

OBSERVATIONS ON THE STATUS AND DISTRIBUTION  
OF SNOW LEOPARDS (Panthera uncia) IN NEPAL

By

Rodney Jackson

Bodega Bay Institute, 240 Fort Mason, San Francisco CA 94123

Snow leopards (Panthera uncia), first described in 1761 by the French naturalist Georges Buffon, are one of the world's least studied large cats. They are shy, well-camouflaged and usually nocturnal; consequently they are rarely seen and difficult to study in the wild. Snow leopards are usually seen above the evergreen forest belt in alpine grassland, near glaciers and on rocky scree or moraine. In Pakistan, they may descend as low as 1,500m during winter to oak scrub or spruce forest habitats.<sup>7</sup> Their typical habitat in much of the Himalaya, however, appears to be above the treeline in sparsely vegetated and dry alpine steppe.<sup>10</sup> Despite conservation efforts and endangered species status, the rare snow leopard continues to decline throughout much of its vast range.<sup>4</sup> The Himalaya forms the southern limit to the cat's range, where snow leopards are more numerous in the more remote inner ranges and valleys.

Except for a few isolated reports, little is known about the status and distribution of the snow leopard in Nepal. This report summarizes available information on this species' status

and distribution and presents the results of a survey I conducted in the Langu Valley of west Nepal during the winter of 1976-77. Also, persons knowledgeable on wildlife in Nepal were consulted to determine the extent of snow leopard populations.

#### STATUS AND DISTRIBUTION IN NEPAL

"Systematic" surveys have been conducted in three localities to date: the Langu Valley of the Mugu District,<sup>6</sup> the upper Bhoti Kosi Valley west of Rolwaling in the East Ramechhap District, and the Shey-Phoksumdo Lake area of Dolpo District.<sup>10</sup> Snow leopard sightings have been reported from many other localities, but they are difficult to substantiate because snow leopards, and their tracks, are easily confused with the more common forest leopard (Panthera pardus). While present information is inadequate to produce an accurate range map for snow leopards in Nepal, the species appears to be largely restricted to areas north of the main Himalaya, which is along the sparsely populated Tibetan border.

In eastern Nepal, snow leopards have been recorded in the vicinity of Mount Everest (now Sagarmartha National Park);<sup>2</sup> in 1972, Schaller<sup>8</sup> observed the tracks of an estimated three individuals near Lapche in the Bhoti Kosi Valley along the Tibetan border. Snow leopards reportedly occur in the mountains around Gauri Shankar, Kanchenjunga, Makulu, Walungchung, and the Arun Valley (Cronin and Fleming, Jr., pers. comm.). In central

Nepal, the species is likely to occur in the Buri Gandaki and Sajin Valleys of the Ganesh and Lamjung Ranges, Manaslu, and in the Annapurna and Dhauligiri massifs<sup>12</sup> (Fleming, Jr., pers. comm.).

→ With the exception of the latter two mountain ranges, no recent sightings have been confirmed. In 1977, a single set of leopard tracks was observed at an elevation of about 4,500m in Langtang National Park near the Tibetan border.<sup>3</sup> Since the area's inhabitants have not seen snow leopards in recent years, these tracks may have been made by an animal that visited from nearby Tibet. No other evidence to substantiate either the presence or absence of snow leopards in this newly established park was found by the Durham University investigators during their 14-month survey of the area.<sup>3</sup>

Existing data suggest that snow leopards are most abundant and widely distributed in parts of western Nepal, particularly the → Dolpo Plateau and the inner valleys of the Mugu District. Snow leopards occur in the Sisne and Kanjiroba mountains west of Dhauligiri and on the Dolpo Plateau to the north; they may also occur west of Mugu and north of the Humla Karnali in the Changla and Takh Ranges along the Tibetan border, and in the vicinity of the Saipal and Api Peaks in the far west, near the Indian border. Schaller,<sup>10</sup> in 1973, surveyed about 500 square kilometers around Shey Gumpa and Phoksumdo Lake on the eastern edge of the Kanjiroba Range in Dolpo. He estimated a minimum of six snow leopards utilized this area during the winter months; he also → concluded that these animals probably ranged widely because of

the area's limited food availability. None of the individuals were thought to be wholly resident in the area Schaller surveyed.

During the winter of 1976-77, I surveyed the remote and essentially uninhabited Langu Valley along the northern slopes of the Kanjiroba Range for snow leopards. This area is some 45 kilometers northwest of Schaller's study area. On the basis of tracks, scrapings, and hunters' kills, I estimate that a  
→ minimum of five snow leopards occupied an area of at least 400-500 square kilometers in extent.<sup>6</sup> Snow leopards in the study area evidently centered their activities on sparsely vegetated south-facing slopes between elevations of 3,000-4,800m where blue sheep (Pseudois nayaur), their primary prey, spend the winter months. A snow leopard was photographed at about 4,900m near the Jagdula glacier of the Sisne Range, immediately south of my study area in November of 1977 (Justice, pers. comm.).

It is extremely difficult to estimate the total snow leopard population in Nepal because few surveys have been undertaken and, therefore, very little reliable data exist. Using topographic maps of Nepal (1:250,000 scale), I have crudely estimated the range available to the species. This total is approximately 27,000 square kilometers. All areas above 3,000m in elevation were measured with the exception of areas of dense human population and isolated mountain massifs south of the main Himalaya. This estimate of available range is believed to be

accurate since it includes land areas above 6,000m that are rarely, if ever, used by snow leopards, as well as the more disturbed southern slopes of the Himalaya where very few individuals have been reported. Extrapolating the winter estimates for the Langu Valley<sup>6</sup> and the Shey-Phoksumdo area<sup>10</sup> to the cat's possible range over all of Nepal yields a population → "questimate" of 150-300 animals. Since both census areas are atypically remote and sparsely populated by humans, this total ? estimate may be optimistic.

Judging by the few encounters early Europeans had with the cat, → snow leopards have probably never been common. Burrard (1925) and Stockley (1936) note that most snow leopard encounters were ↪ along the northern slopes of the Himalaya and the edge of the Tibetan plateau, a pattern that persists to the present. To what extent Nepalese snow leopard populations have declined is difficult to determine, but the increasing scarcity of the species is reflected by fewer reports of snow leopard-related livestock losses in recent years. The species has apparently disappeared from parts of its former range; there have been, for example, → no sightings in the Everest area for at least two years despite the increased number of people visiting the area capable of identifying the species (Jefferies, pers. comm.). Nepalese shepherds interviewed recently in the Dhorpatan area southwest of Dhauligiri knew of no snow leopards, although this area still supports abundant blue sheep populations (Wilson, pers. comm.). Snow leopards were reported in this area several years ago.<sup>12</sup> This ↘ pattern of low snow leopard density and locally declining populations appears to hold for other parts of the snow leopard's range.

For example, snow leopard populations as low as four or five animals per 3,000 square kilometers have been reported for the Chitral region of Pakistan, where the species' status changed from tenuous to seriously threatened within four years.<sup>9</sup> Even in the rugged and remote Karakorum Mountains of Pakistan, snow leopards are rare.<sup>10</sup> Dang (1967) estimated the snow leopard population of the Himalaya complex to be "in the region of 400, give or take two hundred," but this figure is evidently low compared to my estimate for Nepal. Regardless, snow leopards are extremely rare in many parts of their range in Nepal, India and Pakistan.

#### CONSERVATION

X The primary factors in the snow leopard population decline appear to be (1) overhunting for pelts, (2) the reduction of ungulate prey herds, (3) the strong hunting traditions of many mountain tribes, and (4) increased use of alpine pastures by man and his livestock.<sup>4</sup>

X In the Langu Valley of West Nepal, I found that Bhotia tribesmen continue to hunt snow leopards despite substantial declines in the worth of the leopard pelts and the availability of musk deer, a potentially lucrative source of income.<sup>5</sup> Each winter, several dozen men spend two or more months poaching musk deer (Moschus moschiferus moschiferus), blue sheep, and an occasional snow leopard. Bamboo spears are set upright in the ground and the sharp tip is smeared with a potent, locally concocted poison.

Each spear is a highly effective weapon. Despite being a wide-ranging and nomadic species, snow leopards are vulnerable X to this hunting method because they habitually use the same trails to traverse their large home ranges. In order to circumvent impassable sections of the Langu Gorge, snow leopards rely heavily upon strategic trails, often ledges only a meter or \* less wide. Once poisoned spears have been placed in an appropriate place along a favored trail, it is simply a matter of time before a snow leopard springs from a rocky ledge, impaling itself on the spear or spears placed below.

Musk deer are the primary targets of the hunters since the musk extracted from the gland of an adult male deer (worth as much as \$250 (US) to the hunter) can supply a hunter and his family with one year's income.<sup>5</sup> Although musk harvesting and exporting was banned by the Nepalese government in 1973, this well-meant X legislation has unwittingly stimulated a thriving black-market by increasing the price of musk. Prior to the 1973 international ban on trade in the pelts of spotted cats by member governments of the Convention on International Trade in Endangered Species of Wild Fauna and Flora, snow leopard pelts were worth \$50 (US) or more to mountain hunters in remote west Nepal. By 1976, pelt prices had declined to around \$10 (US) and traders in India, the main market for Nepalese pelts, had become increasingly reluctant Y to trade in these illicit furs. Yet some Bhotias continued to hunt snow leopards, probably for the social esteem attached to killing such an elusive predator. In the Langu area at least,

snow leopards are not a threat to livestock according to local residents who have reported few losses.<sup>6</sup> In the areas studied to date, blue sheep are the most important item in the diet of the Nepalese snow leopards. Schaller reported that, of the 27  
× scats analyzed from Shey and Lapche, 50 and 73 percent, respectively, contained the hair of blue sheep; livestock remains were only found in 13 and nine percent respectively.<sup>10</sup> Blue sheep hair was present in 82 percent of the 17 Langu Valley scats I examined; domestic livestock hair was found in six percent.<sup>6</sup>

As a result of hunting, the Langu snow leopard population  
× declined an estimated 40 percent during the hunting season of  
? 1976-77. Although it may be replenished by immigration from the uninhabited and largely un hunted terrain to the east and north (along the Tibetan border), it is doubtful that such hunting pressures can be sustained for long.<sup>5</sup> Snow leopards are also hunted in other parts of Nepal; the use of poisoned stakes and pitfall traps is reported in areas as far apart as Dhorpatan and Makulu (Wilson, pers. comm.), and many mountain people still possess muzzle-loading guns. Leopards are heavily hunted near settlements in the Rasuwa District of the Ganesh Range.<sup>12</sup>

× Fleming (pers. comm.) attributes the disappearance of snow leopards from Sagarmartha National Park, not only to hunting, but also to the killing of cubs in discovered dens. The  
× depletion of blue sheep herds by poaching may be contributing to the rarity of snow leopards in the Manang and Annapurna areas.



χ Snow leopards are protected by the government of Nepal, but enforcement is hampered by poor communications, inadequate funds, and limited manpower to police the species' rugged habitat (Poppleton, pers. comm.). As wild ungulate populations decline, snow leopards will be forced to travel far in search of food or be forced to prey on domestic stock, thereby increasing their vulnerability to human retribution. With increasing human populations, shifts in traditional patterns of livelihood, and a weakening of Buddhist values, it appears inevitable that a shy and wary animal such as the snow leopard, which seeks wilderness and avoids contact with man, will decline and possibly go extinct.

Possible conservation measures include the development of large, ecologically intact sanctuaries and the promotion of viable forest, range and wildlife management plans under the control of village councils. With a system of carefully regulated land-use plans responsive to human needs, yet subject to ecological constraints, as well as the designation of a few reserves encompassing year-round snow leopard range, it should be possible to foster coexistence between man and snow leopard.

χ With the possible exception of Langtang National Park, snow leopards appear to be absent from Nepal's three mountain parks. Although recommended as a wildlife reserve, Shey has yet to be formally gazetted; in view of the pressing need for tourist trade revenues, poor accessibility and limited funds, the Shey

reserve is unlikely to be given a high priority. Its 400 square kilometer area is too small to afford year-round sanctuary to even a few snow leopards. However, enlargement of this proposed reserve may be justified by locally strong Buddhist influences that promise minimal molestation of the resident blue sheep herds. Other possible snow leopard sanctuaries may exist in the controlled hunting areas presently being developed in several regions of the Nepalese Himalaya.

The conservation of snow leopards is a formidable task since the species is wide-ranging and not easily confined within the protected boundaries of a preserve. Furthermore, the presence of villages within preserves or national parks is a fact of life in the Himalaya; however, these very villages could easily become the strongest guardian of each local snow leopard population provided a direct benefit existed between cats and man. To many tourists, snow leopards symbolize snowy expanses, immense solitude, and a rare wildness. A snow leopard at a kill in the awesome setting of a Himalayan national park provides a powerful tourist attraction. Basic research and the economic and technical resources of the developed world are needed for this dream to become a reality.

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Typical snow leopard habitat in the Langgu Valley of West Nepal (Dey  
inner valley where I suspect the major wild populations of the Himalayas  
remain). N79-6; N37-27; N28-25; N72-16; N11-22; N23-15.

Snow leopard tracks N60-7

Snow leopard scrapping/scenting in patch of snow on a pass. Dec 1976. N11-23

" " Scrapping on well-used snow leopard trail N200-25

" " "trail" above Dalphu village. About a foot wide, traversing a cliff  
- N200-18

Poisoned spears set along trail for snow leopard N38-33; N18-28. Usually  
set along strategic cliff trail. Animal jumps from ledge onto spear.

Tip of spear with poison N28-14.

Live-trap for snow leopard (N200-8). Constructed by Dalphu hunters.

Spear set along blue sheep (Bhawal) trail N216-27

Fires started by hunters to push muskdeer into trapped areas (N32-34  
and N29-14).

! Blue sheep N11-17; N216-34

Musk deer (♀) killed by poisoned spear. N43-16

Snow leopard (♂) killed by poisoned spears. Pelt removed N38-10

Snow leopard pelt — Shopa & Game Warden N50-3

Local hunter/trader N75-20

Musk deer/blue sheep pelts at hunter's camp N16-27

Dalphu village N4-19

TOTAL 25 SLIDES  
(ORIGINAL SPARES)