Wildlife Conservation and Participatory Monitoring

for

Pamir High Mountains Integrated Project

Summary Report on a Mission to Murghab District
July 15 – July 28, 2003

Submitted to:
ACTED, Murghab

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INTRODUCTION

The *Pamiri High Mountains Integrated Project* (PHIP) has been under implementation in the remote District of Murghab since 1999, under the leadership and guidance of ACTED, an international NGO based in Paris. The project area is large (38,000 square kilometres), remotely situated, mountainous, and located within the highly arid and climatically rigorous Pamir zone. The rugged mountainous terrain effectively ensures its isolation from the rest of Tajikistan, a factor that is further amplified by the very sparse human population (totalling about 16,000 persons or a density of one person per 2.5 square kilometres). These people, mostly ethnic Kyrgyz, are inexorably constrained by poor or very poor economic opportunities resulting in high levels of poverty (approximately 80% of the population lives at or below the poverty line, and earn less that $200 per annum). Prior to independence, the Gorno Badakhshan Autonomous Region (GBAO) was heavily supported with infrastructural and economic subsidies by the ruling Soviet government due to its classification as a "disadvantaged area."

PHIP seeks to improve economic conditions and alleviate poverty through credit and micro-enterprises, including community-based ecotourism, among other interventions. The Agha Khan Development Network's Mountain Societies Development Support Program (MSDSP) also addresses these issues, but with more emphasis upon health.

In 2002, UNESCO provided seed funding to ACTED for initiating a community-based ecotourism project aimed at protecting the unique cultural and biological heritage of the High Pamir, by introducing new opportunities linked with the underlying animal husbandry livelihood support structure. Employing a community-based approach, the PHIP eco-tourism component has the following objectives and indicators:

Objective 1:	To devise and implement a scheme for community-based nature conservancy.
Indicators:	• A participatory plan till 2005 with focus on tourism attractions, especially wildlife. • A local team of community members identified trained and carried out the plan.
Objective 2:	To devise and implement a scheme for community-based preservation and enhancement of cultural and historical heritages.
Indicators:	• A participatory plan till 2005 with focus on 3 major sites and 2 secondary sites nearby. • A local team of community members identified trained and carried out the plan.
Objective 3:	To design and promote a socially and environmentally responsible community-based tourism product.
Indicators:	• A variety of itineraries using local traditional accommodation (e.g. yurts, homestays, and local cuisine, etc.) with energy saving devices. • Codes of Conduct for hosts and visitors. • Level of local income generated from ecotourism activities. • Number of satisfied visitors and/or contracts with Tour Operators.
Objective 4:	To assess and build-up the required local capacity of human resources both at government and community levels with focus on installing self-mobilisation processes.
Indicators:	• Minutes of workshop leading to Strategy Document. • Strategy Document. • "Formalised" and operational cooperative set-up.

An ecotourism expert, Mr. Guy Delaunay, has been contracted to conduct an inventory of existing and potential resources, identify potential ecotourism products and commercial links

with regional and international tour operators, and to recommend a strategy for the phased implement of rural tourism in the District.

Along with its distinctive *Pamir* or rolling mountain terrain, the presence of unique wildlife like the world renown Marco Polo sheep (*Ovis ammon polii*) and the endangered snow leopard (*Uncia uncia*), the Pamirs is endowed with a wealth of archeological sites (ancient mines, petroglyphs and Zoroastrian sites), hot springs, and a distinctive culture. These represent attractions upon which a small-scale community-based ecotourism could be developed to the benefit of local residents and the regional Tajik economy. These same resources, however, are extremely fragile and highly vulnerable to destruction, so that development must proceed in tandem with conservation in a rational and carefully planned manner.

OBJECTIVES OF MISSION

From the onset of the PHIP program, ACTED and its donors have noted the importance of protecting the Pamir's unique wildlife, along with promoting community-based stewardship of the natural resources, as the basis for sustainable livestock production and income-generation in this remote and arid mountain ecosystem.

Accordingly, ACTED invited the participation of the Snow Leopard Conservancy and wildlife expert Dr. Rodney Jackson to explore such options in more detail, and lay the framework for continued skills development and capacity building of project staff and local community partners.

The primary objectives and proposed outputs of the three-week mission were to:

1) Conduct a reconnaissance / familiarization field trip to one or more project sites in order to establish current wildlife conditions, identify underlying threats to rare species and their habitat, and explore wildlife-related opportunities and constraints which may affect the development of community based tourism initiatives.

Anticipated Outputs:

- Mapping of key wildlife species (distribution and status) initiated
- Wildlife concentration areas and critical habitats and/or sites identified
- Primary internal and external factors threatening the future of wildlife and their habitat identified and if possible ranked in terms of importance

2) Assist PHIP staff and local community (herders, village leaders, State wildlife agency or hunting organizations posted in the project area) to develop a simple participatory monitoring plan for snow leopard and selected prey species (especially Marco Polo sheep).

Anticipated Outputs:

- Feasibility of utilizing standardized survey methods such as SLIMS (Snow Leopard Information Management System) for tracking snow leopard and prey numbers in the project area determined
- List of prospective wildlife monitors and stewards initiated
- Initial training of ACTED staff and local members in survey methods completed

3) Prepare a simple handbook and train selected staff as well as community participants in monitoring / survey methods.

Anticipated Outputs:

- Simple handbook of survey methods compiled, based on local needs and training completed within this limited time frame.
- Recommendations for future training and capacity building

4) Explore opportunities for continued collaboration between SLC, PHIP and relevant local organizations aimed at promoting community-based wildlife stewardship with economic benefit.

Anticipated Outputs:

- Opportunity / Needs Assessment with recommendations for next steps completed
- Integration of findings into Ecotourism Strategy Plan being developed by Expert Guy Delaunay.

THE PROJECT AREA

The Gorno Badakhshan Autonomous Region (GBAO) covers 44.5% of Tajikistan's land area. For background on the area's physiography, geology, fauna and flora, the reader is referred to draft Pamir Strategy Project Report, titled, "Summary results of the Pamir Strategy Project" prepare for the 21-24 October 2002 Workshop held in Khorog, Tajikistan, and prepared by the Centre for Development and Environment, University of Bern (funded by the SDC - Swiss Agency of Development and Cooperation), as well as classic Russian and European academic literature.

Work under this consultancy was limited to the central portion of the eastern Pamirs. The Pamirs are located in eastern Tajikistan and comprised of two distinctive zones based on geological, physiographic and floristic or biogeographic features:

The Pamir ranges in elevation from some 3,000 to nearly 7,500 m, and is characterized by well-eroded and rolling terrain, with numerous mostly small glaciers, and narrow valleys. The annual precipitation ranges between 50-300 mm. Along with a high evaporation rate, vegetation is very sparse and adapted to the xeric climate in which average summer and winter temperatures range from 23º C to -18º C. Summers are dry, with most precipitation occurring in winter (snow) or spring (rain). Precipitation in the Pamirs diminishes from north to south and west to east. The western Pamirs merge imperceptibly into the eastern Pamir range, around the 73 degree longitude line, as conditions become ever more arid (see Table 1, E. Kleinn, Nabu 2002 Report).

The following vegetation types have been recognized (see Kleinn for details):

(1) Juniper (*Juniperus*) scrub (3 species) occurring in isolated stands below 3,500 m and concentrated around Sarez Lake;

(2) "Tugai" riverine forests along mountain valleys comprised of willow (*Salix*), birch (*Betula*), poplar (*Populus*) and seabuckthorn (*Hippophae*), best developed in the western Pamir;

(3) Valley and hillslope meadows comprised of grasses at lower elevations (3,700-3,900 or 4,200m), *Carex* at elevations of 4,000 – 4,300 m, and *Kobresia* communities in the wettest sites at elevations of 3,000 – 5,000 m.

(4) Screes and other rocky sites are dominated by several shrub species including *Prangos pobularia* and *Ferula grigorievii*, along with *Ephredra*, *Ribes*, and some *Cicer*.

(5) Desert vegetation at lower elevations is characterized by a number of sage (*Artemisia*) species, and the important fuelwood shrub known as *Teresken* (*Ceratoides papposa*), mostly below elevations of 4,200 m.

(6) Higher mountain slopes support more xerophytic vegetation comprised of hardy pincushion plants like as *Acantholimon* and spiny legumes like *Astragulus* species.

(7) Herb communities are found in areas with more moisture and better soils. Typical genera include *Oxytropis*, *Primula*, *Sibbaldia*, *Potentilla*, *Leontopodium*, *Draba* and *Ajanjia*.

(8) Sandy and loamy soil sites support a variety of grasses in which *Stipa* species predominate along with *Festuca* and *Poa* species, interspersed with a few herbs such as *Nepeta* and *Zizphora*.

The Tajikistan Red Data book lists 60 plant and 58 animal species as occurring in the Pamir, with the Darvaz range supporting the highest degree of endemism (32 species). The NW Pamir also supports many rare or endemic plants (43 species) and animals (29 species). Important animal species include the snow leopard, Asiatic lynx (*Lynx lynx isabellina*), brown bear (*Ursus ursus*), Marco Polo sheep, Menzbier's marmot (*Marmota menzbeirii*), several species of weasel (*Mustela*), and nearly 20 bird species (including many birds of prey). For more information on floral types and biodiversity patterns in the different districts of the Pamir, see Kleinn as well as the classical Russian literature.

ACTIVITIES UNDERTAKEN DURING THE MISSION

The consultant arrived at Murghab in the late evening of July 15. A briefing meeting was held with ACTED PHIP Coordinator Mr., Eric Engel and Ecotourism Coordinator Mr. Obaidullah Mamadiev on July 16th in order to review the Mission's intended objectives and schedule. In the afternoon Jackson and Obadullah Mamadiev conducted an initial mapping exercise, as described below.

Initial Mapping Exercise: Members of the Ecotourism Association were asked to identify and map wildlife distribution patterns and concentration areas, identify and discuss underlying threats to rare and endangered species like Marco Polo sheep and snow leopard, and to lay the framework of the initial field visit.

Following introductions and a review of the purpose of the exercise, participants were asked to outline the important Marco Polo distribution areas on a 1:200,000 Russian Topographic Survey map covering most of the eastern Pamir region.

Table 1 lists the participants and their geographic area of expertise.

Person's name	Profession	Geographic Area of Familiarity & Knowledge
Taimankulov Marman	Self-employed driver / guide	Kara-kul & Madian
Ahmedsharipov Tariel	Hunting Area Leaseholder	Bash Kumbuz
Turdukulov Janazak	Self-employed guide	Chesh-Tobo
Kalandarhonova Aiymgul	ACTED Ecotourism Field Officer	Murghab
Mamadiev Ubanjdullah	ACTED Ecotourism Program Coordinator	Ran-Kul

Note: these individuals are members of a Tourism Association created by ACTED in 2002

Marco Polo Sheep Distribution: Five main areas of sheep concentrations in GBAO were delineated by the participants. The border area with China was not considered because of its exclusion within a border fence and limited knowledge of the area by these participants. Areas delineated at this meeting were:

1) Kara-Kul (located to the west of Karakul Lake)
2) Ak-Baital and Boz-Teri (located southwest of Karakul Lake)
3) Alichor Boz-Teri
4) Uch-Kol (located along central portion of Wakhan Corridor)
5) Tchesh-Tobo (located along eastern part of Wakhan Corridor and the Chinese border)

Participants used the pair-wise matrix method to rank the areas in terms of overall sheep numbers and habitat suitability (Table 2). This suggested that those sites (Ulch-Kol and Tchesh-Tobo, sites # 4 & 5) bordering the Wakhan Corridor supported the best populations of Marco Polo sheep, followed by the Kara-Kul area (site # 1). This ranking reflects the knowledge of the participants and should not be taken as final. Thus, a just-completed survey of the Kara-kul area indicated there are very few sheep here compared to the mountain massifs along the border with China and Afghanistan (George B. Schaller, pers.comm.). It is also clear that the best Marco Polo habitats are those areas are located along the Wakhan Corridor and associated Afghanistan border. The central Pamir is the other important area, and toward this end surveys are urgently needed to establish the status of sheep and other wildlife populations within the Tajik (Pamir) National Park.

It was not possible to delineate precise areal polygons in which Marco Polo sheep are known, suspected or likely to occur: the areas delineated by the groups are only very approximate, and based on local knowledge and perhaps presumed habitat availability. Thus, boundary lines were drawn at higher elevations (above 4,500 m) and in close proximity to glaciers, since these features encompass areas considered to provide suitable summer-time habitat for this high mountain sheep (see Box 1). In late December, with the arrival of snow and following the rut, Marco Polo sheep descend to lower elevations in the valleys and fringing slopes where snow fall is limited or absent, and suitable forage (grasses and some forbs) is available. In this regard, sheep are likely to occur at higher elevations in areas with predominately south and west-facing terrain, than in areas with more northerly slopes that are colder and which preserve snowfall for longer intervals than sites exposed to intense solar insulation.

Table 2: Pair-wise Ranking of the Key Marco Polo Areas

Name of Marco Polo Area						
		1	2	3	4	5
		Karakul	Ak-Baital	Alichor-Boz	Uch-kol	Tchesh-Tobo
1	Karakul		1	1	4	5
2	Ak-Baital			2=3	4	5
3	Alichor-Boz				4	5
4	Uch-kol					5
5	Tchesh-Tobo					
	Total Scores	2	1	1	3	4

The participants indicated that the best concentration areas were those mountain massifs well interspersed with glaciers and valleys free of roads, or at least easy vehicular access which permits the penetration of trophy hunters and meat poachers. The abundance of roads and summer livestock herding camps are considered the primary reasons that Marco Polo numbers are marginal in the more insular mountains of the Akbara area east of Murghab. Massifs near the international border with China are subject to regular poaching from the Tajik and China border guards.

Along the southern border of Tajikistan, Marco Polo sheep are thought to migrate 70 or kilometers between their summer and winter ranges. Much of the summer habitat is located across the border in the Wakhan Corridor.

The narrow strip of mountains along the Tajikistan – China border were excluded from further consideration by these participants, because the area is essentially closed to all public access. There is a permanent wire mesh fence along at least 75% of the approximately 500 km border, which serves as an effective barrier excluding any cross movement by wildlife the size of a hare or larger. Thus, Marco Polo and argali sheep (northern area near Kyrgyzstan) are entirely restricted to the 20-40 km wide strip within the Tajik territory, as well as habitat located within Chinese territory, and which is not excessively disturbed by herders or poachers. Formerly, during the Soviet era, the fence was electrified and heavily patrolled. The fence has been eliminated in some areas near the Afghanistan border by local people who have removed poles for firewood.

The map-scale used is too coarse to permit mapping of potential ibex (*Capra sibirica sakeen*) habitat. This species is associated with steep and very steep rocky terrain and cliffs adjacent to alpine meadows and shrublands. It may be possible to map larger and more contiguous habitat blocks from 1:50,000 (and possibly also 1:100,000) scale topographic maps, using slope steepness as indicated by contour spacing. Areas above 40 – 50 degrees would be regarded as suitable habitat for ibex. Otherwise the only realistic means of producing a useful distribution map for ibex would involve systematic field-based surveys and herder interviews, which is clearly both time-consuming and expensive.

Box 1: Marco Polo Sheep Annual Movement Pattern

Marco Polo sheep or Arkari follow a distinctive annual cycle in which males and females segregate into separate herds except for the brief rutting season (early December). During the spring, summer and fall, they are to be found at higher elevations, generally above 4,500 m and as high as 4,900 or 5,000 m. Alpine basins at the end of the valleys and near glaciers constitute preferred sheep habitat, with female herds occurring at a somewhat lower elevation than male herds. Some valleys seem to contain only female groups (comprised of adult females, lambs and yearlings), while others are dominated by male groups. Marco Polo sheep tend to select high ridges and plateau-like areas where there is sufficient food in the way of forbs and grasses, and where they may escape troubling insects and poachers.

In fall, and as early as late October, the males join female groups to form larger mixed herds that remain together for the rut (which peaks in mid-late December). These herds slowly make their way to lower elevations with the arrival of snow. Several weeks after the rut, the males separate from females again, and both herds independently return back to the high country again with the arrival of spring and summer. The lambs are born in late May and early spring, the fresh growth of vegetation enabling the ewes to produce milk to meet the demanding nutritional needs of their rapidly growing lambs. In good habitat as many as 80-90% of ewes may be accompanied by lambs.

The seasonal altitudinal migration regularly entails distances of 15-20 km, with populations near the Afghanistan border moving as far as 70-100 or more kilometers. Males tend to spend the summer in the Wakhan corridor, while females mostly remain in Tajikistan. Along the Chinese border, the reverse seems to apply: males' summer within the militarily fenced area in Tajikistan, while females stay closer to the international border or move into China.

Marco Polo sheep are especially vulnerable to poaching during the rut when they are inattentive and located close to roads and accessible jeep trails.

Since this large cat is so rarely seen, the delineation of snow leopard range is highly problematic. However, it is heavily dependent upon such prey species as ibex and marmot (*Marmota*), so that mapping of ibex areas will suffice to include snow leopard as well. Like ibex, snow leopard prefer terrain which is well broken by rocky outcrops, cliffs and gulleys: these features provide cover for hunting and afford better protection from detection by humans or other predators like the wolf. Snow leopards occasionally prey upon Marco Polo sheep, although this fleet-footed ungulate easily outruns the cat, and tends to forage in areas where hunting cover is scarce. Snow leopards are more likely to prey upon ewes, since they are said to use more rugged terrain than male Marco Polo sheep. Yearlings are also more vulnerable prey.

The participants also mapped some areas known for the frequency of brown bear (*Ursus ursus*) sightings, a rare species that relies upon marmot, grasses and roots of forbs for its survival.

Threats to Wildlife: Poaching of Marco Polo sheep and ibex is endemic and widespread. The participants developed a simple graph illustrating the relative change in wildlife and livestock populations over the past 20 years (since 1983). Discussions indicated that Marco Polo sheep

populations have declined by 200-300% since independence in 1991, while ibex numbers have dropped somewhat less significantly. The decline is attributed to the influx of automatic weapons among civilians during the civil war (1993-1997), and the tendency of border guards, security police (KGB), and others to hunt sheep for meat. Persons with access to vehicles and fuel are more able to visit remote areas where sheep numbers are greater. Ammunition is freely available on the market. With the departure of the better supplied and fed Soviet Army, and their replacement by Tajik units, poaching for cash and subsistence is said to have increased significantly among this profession. The emergence of a commercial meat market has apparently taken place over the past few years, with one kilogram of sheep meat selling for 3 somanis (US $0.94/kg) in the market-place (compared to $1.6 / kg for yak and $2.2 for domestic sheep; $1 = 3.18 somanis). There is a strong evidence that herders will regularly poach if they have access to suitable weapons, rather than slaughtering their own livestock (which most consider to be too few in number, anyway). Apparently, livestock numbers of the poorer herders is decreasing, because they have to sell animals to buy flour for their own consumption. If they have access to firearms, the hunting of Marco Polo sheep and ibex is seen as a good alternative to slaughtering their own valuable stock.

Many households, and all local restaurants and hotels in Murghab regularly offer Marco Polo meat to guests. Such widespread meat hunting poses a very serious threat to the Marco Polo sheep population.

There is no reliable population estimate for Marco Polo sheep in Tajikstan. The population has decreased from an estimated 70,000-80,000 individuals in the 1960's to approximately 20,000 in the mid-1970's, and 10,000-12,000 by the late 1980's. The last national survey of argali was conducted in 1991, which revealed "the total number of argali in the Pamirs was estimated to be 9,900-10,300 individuals" (U.S. Fish and Wildlife Service briefing dated 11/4/94).

Wolf numbers are judged to have increased notably over the same time period, while snow leopard numbers appear to have increased only slightly. The smooth nature of the terrain favors wolves over snow leopard. There are very few reports of people killing snow leopards, or hunting this species for its fur or bones. Unlike wolf, livestock depredation by snow leopard is not considered a problem in the Pamir. Thus, the potential for retributive killing, such as occurs in Pakistan and elsewhere in Central Asia appears to be low in GBAO.

The increase in predators has been accompanied by a four-fold decrease in the number of sheep and goats, and a similar decline in the yak population, following the dissolution of the Soviet with its institutional collective herding pattern, the collapse of supplemental feeding in winter (haying), and the loss of an effective regional marketing and transportation system which moved animals long distances between winter and summer pastures. However, numbers of yak and sheep/goats have risen steady among some families over the past five years, as more wealthy herders consolidate their operations and find ways of marketing their animals and dairy products. By contrast, herd size seems to be decreasing among the poorer herders, for reasons noted above.

Other threats to wildlife include overgrazing by livestock (more of a problem during the Soviet era than today), and the over-harvesting of shrubs (*teresken – Ceratoides papposa*) for domestic fuelwood. Some areas may be negatively impacted by medicinal plant collection, and road construction or maintenance.

Nature Protection: The Ministry of Nature Protection and Environment is responsible for wildlife and habitat conservation under the Nature Conservation Act (1993), with additional legal instruments being provided by the State Control of Environmental Protection and Use of Resources (1994) and the State Ecological Review Act (1994).

The Tajik National Park (TNP), totaling 2.6 million ha, was established by the Ministry of Nature Protection and Environment on July 20, 1992. Institutional structure and management of the national park is based upon the Soviet system; but with dismal funding for patrolling or other managerial functions, a very poorly paid staff, and minimal public or political support, TNP is little more than a "paper park," with one staff member stationed in Khorog (more than 200 km outside the park), and three members in Dushanbe, 2-3 days drive away. No-one is stationed within the Park, which has about 6,000 local people within its boundaries, as well as a few mines. No extensive wildlife inventories or surveys have been undertaken in this listed protected area, and there is thus an urgent need to initiate systematic surveys within this vast area.

The Ministry issued 145 hunting licenses for Marco Polo sheep between 1999 and 2002, with the accruing fees totaling an estimated USD 1,450 000. However, very little of this substantial revenue has filtered down to Murghab District for the benefit of wildlife conservation or the communities in whose areas sheep are hunted. Local people are offered little or no incentive to protect Marco Polo sheep; indeed many see no problem in poaching them for household consumption, clearly a use which greatly undervalues this unique Pamir wildlife resource. It should also be noted that no proper records are maintained by the government or hunting companies on issued licenses or how the hunt is executed (including the number of trophies taken). Corruption is rampant and was reported as far back as 1994 (Cunha 1997). It is rumored that hunters pay a bribe if they see a larger trophy ram after collecting their first and only legitimate trophy.

Although hunting is technically regulated with poaching being illegal, both forms of hunting are extremely widespread -- indeed pervasive -- because of poor law enforcement resulting from insufficient capacity or funds, and will on the part of the Nature Protection authorities to protect Tajikistan's wildlife. Attobeg appears to be the only hunting company willing to commit some resources to conservation. Very few local residents take out the 15 somani license for an ibex. The $30,000 accruing from each of the 20-45 licenses issued annually to foreign hunters for Marco Polo sheep, perhaps the world's most sought after trophy, is largely captured by corrupt officials. Very little money filters down to the hunting block where the trophy was taken, for the benefit the people living in the area. Virtually none is used to support population status surveys or ongoing monitoring. In short, the local officials and people have almost no incentive to protect or sustainably manage this rare and valuable resource.

With the worsening state economy and budget (48% decline in GNP in real value since 1989/1990), and increasing official and private corruption, conditions are highly conducive to accelerated poaching of wildlife and other valuable natural resources. Since the Nature Department staff cannot, or at least are unwilling, to control poaching, the only option lies in encouraging more responsible and locally active hunting organizations and instilling a sense of stewardship among local herders to (a) refrain from destructive meat harvesting and (b) to report any poaching of wildlife within their territory.

Kleinn (2002) offered the example of the Attobek Hunting Company, which was founded 5 years ago and which leases a 365,000 ha hunting area in the Istik Valley. The company employs 12 wildlife guards to patrol its area at an annual salary of $150 each (compared to $1.5 per month for *zapovednik* rangers). An additional 47 persons are hired for the hunting season (November - December). The guards are reported to apprehend some 10 poachers (including Afghanis and some border guards) annually. With greatly reduced livestock numbers since Soviet withdrawal, the pastures have been slowly improving, and as long as the Marco Polo sheep are protected from poachers, the production of trophy-sized animals is expected to be good. Each hunters pays $27,000 for a license, of which 1,500 remains with the Hunting Company, $9,000 accrues to the foreign business partner and $10,000 for Murghab Rayon.

A complementary strategy of local stewardship among pastoralists may be more viable over the long-term, since herders can be relied upon to be in the field tending their livestock during the spring, summer, and fall – and not just in fall or early winter in the case of hunting staff. Local people are in a good position to regularly monitor the area, and could fulfill the role and obligations of an onsite wildlife guard. The development of wildlife viewing could provide rural families with supplemental income, especially if allied with yurt-based homestays by tourists, as suggested by Guy Delanay and the ecotourism division staff of ACTED. This consultancy explores this option, and makes specific recommendations for future steps.

Nature Protection Department Meeting: I met with Mr. Gulomshoev Sang, a wildlife officer with the Department on July 18 to discuss wildlife conservation in Murghab District. He indicated that no anti-poaching patrols are undertaken because of the lack of vehicles, fuel and other supplies. Salaries are very low ($8 or less per month), and the low budget limits work to the office. Mr. Sang was not able to inform me what the department's annual budget was. The Murghab office lacks any distribution maps, even for such important species as Marco Polo sheep. District offices are not appraised by headquarters of the number of hunting licenses issued, no local records are maintained in this regard, and as noted the District receives no revenue from such hunts.

Mr. Sang estimated that 40-45 licenses were issued for Marco Polo in GBAO in 1998 and 1999, 40 in Year 2000, 12-15 in Year 2001, and 25-30 last year. Three years ago, a Russian-Tajik team conducted a survey, and placed the total number of sheep at 10,000, but to date no report has been forthcoming. Nature Protection staff are presently accompanying a survey team lead by Dr. George B. Schaller of WCS, and accompanied by experts from the Institute of Zoology and Parasitology, Academy of Sciences, Dushanbe. The team is surveying Marco Polo and other wildlife in the Karakul, Rang-kul and Tesh Tabo areas.

Regarding poaching, he estimated that at least 25 Marco Polo sheep are being poached annually: the number is obviously substantially higher than this, probably in the hundreds of animals. Two people were arrested last year, and the same number so far this year. The fine for taking a Marco Polo sheep is very high: 20,000 somani ($6,289!!), with a 3-5 year jail sentence and confiscation of firearms and other involved property.

He listed the main threats to wild sheep as poaching by the Border Guards, and officials from the Security Police, Customs and related departments. Poaching by herders as well as the

general public is second in significance. Natural threats include predation by wolf, periodic outbreaks of disease, and severe winter snowfall, which forces animals to even lower elevations close to roads and poachers.

There are said to be 20-25 sightings of snow leopard annually in Murghab District. Predation on livestock is rare. Formerly there was some poaching by the Russian military (especially border guards who sold pelts to Russians). There is no evidence of cross-border trade of snow leopard fur or bones with China. The government has set 23,000 Somani ($7,232) as the fine for killing a snow leopard.

Mr. Sang expressed special interest in the promotion of ACTED's ecotourism initiative and requested to be involved in any training that I or other experts may offer. ACTED should obtain a copy of the 2001 Nature Protection Regulations from Dushanbe.

Meeting with US-Tajik Wildlife Survey Team (led by Dr Schaller) July 20th, Murghab: I met with George Schaller and the five person team from the Academy of Sciences and Khujoud State University. They are conducting a 6-8 week wildlife survey, with emphasis on Marco Polo sheep, of large portions of the GBAO, especially along the Chinese and Afghanistan border regions. However, they are not planning on surveying any areas within the Tajik National Park, so that determining the status of arkari and other wildlife in the park remains a very high priority. The US-Tajik team conducted some 35 household socio-economic surveys which indicate a declining livestock herd, as people sell their animals to buy flour and other food staples. We also discussed the need to develop education awareness materials, such as a simple poster focused on Marco Polo sheep, and periodic newsletters for distribution by ACTED to teachers and schools in the District.

Results of Field Visits July 19-26: Due to time constraints, it was only possible to visit two sites close to Murghab during this Mission.

1) Maljorang Valley, located approximately 30 km west of Murghab: We visited two jailoos and met with herders who prepared resource maps for the area indicating the locations of pastures, wildlife hotspots and other features of interest. Each jailoo is used from June through October, after which the herders move to a lower elevation closer to the main Murghab-Karakul road. They also informed us that they periodically undertook 2-3 day hunting expeditions, in which borrowed automatic weapons are used. In the most recent event, five ibex (1 female, 4 male and young) were killed by seven persons from Murghab.

We rented two horses at $3/day each and camped 3.5 km up the Maljorang valley, and early the following morning conducted a count of Marco Polo sheep at the head of the valley. No ibex were seen. Table 3 indicates the sex and age of the four groups spotted from our observation point (N 38º/ E 73º 42.543, approximately 4,450 m). These indicate a ewe-lamb ratio of 100:83.3, which represents a very good lambing rate, suggesting good climatic and forage conditions for this year. The adult female/yearling ratio is 100:50. However, these figures should be interpreted with some caution, as they represent only four groups and a single day's count. Some double-counting may also have occurred, due to the steeply rolling terrain with deep drainages. More sampling is imperative.

Other sign seen included the fresh tracks of a single wolf, and snow leopard droppings and a scrape estimated to be at least 4-6 months old. Pastures in the valley were clearly little used by local people, and displayed an amazing diversity of wildflowers.

Table 3: Marco Polo Sheep Seen in Maljorang Valley:

Group	Ad Female	Lamb	Yearlings	Unidentified	Total
1	7	7	2	0	16
2	5	4	1	0	10
3	12	9	2?	1	24
4	0	0	7	0	7
Totals	24	20	12	1	57

2) *Field Training Session:* July 24- 26

The training workshop was opened with an introductory session at ACTED office, in which the objectives of the training workshop and Ecotourism Program were discussed. Each person introduced themselves: along with their affiliations, each offered the name of a different animal. The following table indicates the names and affiliations of each participant.

Table 4 indicates the workshop participants and trainers.

Name	Affiliation / function
Obaildullah Mamadiev	ACTED, Trainer /participant
Rodney Jackson	SLC, Trainer
Eric Engel	ACTED, Trainer / participant
Kalandarhonova Aiymgul	ACTED Ecotourism Field Officer
Gulomshoev Sang	Wildlife Protection Department, Murghab / Trainee
Ecotourism Association Members:	
Taimankulov Marman	Self-employed driver / guide / Trainee
Ahmedsharipov Tariel	Hunting Area Leaseholder / Trainee
Turdukulov Janazak	Self-employed guide / Trainee
Mourzamambetov Askar	Driver/ guide / Trainee
Aidarov Ysa	Herder / Guide / Trainee (Field session only)

The group identified the following outputs for the training session:

- Identify a survey area and complete a wildlife survey
- Identify how to conserve wildlife
- Work with local herders to identify main threats to wildlife
- Learn how to survey wildlife using simple methods
- Find out how wildlife monitoring can be related to the ecotourism program to mutual benefit

The team of 8 persons then drove to the remote Baza Dara valley southwest of Murghab for the “hands-on” training in wildlife surveying methods. The group met with local herders, and invited Aidarov to accompany the team as a guide.

The first camp was made over the 4,600 m high Baza Dara pass, near a lake with spectacular views of glacial capped ranges, and a rich carpet of wildflowers – both strong elements for attracting tourists.

A list of local wildlife species was developed with the help of the herder who reported that a few Marco Polo sheep visit their jailoo area each year, with up to 30 animals seen in the upper valleys near the silver mine. Ibex are also abundant, especially in the more rocky areas to the west of the mine. Besides common species like marmot, small rodents, and hares, the main predators are wolf (red and gray are considered to be two forms or species), red fox, brown bear, and the rare lynx. The herder noted there were two kinds of snow leopard, the more common black-and-white pelaged animal, and the rarer brown or yellowish cat. Six species of birds were mentioned, including golden eagle, vulture (several species including lammergeyer), raven, snow cock, snow partridge, ruddy shelduck, and the barheaded goose. Team members discussed how each species was interrelated to others through the complex food-web, which all agreed could be easily disrupted.

All species are viewed positively with the exception of the wolf. Participants especially praised Marco Polo sheep (beautiful animal with exceptional horns, and offering good meat), ibex (sharp-footed and valuable for its meat), snow leopard (valuable skin and predator which keeps wild sheep and goat populations healthy), and the lynx (very beautiful and rarely seen).

Principal threats were identified and discussed in some detail. In regard to hunting, the group ranked the primary offenders as follows:

- Russian / Tajik border guards (40%)
- KGB (20%)
- Herders (5%)
- Foreign hunters (5%)
- Wild predators (30%)

July 25: In the early morning, Rodney Jackson instructed the team in the transect method of wildlife surveying and monitoring. A total of 6 wolf tracks and/or droppings, one hare, an old brown bear digging of a marmot hole, and two ibex (females) were observed along the 2.18 km transect (Location N 37º 59.578 / E 93º 23.131).

The team then drove to the ancient 11th Century silver-mining settlement or caravanserai of Bazar Dara, located in the middle section of the Ak-Jilga valley, many miles from the nearest settlement. The ruins are some 600 by 220 meters in size or 2,000 square meters. There are two entrances, with many densely packed houses, a cemetery, a bath-house and some scattered buildings. There is also a small "Temple of Fire," comprised of three rooms, possibly related to the Zoroastrians. The majority of rooms measure 11.5 to 22.2 sq meters in size. Traders of the Silk Route passed through the town, and were levied customs fees according to historical documents. Transportation was provided by donkeys and camels.

After examining the ruins, the group drove up the valley to the site of a silver mine which operated during the Soviet era from about 1984 through 1991. In the late afternoon, the team formed two groups, each of which that conducted a practice survey, The first group, led by Obaidullah, observed numerous marmot colonies with old brown bear sign and ibex tracks along a 2.20 km transect. The second group, walking up the valley found abundant wolf sign (fresh and old), and observed a herd of 22 ibex along the 1.7 km transect. Clearly, these

pastures are in excellent shape, and we were told that they were hardly used during Soviet times, as collective farms were all located in more accessible areas along main roads.

July 26: A survey of the upper valley was conducted, but no Marco Polo or ibex were sighted (N 37º 56.532 / E 38º 16.545; 4,300 m). Marmots are very common, along with evidence of wolf. The herder reported that the sheep are located on the top of mountains at this time of year, and consequently are very difficult to spot.

In mid-morning the team returned to winter jailoo, and interviewed the father of Aidarov. He estimated the Marco Polo population to number about 500 individuals in 1989; after the mine was abandoned in 1992, the number of sheep has increased to the present population estimated at about 800 animals. Livestock numbers declined precipitously from 1,200 in 1992 (when the Soviets withdrew and the elaborate system of moving livestock by truck to alternative pastures or trucking in hay from Kyrgyzstan collapsed) to half (600) by 1994, and 360 animals by 2003. Severe winters were recorded in 1994, 1996 and 2002, which also contributed to the problem of maintaining the herd size. Despite this decline, the quality of rangeland has also declined, evidently due to a drying trend exacerbated by increasingly strong winds. Apparently, the wolf pack sizes have increased from an average of 3-4 animals in 1989 during Soviet time (with its ongoing predator control program) to as many as 10-17 individuals in 2003, following ten years without any formalized control program.

The average family currently needs to sell about 8 sheep and 3 yaks annually in order to purchase basic staple food and commodities. With the current increase in the value of livestock, this number has decreased from the 10 sheep and 5 yak which were required in 1999/2001. Other factors constraining the herders ability to increase their livestock holdings include the high prevalence of natural disasters (adverse winters), a severe lack of winter forage, and the discontinued practice of supplying winter-time fodder. Livestock owners minimize depredation by watching over herds during the daytime, and ensuring they are housed within secure livestock pens at night.

The team asked the herder what trends he would like to see over the next 5-10 years. He indicated that he would like to see a drastic decrease in wolf numbers, a rising Marco Polo population (to about 1,200 animals), and with the livestock population returning the Soviet-era level of around 1,200 animals.

The team returned to Murghab in the evening.

Report Preparation and Wrap-Up: July 27
Program Coordinators Eric Engel and Obaidullah Mamadiev were briefed on the findings of the Mission. The next steps were discussed, and are highlighted in the following section.

CONCLUSIONS AND RECOMMENDATIONS

1) Current Status and Threats to Wildlife of Murghab District: Poaching of Marco Polo sheep is of special concern, and hunting must be controlled without delay. All of the persons interviewed noted that wildlife numbers have been declining rapidly across all of Gorno Badakhshan Autonomous Oblast, due largely to rampant poaching and unregulated meat or trophy hunting. Populations of Marco Polo sheep have declined from an estimated 70,000 or 80,000 individuals in the 1960's to some 20,000 in the mid-1970's, and half that number by the late 1980's. The last national survey was conducted in 1991, which revealed "the total number of argali in the Pamirs to be some 9,900-10,300 individuals." The current population is not known, but may number as few as 6,000 individuals.

There is no doubt that the poaching of Marco Polo sheep and ibex is exceedingly widespread in this sparsely populated region of Tajikistan. While military border guards and the KGB police are routinely cited as the primary offenders, a good proportion of private citizens hunt to provide their families and friends with cheap meat. The restaurants in Murghab customarily serve Marco Polo meat in place of the more expensive mutton or yak. Hunting occurs year-round, but is most intense during fall and winter when the sheep are concentrated at lower elevations and are situated closer to roads -- thus being easily detected and killed.

It is thought that at least 400-800 Marco Polo sheep and ibex are killed annually. Only two persons were apprehended and prosecuted last year for poaching, a dismal record on the part of law enforcement authorities. With a total population of less than 10,000, it will not be long before the Marco Polo population is depleted to a seriously low level, with only the most remote areas retaining good densities. This represents a senseless and tragic loss of a species unique to the Pamir mountains, and one that finds its main distribution within the territory of Tajikistan. The populations in Afghanistan and China are much smaller, but also appear to be under threat, especially in China. Some populations use these countries only seasonally, so that international cooperation will be required to ensure the conservation of the species. For example, a few Marco Polo sheep cross the border into Pakistan to lamb, and thus this population cannot be considered self sustaining. All males remain within Chinese territory.

The Tajik trophy hunting program is surrounded by controversy and a virtual lack of transparency. Corruption is said to be widespread, and only one local hunting company appears to be making an effort to improve the situation. As noted very little, if any of the $27,000 + fee charged to the foreign hunter filters down to the local level or in any way benefits local people. However, if the program were properly administered, and with the long-term welfare of the sheep population in mind, it could offer local people with powerful incentives not to waste such a valuable resource through uncontrolled meat poaching. While the fine for poaching is substantial, it seems unnecessarily excessive, and thus unenforceable. Complaints that the Nature Protection Department of the Ministry lacks the necessary resources to patrol and enforce the law should not serve as an excuse for no action. The heart of the problem appears to be lack of will on the part of the government to educate the public on the value of Marco Polo sheep to the people of Tajikistan. As this animal and other

wildlife disappears, so future generations will certainly regard the action of the current administration as irresponsible and highly negligent.

On a more positive note, it appears that populations of the endangered snow leopard are not presently under any serious threat. However, as the native prey base of ibex and Marco Polo sheep is depleted, so this cat will turn to domestic livestock for its survival. Given the importance of livestock to the subsistence economy, predictions of adverse people-wildlife conflicts are certainly not unreasonable. Therefore, any education initiative should approach conservation education from an ecosystem perspective, and highlight the uniqueness and fragility of the Pamir mountain environment.

Recommended Actions: Clearly, immediate action needs to be taken by local and central governmental authorities to stop poaching and reverse the current "free for all hunting" mentality, if populations of Marco Polo sheep are not be extirpated from significant parts of their current range. While ACTED can do little by itself to reduce poaching, it can provide a valuable public service by preparing and distributing materials for education and environmental awareness raising to schools, teachers and children. Materials could be prepared in partnership with the Nature Protection Department, Tajik National Park and the Institute of Zoology and Parasitology, Tajik Academy of Sciences.

Such items could include posters, leaflets, children's books and audio-visual materials for distribution via radio and television. A poster on the Marco Polo sheep and elusive snow leopard, with a simple and highly focused conservation message, would be highly effective in increasing public awareness of the impact of poaching and highlighting alternative values for these two "Red Book" species. SLC would be pleased to assist in the preparation of such materials.

2) Promotion of the Tajik (Pamir) National Park: ACTED and other conservation-oriented NGO's and agencies should to work with the government (in particular with the local representative of the Ministry of Nature Protection and Environment) to ensure that the Tajik National Park is strengthened as soon as possible, with the long-term goal of establishing it as a model high mountain protected area for the west Central Asian region.. What is really needed are the resources and imbedded commitments from a 5 year investment by the World Bank or UNDP under the GEF global biodiversity program to properly build the necessary infrastructure and staff capacity of the park. An important first step would be to clarify the boundaries of the park.

Recommended Actions: By preparing and distributing educational materials, ACTED would raise awareness among the local populace and officials of the need to protect the park's wildlife and natural heritage as soon as possible. Further importance would be attached to the park as the ecotourism program gained a reputation for offering a unique cultural and nature experience.

As part of the Ecotourism Programme, ACTED should encourage the mapping of wildlife hotspots or concentration areas in the National Park, through local participatory methods. These are best delineated on the 1:50,000 and 1:100,000 maps

prepared for the Pamir Strategy Project (PSP) by the University of Bern Centre for Development and Environment (CDE).

3) Wildlife Ecotourism: an alternative non-consumptive scenario for wildlife conservation: An alternative to poaching for meat and further expansion of the corruptible trophy hunting could rest with community-based ecotourism, wildlife viewing opportunities and the development of nature stewardship among local pastoralists.

The Tajik National Park (TNP) and areas near Murghab are the most logical places in which to explore and develop wildlife or nature viewing in conjunction with jailoo homestays, hiking and horse-riding treks targeting the adventurous and independent tourist. While the demand and market for such activities is currently very small and likely to remain quite limited until Tajikistan's transportation infrastructure is improved, such tourism activities could represent an important source of income for households located in or close to wildlife "hotspots." And if the local people perceived direct connection or linkage between protection and nurturing of wildlife and this source of income, there would be a sound basis for establishing community-based nature and environmental stewardship – with long-term benefits to the pastoral livelihood system. If suitably trained and motivated, local herders could serve as effective "wildlife watchers" -- thereby reducing the number of government employees needed to be stationed within the park. Currently, the TNP has only four employees, all of whom are located many miles from the park. Herders could be deputized and trained to patrol the area, educate other local residents and discourage poaching by outsiders, at a fraction of the cost of stationing permanent government employees in the area. Abuse of the system could be minimized by ensuring local people participate in planning from the onset, and are held accountable to both the local community and the government. A simple monitoring system could be established for tracking compliance and ensuring that the wildlife population remains stable or increases over the long-term.

Winter offers the best viewing opportunities, for wild sheep are forced by snowfall to move to low elevations, often close to roads (where, of close, they become highly vulnerable to poaching). Clearly, given the winter harsh climate, few if any tourists will come at this season. However, the open habitat of the Pamir mountains facilitates the sighting of Marco Polo sheep during summer at a relatively great distance, if one climbs high enough. Female herds spend summers at a lower elevation than male groups, a disadvantage for those wishing to see the legendary horned Marco Polo male. Other wildlife species of interest include ibex, marmot, brown bear, snow leopard, wolf and lynx. Although many of these animals are shy and rarely sighted, their sign is more readily seen. There are local people who have good knowledge of where to find such sign and where best to search for wildlife who could be involved in the program.

If areas could be set aside as a "community-managed nature sanctuary" in which hunting is prohibited, and if the government and local people were able to largely preclude poaching or disturbance by humans, the sheep should become fully habituated to human presence within several decades – enabling a close approach and thus offering realistic photographing opportunities for nature enthusiasts. The rich

summer wildflower displays with backdrops of “arctic-like” glaciers could attract special “photo safaris” to supplement the current focus on cultural and scenic tourism.

Recommended Actions: As the first step, we recommend that a pilot wildlife tourism and stewardship program be initiated in one or preferably 2-3 sites under the ACTED-sponsored Ecotourism Program.

There was only sufficient time during this Mission to conduct an introductory training of monitoring techniques for Association members and project staff. This first step entails the use of a simple participatory system in which local herders should be encouraged to conduct regular “walking transects” up selected valleys to near the glaciers, counting wildlife as they go and entering the information onto a special data-form.

Representative transects should be established in wildlife concentration areas. Involved persons should be trained, so that each follows the same procedures and all should conduct surveys at about the same time each year in the same valleys from one year to the next. Herders, with support from ACTED, should conduct surveys in critical Marco Polo winter habitat during the rut (December), and then again in July-August in the species’ summer range. ACTED should collect all forms from participating communities, summarize the findings (number of animals / sign observed per kilometer of transect), and report back to all stakeholders and donors.

ACTED needs to develop procedures (along with a form) for gathering detailed background information on each site, including geographic location, type of landscape, vegetation, wildlife species present, pastoral use, etc. This is best undertaken as a participatory planning exercise with the involved service providers and stakeholders. All monitoring areas should be mapped on topographic sheets at scale of at least 1:100,000.

At a future date, a more rigorous ungulate (sheep and goat) monitoring system, in which detailed counts and herd sex/age classifications are made within sample census blocks, could be initiated. This phased implementation gives ACTED the time and resources to concentrate on implementing the ecotourism activities, training service providers, and educating stakeholders on the importance of developing systematic wildlife surveys over the long-term. The “Block Survey” count method is one option.

The smooth and open terrain of the Pamir mountains is not amenable to the use of the SLIMS’s based snow leopard sign transects. Interested persons are referred to ISLT’s website (www.snowleopard.org/slims/home.htm). The consultancy recommends that modification of the standardized SLIMS approach to include a simple system enabling herders to record any sightings. This should be supplemented with spot checks by ACTED staff of preferred habitat for snow leopard sign (pugmarks or tracks, scrapes and feces), which should be undertaken during winter or early spring (preferably when there is snow on the ground). Such presence/absence surveys are described under SLIMS First Order surveys, for which forms have already been provided in Russian. However, these should be reviewed and adapted to local conditions and project priorities as necessary.

Further training is clearly needed, and it is appropriate to determine how best to provide this through continued collaboration between ACTED and SLC and its partner organizations.

4) Community-based Stewardship: Besides launching the wildlife monitoring program, the expansion and strengthening of ACTED's ecotourism program should provide the most important underpinning for promoting community-based wildlife conservation in the Pamir.

Recommended Actions: Appendix 1 offers initial suggestions for developing wildlife oriented ecotourism activities and capacity building efforts for promoting community-based wildlife stewardship. ACTED should hold a special planning session this coming winter at which all households using the proposed project area(s) would participate and assist ACTED staff to identify the best site(s) for promoting linked nature stewardship and viewing. At the meeting, participants would first be asked to identify, characterize and map all wildlife conservation areas within their grazing area or territory. They would then brainstorm on what criteria could be used to facilitate site selection, such as a good concentration of wildlife species, good viewing opportunities, abundance of summer wildflowers, pleasing or unique scenery etc. The sites would then be ranked using these participatory-derived criteria, thus providing a logical and sound "grass-roots" basis for proceeding with the homestay program.

By encouraging local people, and supporting Ecotourism Association members to conduct ongoing monitoring, the project should greatly raise local awareness of the significant underlying threats to wildlife resulting from poaching and meat hunting.

It is imperative that the program avoid unduly raising expectations of the local people. It should set incremental activities which match the anticipated relatively slow pace of tourism growth for this remote and largely unknown region. Participating herder families need to be made aware that many other factors constrain tourism, so that they see each new visitor as an important step forward. It is also important for providers and the project to learn from the visitors, and toward this goal, ACTED could conduct an informal survey of visitor interests and desires. Questionnaires and feedback forms should be deposited with homestay providers for visitors to complete. These could be adapted in part from the sample questionnaires posted on SLC's website (http://www.SnowLeopardConservancy.org)

Once the local providers have gained more confidence from servicing visitors, it would be appropriate to think about nature guide training and a more formal promotion of wildlife viewing products. By then, the participating pastoral communities should have identified and characterized in some detail the principal wildlife hotspots and viewing opportunities, and hopefully tourist visitations will have increased beyond the present trickle to a more consistent and predictable flow.

In conjunction with nature education materials, SLC and ACTED could collaborate in developing simple interpretive materials for placement in yurts and local guesthouses targeting prospective trekking routes, wildlife viewing or guiding opportunities, and homestays elsewhere in the region. Such materials would educate tourists on cultural norms and values, as well as nature and how to behave responsibly to the environment (including ensuring they do not eat Marco Polo meat in restaurants or guest-houses).

Appendix 1: Nature Viewing and Monitoring: A Summary

The development of a simple wildlife monitoring system intimately tied to the proposed Homestay program under development by ACTED. With the limited time, it was only possible to lay the conceptual basis for this linkage, offering an incentive whereby local people may directly benefit through offering simple guided or self-guided wildlife viewing to their homestay customers. Such revenue would valuate wildlife beyond just meat or trophy animals killed by wealthy foreigners and hunting companies with little or no leakage to local communities. Candidate enterprises could include wildlife viewing, nature photography, trekking on horseback, jeep mountain tours, etc in which visitors stay in yurts at established jailoos and use the services of trained nature guides and drivers.

We rationalize that involved herders, guides and drivers will act to protect wildlife if they it provided income, if they perceive such income was threatened, and if they could exert some control over the underlying threats. As noted, the major threats to Marco Polo sheep in the Pamirs are poorly regulated trophy hunting and pervasive meat poaching for home consumption or sale.

Suggested criteria for identifying prospective jailoos and households could include households which are members of the Ecotourism Association, areas close to glaciers and good summer wildlife viewing area and no further than 10 km from the nearest yurts; area without minimal poaching, especially from outsiders, households who do not own any firearms; person committed wildlife and nature protection, and households located along main trekking routes or near a jeep tourist route.

A highly participatory approach such as APPA should be used to engage stakeholders in the planning from the onset. All activities should be designed using design and monitoring indicators that maximize environmental, social and economic sustainability. For information, consult the materials posted on the Snow Leopard Conservancy's website, or contact the author of this report directly (www.SnowLeopardConservancy.org)

Planning is most effective if it is fully participatory and if herders are involved at all stages. The following box lists some of the tools that may be used to facilitate information gathering, planning and decision-making. For more information on these tools, see Pretty, J. N., I. Guijt, I. Scoones, and J. Thompson. 1995. *A Trainer's Guide for Participatory Learning and Action*. IIED Participatory Methodology Series, International Institute for Environment and Development, London).

Tools for Engaging Herders in Planning

Resource Map: Hand-draw maps indicating the location of rivers or streams, mountains, jailoos, pastures, fuelwood collection areas, wildlife "hotspots," and any other important natural resources or features identified by the community.

Trend Line: Simple graphs showing trends of livestock numbers, wildlife sightings and population size, pasture condition, number of tourists, number of poaching incidents, local attitudes toward wildlife, etc. These can indicate past, present or potential future conditions.

Pair-wise or Matrix Ranking: Used to rank the importance of different pastures, compare wildlife populations from different areas in order to determine which has the highest biodiversity or number of a particular species, compare the kinds and ages of livestock killed by predators; and rank the importance of mortality due to various factors (such as weather; natural disasters; poor nutrition or soil; disease; or accidents) determined through brainstorming).

Venn Diagram: Provides information on local institutions, their roles and relationships in order to determine the important institutions and persons for affecting change (the larger the circles, the more important the institution; the closer different circles appear, the more interaction between different organizations). Can also be used to show the relative importance of natural resource by quantified use (i.e., what is most important to the community).

Seasonal Calendar: Shows seasonal grazing patterns with respect to different pastures, life-cycle of selected wildlife species, annual agricultural cycle, and favorable seasons for tourism activity (weather, flowers, wildlife, hazards, and trails).

Mobility Map: Used to identify movement patterns of livestock between different seasonal pastures, or movement patterns of wildlife between their summer and winter ranges.

Relationship or Flow Diagram: Can be used to show the relationships between different sources or kinds of threat to wildlife, specific species or a particular area.

Wildlife Monitoring: It would be desirable to initiate a staged monitoring program from the onset of the Ecotourism program. Household surveys should be conducted to establish baseline conditions with respect to household size and composition, livestock herd structure and numbers, income sources and amounts, and general attitudes toward wildlife and conservation in the area. Wildlife monitoring would consist of Phase 1 (Walk-through Valley surveys or transects) followed at a later date by more rigorous censuses under the Phase II (Block Counts) methodology. The latter would be better developed at a later date in collaboration with staff from the Nature Protection Department.

Walk-though Valley (Transect) Surveys are recommended as the monitoring system for *Stage 1* of the project. Here the observer walks or rides through a valley (in early morning or late afternoon) from its bottom to its head near the permanent glaciers, scanning both sides of the valley for wildlife using binoculars and recording all sightings on a standard data form, or in a special "monitoring notebook" that is issued to participating households. The Output consists of a simple count of the number of herds of Species X seen, the number of animals in each herd and the total number of individuals observed along the length (X km) of the valley, and maps of wildlife concentration areas.

Surveys should be conducted twice annually in summer (July-August – just after the lambing season) and if possible again in winter (December during the rutting period). Each valley or site should be visited at least 3-5 times during each seasonal period, preferably within the same 1-2 week period each year (depending on weather conditions).

Due to the unsuitable terrain and tracking medium, SLIMS (Snow Leopard Information Management System methodology) is not suitable for monitoring of snow leopards, whose populations in any case are scarce in the eastern Pamir compared to the western

portion of the range. At this stage, snow leopards are best monitored by (a) having member households record the date, time and location of any snow leopard sightings; (b) noting any pugmark tracks seen in sand or snow while conducting the wildlife valley transects and or their regular herding duties; and (c) interviewing herder families in adjacent areas to determine presence/absence and general distribution patterns of snow leopards and their prey. ACTED should encourage interested herders to keep an ongoing record of snow leopard sightings, including the date, place, number and sex/age class of cats observed, activity (hunting, traveling, resting), and any other observations of interest. Herders could be provided with special notebooks for recording their observations. ACTED should gather records from different jailoos for annual mapping of all sightings on 1:100,000 maps.

The project could employ the Biodiversity Threats Reduction Assessment to identify the primary threats underlying loss of biodiversity, and assessing which merit immediate or the most urgent attention in order to better ensure that species and habitats of global and national significance are adequately protected and efficiently managed. For details see Biodiversity Support Program website (www.bsponline.org).

Appendix 1 - ACTED Ecotourism Programme -- Valley "Walking" Transect Data Form

Date: _____ Valley Name and Location: _____

Observer Name(s): _____ Starting Time: _____ Ending Time: _____

Weather (Cloud cover / wind / temperature): _____ End Distance: _____

Serial Number	*Time*	*Distance from observer (m)*	*Species*	*Number in group*	*Description / Sex & Age*	*Distance along Valley*	*Place Name*

Serial Number	*Time*	*Distance from observer (m)*	*Species*	*Number in group*	*Description / Sex & Age*	*Distance along Valley*	*Place Name*

Comments (enter any observations and suggestions in this space):