>	26-Sep-11	Nusai	3
62	Rock Sparrow	<i>Petronia petronia</i>	26-Sep-11	Nusai	32
63	Eurasian Hobby	<i>Falco subbuteo</i>	27-Sep-11	Nusai	1
64	Citrine Wagtail	<i>Motacilla citreola</i>	27-Sep-11	Nusai	7
65	Bluethroat	<i>Luscinia svecica</i>	27-Sep-11	Nusai	3
66	Sulphur-bellied Warbler	<i>Phylloscopus griseolus</i>	27-Sep-11	Nusai	3
67	Greenish Warbler	<i>Phylloscopus trochiloides viridanus</i>	27-Sep-11	Nusai	9
68	Brown Accentor	<i>Prunella fulvescens</i>	27-Sep-11	Nusai	13
69	Twite	<i>Acanthis flavirostris</i>	27-Sep-11	Nusai	17
70	Black Kite	<i>Milvus migrans migrans</i>	28-Sep-11	Nusai	1
71	Little Ringed Plover	<i>Charadrius dubius curonicus</i>	28-Sep-11	Nusai	4
72	Common Sandpiper	<i>Actitis hypoleucos</i>	28-Sep-11	Nusai	2
73	Plain Mountain-finch	<i>Leucosticte nemoricola</i>	28-Sep-11	Nusai	23
74	Oriental Turtle-dove	<i>Streptopelia orientalis meena</i>	29-Sep-11	Nusai	1
75	Spotted Flycatcher	<i>Muscicapa striata</i>	29-Sep-11	Nusai	1
76	White-capped Bunting	<i>Emberiza stewarti</i>	29-Sep-11	Nusai	3
77	Lesser Grey Shrike	<i>Lanius minor</i>	30-Sep-11	Nusai	1
78	Rufous-tailed Rock-thrush	<i>Monticola saxatilis</i>	30-Sep-11	Nusai	3
79	Grey-necked Bunting	<i>Emberiza buehanani</i>	30-Sep-11	Nusai	17
80	Eurasian Sparrowhawk	<i>Accipiter nisus</i>	1-Oct-11	Nusai	2
81	Alpine Swift	<i>Tachymarptis melba</i>	3-Oct-11	Nusai	5

82	Common Quail	<i>Coturnix coturnix</i>	3-Oct-11	Shukai	1
83	Little Forktail	<i>Enicurus scouleri</i>	3-Oct-11	Shukai	1
84	Common Snipe	<i>Gallinago gallinago</i>	4-Oct-11	Shukai	1
85	Red-tailed Wheatear	<i>Oenanthe chrysopygia</i>	4-Oct-11	Shukai	7
86	Black-throated Accentor	<i>Prunella atrogularis</i>	4-Oct-11	Shukai	8
87	Common Cuckoo	<i>Cuculus canorus</i>	5-Oct-11	Shukai	1
88	Common Redshank	<i>Tringa totanus</i>	8-Oct-11	Kof Ab	1
89	Winter Wren	<i>Troglodytes troglodytes</i>	8-Oct-11	Kof Ab	1
90	Common Teal	<i>Anas crecca</i>	9-Oct-11	Kof Ab	5
91	Mallard	<i>Anas platyhynchos</i>	9-Oct-11	Kof Ab	4
92	Turkestan Tit	<i>Parus bokharensis</i>	9-Oct-11	Kof Ab	7
93	Yellow-breasted Tit	<i>Parus flavipectus</i>	9-Oct-11	Kof Ab	4
94	Spanish Sparrow	<i>Passer hispaniolensis</i>	9-Oct-11	Kof Ab	7
95	Common Whitethroat	<i>Sylvia communis</i>	10-Oct-11	Kof Ab	8
96	Hume's Whitethroat	<i>Sylvia althaea</i>	10-Oct-11	Kof Ab	2
97	White-winged Pied Woodpecker	<i>Dendrocopos leucopterus</i>	11-Oct-11	Kof Ab	2
98	Tawny Pipit	<i>Anthus campestris</i>	11-Oct-11	Kof Ab	3
99	Siberian Chiffchaff	<i>Phylloscopus collybita tristis</i>	11-Oct-11	Kof Ab	20
100	Fire-fronted Serin	<i>Serinus pusillus</i>	11-Oct-11	Kof Ab	34
101	Black-throated Thrush	<i>Turdus ruficollis atrogularis</i>	12-Oct-11	Kof Ab	2
102	Falcon?	<i>Falco sp.</i>	13-Oct-11	Kof Ab	1
103	European Roller	<i>Coracias garrulus</i>	13-Oct-11	Kof Ab	1
104	Eurasian Goldfinch	<i>Carduelis carduelis</i>	13-Oct-11	Kof Ab	5
105	Common Chaffinch	<i>Fringilla coelebs</i>	13-Oct-11	Kof Ab	13
106	Himalayan Snowcock	<i>Tetraogallus himalayensis</i>	14-Oct-11	Kof Ab	2
107	Himalayan Vulture	<i>Gyps himalayensis</i>	19-Oct-11	Kof Ab	1



### *Appendix 5: Daily activities summary*

Day 1, 17-Sep-2011:

The survey team flew from Kabul to Faizabad, and in the afternoon they went to Provincial Governor Office and submitted a letter from MAIL, Kabul, and asked for an introduction letter for the three districts of Darwaz (Shukai, Nusai and Kof Ab). The survey team met Eng. Alim head of MAIL Dep. Faizabad to submit the letter that had brought from Kabul and explained the objectives of Darwaz mission for him, also we changed the money from \$ USD to AFN.

Day 2, 18-Sep-2011:

We got the letters from MAIL Dep. Faizabad to Darwaz Districts; MAIL Faizabad introduced us to Mr. Nasratullah who will accompany us for the entire survey. We went to NEPA Department, Faizabad to meet them. Head of NEPA was not there, we explained our mission to the administration manager Mr. Jafar Khan. We did shopping and packed the equipment for Darwaz mission and rented a vehicle.

Day 3, 19-Sep-2011:

The team drove from Faizabad towards Darwaz and spent the night in Naw Abad village in Dasht-e-Aesh in Kof Ab District.

Day 4, 20-Sep-2011:

Drove from Dasht-e Aesh to centre of Kof Ab district and met Mr. Nadir Shah Kofi, the district governor of Kof Ab and, introduced ourselves and explained our objectives to him, submitted the letters from governor's office and MAIL to him. We rented a room there as base camp in Kof Ab district.

Day 5, 21-Sep-2011:

Drove from Kof Ab district to Dahn-e Ab with our vehicle and rented donkeys from Larum village to Jarf, centre of Shukai District. There we met the Acting District governor of Shukai, Mr. Mohammad Yaqub Rasuli and submitted the MAIL and governor's letters to him.

Day 6, 22-Sep-2011:

We moved from centre of Shukai District to Zingiria village and spent the night in Deh Khah village.

Day 7, 23-Sep-2011:

We moved from Deh Khah village to Mahnaw village. People of this village said the way was closed to Nusai District, and afternoon we moved to other way from this village and spent one night on the mountain.

Day8, 24-Sep-2011:

We arrived in Nusai District in the morning and met the district governor, Mr. Nayab Azimi and Mr. Abdul Samad Gardush, head of MAIL in Nusai District and submitted the letters of governor's office and MAIL Department of Faizabad to them. Then we rented one room there for the survey period in Nusai district.

Day 9, 25-Sep-2011:

The team again met with the district governor, Mr. Nayab Azimi and Abdul Samad Gardush, head of MAIL in Nusai District and introduced their team members to them and explained their objectives. The district governor introduced Mr. Amanudin, the district forest officer to participate in the entire survey in Nusai. The team then moved from central Nusai District to Shoryan valley with one car and spent the night in the Wajm-e Payan and introduced their team and explained the objectives, interviewed the people and educated them about conservation.

Day 10, 26-Sep-2011:

Moved to Wujm-e-Bala in the early morning, interviewed the people than moved to Zin, Dowab and Wud Ab villages, interviewed the people and spent the night in the Wud Ab village.

Day 11, 27-Sep-2011:

Interviewed the people in three villages Wud Ab, Mahgai and Badamak, visited the Bughaz forest and observed some new birds in this area.

Day 12, 28-Sep-2011:

Spent night in the Shalmak, the eastern part of Kai village. In the early morning we explained our duty and did interviews. This village was our last target in Chap Dara and we returned back to Rast Dara. We observed a lot of birds in these areas when we walked from Kai village to Khurkad village on the return.

Day 12, 28-Sep-2011:

Interviewed the people in Khurkad village, people complained about Brown Bear and Porcupine in this village.

Day 13, 29-Sep-2011:

Moved from Khurkat to Jaway valley and interviewed the people in Parkhikh and Arun villages, spent the night in Arun village.

Day 14, 30-Sep-2011:

Interviewed the people in different places in Arun village and returned from this valley and interviewed in the Zeghar and Khaghaz villages and came back to base camp in the centre of Nusai District.

Day 15, 31-Sep-2011:

Got interviews in centre of Nusai District and then went to Bazari Mushtarak to purchase needed supplies.

Day 16, 1-Oct-2011:

Interviewed the people in the Paryard, Washnishar, Jawmarj and Jugani villages.

Day 17, 2-Oct-2011:

Met with administrative manager of Nusai District and got the information regarding the population, schools and livestock in this District.

Day 18, 3-Oct-2011:

Moved from Nusai District to Shukai District and interviewed the people in Duak, Narghaw and Khwand villages. We spent the night in Khwand village.

Day 19, 4-Oct-2011:

Early in the morning we moved from Khwand to Deh Khah and Nuwazem villages and interviewed the people in these villages. In the afternoon we moved from Deh Khah to Ghumai village.

Day 20, 5-Oct-2011:

Interviewed the people in Ghumai village and then moved to Jarf Village, centre of Shukai District. There we interviewed people about their wildlife. In the afternoon we met the acting governor and other officials of Shukai District and explained them about our duty and objectives but they paid no attention to us. The Intelligence Manager of Shukai District told us about the official letter that they have received from NEPA department from Faizabad, saying “there are group(s) of people from some NGO, trying to illegally collect biological samples and smuggle them to abroad”. The authorities of Shukai district were suspected on the survey team, therefore the team decided to leave Shukai district as soon as possible.

Day 21, 6-Oct-2011:

Again met the Authorities of Shukai District got some information from Shukai District and in the afternoon moved from Shukai to Kof Ab district by motorcycles the only means of transportation.

Day 22, 7-Oct-2011:

Met with the Acting District governor of Kof Ab, Mr. Khairullah Mirzayee, who introduced Mr. Said Murtaza to participate in the survey in Kof Ab district.

Day 23, 8-Oct-2011:

Moved to Leiwgard the westernmost villages belong to Kof Ab district. There we interviewed the people. We observed a lot of bird species in the areas on the way back and forth.

Day 24, 9-Oct-2011:

Early in the morning, we interviewed the people of Leiwgard, explained the benefit of wildlife then they brought horns of markhor and a skin of brown bear (Figures 8&9). The local people arranged a breakfast party where almost all the villagers were present there. They advised us to go to Gandamargh area in order to see some wild species such as markhor, brown bear, etc. After breakfast we got field guides from the village and went for a field visit in this area and moved to Gandamargh valley. We decided to spend a night in Gandamargh valley so that we could scan the area early in the morning. After we got to the field the weather suddenly changed and it started raining. In the evening our field guides observed two markhor.

Day 25, 10-Oct-2011:

Early in the morning we sighted four markhor in the Gandamargh valley and we also saw brown bear evidence, leopard scats, horns of ibex, and wolf scat. We observed many bird species as well. In the afternoon one of the team members (Zalmai Moheb)

fell from a rock and injured his left leg, so the team had to leave the field visited half way and they carried Zalmai to the base camp in the centre of Kof Ab district.

Day 26, 11-Oct-2011:

The other team members moved to Shipun village for interviews. The people complained about wild boar damage in their areas.

Day 27, 12-Oct-2011:

The team interviewed people in Khirsh village. People complained about their neighbouring village that they cut wood from their areas and they come and hunt wildlife in their areas.

Day 28, 13-Oct-2011:

The injured team member went to Faizabad. The other team members went to Wargh, Deh Wari and Aabgard villages and did interviews. In the evening they returned to the camp. These villages are located in the south and southwestern parts of Kof Ab where Kochi nomads bring their livestock there from the other provinces. Local people used to complain about those Kochies.

Day 29, 14-Oct-2011:

The team members did interviews in Pasi Fi, Fi, Delwakh and Khufak villages. One person in Fi village said that he had hunted a lynx ten years ago. In the evening the team returned back to the camp.

Day 30, 15-Oct-2011:

The team interviewed people in Qala-e-Kof village and met the Acting District governor. Got the available information about schools, animal clinics, population and situation of forests in Kof Ab district.

Day 31, 16-Oct-2011:

The survey team moved from the centre of Kof Ab district to Dasht-e Aesh and interviewed people in Pasi Band Karniw, Safed Koh and Naw Abad-e Aesh. For the night they stayed in Naw Abad-e Aesh village.

Day 32, 17-Oct-2011:

The weather was getting worst day by day and our survey schedule for Kof Ab district was almost completed, so the team left the area and returned to Faizabad.

Day 33, 18-Oct-2011:

Survey team went to Agriculture Department in Faizabad and visited Eng. Alim Alimi, head of the Department. Also explained the activities done in Darwaz districts. That afternoon the team flew to Kabul.