

THE SNOW LEOPARD, *PANTHERA UNCIA*, IN CAPTIVITY
AND THE 1977 WORLD REGISTER

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In the autumn, 1976, the Helsinki Zoo took over the responsibility of keeping the Snow leopard studbook (1). Questionnaires were sent to all the Zoos keeping this species; the information requested included: number of Snow leopards, house names, dates of birth and parents, or place and date of capture, together with details regarding the arrival of the animals at respective Zoo. Furthermore, date and cause of death, and information on animals transferred to other Zoos was requested. Each Zoo was also asked for a list of all the animals which had ever been in the Zoo's possession, including those which had been transferred or died.

For the studbook to be kept up to date, it is essential that the studbook keeper should be kept informed at all times of the present situation, and the Zoos are, therefore, requested to report exchanges of Snow leopards, either as breeding loans, transfers, or sales. A questionnaire will be sent annually and it is to be desired that this should be completed and returned promptly.

The animals, here included, have been given a studbook registration identification, including the name of the Zoo where they were born or first received after capture, and a number, indicating the order in which the animals had been received at that Zoo. All wild-caught animals were registered on arrival, captive-born animals were not registered before the age of six months, although cubs that had died before this date are noted in the studbook of both parents.

Altogether 328 Snow leopards have been registered (2), of which 169 were alive on the 31st of December 1977, Table (3). The earliest registered animal is one that was received at the London Zoo in 1891. The oldest known male Snow leopard was the male "Akbar", Copenhagen 4", born in the Copenhagen Zoo in May, 1958. This male, which arrived at Lincoln Park via an animal dealer from Brockfield, was

recorded as wild-caught in LPZ and got the house-name of "Walter". The author also first registered him as "Walter, LPZ 2", but later on I have found out that this is the same animal that was born in Copenhagen on the above mentioned date. However, when I found this out, I no longer wanted to change the whole registration system for LPZ, as the studbook had already been sent to all Zoos, keeping Snow leopards. "Walter, LPZ 2" died in March, 1978, thus reaching an age of almost 20 years.

LIFESPAN

Jones mentions an average lifespan of 5.2 years and a maximum length of 13 years for Snow leopards during the period 1955-1970 (3). A lifespan of 17-19 years among the wild-caught specimens has been reported from Lincoln Park (4), and Crandall states a period of 6-8 years (5), while Marra et al. report a maximum of 11 years from Kaunas (6). Blomqvist, on the other hand, showed that one of the females from Kaunas Zoo, "Ramune, Kaunas 1", lived for almost 17 years (1).

Of the more than 150 Snow leopards, which were zoo-born and reached the age of half a year, the average for the males is 4.7 years and 4.1 for the females. However, it has to be taken into account that most of the zoo-born animals were born in the 1970's (Table 1, Fig. 1) and thus still rather young. This is the reason why the known lifespan of the zoo-born animals is that short. If we add the wild-caught Snow leopards, of which we know the approximate year of birth, to the zoo-born ones, the average lifespan of the males and females increases to 6.4 and 6.9 years, respectively. In the Snow leopard register (2), there is a number of animals captured in the 1960's that are still alive. The age of these animals would also increase the average length of life.

Knowledge of the lifespan is important to the management of the captive population, as far as it relates to the length of reproductive life. The age of the female at 1st birth, death, and last reproduction are known for 12 Snow leopard females (Table 2). The average length of these females was 9.5 years, while the average

at the time of the last birth was 6.9 years. None of these females was reproductive beyond 11 years but, for example, the first wild-caught female at the Helsinki Zoo, "Vilma, Helsinki 1", which arrived as adult in 1964, gave birth to her last litter in 1974 at an age of at least 13 years. Another female, "Lhasa, Brookfield 2:", which arrived at Brookfield as wild-caught in 1963, gave birth to 1 cub in 1976. At that time, she must at least have been 13 years old but, unfortunately, I do not have any information about her age upon arrival at Brookfield. The father of the male cub was "Ikaz, Brookfield 1", which arrived at Brookfield at the same time as "Lhasa, and "Ikaz" sired the cub at an age of at least 13 years.

BIRTHS

The first post-war birth was reported from Copenhagen in 1956 through the successful breeding of "Hassan, Copenhagen 1" and "Muddi, Copenhagen 2". The female cub (born in 1956) died but the male "Tamerlan, Copenhagen 3", lived for almost three years in Copenhagen. From the studbook material it can be observed that the 138 litters born after the war produced 234 cubs, of which only 155 (54,6 %) of these cubs reached the age of six months (Table 1). The mortality of the new-born cubs is also very high and, during the period of 1956-1977, only 49,7 % of the cubs lived long enough to be registered. Fig. 2 shows that half of the births have been recorded in May, 23,2 % in June, 14,5 % in April, 9,2 % in July, 2,9 % in August and 0,7 % in March and September. This information is in accordance with earlier data. Helen Freeman reports 62 % of the births occurring in May, 21 % in June, 9 % in April and 6 % in July (7, 8, 9). Of the 19 births, recorded in the Helsinki Zoo between 1967-1976, 36,8 % were born in May (10). The sex ratio of the zoo-born animals is 10 males/11 females.

Most of the females that have given birth, have been at least 4 years old but some exceptions are to be found. "Valma, Helsinki 20", born in the Helsinki Zoo in April, 1974, gave birth to two cubs in Krefeld Zoo, where she had been transferred the previous

year, 1976, at an age of 25 months. Both cubs died but the next year, 1977, when "Valma" was three years old, she gave birth to one pair of cubs, of which the female, "Irina, Krefeld 6" still lives in the Krefeld collection. Another female from Helsinki, "Venla, Helsinki 6", born in 1971, gave birth to her first litter, sired by an imported male from Lincoln Park in 1974, at the age of three years (10). Both cubs were successfully reared by "Venla"; one was exchanged with a male from Cincinnati in the autumn of 1977, the other one, also a female, still lives in the Helsinki Zoo. The female, "Elektra, Oklahoma 14", born in OKCZ in 1974, also gave birth to a litter, comprising 2, 1 cubs in 1977, but two of the cubs were killed by the mother and the third died during attempts to hand-rear it in July, 1977 (personal comm. by Linda Turner). The females, "Tippy, Bronx 19", "Lara, Cheyenne 5", "Ili, Moscow 5", and "Anastasia, LPZ 13" have also been reported to have given birth to their first cubs at the age of three years.

LITTER SIZE

Of the 138 litters born, 22 % (31 litters) consisted of one cub only, 48,5 % of 2 cubs (67 litters), 26 % (36 litters) of three cubs, while four cubs have been born in only three litters. In 1978, one of the zoo-born females from LPL, died during pregnancy because one of her four cubs was positioned abnormally in the birth canal (personal comm. by Mark Rosenthal). This is the fourth case reported of a litter comprising of four cubs. However, it is to be noted that in none of these litters all four cubs have ever survived. In the Helsinki Zoo, the average litter size has been 2,2 cubs/litter (10), while it was 1,03 in the Kaunas Zoo (6). Freeman reports 2 cubs/litter in 43 % of the births, 21 % consisted of 3 cubs and in 6 % of the births, 4 cubs were born. Freeman's data are based on a questionnaire, distributed to 12 Zoos where 33 litters had been born (9). Jones has reported a litter size of 2 cubs/litter in 53 % of the births and 1 cub in 20 % of the cases (3).

THE SITUATION IN 1977

The Tables 1 and 3 show that 50 cubs were born to 27 females in 19 different Zoos in 1977. One of the births was, however, recorded as that of a wild-caught female which was pregnant at arrival at the Zoo. This female was the only wild-caught animal in 1977.

Of the 50 cubs, born in 1977, only 23 (7, 16) lived long enough to be registered, the mortality being as high as 46 %. Of the females giving birth in 1977, ten were wild-caught and 17 zoo-born. It is very encouraging to note that also zoo-born animals are able to reproduce, especially, when studying Fig. 1 and Table 1. The number of zoo-born animals has increased during the last years, with a special peak in 1977. The question, whether wild-caught animals are better breeders than the zoo-born ones, was raised during the First International Snow leopard Conference in Helsinki in March 1978, where the opinion was that the zoo-born females did not reproduce as well as the wild-caught ones. This doubt has, however, been proven unfounded and thus, the future of the Snow leopard in captivity looks quite promising. By using the material we have in different Zoos today, in the way recommended by the attendants of the First Conference, there is no need to import wild-caught specimens of this extremely rare species from the wilds (12).

TABLE 1. NUMBER OF LITTERS BORN BETWEEN 1956-1957

Year	Births	Litter size	^e Rached 6 months' age
1956	1	1,1	1,0
1957	1	1,1	-
1958	1	1,1	1,0
1959	1	2,1	2,1
1960	3	4,2	3,2
1961	1	2,1	-
1962	2	2,3	-
1963	1	1,2	-
1964	1	1,1	1,1
1965	1	4,0	-
1966	4	5,4	5,2
1967	8	6,11,3	3,3
1968	4	4,4	3,4
1969	8	7,9	4,6
1970	6	3,8,1	0,3
1971	7	6,4,1	5,3
1972	10	10,10,3	6,7
1973	11	8,12,3	5,9
1974	12	7,15,2	6,12
1975	16	19,12,3	13,7
1976	13	11,11,2	8,6
1977	26	19,26,5	7,16
Total	138	124,139,21	73,82

TABLE 2. LIFESPAN AND AGE AT LAST REPRODUCTION OF SNOW LEOPARD FEMALES. THE FIGURES WITHIN THE PARENTHESIS INDICATE AGE IN YEARS.

Name, reg. no.	Born	Died	Last litter
Maroesjka, Amsterdam 1	1965	1970 (5)	1969 (4)
Tippy, Bronx 19	1972	1975 (3)	1975 (3)
Lära, Cheyenne 5	1974	1977 (3)	1977 (3)
Copenhagen 7	1959	1970 (11)	1967 (8)
Dallas 2	1962	1975 (13)	1967 (5)
Natasha, Edmonton 4	1964	1978 (14)	1975 (11)
Tanya, LPZ 1	before 1957	1972 (15)	1967 (10)
Ida II, LPZ 3	before 1964	1973 (9)	1973 (9)
Big Head, LPZ 7	1969	1978 (9)	1978 (9)
Tanya, Oklahoma 2	1961	1977 (16)	1968 (7)
Caterina, San Francisco 5	before 1964	1972 (8)	1971 (7)
Frisco, San Francisco 6	1969	1977 (8)	1976 (7)

TABLE 3. 1977 WORLD REGISTER OF SNOW LEOPARDS IN CAPTIVITY

Location	Total 1976	Births	Deaths	Transferred to	Transferred from	Total 31.Dec.1977
Alma-Ata, USSR	2,3		0,1			2,2
Arnhem, Ne.	1,1	1)				1,1
Basle, Switz.	0,1			0,1 Zürich (loan)	0,1 Zürich (returned)	0,1
Bekesbourne, GB (Chicago, LPZ 1,1)	1,1	1,1				2,2
Tierpark Berlin, GDR	1,2		0,1			1,1
Zoo Berlin, GFR	1,1		1,1			-
Buffalo, USA	1,1		1,0			0,1
Calgary, Can.	1,0					1,0
Center Hill, USA ⁺	1,1					1,1
Cheyenne, USA	2,3	6,1	5,2			3,2
Chicago, Br., USA ⁺ (W. Orange 1,0)	3,2					3,2
Chicago, LPZ, USA (St. Louis 1,0)	4,4	0,3	1,3		1,0 Milwaukee (loan)	4,4
Cincinnati, USA	1,1				1,0 San Diego 0,1 Helsinki 0,1 Columbus	2,3
Columbus, USA (Cincinnati 0,1)	1,1		1,0	0,1 Cincinnati		-

+ No reply to questionnaire

1) Birth recorded but cubs eaten by mother

Location	Total 1976	Births	Deaths	Transferred to	Transferred from	Total 31.Dec.1977
Cleveland, USA	0,1					0,1
Denver, USA (L.Angeles 0,1)	1,1			0,1 L.Angeles (returned)	0,1 L.Angeles (loan)	1,1
Detroit, USA (Milwaukee 1,0)	2,2					2,2
Dushanbe, USSR ⁺	1,1					1,1
Dvur Kralove, Cz.	1,1					1,1
Edmonton, Can ⁺	1,1					1,1
Hannover, GFR	1,1					1,1
Helsinki, Fin.	6,10	0,3	1,2	0,1 Marwell 0,1 Cincinnati	<i>San Diego</i> 1,0 Cincinnati	6,9
Houston, USA	1,1	1,0	1,0			1,1
Kaunas, USSR	3,1	0,2				3,3
Krefeld, GFR	1,2	1,2,1	1,1,1			1,3
Leipzig, GDR	1,2		0,1			1,1
Leningrad, USSR	1,1	0,0,1	0,0,1			1,1
Los Angeles, USA	1,1	0,1		0,1 San Francisco 0,1 Denver (loan)	0,1 Denver (returned)	1,1
Marwell, GB	-				0,1 Helsinki 1,0 Portland	1,1
Milwaukee, USA	4,2	1,1		1,0 LP2 (loan)		4,3
Moscow, USSR	2,2	1,0		1,0 Rostov-on-Don	0,1 wild-caught 0,1 Tallinn (loan)	2,4
Shanien, GFR	1,1					1,1
Soyaya, Jap.	0,1					0,1

Location	Total 1976	Births	Deaths	Transferred to	Transferred from	Total 31.Dec.1977
New York, Br., USA (Chicago, LP 1,0 Cincinnati 1,0)	2,2		0,1			2,1
Novosibirsk, USSR ⁺	2,3		0,1			2,2
Oklahoma, USA	5,5	2,1,2	2,2,2			5,4
Omaha, USA (Seattle 1,0)	2,3	2,0	2,1	1,0 S.Antonio (loan)	1,0 Seattle (loan)	2,2
Peking, China	2,2		0,1			2,1
Pittsburgh, USA	1,0					1,0
Portland, USA (Seattle 2,0)	2,0			1,0 Marwell (loan)	0,1 Seattle (returned)	1,1
Prague, Cz.	1,2					1,2
Rochester, USA	1,0					1,0
Rostov-on-Don, USSR	0,1		0,1		1,0 Moscow	1,0
Rotterdam, Ne.	1,1					1,1
San Antonio, USA (Seattle 1,0)	3,4	2,3,1	1,0,1			4,7
San Diego, USA (Cincinnati, 2,0)	2,0			1,0 Helsinki 1,0 Cincinnati (returned)		-
San Francisco, USA	1,1		0,1		0,1 L.Angeles	1,1
Seattle, USA	2,5	0,5		0,1 Portland (loan) 1,0 Omaha (loan)	1,0 Omaha (loan)	2,5
Tallin, USSR	1,1	2,1	3,1	0,1 Moscow (loan)		-
Tskkent, USSR ⁺	1,1					1,1
Winnipeg, Can.	1,2	0,1	0,1			1,2
Zurich, Switz.	1,5	0,3	0,2	0,1 Basle (returned)	0,1 Basle (loan)	1,4
Total	79,88	19,26,5	20,24,5			78,91

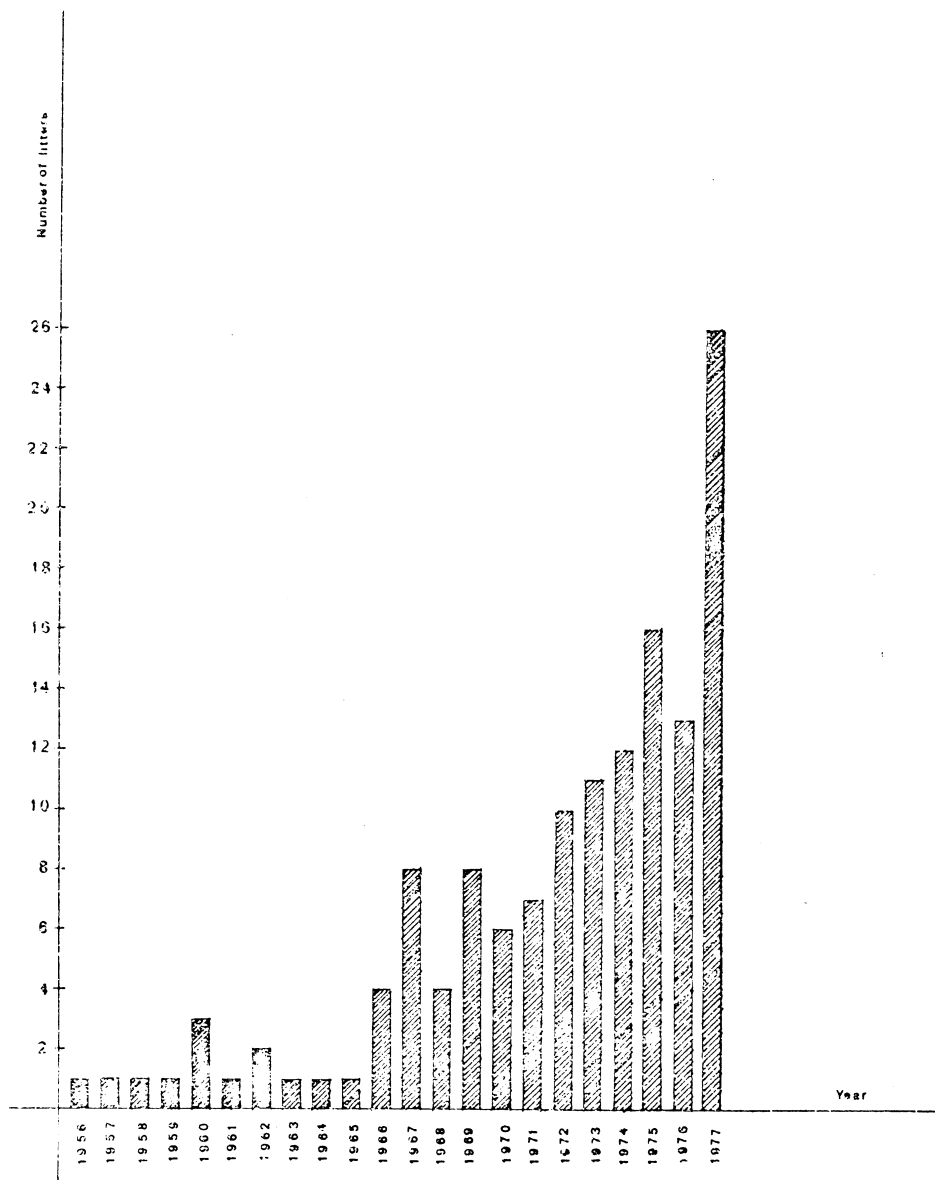


Fig. 1. Number of litters born between 1956-1977

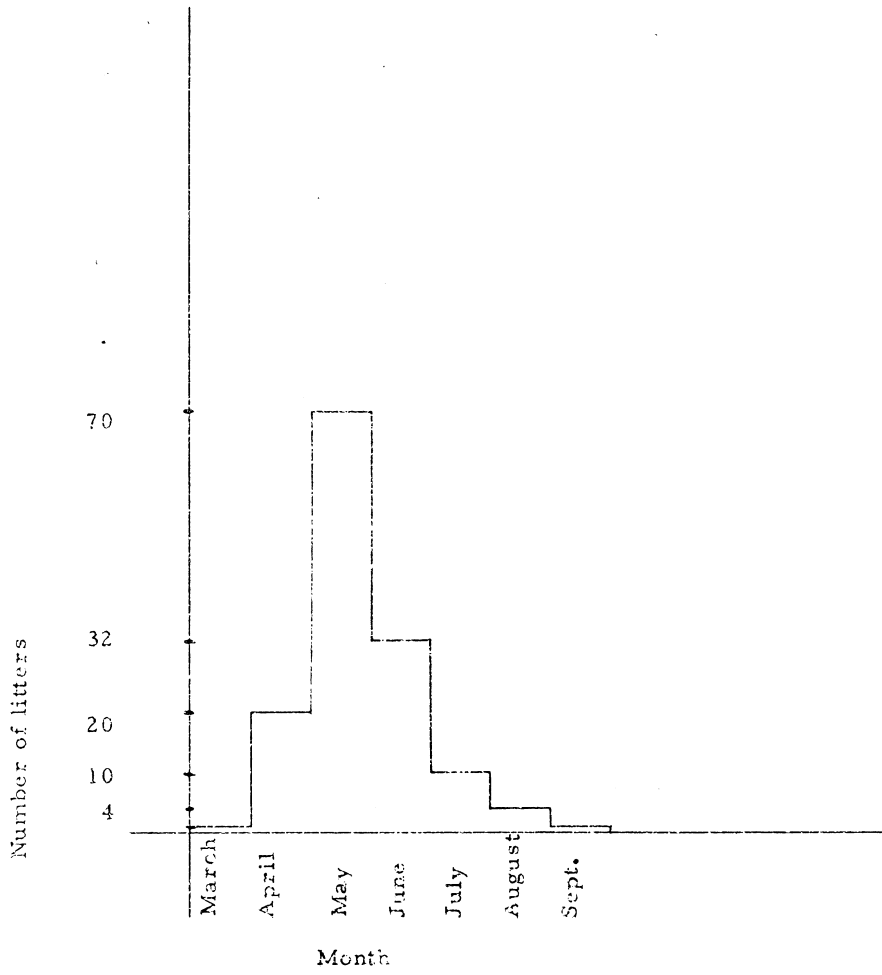


Fig. 2. Month of birth for Snow leopard cubs, born between 1956-1977.

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