

THE SNOW LEOPARD (*Uncia uncia*, Schreber 1776) IN SIBERIA

M.N. Smirnov, G.A. Sokolov, A.N. Zyryanov

Institute for Hunting and Fur Industry; Siberian Department, ul. Tsernysevskogo 92, 660043

Krasnojarska 43, USSR

ABSTRACT

In the area inhabited by the snow leopard in Siberia at present consists of three major centres which are not separated from each other: Altai, Western Sayan and Eastern (Central) Sayan. In the last 25-30 years snow leopards have become somewhat more frequent in the region than earlier, the total population is now about 80 individuals.

If the snow leopard and the entire complex of mountain habitat are to be protected in addition to the already available reserves, the Sayan Reserve must be restored and another formed in Eastern Sayan .

The snow leopard is one of the rarest animal species in Siberia, recorded in the Red Data Book of the USSR (1984) and RFFSR (1985)

As much as 200 years ago the range of the species extended from the Altai mountains to the sources of the Lena river. At the turn of the last century the snow leopard was to be found only in the Altai mountains and the regions of Western Sayan bordering on them (Dulkeit 1970, Heptner & Sludsky 1972). The so far scanty knowledge about the snow leopard within the limits of this region is due not only to its great rarity, but also to the extremely difficult access to its habitats. Therefore, we regard even fragmentary evidence, and records of every observation of an animal or its tracks as worthy of attention and publication.

We have been collecting evidence of the snow leopard's distribution and biology for the last 30 years in field research of large mammals during expeditionary and stationary observations practically in all the large orographic formations of the region except for the extreme west. Our data were in part obtained by interviewing experienced professional hunters, and scanning the available literature.

The range of the snow leopard is known to lie mainly beyond the limits of the USSR and in Siberia along the extreme N-E edge of the region. Because of the very severe environmental conditions (including the not very abundant food resources) the snow leopard is unlikely to have been numerous in our region even in the remote past. However, it should be mentioned that its main objects of prey, the Siberian ibex (*Capra ibex sibirica*) and the argali (*Ovis ammon*), were many times as common as they are now (Smirnov 1983), and the snow leopard seems to have been a widespread animal. However, the population, never reached the size likely to be found in a fossil state. None of the numerous published lists of archeological and palaeontological finds from Siberia, that we have examined mention snow leopard bones in the deposits of the Iron, Bronze or Stone Age. It is curious that no bones of snow leopards have been found even in the kitchen refuse at the dwelling sites of ancient man in the Western Sayan adjacent to typical habitats of the ibex, whose bones are the most numerous parts in such refuse (Vassilyev 1986). Nor is there any palaeontological evidence of *Uncia* in its habitats elsewhere (Heptner & Siudsky 1972). Nevertheless, among the petroglyphs found in the low mountains of southern Siberia, which experts attribute to the Neolithic and Bronze Ages (Okladnikov, Zaporozhskaya 1970), there occur drawings of the snow leopard, which beyond any doubt indicate their commonness in these regions. According to both Bannikov (1954) and Grachev & Fedosenko (1977) in the remote regions of Mongolia and Kazakhstan even in the middle of the backwards century, snow leopards were to be found at all times of year in the low rocky mountains 600 - 700 m above sea level, where they were relatively more numerous than higher up in the mountains. We think that the present habitats of the snow leopard, as of many other wild animals in Siberia, are not optimal and should be attributed primarily to man's activities. Apparently, the snow leopard was eliminated from the regions around Lake Baikal before the ibex and argali. Ibex still inhabit the Tounkin and Kitoi Alps, but there is no evidence of the snow leopard in these areas during the last 100- 150 years (Smirnov 1988a, b, c). In the middle of the 19th century Radde (1862) wrote that while travelling across the eastern part of the Sayan, Baikal mountains and Transbaikalian regions, he never saw a snow leopard and never heard anything about it from the local people. The rarity of the snow leopard in the neighbouring Touva in the late 19th century is indicated by the fact that the list of fur prices did not include any mention of snow leopard skins (Afrikanov 1890), but in the list of taxes paid by the Touvinians to the Chinese authorities the skins of the snow leopard were at the end of the list of 9 kinds of fur (Carruthers 1914).

Today, in Siberia, the snow leopard is found only in mountain massifs predominately in the subalpine and alpine belts. In the last 30 years their tracks have not been seen regularly on the southern slopes of Udinsky and Yergak-Torgak-Taiga ridges, and less frequently in the Kourtoushibinsky, Academic Obruchev Western Tannu-Ola, Tsagan-Shibetu and Mongoun Taiga ridges (Table 1). The snow leopard occurs in the mountains of the western part of Western Sayan (Sayansky, Khemchiksky, the Saylyk-Khem-taiga). This is the Sayan Shushensky reserve, where the snow leopard density is 0.1/1000 ha (Zavatsky 1988). In the Altai, the snow leopard is relatively more numerous (Sopin 1977) in the Katounsky, north and south Chuysky, Kouraisky and Chulyshmansky ridges. The population density is close to the above mentioned (0.08/1000 ha).

The Bashkaus river basin is inhabited by several snow leopard families, which total 13

Table I.

Occurance of snON leopards and its tracks in Siberia (1958-88)

YEAR	LOCATION		N. INDIVIDUALS		REFERENCES
	Int. ,ridge	River ,basin, lake	Ind.	Tracks	
1960	Bentey	Chikoi r.	1(killed)	-	Baranov,Boiko, 1988
1973.		Henza r.	1.		Shvetsov et al.1984
1973	Udinsky	Kizhi-Khel r.		1	Ochirov,Bashanov,1975
1973				1	ONn data
1958	Acadelic Obrouchev	Uzhep r.	1		Ochirov,Bashanov,1975
1972	• •	Kaa-Khel r.	1	-	Nik iforov, Shourygin, 1977
1985	Tannu-ola	Sagly r.	2(killed)	-	OND data
1984	Tsagan-Shibetu	Kargy r.	1	-	Shourygin,1988
1974	Morgun-Taiga	Kara-Beldyr r.	1(killed)	-	Ochirov,Bashanov,1975
1971	Yergak-Torgak-Taiga	Systyg-Khel r.	1	-	Nikiforov,Shourygin,1977
1972	• • •	Kazas r.	-	1	own data
1973	• • •	Chavash r.	2	-	ONn data
1975	• " "	Systyg-Khen r.	-	1	OND data
1981	•	Kazir r.	-	1	ONn data
1983	"	Kazir r.	-	1	ONn data
1988	• " •	Aina r.	-	1	own data
1987	Kansky	Pezc r.	1	-	OND data
1979	Kourtoushibinsky	Gagulskyer lakes	1(killed)	-	ONn data
1960	Sayan	Haliye Ury	1	-	OND data
1978-85	Sayan	Haliye & Bolshiye Ury 7 18 Zavatsky,1988			
1983	Khelchinsky	Bolshiye Ury r.	1	-	ONn data
1987	Khelchinsky	Aldy- Ishkin r.	-	1	OND data
1960	Sailyg-Khel-Taiga	Ulug-Hungash			
		Khol-lake	1(killed)	-	OND data
1983	■ ■ ■	Ona r.	1	2	ONn data
1987	• • •	Aksu r.	1	-	OND data
1984,86	Kuznetsky Ala-Too	Bely lyus r.	-	3	ONn data
1960	Southern Chuya	Argut r.	1	-	Bondarev, 1988
1969	• • •	Irbistu r.	1	-	Bondarev,1988
1972	Gorny Altai Aitynkal	Karakoul r.	-	1	Geits,Makarov,1977
1972	■ ■ ■	Katun r.	1(killed)	-	Geits,Hakarov,1977
1974	• • •	Chuya r.	1(killed)	-	Geits,Hakarov,1977
1976	Abakansky	Koksha r.	1	-	Geits,Hakarov,1977
1968-75	Kuraisky,Chulya shansky	Bashkaus r.	7(killed)	-	Sopin,1977
1974-75	Chikhacheva,Talduair	Chuya r.	-	3	Sopin,1977
TOTAL			38	34	

individuals (Bondarev 1988).

From the published evidence and the information which we have collected (Table 1) we conclude that today the snow leopard occurs permanently in the following ridges:

1. S and S-E Altai (Western Sayan Centre)
2. Sayansky, Khemchiksky, Saylyg-Khem-Taiga (Western Sayan Centre)
3. Yergak-Torgak-Taiga, Udinsky (Central Sayan Centre).

All these centres are well stocked with wild cloven-hoofed animals. Within the limits of the Altai centre the density of the Siberian ibex is up to 40 animals/1000 ha, and of the argali 8.5/1000 ha (Sopin 1977). In the second centre the density of the ibex is 25/1000 ha (Zavatsky 1988). The Siberian ibex is quite a feature of the landscape of the third centre, red deer (*Cervus elaphus*) are numerous in all three centres and snow cocks (*Tetraogallus altaicus*) are not infrequent. Incidentally, according to our evidence, the snow leopard successfully hunts young red deer (in November 1988 a snow leopard killed a yearling in the Aina river basin), and it pursues reindeer (*Rangifer tarandus*) (observed in 1983 in the Bagra river in the Kazir basin). Recently we were informed that in 1985 two snow leopards killed a young domestic yak (*Bos grunniens*).

The southern edge of the Altai Centre adjoins the area of the snow leopard from the Mongolian Altai. From here, as well as from the Mongolian part of the Tsagan-Shibetu ridge leopards penetrate into Touva - the Mongun- Taiga mountains and the western Tannu-Ola mountains, which seem to have no permanent populations of snow leopards. From the Mongolian territory out of the Khorhdil-Sarhdag ridge the animals come into the Academic Obrouchev ridge too, and the snow leopard population of the Mongolian Hantey "allows" migrants into the S-E Transbaikal region. The centres in the USSR territory are not isolated from each other, either this is proved by the occurrence of the animals on the Shapshal and Kurtushibinsky ridges. Of special interest is the occurrence of the snow leopard in recent years (1984-1988) on the Kuznetsky Ala-Too and Kan ridges. In this light, Radde's report (1862) that no snow leopards were seen in the area around Krasnoyarsk in the middle of the last century - a statement which Heptner & Sludsky also doubt (1972), is surprising. It is a fact that snow leopards regularly enter Belyi Lyus (Kuznetsky Ala-Too), Chikoi (Northern Hentey), Bii-Khem (over the Academic Obrouchev ridge) and also occur around Krasnoyarsk. Siberian ibex and argali inhabit these regions (Smirnov 1983), and snow leopards in search of prey follow them into these areas. As if the memory of the genus *Uncia* manifests itself, the snow leopard tends to reoccupy those regions where it occurred in the past.

The present data on the occurrence of the snow leopard and its tracks indicate, in our view, a relative increase of its distribution, especially in the last 25-30 years. This can be attributed to a certain increase of prey species in the region, particularly of the red deer (Sokolov 1979, Smirnov 1988). On the other hand, the more frequent reports of the snow leopard may be due to the deeper penetration of people into areas that were earlier inaccessible as a result of the expansion of commercial hunting and tourism. In evaluating the total population

of snow leopards in Siberia, account should be taken of the estimate of the snow leopard population by Sopin (1977) in the Altai Centre (40 individuals) and by B. P. Zavatsky (1988) in the Western Sayan Centre (20 individuals). In the Central Sayan Centre there are unlikely to be more than 15 animals. Thus we can assume that, including the animals visiting Mongolia, the Siberian territory has a maximum of 80 snow leopards.

No doubt, the prospects of the snow leopard in Siberia would be good, were it not for the barbarous attitude of people towards it. This is also to some degree evidenced by Table 1 - of the 38 snow leopards seen, 16, or roughly half were shot (data from the Sayan-Shushensky reserve; Zavatsky 1988).

One of the constructive measures to conserve the snow leopard would be to establish new guarded territories (Smirnov 1988, Sokolov 1988). The establishment of an Eastern Sayan Reserve in the basin of the Oka river, as already recommended, would be of great importance for the snow leopard population in the whole Baikal region. This is also confirmed by the increase in its population in the biogeocoenoses of the Sayan-Shushensky Reserve formed in 1976. The reserve provided facilities for breeding the animal in semi-captivity to release it into the guarded landscapes. The Sayan Reserve, which should include the Udinsky ridge and the Yergak-Torgak-Taiga ridge (Sokolov 1988), must be restored.

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