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Abstract: Preliminary recommendations for the management of snow leopard and its prey are provided for the Langu Valley segment of the Shey-Pkoksundo National Park. Park-wide and country-wide conservation options and management recommendations await results of the surveys scheduled for 1987. The following management objectives are formulated: 1) Protection and ultimate restoration of all natural communities within the area 2) Special protection measures for snow leopard and musk deer (strict control of hunting and livestock grazing) 3) Secure natural resources around local villages 4) Respect traditional rights of villagers, while controlling high impact human activities 5) Secure cooperation of local people. These objectives are refined and recommendations for concrete conservation actions are made.

Notes: document is a part of the Himalayan Snow Leopard Project: Final Progress Report, Phase I

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8.0 APPENDIX:

SNOW LEOPARD MANAGEMENT RECOMMENDATIONS PROVIDED TO HMG

Preliminary recommendations for the management of snow leopard and its prey are provided for the Langu Valley segment of the Shey-Pkoksundo National Park. Our request for permission to examine the remaining 90% of the park is under consideration. The guidelines provided below therefore only apply to the far mid- western corner of the park, namely the Langu Gorge from the Ruka Khola west to Bailung Khola immediately east of Dolphu (Figure 1). This is the only village located within the park in our area.

Park-wide and country-wide conservation options and management recommendations await results of the surveys scheduled for 1987.

The Langu Gorge is unique in terms of the density of snow leopard it supports: numbers are greater than reported anywhere else in the cat's range. As such, it provides Nepal with the opportunity to ensure this endangered species continues to exist under near pristine conditions in at least one area.

Management Objectives

1. To ensure the protection and ultimate restoration of all natural communities within the affected area. Alpine and subalpine habitats in this area are especially vulnerable to disturbance because of steep slopes, shallow soils and semi-arid climatic conditions. The Langu Gorge is essentially uninhabited by man, and consequently reflects wilderness conditions rare in Nepal's mountain environment.
2. To provide special protection for endangered species, particularly the snow leopard and musk deer. Protection of these species requires that hunting and livestock grazing be strictly controlled.
3. To implement measures to protect soils, rangeland resources, fuelwood and watersheds with particular emphasis on the area around Dolphu village.
4. The traditional rights of villagers should be respected, but controls are needed for those activities impacting the area's fauna and flora.
5. Securing the co-operation of local people is a vital step in properly managing the park's resources. An important objective is to facilitate conservation education in schools and among all villagers, including community leaders.

6. The dangerous terrain of the Langu Gorge does not lend itself to the promotion of trekking, although Dolphu and Wangri could be considered in the future as part of the region's resource base. However, the Karnali Zones' remoteness and lack of basic facilities severely limits its foreseeable potential for tourism. The Langu Valley is a restricted area.

National Parks are often viewed negatively by mountain residents, and DNPWC should place the highest priority on changing this attitude. One approach would be to incorporate the Conservation Area concepts suggested by the Annapurna Conservation Study Project (Sherpa et al 1986), in order to better address the legitimate needs of local residents. The fact that most of the Langu Gorge portion of the Shey-Phoksundo National Park is uninhabited, offers some de facto protection, an advantageous situation for the short-term given the remoteness of this area, and the consequent difficulty in implementing administration with present staffing.

However, it would be most unwise to take no action, for problems exist and are likely to become worse. DNPWC would be most prudent to enlist the support of local resident and other HMG offices immediately in its difficult task of protecting Nepal's natural heritage. The local villagers could well become the Department's best allies if their concerns and legitimate needs are addressed.

Management Recommendations

A. General

1. Local Participation in Decision-making:

The establishment of a Panchayat Conservation Committee to assist in wildlife, rangeland and forest resource protection, and to participate in enforcing the park regulations is strongly recommended. The committee could play an invaluable role in implementing much needed grazing, firewood, watershed and wildlife protection plans, especially in the rapidly deteriorating environment around Dolphu village. Participation by village leaders is an essential ingredient in the effectiveness of protective measures, especially as the local villagers depend upon park resources and have traditionally utilized these.

Neither Dolphu nor Wangri residents spoke well of the "National Park" designation, and many were frustrated that it had been established without their prior knowledge or participation. Most were not even aware of its boundaries, or how their lives might be affected. Many assumed a repeat of the Lake Rara National Park experience, which many local residents considered a calamity. With Dolphu located within the park and its "sister" village of Wangri outside, fractional politics could lead to competitive resource exploitation.

Therefore, we recommend that officials from the DNPWC visit the area as soon as possible to alleviate local concerns and gain the confidence of the villagers.

2. Hunting

Hunting is regarded as a traditional activity by the villagers of Dolphu, Wangri, Kartik and Chuti. This activity declined substantially between 1982 and 1985, presumably because of our presence, in sharp contrast to the situation Jackson observed in 1976/77 (Jackson, 1979a). The Langu gorge supports a dense population of snow leopard, while such prey species as bharal and Himalayan tahr occur in good numbers. The relatively unskewed sex and age counts suggests the population have not been significantly impacted by past hunting pressures. By contrast, musk deer are now extremely rare, not having recovered from past hunting pressures.

We anticipate that hunting will be resumed, particularly during the winter (November - January), with the primary targets being musk deer and bharal or tahr (harvested largely for their meat).

Hunting should be controlled in accordance with the NPWC Rules (1974). While a total prohibition on musk deer harvesting is essential, it is unrealistic to attempt to enforce a ban on unthreatened species like the bharal and tahr. Local populations could sustain harvest rates of about 10% without harm; therefore some hunting under license is recommended for the trade-off it would bring in village co-operation. However, the practice of hunting with poisoned bamboo spears should be discouraged because it is unselective in the species killed, and snow leopard are equally vulnerable.

3. Livestock Depredation:

Livestock depredation by snow leopard is apparently not a significant problem, in contrast to livestock losses from the forest leopard (*Panthera pardus*). During our study we confirmed some 6 chauris (mostly calves) and a few goats were taken by snow leopard. Forest leopard losses for 1982 alone totalled over 10 yaks and cross-breeds, while jackal (*Canis aureus*) reputedly took at least a dozen goats. We have not confirmed snow leopard depredation since 1982, but the common leopard has killed up to 4 or 5 chauris within short time periods, and losses due to this predator constitute a problem. In response, the villagers set traps and have killed at least one cat.

The villagers did not seem to perceive the snow leopard adversely, but repeatedly expressed their desire to control the common leopard. Present losses, while significant, are not unacceptable, and the status quo seems appropriate. We would not recommend implementing a policy of compensation for losses, as it could easily be abused and may lead to subtle shifts in attitudes that would be difficult to control in the future. However, losses due to snow leopard could become worse at some time in the future. In addition to livestock damages, Dolphu village suffers from crop depredation by langurs. Special measures are not presently required.

4. Harvesting of Plant Resources

Wild garlic (*Allium*) or "jimbu" represents an important resource to local villagers who use it for personal consumption and trade as far away as Kathmandu. Present harvesting methods and levels are not detrimental, and continued use should be permitted. Jimbu is primarily collected by women during the months of June and July, and much of the harvesting is done south of the river, outside the park boundaries. A small area occurs within the park (Phukchang Khola). The same applies to the use of wild peach (*Prunus mira*). We are aware of no problem with the collection of medicinal herbs, but this should be verified.

5. Firewood and Forest Protection

Firewood is a precious resource for the Dolphu villages, who rely upon juniper stumps collected above the village in an area entirely within the park. Large stands of scrub juniper have been burned preparatory to extraction and removal. Many residents acknowledge the deteriorating fuel situation, but no corrective measures have been implemented. Rugged, dangerous trails preclude wood collection beyond Shimbu. We recommend that juniper be revegetated and that no improvements be made to existing trails into the gorge east of the village (see livestock grazing).

Timber for construction has to be hauled several miles, across the Langu River from the *Pinus wallichiana* forests that grow on the north-facing slopes of the valley. Given the high costs involved, tree felling for house construction does not appear to be a problem. Several villagers, including a number from Wangri, have slashed and burned large areas in the Sunduk Khola opposite Dolphu for potato fields. Neither of these areas are located in the National Park.

6. Livestock Grazing Practices:

There is no livestock grazing beyond Shimbu, 4 km east of the village because cliffs preclude upstream access even by goats. We strongly recommend that this situation be maintained unchanged; any improvement of the trail system would result in the introduction of livestock into previously untouched pastures, thereby adversely affecting native ungulate populations. While technically feasible, trail construction would be extremely costly; available funds are better allocated to improving existing rangelands.

7. Traditional Culture and Spiritual Sites:

Chynnath or Yablang peak (19,400 feet) is sacred to both Hindus and Tibetans. It should not be opened to mountaineering. Improvements, such as a shelter near the base of the mountain, are appropriate. The preservation and authentic restoration of the village gumpa is recommended.

8. Coordination with other HMG offices:

The DNPWC should coordinate management activities with other HMG offices, especially those responsible for local development and livestock management.

9. Administrative Facilities:

We see no need for the construction of a guard post at Dolphu, or for assigning Army guards to the area at the present time. This would be viewed adversely by local residents. Administration could be better achieved by the formation of a Panchayat committee, which could be chaired by the Warden of Lake Rara National Park (the nearest and logical DNPWC administration base).

10. Tourism/Trekking:

The area is presently closed to foreigners. The Langu Gorge is acknowledged as among the most forbidding terrain in Nepal (Tyson, 1969); trails are non-existent and precipitous cliffs block upstream access, making travel extremely hazardous. Rock-falls and landslides are prevalent. Trail development and improvement would adversely impair the fauna and flora. We therefore strongly recommend against developing the uninhabited portions of the Langu Gorge for trekking.

Dolphu and Wangri could serve as tourist destinations, but such development is long-term given the poor access and essential lack of necessary infra-structure and facilities (lodges, tea-houses etc).

B. Species Specific Management

Other than the measures recommended above, special protective measures for snow

leopard and their large prey are not judged critical at the present time. The species-specific measures listed below are designed to achieve management objectives previously identified. It is essential that the snow leopards of the Langu Valley not be viewed in isolation with those inhabiting other parts of the National Park (see below), and that park-wide surveys be given the highest priority.

While counterpart Karan B. Shah will submit recommendations on bharal management, we have taken the opportunity to provide our own below. These are not intended to supercede any he makes.

1. Snow leopard populations, prey species and their habitat are best protected by controlling hunting and by ensuring that livestock grazing of presently ungrazed rangeland is not permitted. As long as native ungulate populations persist at present levels, livestock depredation by snow leopard should not develop into a problem. The depletion of native prey species and retribution by livestock herders are judged as significant factors in the decline of snow leopard throughout the cat's range.
2. Snow leopard population trends should be monitored by undertaking sign surveys every 2 years, using carefully placed, permanent transects and standardized techniques. Surveys must be made during the late winter (February - March), and should follow the methodology developed during this study. We plan to prepare a handbook on survey methods, following the next phase of work.
3. Snow leopards can only be preserved by managing intact populations, i.e. by considering the population of the Shey-Phoksundo National Park and adjacent buffer areas as a single unit. Thus adequate management recommendations cannot be provided until a survey has been undertaken to determine the species' status and distribution in the Park-at-large. Integral to this investigation, is a survey of prey populations, competing predators such as the wolf (*Canis lupus*), habitat mapping and characterization, examination of habitat edge and interspersion, a determination of livestock grazing patterns, and examination of traditional man-wildlife interaction patterns with special emphasis on hunting, livestock depredation and grazing needs. Use of a habitat suitability model (Jackson and Ahlborn 1984) to evaluate habitat potential is recommended.

Such aspects as minimum population size, reserve (management area) size and configuration, genetic diversity, dispersal corridors and habitat suitability cannot be addressed solely from the Langu information base: a wider-ranging, comparative survey is an imperative requisite to the development of sound management recommendations.

4. Annual or biennial censusing of bharal and tahr populations should be undertaken in selected areas. This is the best way of alerting DNPWC to possible declines and provides the only sound means upon which to base the issuance of hunting licenses. Counts are best undertaken at two seasons: rutting season (December - January)

and the lambing season (late May - June).

5. The general inventoring of the fauna and flora should be continued.
6. Studies should be undertaken of the effects of burning on bharal and tahr rangeland before permitting local villagers to set fire to inner gorge areas.

C. Development of a National Snow Leopard Conservation/Recovery Plan

We strongly recommend that DNPWC develop a National Snow Leopard Conservation and Plan, in order to better manage this unique species, as well as its high mountain habitat. A draft plan requested by the IUCN Survival Species Service, Cat Specialist Group, is appended in Appendix A. It should be viewed as preliminary, and subject to comment from the appropriate HMG agencies; even more importantly, surveys need to be undertaken to confirm that the conservation problems identified in Appendix A are indeed the most significant ones.

Nepal has demonstrated its keen interest in conservation by establishing 6 mountain national parks. With one possible exception, all are too small or too populated by man to support significant snow leopard populations. Conservation of this species can only be achieved by protecting habitat through all means possible, including sound land-use and management outside the narrow confines of a national park. Large predators like the snow leopard are sensitive indicators of environmental quality; ecological homeostasis is strongly correlated with population size and land-use patterns. By addressing the needs of this rare species and its prey, the habitat requirements of many other plants and animals that share the same ecosystem are met. Thus a National Snow Leopard Conservation Plan would also protect other species.

A major factor in conservation is how the local people both perceive a particular species and how it impacts their local economy. As one Nepalese official put it, "Tigers and rhinos don't elect politicians - people do". People residing within the confines of a national park are a fact of life in Nepal, as well as most of the Himalaya. For centuries they have used its resources. Only by promoting land-uses whereby predators like the snow leopard can co-exist with man, can we hope to preserve this beautiful cat. Surveys are urgently needed to identify populations of snow leopard and large ungulate prey, to delineate potential conflicts and to determine specific conservation strategies.

The snow leopard stands as an internationally recognised symbol of the high Himalayan ecosystem. By promoting wildlife surveys as suggested above, Nepal not only confirms its commitment to conservation, but provides outstanding leadership in the region.