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Leif Blomqvist

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Compiled and edited by:
Leif Blomqvist
EEP Coordinator for Wolverines
leif.blomqvist@nordensark.se

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Foreword

This studbook volume contains, in addition to a status report and the studbook, also a paper on tick infestations among captive wolverines. With global warming, ticks have become an increasing health problem issue in several zoo collections. I have therefore found it important to pay attention to possible tick-borne diseases and included the results and conclusions of a survey among EEP holders in 2015-2016 into the studbook.

The studbook contains data of 336 (147.154.35) wolverines living in captivity prior to 1.1.2016 as well as updated data of 16 (8.4.4) kits born 2016.

I would like to thank all institutions that have provided information in order to publish the 5th. edition of the studbook. My special thanks go to David Barclay at Highland Wildlife Park in Kingussie, Scotland for his valuable comments of the earlier draft of the manuscript and to Ola Jennersten who has donated the front cover of a wild wolverine from Finland.

Nordens Ark in October 2016

Leif Blomqvist

" The wolverine is a tremendous character…. a personality of unmeasured force, courage, and achievement so enveloped in a mist of legend, superstition, idolatry, fear, and hatred, that one scarcely knows how to begin or what to accept as fact."

Ernest Thompson Seton
from *Lives of Game Animals:* Vol. II, 1925-1927

Wolverine EEP Species Committee

Leif Blomqvist, Nordens Ark, Hunnebostrand, Sweden. (leif.blomqvist@nordensark.se)
Jamie Craig, Cotswold Wildlife Park, Burford, U.K. (jamiecraig@cotswoldwildlifepark.co.uk)
Tatyana Kotova, Moscow Zoo, Moscow, Russia. (t.kotova@moscowzoo.ru)
Thomas Lind, Kolmården Zoo, Sweden. (thomas.lind@kolmarden.com)
Linda Törngren, Skansen Zoo, Stockholm, Sweden. (linda.torngren@skansen.se)
Carsten Zehrer, Tierpark Hellabrunn, Munich, Germany. (carsten.zehrer@hellabrunn.de)

Twenty Years of Joint Wolverine Management in Europe

Leif Blomqvist

EEP Co-ordinator for wolverines
Nordens Ark, Hunnebostrand, Sweden

leif.blomqvist@nordensark.se

1. Status Of Wild Population In Fennoscandia

1.1. On the brink of extinction 50 years ago

Historically wolverines had a widespread distribution throughout Fennoscandia and eastern Europe occurring as far south as in Estonia, Lithuania and the north-eastern parts of Poland (*Landa et al. 2000*). During the last century the species disappeared from the southern parts of its former range and like most large carnivores in Europe, the Fennoscandian population also suffered from large range collapses. In the Nordic countries the species was thus forced to retreat to the most uninhabited and remote upland areas in the 1960s and 1970s. Wolverines were considered almost extinct in southern Norway by the end of the 1960s, with severe declines also in Sweden and Finland. The species was legally protected in Sweden in 1968, to be followed in 1973-1983 in Norway, and in 1978-82 in Finland.

The protection has played a major role in the species' recent comeback on the Fennoscandian peninsula but the recovery has been slower than that of the other three large carnivores of northern Europe. When large scale monitoring was established in the mid-1990s, the population estimates for the three Nordic countries barely exceeded 500 individuals. Due to the adherence of Sweden and Finland to the EU, wolverines are today protected under the EU's Habitat's Directive (Annexes II and IV) and in all three Nordic countries also under the Berne Convention (Appendix II). An Action Plan for wolverine conservation in Europe was published in 2000 (*Landa et al. 2000*) and the distribution of wolverines is illustrated in Figure 1. According to the regional Red Data Books, wolverines are currently listed as VU in Sweden, EN in Norway and CR in Finland.

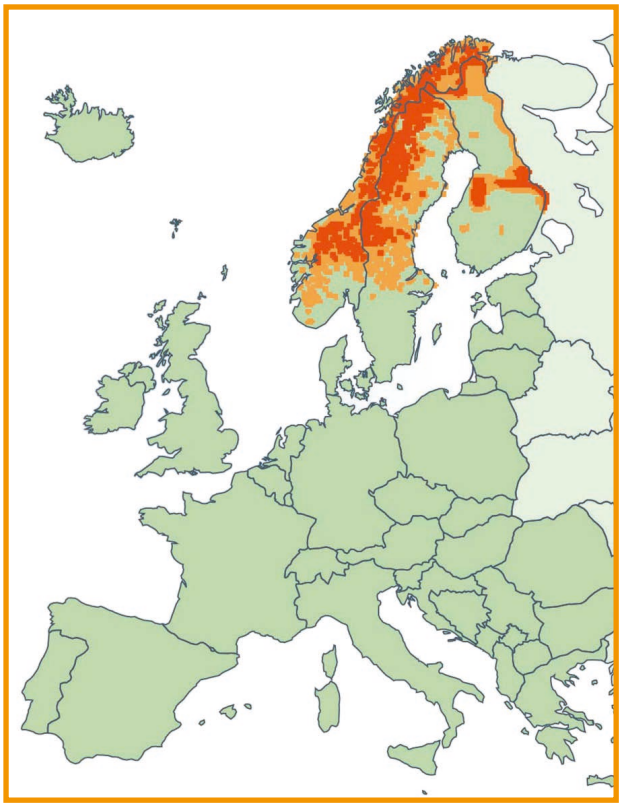


Fig. 1. Current wolverine distribution in the Nordic countries

1.2. Different management regimes in range countries

Despite years of legal protection, wolverine recovery was slow and it took almost 30 years before significant improvements took place. The wolverine is a rare and elusive species with low population densities, slow reproduction rates and large home ranges and therefore difficult to monitor. Much of its biology and ecology has been unknown until recently when jointly managed research projects were established in the Scandinavian countries. As a result of the current large-scale monitoring in Sweden and Norway, population estimates are nowadays more exact than in the past.

A new compensation scheme for damages on semi-domestic reindeer was implemented in Sweden in the mid-1990s, where herders are compensated for each documented wolverine reproduction. Adult females so vital for population growth, were now less likely to be illegally killed than males. The adapted system has not fully eradicated illegal killings, but it has significantly reduced female mortality. Limited culling still occurs in Sweden whereas it is rare in Norway where wolverines are more intensively managed through population control and generous hunting quotas (*Brøseth et al. 2010*). To minimize conflicts with sheep herders in Norway, population goals are distributed into regional management zones, and in the southwestern parts of the country, the present policy is a "null-tolerance" regarding wolverine reproductions.

In Sweden where wolverines are protected and only limited lethal control is allowed, poaching is the main source of human-caused mortality (*Persson et al. 2009*), while illegal killings are much more rare in Norway than in Sweden and Finland. Wolverine management therefore represents an interesting case where Sweden and Norway share a common population, but have totally diverging management policies regarding population goals, harvest regimes, and economic incentives for human-carnivore coexistence.

Due to the low numbers in Finland, wolverines are fully protected in the country. Roughly half of the Finnish population inhabits the borders of the reindeer management area (*Koskela 2013*), while the other half is distributed in the eastern and central parts of Finland (Figure 1). The population in central Finland

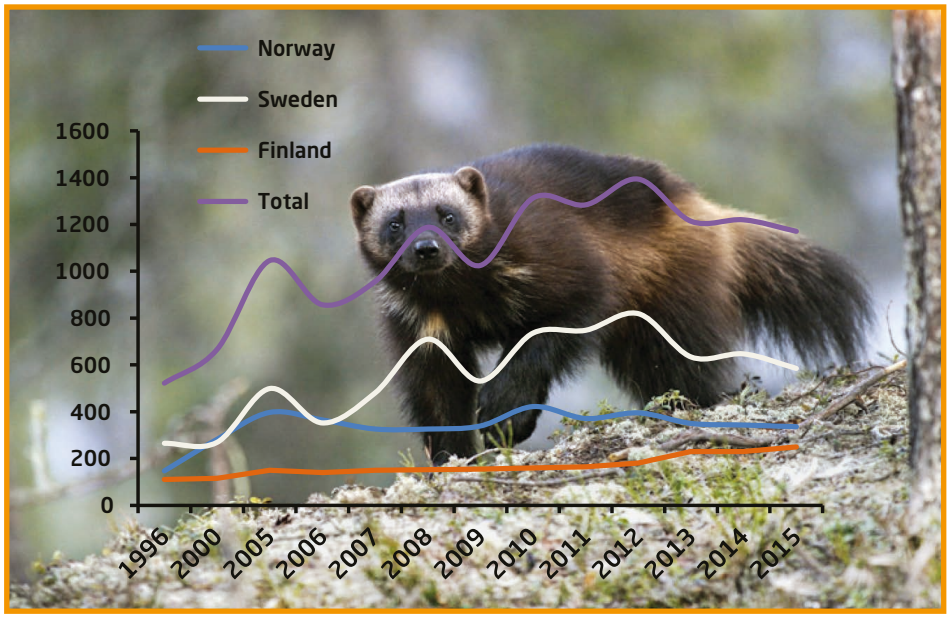


Figure 2. Development of wild wolverine populations in the Nordic countries 1996-2015

most probably descends from 10.6 wolverines which in 1979-1998 were translocated from northern Finland in an attempt to reduce reindeer predation but also to expand the species' distribution southwards (*Pohja-Mykrä & Kurki 2008*). In contrast to wolverine expansion in the two other Nordic countries where populations have doubled, the Finnish population shows a more modest increase (Figure 2). Whether this depends on prevailing poaching is unclear, but illegal killings play a significant part of the species' population dynamics in the northern parts of both Sweden and Finland (*Persson et al. 2009; 2011; Kojola et al. 2007*).

Population estimates from Russia are insufficient and rough estimates of 1 400 animals living in the European parts of the country have been presented (*Landa et al. 2000*). The numbers are, however, most likely overestimated and wolverines are known to be in decline in many parts of Russia (*Aronsson & Persson 2013*). Due to the insufficient Russian data, this report focuses on population estimates available from the Nordic countries where Sweden is the undisputed stronghold for wolverines in Europe with smaller fragments living in Norway and Finland.

1.3. Expansion from tundra to taiga

Since 1996, the number of monitored births have increased in Sweden with a mean of 3,8% per year, while the corresponding increase for Norway has been 5,3% during the same period (*Persson & Brøseth 2011*). The wolverine populations have therefore been doubled in both countries since the mid-1990s (Figure 2). The Swedish population has mainly expanded east- and southwards towards forested habitats where ungulate densities are much lower than in the tundra region and wolverines are spreading mainly towards the boreal forests where they were extremely rare or non-existent only two decades ago (*Aronsson & Persson 2012*). Today there are reproducing populations from Västerbotten to Dalarna with single observations also found in Värmland, Uppland and in regions close to Örebro. The southernmost reproduction took place in in 2016 when a lactating female was captured and radio-collared in Branäs, Värmland (*Anonymous 2016*). Similar expansions towards the boreal forests have also been observed in Finland where reproducing wolverines are spreading into the central parts of the country. Recent surveys indicate that wolverine increase has been higher in the boreal

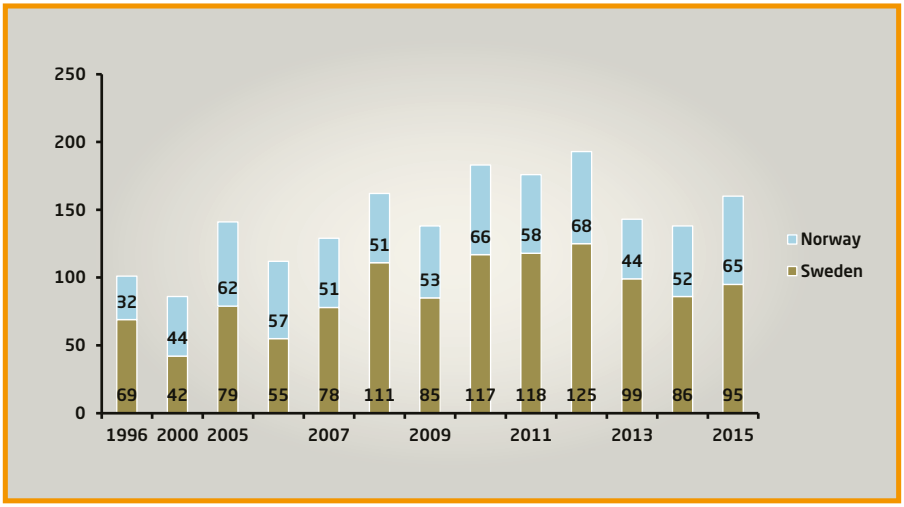


Figure 3. Number wild wolverine litters born in Sweden and Norway 1996-2015

Table 1. Development of wolverines EEP in 2015. Legend to Table: 1.0 = 1 male, 0.1 = 1 female, 0.0.1 = 1 unsexed.

*New participants marked in italics with **

In EEP: Institution	Status 1.1. 2015	Born	To EEP	From EEP	To Non-EEP	From Non-EEP	Deaths	Status 1.1. 2016
Ahtari/FIN	1.3	-	0.1 Helsinki 0.1 Budapest	-	-	-	-	1.1
*Anchorage/USA	-	-	-	0.1 Novosibirsk	-	-	-	0.1
Berlin TP/D	1.1	-	-	-	-	-	1.1	-
*Big Game/USA	-	-	-	1.0 Kristiansand 0.1 Skåne	-	-	-	1.1
Borås/S	2.2	-	1.0 Han-Sur-Lesse 0.1 Kingussie	-	-	-	-	1.1
Brno/CZ	1.1	-	-	-	-	-	-	1.1
*Budapest/HUN	-	-	-	0.1 Ahtari 1.0 Moscow	-	-	-	1.1
Burford/UK	1.1	2.1	-	-	-	-	-	3.2
Calviac/F	1.1*	-	-	-	-	-	-	1.1
Cezallier/F	1.1	-	-	-	-	-	-	1.1
Chomutov/CZ	0.1	-	-	-	-	-	-	0.1
Columbus/USA	1.1	-	-	-	-	-	-	1.1
Duisburg/D	1.1	-	-	-	-	-	-	1.1
Eberswalde/D	1.1	-	-	-	-	-	-	1.1
Hanstedt/D	2.0	-	-	-	-	-	-	2.0
*Han-Sur-Lesse/B	-	-	-	1.0 Borås 0.1 Novosibirsk	-	-	-	1.1
Helsinki/FIN	1.0	-	-	0.1 Ahtari	-	-	-	1.1
Hluboka/CZ	1.1	-	-	-	-	-	-	1.1
Hunnebostrand/S	2.2	2.0	-	-	-	-	-	4.2
Järvsö/S	3.2	2.0	-	-	-	-	-	5.2
Kerkrade/NL	1.1	-	-	-	-	-	1.0	0.1
Kinguisse/UK	1.0	-	-	0.1 Borås	-	-	-	1.1
Kolmården/S	1.1	2.2	0.1 Ste. Croix	-	-	-	2.1	1.1
Kristiansand/N	2.1**	0.1	1.0 Big Game	-	-	-	-	1.2
Lycksele/S	2.2	-	-	-	-	-	0.1	2.1
Minnesota/USA	1.1	-	-	-	-	-	-	1.1
Moscow/RUS	4.6	-	1.0 Budapest	-		0.1 wild	-	3.7
Munich/D	1.1	-	-	-	-	-	-	1.1
Namsskogan/N	1.0	-	-	-	-	-	-	1.0
Nikolaev/UKR	1.1	-	-	-	-	-	-	1.1
Novosibirsk/RUS	1.4	-	0.1 Han-Sur-Lesse 0.1 Anchorage	-	-	-	-	1.2
Opole/POL	1.1	-	-	-	-	-	-	1.1
Orsa/S	1.0	-	-	0.1 Ranua	-	-	-	1.1
Osnabruck/D	1.1	-	-	-	-	-	-	1.1
Paris Zoo/F	1.1	-	-	-	-	-	-	1.1
Ranua/FIN	1.3	-	0.1 Orsa 0.1 St. Felicien	-	-	-	-	1.1
Salzburg/A	1.1	-		1.0 Skåne	-	-	1.0	1.1
Skåne/S	2.2	-	1.0 Salzburg 0.1 Big Game	-	-	-	-	1.1
Springe/D	1.1	-	-	-	-	-	1.0	0.1
*Ste. Croix/F	-	-		1.0 Stockholm 0.1 Kolmarden	-	-	-	1.1
Saint Felicien/CAN	1.0	-	-	0.1 Ranua	-	-	-	1.1

Stockholm/S	1.1	2.1.1	1.0 Ste. Croix	-	-	-	0.0.1	2.2
Szeged/HU	1.1	-	-	-	-	-	-	1.1
Usti/CZ	1.1	-	-	-	-	-	-	1.1
Whipsnade/UK	1.1	-	-	-	-	-	-	1.1
In EEP	50.51	10.5.1	5.9	5.9	-	0.1	6.3.1	54.54
(44 institutions)	(101)	(16)	(14)	(14)	(-)	(1)	(10)	(108)
Non-EEP:								
Bielefeld/D	1.1	-	-	-	-	-	1.0	0.1
Furstenwalde/D	1.1	-	-	-	-	-	-	1.1
Izhevsk/RUS	1.1	-	-	-	-	-	-	1.1
Krasnoyarsk/RUS	0.1	-	-	-	-	-	-	0.1
Nizhny Novgorod/RUS	1.1	-	-	-	-	-	-	1.1
Sababurg/D	1.1	-	-	-	-	-	-	1.1
In Non-EEP	5.6	-	-	-	-	-	1.0	4.6
(6 institutions)								

** Earlier informed as 0.1*
*** Earlier informed as 3.1*

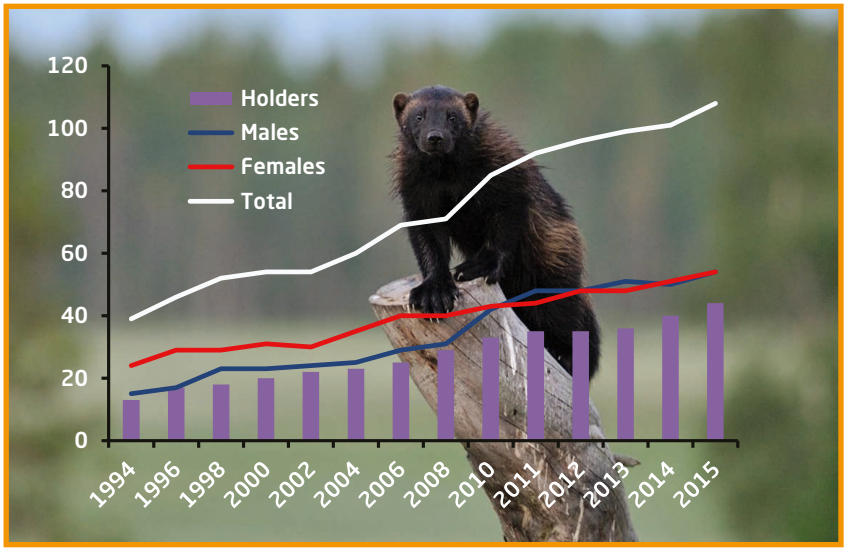
forests than in the tundra. The numbers of litters born in Sweden and Norway are illustrated in Figure 3, showing that the highest number of reproductions took place in 2012. The expansion of brown bears, wolves and lynxes has led to more available carcasses in the forests, also favoring the scavenging mustelid. It has therefore been suggested that wolverines favor areas with more successful hunters (*Koskela 2013*).

Recent population trends in Fennoscandia indicate that wolverines are well-suited to survive in forest habitats with low densities of ungulates. With a lot of suitable wolverine habitats available in Fennoscandia, one can conclude that the current population has not yet reached its carrying capacity (*Persson & Bröseth 2011*) and further expansions can be expected.

An important factor of wolverine dispersal into the forest belt can partly be explained by the increasing numbers in the tundra with dispersal of young animals from already occupied habitats. In forested areas wolverines seem to benefit from the sympatric distribution with wolves which are practically absent in the reindeer husbandry area. Wolves and lynxes are more efficient predators than wolverines, and offer increased scavenging opportunities for the latter species (*Aronsson & Persson 2012; Koskela 2013*). In Sweden and Finland wolverine predation on livestock is extremely rare south of the reindeer husbandry area, whereas the situation in Norway is more complicated with frequent depredation on free-ranging sheep during the summer months (*Persson 2003*). The low degree of life-stock depredation has, most likely, also had a positive influx on wolverine expansion towards forested areas in Sweden and Finland.

1.4. Indicator for biodiversity

The wolverine is a solitary generalist predator obtaining food by scavenging and hunting. Like most large carnivores, wolverines exist in low population densities with large habitat



Figur 4. Census of EEP Population 1994-2015

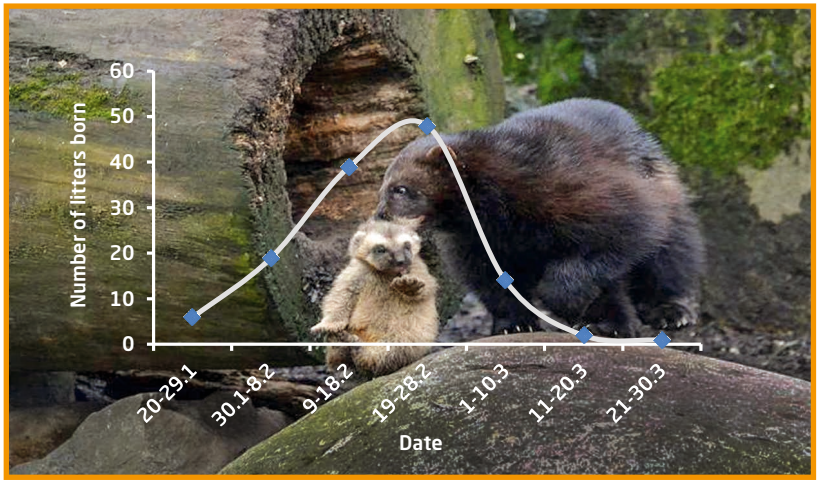


Figure 5. Time of delivery among 125 wolverine captive births delivered prior to 2016

requirements and a position at the top of the food chain. If effectively protected wolverines can therefore be regarded as target species of conservation efforts, offering protection to a variety of other species. As such, wolverines are excellent indicators for biodiversity. Small populations are, however, more prone to extinction through random fluctuations and loss of gene diversity. Extinction rates are greatest among the large carnivores, and small populations are more vulnerable to extinction than others. The species' low reproduction rates also make them more sensitive to changes in survival rates than species with higher reproductive rates. Like all other predatory species, wolverines exist under increasing pressure where human population and infrastructure have resulted in fragmented and eroded habitats for wolverines. Therefore, when implementing conservation policies and culling regulations, wildlife managers toned to carefully consider wolverine demographics.

2. The Captive Population

Poor breeding success combined with decreasing numbers in the wild in the 1970s and 1980s, accelerated the plans to include the wolverine into the pan-European breeding program EEP. The Wolverine EEP was established in 1994 (*Blomqvist 1995*), at a time when only 13 zoos exhibited the nominate form of wolverines. In 2013 the Wolverine EEP expanded to North America when Minnesota Zoo decided to partner the European program (*Blomqvist 2015*). The expansion of the EEP to the New Continent was influenced by low breeding success of the native North American sub-species *Gulo g. luscus*, and an evident danger of completely losing wolverines from North-American collections. During the two following years, in 2014 and 2015, the transatlantic exports from EEP continued, and currently five institutions in U.S.A. and Canada have joined the European breeding program (Table 1).

The previous studbook was published in 2012 with data current to 31st December 2011 (*Blomqvist 2012a*). Updated reports for 2012-2014, have since been published annually by Nordens Ark (*Blomqvist, 2013; 2014; 2015*). The current 5th edition of the regional studbook thus covers the year 2015 with updated data current to October 2016. Changes reported after 1.1.2016 are marked with red in the studbook but are not included in the analyses in the text below.

Like many species participating in jointly managed breeding programs, wolverines' affiliation to the wolverines' inclusion as an EEP has had a positive impact on the species' management, resulting in an increased numbers of holders and as well as a rapid expansion of the captive population (Figure 4). Although 220 kits have been born in 97 litters since the establishment of the program, not more than an average of six litters per year have been born during the past five years. In 2000-2015, only 22 facilities recorded breeding success with 13 males and 14 females, and at 1.1.2016, the Wolverine EEP counted 54.54 animals distributed over 44 institutions in Europe and North America. Table 1 also indicates that 4.6 additional wolverines are maintained in six institutions in Russia and Germany.

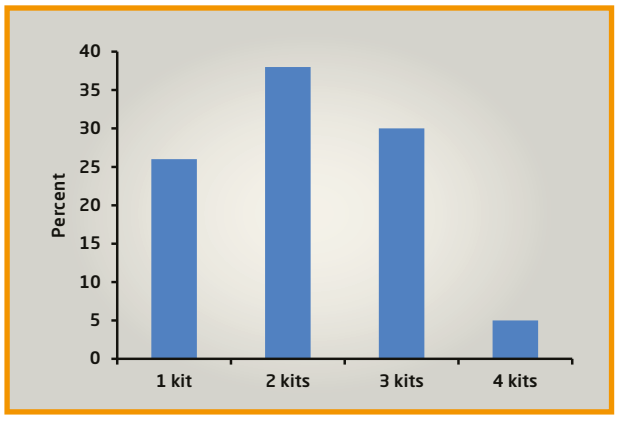


Figure 6. Litter size in 125 wolverine litters born 1967-2015. Mean size=2.1

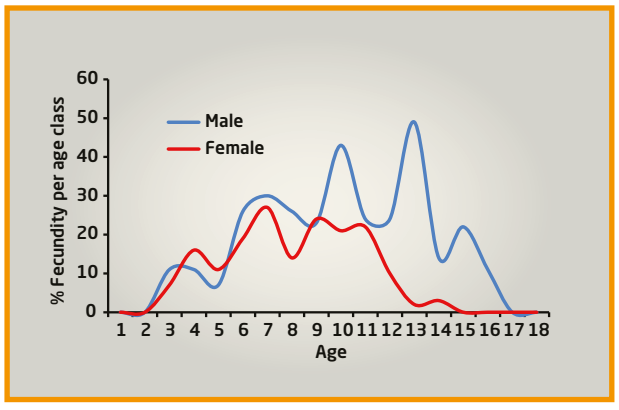


Figure 7. Fecundity in captive born wolverines of known age. Data based on 215 birth events taking place prior to 2016

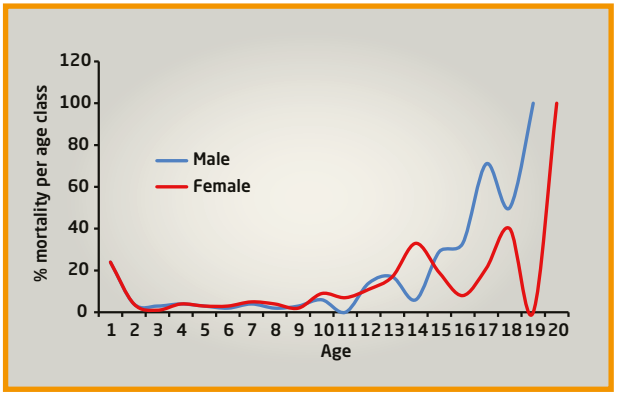


Figure 8. Mortality in wolverines calculated from 164 captive-born death events prior to 2016

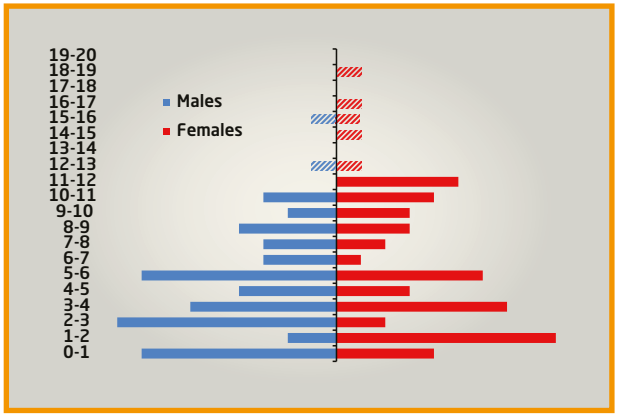


Figure 9. Age/sex distribution in Wolverine EEP as of 2015. The shaded 2.5 animals in the Figure have passed their main breeding age and are removed from the analysis

Although registered in the European studbook, these animals do not participate in the EEP-program. The total census for the sub-species is consequently 58.60 animals maintained in 50 institutions worldwide. The pedigrees of all animals in the studbook are known to 100%.

2.1. Reproductive data

Wolverines exhibit delayed implantation with matings around midsummer, holding the fertilized eggs in suspension until the end of the year and, if food resources are adequate, the fetuses implant at the beginning of the year with kits delivered during the coldest time of the year, in February-March (*Blomqvist 2012b*). Mating's have been recorded at 53 different occasions, all of which have been observed between March 16th – August 4th . The 125 litters that have been bred 1967–2015 (Figure 5), confirm that the species is a strict seasonal breeder with births taking place in January–March with a peak during the two last weeks of February. Litter size varies from one to four with a mean of 2.1 (Figure 6).

2.1.1. Female reproductive data

Fecundity among captive-bred females of known age that have delivered kits prior to 2016, shows that although two females have reproduced when they were only two years old (## 161 and 172 in Ähtäri and Kristiansand), reproduction mainly starts when females are three to four years old (Figure 7). The average age for females when they deliver their first litter in captivity is thus 4.10 years, while the oldest dam (# 279 in Ranua) was nine years old when she delivered her first litter. Once females start to deliver, they usually continue to reproduce until they become ten years old. After eleven years, their reproduction declines sharply with the oldest female (#204) that produced offspring being 13.11 years when she delivered her last litter in Springe, Germany.

2.1.2. Male reproductive data

Although 10 males aged two to three years, have managed to reproduce, the majority starts to sire kits when they are older than four years (Figure 7), with the average being 4.4 years. Fertility peaks from 5 to 11, and gradually drops off after 12. Two males (#212 in Moscow and #146 in Stockholm) were 9.2 years when they sired kits for the first time, while the oldest male (#190) to reproduce was 15.2 years when he sired his last litter in Kristiansand, Norway. It should be noted that the high values in the age classes above 13 years in Figure 7 are, however, misleading: when males reach such a high age, they also represent a high proportion of the total numbers of males in that age class.

Table 2. Wolverines excluded from studbook analysis due to post-reproductive age

Stud#	Sex	Birth Date	Sire	Dam	Location	Date	LocalID	Event	Name	Breeder#	Transponder
204	F	21 Feb 1997	146	165	STOCKHOLM	21 Feb 1997	940953	Birth	ANNA-GRETA	SHOLM 3	00013CDF71
					MAGDEBURG	23 Apr 1998	281001	Loan to			
					SPRINGE	28 Oct 2009	1178	Loan to			
231	F	4 Feb 1999	188	183	SALZBURG	4 Feb 1999	M720	Birth	AGNETHA	SALZBURG	3985100006921902
					MOSCOW	27 Jul 2000	200541	Transfer			
235	M	21 Feb 2000	203	202	HELSINKI	21 Feb 2000	200028	Birth	REIDAR	HKI 20	0001E57D5E
					AHTARI	12 Dec 2000	200001	Transfer			
236	F	21 Feb 2000	203	202	HELSINKI	21 Feb 2000	200029	Birth	RONJA	HKI 21	0001BC9E9F
					DUISBURG	19 Jan 2001	4212	Loan to			
252	M	22 Feb 2003	203	202	HELSINKI	22 Feb 2003	203011	Birth	UNTAMO	HKI 23	0001BDD088
					STOCKHOLM	11 Feb 2004	941335	Transfer			
256	F	20 Feb 2003	207	185	RANUA	20 Feb 2003	203013	Birth		RANUA 7	985120022969184
					CHOMUTOV	18 Mar 2005	ROS003	Transfer			
347	F	~ Mar 2001	WILD	WILD	RUSSIA	~ Jul 2003	NONE	Capture	PLOTINKA	EKATERIN 1	
					EKATERINB	~ Jul 2003	PLOTIN	Transfer			
					NIKOLAEV	12 Sep 2003	403055	Transfer			

Table 3. Wolverine studbook data as of 1.1.2016

	Males	Females	Unknown	Total
Total animals registered	147	153	36	336
Wild-born	28	33	0	61
Captive-born	119	120	36	275
Alive in EEP at 1.1.2016	54	54	0	108
Wild-born	1	11	0	12
Captive-born	53	43	0	96
Total number that have bred	49	50	0	94
Wild-born that have bred	10	14	0	24
Captive-born that have bred	39	38	0	77
Total breeding animals alive in EEP	14	18	0	32
Wild born	1	6	0	7
Captive born	13	12	0	25

If such an old animal succeeds in reproducing, it consequently gives a distorted view of what males at that age are capable of. As a result, the chances of reproducing at such a high age becomes highly exaggerated and does not show a realistic expectation for males within the population but is instead a result of a too small data set.

2.2. Lifespan

The first year of life is a vulnerable time for wolverine kits with 24% of the 164 captive-bred animals dying in their first year. When kits enter their second year, mortality drops dramatically, remaining stable with a mean of 4% per age class for both sexes until it starts to increase again when the animals become older than 11 years (Figure 8) and start to approach their post-reproductive age. The oldest captive-bred male died when he was 18.2 years (Chomutov), while the oldest female was one year older when she died in Springe.

Among the current animals, the oldest living male is 15 years and 10 months (#235 in Ähtäri), and the oldest female (#204 in Springe) is 18 years and 10 months upon writing. There is a significant peak in mortality in February -March when 38% of all recorded deaths have taken place. This peak coincides with the cubbing season when 11% of the kits die during the first month of life. In addition to these two months, there are no other death peaks during the remaining 10 months.

2.3. Demographic and genetic status

Wolverines have regularly been exhibited in European zoo collections for more than six decades. Prior to the 1990s, wolverines were, with few exceptions, exhibited mainly in the Nordic countries and only sporadically kept in continental Europe. Although relatively common in Finnish and Swedish zoos, breeding success was, however, rare and most of the animals on exhibit were recruited from the wild.

The first recorded birth at an EAZA institution took place in Borås Zoo in 1967, but during the following two decades, death rates continued to exceed birth rates and it took more than 20 years before the number of captive-bred animals exceeded the

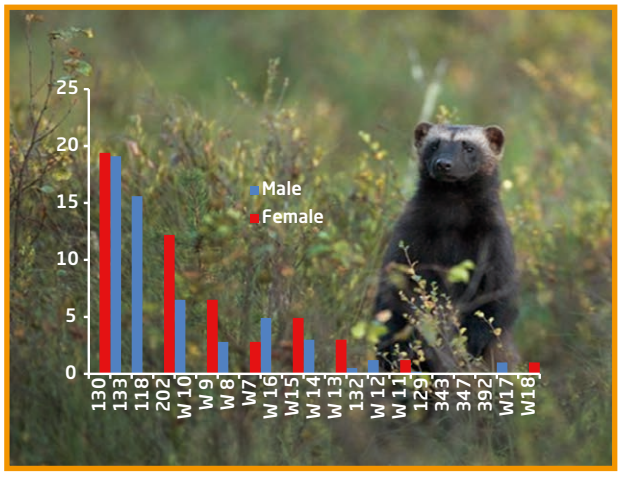


Figure 10 . Founder contribution in Wolverine EEP 2015

Table 4. Genetic summary of Wolverine EEP 2015

	Actual	Potential
Founders (*Fnd*)	18	1*
Living descendants	107	
Founder genome equivalents (*Fge*)	5.05	14.29
Percentage of pedigrees known	100	
Fnds genomes surviving	12.29	14.29
Gene diversity retained (*GD*)	0.901	0.965
Mean inbreeding (*F*)	0.0633	
Population mean kinship (*MK*)	0.0989	
Effective population size/census (*Ne/N*)	0.2947	
Effective population size (*Ne*)	29.48	

** 1 additional founder exists, but due to her high age, she has been excluded from the Table.*

Table 5. Wolverine births in 2015. Changes taking place in 2016 are marked in red but have been excluded from all analyses mentioned in the text.
Restricted to: (*Gulo gulo gulo*)
Cooperative Management: In EEP

Stud#	Sex	Birth Date	Sire	Dam	Location	Date	LocalID	Event	Name	Breeder#	Transponder
408	M	14 Feb 2015	319	324	KOLMARDEN	14 Feb 2015	12660	Birth		KOL 33	968000010167073
						8 Jun 2015		Death			
409	M	14 Feb 2015	319	324	KOLMARDEN	14 Feb 2015	12661	Birth	REIVO	KOL 34	968000010161824
						22 May 2015		Death			
410	F	14 Feb 2015	319	324	KOLMARDEN	14 Feb 2015	12662	Birth		KOL 35	968000010160865
						10 Jun 2015		Death			
411	F	14 Feb 2015	319	324	KOLMARDEN	14 Feb 2015	12663	Birth	VIDJA	KOL 36	968000010161650
					STE CROIX	19 Dec 2015	1643	Transfer			
412	M	23 Feb 2015	252	282	STOCKHOLM	23 Feb 2015	942524	Birth	SAIVO	SHOLM 13	752015900007216
					STE CROIX	19 Dec 2015	1642	Transfer			
413	M	23 Feb 2015	252	282	STOCKHOLM	23 Feb 2015	942525	Birth		SHOLM 14	
						9 Feb 2016		Death			
414	F	23 Feb 2015	252	282	STOCKHOLM	23 Feb 2015	942522	Birth	SUNNA	SHOLM 15	
					HERBERSTN	28 Jul 2016	101732	Transfer			
415	?	23 Feb 2015	252	282	STOCKHOLM	23 Feb 2015	942523	Birth		SHOLM 16	
						5 Mar 2015		Death			
416	M	25 Jan 2015	318	306	BURFORD	25 Jan 2015	MM1951	Birth		COTSWOLD 4	
					OSIJEK	5 May 2016	GG01	Transfer			
417	M	25 Jan 2015	318	306	BURFORD	25 Jan 2015	MM1952	Birth		COTSWOLD 5	
					OSIJEK	5 May 2016	GG02	Transfer			
418	F	25 Jan 2015	318	306	BURFORD	25 Jan 2015	MM1953	Birth		COTSWOLD 6	
419	M	8 Mar 2015	273	285	HUNBSTRND	8 Mar 2015	215004	Birth	ANGUS	HUNNEBO 24	752098100704209
					KERKRADE	10 Apr 2016	M15078	Transfer			
420	M	8 Mar 2015	273	285	HUNBSTRND	8 Mar 2015	215005	Birth	MALCOLM	HUNNEBO 25	752098100706451
					HERBERSTN	28 Jul 2016	101731	Transfer			
421	F	15 Feb 2015	329	275	KRISTIANS	15 Feb 2015	GULGG019	Birth		KRIST 13	578098100363904
					BORAS	27 Apr 2016	RJ0035	Transfer			
422	M	24 Feb 2015	291	278	JARVZOO	24 Feb 2015	JZM15016	Birth		JARVSO 9	968000010080458
423	M	24 Feb 2015	291	278	JARVZOO	24 Feb 2015	JZM15017	Birth		JARVSO 10	968000010079852

TOTAL BIRTHS 2015: 10.5.1 (16)

number of wild-born specimens (*Blomqvist 2012a*). As illustrated in Figure 4, the population has gradually expanded since 2000, with higher growth rates from 2003 to 2006, and from 2009 to 2015 when it again accelerated. Over the last five years the growth rate has been 6% for males and 7% for females.

The age and sex distribution in the EEP-population at the end of 2015 shows not only that an equal number of males and females in the population, but also that two males and five females are older than 13 years and have passed their main reproductive age (Figure 9). Due to their high age, those animals have been excluded from the genetic analysis (Table 2). As seen in the age pyramid, 30% of the animals in the living population consist of young animals which have not yet reached sexual maturity but soon will enter their reproductive age.

Table 3 shows that although 61 wild-caught wolverines have been integrated into the captive population, 39% of them have not bred. Of the 10 male- and 14 wild-caught females that have bred, breeding success has varied. Several founders that have reproduced years ago and only had a few kits, do no longer have a visible representation in the current population, while successful breeders are strongly represented. The 108 animals living in the EEP therefore do not contain the genomes of all 24 wild-caught animals that have bred, but of 18 founders only (Figure 10), seven of which still are alive. Fortunately these

seven founders have been extremely successful breeders and 24 males and 12 females of their F_1-descendants are still alive in the population.

The population also contains two potential founders that have not bred. Of these potential founders, female #347 in Nikolaev is 16 years old and she has therefore passed sexual maturity. This female has therefore been excluded from the analysis (Table 2). Another female (# 343) in Lycksele is six years old and in her prime reproductive age. The current population also contains two wild-caught sibling females in Moscow (#379 and #380). As these females are siblings and consequently not individually genetically unique, they are in theory also potential founders but cannot be regarded as such by the software package PM2000.

2.4. Effective population size

As illustrated in Table 3, 18 wild-caught males and 19 females have not bred. The lack of breeding success among these animals might have depended on a variety of reasons such as unsuccessful management in the past, their high age, poor health status and even sterility. As a result of these factors, the "effective population size" (*Ne*) is normally substantially smaller than the actual population size (*N*) of 108 animals. The ratio of Ne to N is a good indicator of the demographic and genetic health status of the population that informs the rate at which gene diversity is lost. The smaller *Ne* is, the more gene diversity (*GD*) has been lost.

In wild populations the ratio of *Ne*/*N* is reported to lie at approximately 0.1 (Frankham 1995), whereas in captive conditions where it is partly possible to decide how many and which individuals will breed, and with whom, we have a *Ne*/*N* ratio that is larger than that in wild populations. Usually the *Ne*/*N* ratio ranges from 0.2 to 0.4 among captive populations (*Frankham et al. 2002; Mace 1986*). In the wolverine EEP the *Ne*/*N* ratio corresponds to the above mentioned figures being 0.29 (Table 4). In other words, 29% of the total number of animals (14 males and 18 females) consists of successful breeders.

2.5. Founder genome equivalents

An even better measure of the population's health status takes into consideration not only the unequal founder contribution, but also the loss of alleles due to pedigree effects. This is the basis for the concept of "Founder genome equivalents" (*Fge*) or the number of founders required to achieve the observed levels of gene diversity if all wild-caught animals would have been equally represented. Analyses undertaken by PM2000, show that the *Fge* value for the Wolverine EEP is 5.05, but could theoretically be increased to 14.29 if all wild-born animals would have bred in an optimal manner (Table 4). The loss of alleles due to pedigree effects has therefore eroded the levels of diversity and the *ex situ* population has lost 9% of its *GD*. The *GD* therefore equals the gene diversity of five unrelated wild animals randomly caught from the wild. With optimal management, *GD* could be increased to that found in 14 unrelated animals from the wild.

3. Fluctuations In Captive Population 2015

Correction: In late 2014, Kristiansand Zoo transferred one of their male wolverines to Calviac in France. The transfer had not been reported in 2014 and Calviac therefore kept 1.1 animals and Kristiansand 2.1 at the end of 2014 instead of 0.1 and 3.2 as earlier reported (*Blomqvist 2015*). The status for the year 2014, however, remained equal (50.51). The correction has now been posted in this year's status report as shown in Table 1.

Furthermore it can be mentioned that 7.4 animals of known origin that had been wild-caught in Fennoscandia in the past have been found in ZIMS and added to the European studbook. All these animals arrived to well-established European zoos between 1958 and 1974 and none of them ever bred.

3.1.1. Births

Table 1 summarizes the main events in the captive population in 2015. The Table shows that six litters with 16 kits (10.5.1) were born during the year. All litters (Table 5) were delivered in Europe within the frame of the EEP. All parents were proven breeders which had bred in the past and no new breeders were therefore recorded in 2015. A young female kit was conceived in captivity and was born in the wild under a dam that had managed to escape from Moscow Zoo in 2014. The Moscow Zoo staff managed to capture the kit in September 2015 when she was incorporated into the Moscow Zoo stock. The dam, however, is still free-living despite several attempts to capture her.

3.1.2. Deaths

During the year, ten (6.3.1) death events were reported from seven EEP-institutions. Among the reported deaths, four (2.1.1) animals were neonates while the remaining six animals were 12 to 17 years old (Table 6). Among the deceased wolverines, two males were proven breeders which previous reproductive success. As no new breeders occurred in 2015, the small number of proven breeders decreased with two animals during the year.

3.1.3. Transfers

As shown in Table 7, five males and nine females were transferred within the program during the year. None of the animals left the EEP. In addition to these transfers, a female born in the wild but conceived in Moscow Zoo to captive-bred parents entered the program (above). Worth mentioning is also, that one male and two females from Europe, were exported to two new participants in the U.S.A. whereas three new continental zoos in Europe (Budapest, Han-sur-Lesse and Ste. Croix) joined the program in 2015 and obtained animals from breeding zoos in Russia and Scandinavia. A total of five new zoos therefore joined the program in 2015. As Tierpark Berlin, unfortunately left the EEP, the number of participants increased with four zoos in 2015 and stood at 44 institutions on 1st January 2016. For 2016, four additional zoos, two in continental Europe and two from U.S.A., have signed for the program.

3.1.4. Population status for 2015

As the end of 2015, the EEP population stood at 54.54 animals distributed over 44 institutions (Table 1). The net increase for the year was therefore seven animals compared to the previous year when 50.51 animals were kept in 40 facilities.

4. Further Steps

The aim of the wolverine breeding program is to contribute to wolverine conservation by providing a robust backup for the free-ranging populations and if needed, to maintain a potential to supply individuals for future reintroductions and/or restocking attempts. Indirectly a healthy captive population can contribute to the species' conservation through educational raising of public awareness regarding the species' biology. To fulfill these conservation roles, a population in human care requires an *ex situ* stock that is genetically representative of their wild counterparts.

Table 6. Wolverine deaths in 2015. Reported deaths taking place after 1.1.2016 are marked in red but have been excluded from all analyses in the text.
Restricted to: (*Gulo gulo gulo*)
Cooperative Management: In EEP

Stud#	Sex	Birth Date	Sire	Dam	Location	Date	LocalID	Event	Name	Breeder#	Transponder
205	M	20 Feb 1997	144	152	KOLMARDEN	20 Feb 1997	6428	Birth	KARLCHEN	KOL 18	0000195C44
					MAGDEBURG	23 Apr 1998	328002	Transfer			
					SPRINGE	28 Oct 2009	1177	Transfer			
						4 Feb 2015		Death			
235	M	21 Feb 2000	203	202	HELSINKI	21 Feb 2000	200028	Birth	REIDAR	HKI 20	0001E57D5E
					AHTARI	12 Dec 2000	200001	Transfer			
						17 Jun 2016		Death			
242	M	17 Feb 2001	182	191	HUNBSTRND	17 Feb 2001	201005	Birth	KILVO	HUNNEBO 6	00006042C52
					SALZBURG	7 Mar 2002	995	Transfer			
						4 Mar 2015		Death			
245	F	28 Feb 2001	190	168	KRISTIANS	28 Feb 2001	GULGG005	Birth	KRISTINA	KRIST 4	578098100123559
					LYCKSELE	17 Jan 2003	KRISTI	Transfer			
						9 Mar 2015		Death			
248	F	15 Feb 2002	188	183	SALZBURG	15 Feb 2002	994	Birth	BELANA	SALZBURG	4496800000772646
					BERLIN TP	19 May 2004	M02692	Transfer			
						19 Jun 2015		Death			
255	M	20 Feb 2003	207	185	RANUA	20 Feb 2003	203014	Birth	IVAR	RANUA 6	985120022055810
					KERKRADE	17 Mar 2005	M03064	Transfer			
						29 Sep 2015		Death			
262	M	10 Feb 2004	205	204	MAGDEBURG	10 Feb 2004	281003	Birth	MANUEL	MAGDEB 1	96800000231113
					BERLIN TP	27 Jan 2005	M02857	Transfer			
						7 Jun 2015		Death			
286	F	~ Mar 2006	WILD15	WILD16	SWEDEN	28 May 2006	NONE	Capture	PESSINA	LYCKS 14	968000003405967
					LYCKSELE	29 May 2006	LYCK14	Transfer			
					BORAS	2 Jun 2006	RJ0027	Transfer			
						27 Jan 2016		Death			
379	F	~ 2012	WILD17	WILD18	KARELIYA	~ 2012	NONE	Capture		MOSCOW 23	
					MOSCOW	20 Sep 2012	120692	Transfer			
						18 Aug 2016		Death			
408	M	14 Feb 2015	319	324	KOLMARDEN	14 Feb 2015	12660	Birth		KOL 33	968000010167073
						8 Jun 2015		Death			
409	M	14 Feb 2015	319	324	KOLMARDEN	14 Feb 2015	12661	Birth	REIVO	KOL 34	968000010161824
						22 May 2015		Death			
410	F	14 Feb 2015	319	324	KOLMARDEN	14 Feb 2015	12662	Birth		KOL 35	968000010160865
						10 Jun 2015		Death			
413	M	23 Feb 2015	252	282	STOCKHOLM	23 Feb 2015	942525	Birth		SHOLM 14	
						9 Feb 2016		Death			
415	?	23 Feb 2015	252	282	STOCKHOLM	23 Feb 2015	942523	Birth		SHOLM 16	
						5 Mar 2015		Death			

TOTALS DEATHS 2015: 6.3.1 (10)

Table 7. Wolverine transfers in 2015. Reported transfers occurring after 1.1.2016 are marked in red but have been excluded from all analyses in the text.
Restricted to: (*Gulo gulo gulo*)
Cooperative Management: In EEP

Stud#	Sex	Birth Date	Sire	Dam	Location	Date	LocalID	Event	Name	Breeder#	Transponder
373	M	11 Feb 2012	230	263	MOSCOW	11 Feb 2012	120125	Birth		MOSCOW 20	
					BUDAPEST	8 Oct 2015	301089	Transfer			
393	M	25 Feb 2013	329	275	KRISTIANS	25 Feb 2013	GULGG016	Birth	KASPER	KRIST 10	578098100363548
					BIG GAME	14 Apr 2015	KASPER	Transfer			
398	F	27 Feb 2014	296	279	RANUA	27 Feb 2014	214009	Birth	KURU	RANUA 8	981098104653747
					TEXAS	27 Feb 2015	398	Transfer			
					ST FELICI	26 Mar 2015	B14104	Transfer			
399	F	27 Feb 2014	296	279	RANUA	27 Feb 2014	214010	Birth	KAAMOS	RANUA 9	981098104651355
					ORSA	9 May 2015	WV4	Transfer			
400	M	14 Feb 2014	273	286	BORAS	14 Feb 2014	RJ0033	Birth	VALLE	BORAS 21	968000010111657
					HANSURLES	26 Feb 2015	GR42	Transfer			
401	F	14 Feb 2014	273	286	BORAS	14 Feb 2014	RJ0034	Birth	TINA	BORAS 22	968000010079719
					KINGUSSIE	19 Feb 2015	5831	Transfer			
402	F	23 Feb 2014	235	260	AHTARI	23 Feb 2014	214002	Birth	TUIJA	AHTARI 42	985170003021562
					BUDAPEST	12 Oct 2015	301093	Transfer			
403	F	23 Feb 2014	235	260	AHTARI	23 Feb 2014	214003	Birth	PINJA	AHTARI 43	985170003023832
					HELSINKI	25 Mar 2015	215003	Transfer			
404	F	12 Feb 2014	328	338	NOVOSIBRK	12 Feb 2014	123031	Birth		NOVOSIB 1	643110000461974
					HANSURLES	13 Mar 2015	GR41	Transfer			
405	F	12 Feb 2014	328	338	NOVOSIBRK	12 Feb 2014	123032	Birth	OLGA	NOVOSIB 2	643110000461989
					ANCHORAGE	16 Oct 2015	2015-23	Transfer			
406	M	16 Feb 2014	274	294	LUND	16 Feb 2014	406	Birth	LOGAN	HOOR 11	966000000225903
					SALZBURG	5 May 2015	S2085	Transfer			
407	F	16 Feb 2014	274	294	LUND	16 Feb 2014	407	Birth	KAYLA	HOOR 12	966000000215131
					BIG GAME	13 Dec 2015	KAYLA	Transfer			
411	F	14 Feb 2015	319	324	KOLMARDEN	14 Feb 2015	12663	Birth	VIDJA	KOL 36	968000010161650
					STE CROIX	19 Dec 2015	1643	Transfer			
412	M	23 Feb 2015	252	282	STOCKHOLM	23 Feb 2015	942524	Birth	SAIVO	SHOLM 13	752015900007216
					STE CROIX	19 Dec 2015	1642	Transfer			
414	F	23 Feb 2015	252	282	STOCKHOLM	23 Feb 2015	942522	Birth	SUNNA	SHOLM 15	
					HERBERSTN	29 Jul 2016	101732	Transfer			
416	M	25 Jan 2015	318	306	BURFORD	25 Jan 2015	MM1951	Birth		COTSWOLD	4956000003722417
					OSIJEK	5 May 2016	GG01	Transfer			
417	M	25 Jan 2015	318	306	BURFORD	25 Jan 2015	MM1952	Birth		COTSWOLD	5956000003651245
					OSIJEK	5 May 2016	GG02	Transfer			
419	M	8 Mar 2015	273	285	HUNBSTRND	8 Mar 2015	215004	Birth	ANGUS	HUNNEBO	24752098100704209
					KERKRADE	10 Apr 2016	M15078	Transfer			
420	M	8 Mar 2015	273	285	HUNBSTRND	8 Mar 2015	215005	Birth	MALCOLM	HUNNEBO	25752098100706451
					HERBERSTN	29 Jul 2016	101731	Transfer			
421	F	15 Feb 2015	329	275	KRISTIANS	15 Feb 2015	GULGG019	Birth	AKKA	KRIST 13	578098100363904
					BORAS	27 Apr 2016	RJ0035	Transfer			
424	F	~ Dec 2014	371	375	RUSSIA	~ Dec 2014	_____	Birth			
					MOSCOW	9 Sep 2015	150597	Transfer			

TOTAL TRANSFERS 2015: 5.10.0 (15)

Table 8. *MK* values for Wolverine EEP population 2015. One male older than 14 years and 5 females older than 12 years have been removed from the table due to passed reproductive age. Two additional females deceased in 2016 are also removed.

Males					Females			
Stbk #	**Age**	**Location**	**MK**	**Rank**	**Stbk #**	**Age**	**Location**	**MK**
281	10	Borås/S	0.0189	1	343	6	Lycksele/S	0.0
423	1	Järvsö/S	0.0660	2	380	4	Moscow/RUS	0.0071
422	1	Järvsö/S	0.0660	3	379	4	Moscow/RUS	0.0071
391	2	Järvsö/S	0.0660	4	278	11	Järvsö/S	0.0118
385	3	Paris/F	0.0711	5	282	10	Stockholm/S	0.0236
357	5	Usti/CZ	0.0725	6	265	12	Moscow/RUS	0.0330
356	5	Hunnebostrand/S	0.0725	7	285	10	Hunnebostrand/S	0.0389
412	1	Ste.Croix/F	0.0735	8	263	12	Moscow/RUS	0.0442
348	5	Lycksele/S	0.0735	9	264	12	Moscow/RUS	0.0454
319	7	Kolmården/S	0.0761	10	387	3	Minnesota/USA	0.0711
318	7	Burford/UK	0.0796	11	358	5	Osnabruck/D	0.0725
323	7	Whipsnade/UK	0.0807	12	414	1	Stockholm/S	0.0735
390	3	Minnesota/USA	0.0824	13	349	5	Opole/POL	0.0735
389	3	Helsinki/FIN	0.0824	14	340	6	Szeged/HUN	0.0735
400	2	Han Sur Lesse/B	0.0846	15	411	1	Ste.Croix/F	0.0824
383	2	Columbus/USA	0.0846	16	324	7	Kolmården/S	0.0841
382	2	Cezallier/F	0.0846	17	401	2	Kingussie/UK	0.0846
336	6	Moscow/RUS	0.0878	18	372	4	Novosibirsk/RUS	0.0883
420	0	Hunnebostrand/S	0.0890	19	338	6	Novosibirsk/RUS	0.0897
419	0	Hunnebostrand/S	0.0890	20	366	4	Paris/F	0.0926
371	4	Nikolaev/UKR	0.0893	21	365	4	Hluboka/CZ	0.0926
296	9	Ranua/FIN	0.0903	22	418	1	Burford/UK	0.0926
295	9	Duisburg/D	0.0923	23	334	6	Brno/CZ	0.0950
417	1	Burford/UK	0.0926	24	405	1	Anchorage/USA	0.0985
416	1	Burford/UK	0.0926	25	404	1	Han Sur Lesse/B	0.0985
364	4	Munich/D	0.0926	26	306	7	Burford/UK	0.1008
374	3	Hluboka/CZ	0.0944	27	378	11	Kerkrade/NL	0.1105
373	3	Budapest/HUN	0.0944	28	346	6	Eberswalde/D	0.1105
332	6	Moscow/RUS	0.0950	29	345	6	Järvsö/S	0.1105
331	6	Moscow/RUS	0.0950	30	266	10	Usti/CZ	0.1122
328	6	Novosibirsk/RUS	0.1028	31	399	2	Orsa/S	0.1130
344	6	Osnabruck/D	0.1105	32	398	2	St. Felicien/CAN	0.1130
267	10	Kingussie/UK	0.1122	33	290	8	Hunnebostrand/S	0.1186
291	8	Järvsö/S	0.1154	34	279	11	Ranua/FIN	0.1316
252	13	Stockholm/S	0.1186	35	403	2	Helsinki/FIN	0.1318
330	6	Opole/POL	0.1288	36	402	2	Budapest/HUN	0.1318
293	9	Järvsö/S	0.1297	37	369	4	Cezallier/F	0.1318
368	4	Hanstedt/D	0.1318	38	294	9	Skåne/S	0.1325
367	4	Hanstedt/D	0.1318	39	259	11	Whipsnade/UK	0.1332
325	6	Namsskogan/N	0.1318	40	407	2	Skåne/S	0.1376
305	8	Orsa/S	0.1318	41	424	1	Moscow/RUS	0.1387
329	6	Kristiansand/N	0.1332	42	260	11	Ahtari/FIN	0.1396
273	11	Hunnebostrand/S	0.1347	43	421	1	Kristiansand/N	0.1403
406	2	Salzburg/A	0.1376	44	360	4	Munich/D	0.1419
353	4	Lycksele/S	0.1376	45	299	9	Calviac/F	0.1429
274	11	Skåne/S	0.1388	46	381	3	Columbus/USA	0.1432
395	3	St.Felicien/CAN	0.1403	47	275	11	Kristiansand/N	0.1432
394	3	Calviac/F	0.1403	48	317	8	Salzburg/A	0.1443
393	3	Big Game/USA	0.1403	49				
283	10	Szeged/HUN	0.1419	50				
313	8	Brno/CZ	0.1443	51				
312	8	Eberswalde/D	0.1443	52				

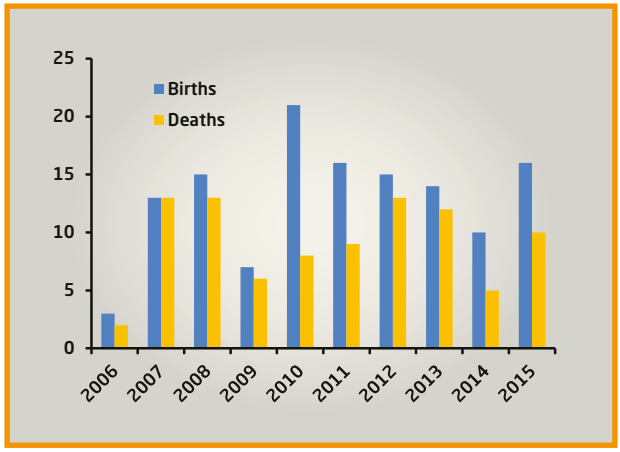


Figure 11. Births and deaths in Wolverine EEP 2006-2015

Genetic variation forms the foundation for all diversity and is a prerequisite for sustaining all evolutionary processes. The extent of *GD* is linked to the numbers of individuals in the population. When the number of individuals decreases, the amount of *GD* simultaneously declines. The more animals the program is able to breed, their cumulative genetic contribution will be passed on to the following generations allowing the population to better retain *GD* over time (*Long et al. 2011*).

As the current population descends from 18 founders and there are 14 founder genomes surviving in the population (Table 4), there is a good chance to improve the *GD* of the population. Individuals with mean kinship (*MK*) values lower 0.098 (Table 8) should therefore be prioritized for breeding. By pairing individuals with similar *MK*, representation of the rarest lineages can be increased. Focus should therefore be on breeding the two siblings at Moscow as well as the female at Lycksele. Table 8 shows the mean kinship rankings of all wolverines included in the genetic analysis, in both the EAZA- and AZA- regions.

A quick and effective way to expand the gene pool in *ex situ* populations is to incorporate new founders into the *ex situ* population at regular intervals. When wild populations have become fragmented and sparse, such periodic re-stockings are often difficult or impossible. This is the case among a majority of the EEP-species. The expanding wild wolverine population in Sweden has, however, resulted in restricted population control where local populations have increased to such a level that they have been considered detrimental to reindeer husbandry. Management authorities have therefore not only allowed destruction of maternal dens, but also allowed periodic immigrations into the captive stock. In 2005 – 2010, seven kits from four different litters have thus been assimilated into the EEP. In addition to recruitments from the wolverine strongholds in Sweden, five females from two litters have arrived to Moscow Zoo in 2004-2012. With such periodic supplementation of wild immigrants, the genetic status of the captive population has not only been improved, but the program can be managed with a smaller target population than otherwise needed.

As shown in Figure 11, the number of births has exceeded the number of deaths during the last decade. If the current birth rate will continue to grow with an average of 14 kits per year as in the last five years, the population will continue to expand and more holding space will be necessary. The Wolverine EEP endeavors henceforth to grow to a minimum of 125 animals. Due to lack of holding capacity, this has, however, turned out to be problematic. Although four new candidates have been approved for 2016 – 2017, additional holders are constantly searched for.

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Ticks and Captive Wolverine: Prevalence and Treatment Options

Emily Boyes

BVetMed MRCVS,
The Cotswold Wildlife Park, Burford

emily@cotswoldwildlifepark.co.uk

1. Rationale

Infestations of captive wolverine, Gulo gulo, with large numbers of ticks have been reported in several collections that keep the species and in one collection, Magdeburg Zoo, the problem was so great they had to stop holding the species following the deaths of young wolverine and an inability to control the ticks (*Grothmann 2011*) (Figure 1).

In order to gain a better understanding of the problem and to compile information regarding treatment options a survey was sent to all EEP holders of the species, with the aim of sharing experiences and attempting to disseminate information gained so that the problem may be more effectively managed in the future.

2. Introduction

2.1. Tick and captive wolverine

The wolverine is the largest member of the mustelid family. They have a circumpolar distribution in the boreal forests and arctic tundras of the northern hemisphere ranging from Norway in the west throughout Eurasia to Canada and the northern parts of U.S.A. (*Blomqvist 2012*). They are generally solitary animals with adults coming together only during the breeding season (late May – June). Young (kits) are born in the middle of winter in natal dens, where they are cared for solely by the mother. They remain in their nests until April – May time when they begin to venture out and they are fully independent by eight month old (*Grothmann 2011*).

During the last few years several European zoos keeping wolverine have suffered severe assaults by tick species *Ixodes ricinus* and *Ixodes hexagonus* (*Grothmann 2011*). In Magdeburg Zoo, where all three development stages (larvae, nymphs and adults) of ticks were found feeding on the wolverines, the animals were subjected to such heavy burdens that two kits were lost. Despite constant treatment by manual removal of ticks from anaesthetised wolverines, in combination with anti-parasitic treatment and chemical treatment of the enclosure, the work was unsuccessful and the zoo had to stop keeping wolverines. Since that time Golden Jackal, *Canis aureus*, have been kept in the historic wolverine enclosure and only one tick has been seen on one animal.

2.2. *Ixodes hexagonus*

Ixodes hexagonus is a three-host nidicolous tick, adapted to live with hosts that use burrows or nests (*Taylor et al. 2015*). The main hosts appear to be the hedgehog and the fox, but it is also commonly found on mustelids, dogs and cats (*Arthur 1953; Matuschka et al. 1990*). It appears to be incapable of feeding on rodents, or on reptiles or birds (*Matuschka et al. 1990*). The lifecycle consists of egg, hexapod larvae, octopod nymph and adult and takes place

Figure 1. Severe tick infestations seen in wolverine at Magdeburg Zoo, Germany (*Grothmann 2011*).

over three years. All lifecycle stages feed on the same hosts for periods of about eight days (*Taylor et al. 2015*). These ticks are nocturnally detaching and will leave the host during the night-time hours, reattaching in the morning before the host leaves the burrow/nest. The majority of the feeding activity occurs during the late evening and early morning hours (*Matuschka et al. 1990*). At the end of the eight day feeding cycle, adult females will drop to the ground and lay 1000 – 1500 eggs over a period of 19 – 25 days, before they die. The eggs are usually laid in the burrow/nest of the host, which greatly improves the chances of the larvae locating and attaching to a host and means that hosts may be infested in large numbers following a hatch. These ticks may be active from early spring to late autumn, but are probably most active during April and May (*Taylor et al. 2015*).

Figure 2. *Ixodes hexagonus* in the non-engorged and engorged states

2.3. *Ixodes ricinus*

Ixodes ricinus is a three-host tick. The lifecycle consists of egg, hexapod larvae, octopod nymph and adult. It typically takes place over three years but can be shorter if climatic conditions are optimal and hosts are abundant (*European Centre for Disease Prevention and Control 2016*). Each stage attaches to a single host and feeds on blood for a period of days before detaching and moulting or producing eggs. An engorged adult female will drop off the host to the ground and seek conditions favourable for egg production. She will remain in this area for 4 – 8 weeks before eggs are produced. Up to 2000 eggs can be produced, after which the female dies and the larvae hatch around eight weeks later. Larvae do not move horizontally over a large area so remain aggregated within their environment whilst waiting for a host. Once a host is found, they can feed and moult to the nymphal stage and become dispersed within the environment (*European Centre for Disease Prevention and Control 2016*).

I. ricinus feeds on a wide range of hosts including small rodents, passerine birds, larger mammals such as hedgehogs, hares, squirrels, wild boar and roe deer with the juvenile stages feeding on smaller hosts such as wood mice and adult stages feeding on larger hosts such as cattle and deer. Larger hosts are important in maintaining tick populations, with populations tending to be lower in the absence of larger hosts (*European Centre for Disease Prevention and Control 2016*).

Ticks quest for hosts using an ambush technique, whereby they climb to the tips of the vegetation and wait for a host to brush past. During questing the tick loses moisture and so has to climb back down the vegetation into the mat layer to rehydrate and therefore the questing period is directly affected by temperature and humidity. They require a relative humidity of at least 80% to thrive and therefore are restricted to areas of moderate to high rainfall with good vegetation. They are primarily observed across Europe in deciduous woodland and mixed forest, but can be found in a range of habitats that support its blood hosts and a moist microclimate (*European Centre for Disease Prevention and Control 2016*).

Figure 3. *Ixodes ricinus* in the non-engorged and engorged states

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3. Results

A survey was sent to all 44 EEP holders of wolverine, and from this there were 14 respondents from eight different countries.

3.1. Prevalence of tick species parasitizing captive wolverine

Of the respondents, six holders reported having seen ticks on their wolverine and eight had not documented any tick attachments to wolverine (Table 1; Figure 4).

Table 1. EEP Survey Respondents - prevalence of ticks on captive wolverine

Name of Collection	Country	Ticks Found on Wolverine?	Level of Tick Burden? Low (1-5); Moderate (5-10); High (10+)
Ähtäri Zoo	Finland	No	
Cotswold Wildlife Park	England	Yes	Moderate
Domaine des Grottes de Han	Belgium	Yes	High
Eberswalde Zoo	Germany	No	
Gaia Zoo	Holland	No	
Highland Wildlife Park	Scotland	No	
Magdeburg Zoo	Germany	Yes	High
Nikolaev Zoo	Ukraine	No	
Nordens Ark	Sweden	Yes	Low
Orsa Bearpark	Sweden	No	
Ranua Wildlife Park	Finland	No	
Sababurg Tierpark	Germany	No	
Salzburg Zoo	Austria	Yes	High
ZSL Whipsnade Zoo	England	Yes	Low

Figure 4. Locations of zoos that responded to the tick survey. Collections that have had cases of tick species parasitizing wolverine are shown in green; those that have had no reported cases are shown in blue

Table 2. Species other than wolverine reported to have been parasitized by tick species.

Collection	Tick attachments to wolverine?	Tick attachments to other species?	Other species affected
Ähtäri Zoo	No	No	
Cotswold Wildlife Park	Yes	Yes	Tapir, Multiple bird species.
Domaine des Grottes de Han	Yes	Yes	Reindeer
Eberswalde Zoo	No	Information not given	
Gaia Zoo	No	Information not given	
Highland Wildlife Park	No	Information not given	
Magdeburg Zoo	Yes	No	
Nikolaev Zoo	No	Information not given	
Nordens Ark	Yes	Yes	Reindeer
Orsa Bearpark	No	Information not given	
Ranua Wildlife Park	No	No	
Sababurg Tierpark	No	Yes	Lynx, horses, deer
Salzburg Zoo	Yes	No	
ZSL Whipsnade Zoo	Yes	Yes	Wolves

Of the six respondents that reported cases of tick species parasitising wolverine, four also reported tick attachments to other species within their collections (Table 2).

Of the six affected collections only one, Magdeburg Zoo, reported serious issues associated with the tick attachments. The tick burdens seen in this collection were much higher than reported in any other collection, with up to several hundred ticks attached to each individual, regularly, twice a year. This burden caused severe and lethal anaemia in two of the young wolverine.

The tick species involved were identified in three of the affected collections as *Ixodes hexagonus* (Magdeburg Zoo and Cotswold Wildlife Park) and *Ixodes ricinus* (Salzburg Zoo). They were not identified in the other three affected collections.

3.2. Enclosure design

The enclosure designs and described favoured sleeping/resting areas of the wolverine were very similar in both collections that were affected by ticks and those that were not (Table 3; Table 4).

3.3. Treatment

Various acaricide treatments were reported by collections that had seen tick attachments to wolverine (Table 5). The methods of administration of the treatments included topical, oral and subcutaneous injection. Though all the products listed were found to be effective initially, most, especially in collections that reported high tick burdens, were not effective at preventing re-infestation for the length of time stated on the manufacturer's datasheets and in some cases of heavy challenge the duration of efficacy was as little as 7 – 10 days. Two products (Dectomax pour-on and Insecticide 2000) were reported to be effective for the duration of the tick season, following a single application.

Of all the collections that reported tick attachments only one, Magdeburg Zoo, had attempted other methods of tick control. These have included burning the surface of the enclosure, spraying the burrows with biological and chemical control products (Bio-Pemox and Indorex respectively) and closing infested burrows so the wolverine build new ones. In Magdeburg Zoo, none of these methods were effective in the mid- to long-term and the problem of heavy tick infestation, requiring 1 – 3

Table 3. Enclosure descriptions and wolverine resting sites in collections that have reported tick attachments on their wolverine.

Name of collection	*Enclosure description (substrate/topography)*	*Wolverine sleeping/resting areas*
Cotswold Wildlife Park	Mixed woodland (predominantly pine, oak, lime). Ground cover mainly soil, laurel bushes and dead wood. Little ground vegetation. Pond. Small underground artificial den.	In trees or in burrows dug by the wolverine. Artificial den mainly used by female when raising young.
Domaine des Grottes de Han	Hillside in a pine forest. Ground cover with soil, vegetation, moss and rocks. Pond. Small facility for shelter and containment.	Artificial nests in concrete and holes in rocks.
Magdeburg Zoo	Woody slope (mainly conifer trees) with natural sandy ground next to a small river. Artificial wooden sleeping boxes.	Several burrows dug by the wolverine themselves.
Nordens Ark	Wooded (pine trees). Ground cover of meadow, rock and wood. 3 man-made concrete dens.	On the ground under pine trees.
Salzburg Zoo	Hillside. Ground cover of stones, soil, grass, bushes and tree trunks.	Burrows dug by the wolverine themselves.
ZSL Whipsnade Zoo	Rough grass with boulders, trees and plenty of shrubs. Artificial den.	In trees or in burrows dug by the wolverine.

Table 4. Enclosure descriptions and wolverine resting sites in collections that have not reported tick attachments on their wolverine

Name of collection	Enclosure description (substrate/topography)	Wolverine sleeping/resting areas
Ähtäri Zoo	Open area with human-made climbing trees. Large rocks and stones. Vegetation mainly grass and nettle. Moss and fern on rock. Artificial indoor dens.	Shallow dells or crevices in rocks. Artificial indoor dens with straw bedding are also used.
Eberswalde Zoo	Hill with sand substrate and pine trees. Outdoor wooden sleeping boxes. Indoor area also.	Self-dug scrapes.
Gaia Zoo	Substrate of soil and grass. Many trees (maple, beech, ash) and bushes (hazel and blackberry). River running through enclosure. Ponds. Two separation dens with nest boxes.	Male – nest box in separation area; also outside in shallow pit or under bush. Female – outside in shallow pit.
Highland Wildlife Park	Steep hillside. Grass substrate. Several large birch trees and juniper bushes. Pond. House with artificial nest boxes. Self-dug dens.	Self-dug dens under juniper bushes.
Nikolaev Zoo	Grass substrate. Trees and bushes. Small hill with standing dead trees. Wooden hut.	Wooden hut and between standing dead trees on the hillside.
Orsa Bearpark	No information given	No information given
Ranua Wildlife Park	Grass and natural vegetation ground cover. Some bare soil. Two artificial nests/caves made of concrete bricks; one partly underground. Wooden shelters filled with straw.	Shelters above ground. Burrows on ground on warm days. Dig tunnels in snow in winter.
Sababurg Tierpark	Bushes, trees, dead wood, rocks and ponds. Ground cover of grass and soil. Caves; natural and man-made.	Male – sunny patch on top of stony hill. Female – dead tree.

anaesthesias per year to allow manual removal of the ticks, always recurred.

4. Discussion

4.1. Tick species

In some cases, collections that experienced significant problems with ticks in wolverine did not see the same issues in other species. In Magdeburg Zoo, where they had to stop keeping wolverine due to the severity of the tick problem. Golden jackal, *Canis aureus*, have been kept in the enclosure since the removal of the wolverine and in five years only one tick has been seen on one animal and at Cotswold Wildlife Park wolves, *Canis lupus occidentalis*, are kept in an enclosure very similar to the one that houses the wolverine and whilst the wolverine frequently have moderate to large numbers of ticks parasitising them, the wolves have never been documented as having a single tick attachment. The reason for this is likely to be due to the tick species involved. At both Cotswold Wildlife Park and Magdeburg Zoo the tick species found attached to the wolverine was *I. hexagonus*. This species of tick is adapted to parasitise hosts that use burrows or nests. It has previously been reported as being associated with several mustelid species (*Arthur 1953; Sherrard-Smith et al. 2012*). Each adult female tick can produce 1000 – 1500 eggs which she will lay in the burrow of the host and this can result in hosts being infested in large numbers following a hatch. As *I. hexagonus* is specifically adapted to parasitise nidicolous species, such as wolverine, if other animal species, such as jackals or wolves, are kept in similar enclosures to those that house the wolverine they are unlikely to be affected by this tick species in the same way, although occasional attachments are still possible. Juvenile wolverine may be more susceptible due to the amount of time they spend in the den where the ticks quest for hosts, meaning they are disproportionately exposed to the parasites. This has also been documented as being the case in other mustelid species, such as otter, that are affected by *I. hexagonus* (*Sherrard-Smith et al. 2012*).

Because *I. hexagonus* lays eggs in the burrows of hosts there is a much greater chance of larvae locating and attaching to hosts then for tick species such as *I. ricinus* who rely upon chance encounters with hosts in the environment. Being in a nest or burrow also makes them less susceptible to environmental and climatic conditions than *I. ricinus* who require a relative humidity of 80% in their environment to survive and, therefore, are restricted to areas of moderate to high rainfall with good vegetation cover (*European Centre for Disease Prevention and Control 2016*). Both *I. hexagonus* and *I. ricinus* have been reported on wolverine in this survey, but in several cases the tick species was not known. It seems likely that in the cases where collections only see the occasional tick attachment, or tick attachments in lower numbers that the species involved is *I. ricinus* and those that see heavy and persistent burdens are more likely to be *I. hexagonus* or a combination of both species. This would form an interesting area for further research, which may help guide management options and enclosure design for the future.

4.2. Zoo location and enclosure design

There did not appear to be any significant pattern relating to zoo location or enclosure design and whether ticks were seen on wolverine.

Both species of ticks known to parasitise wolverine, *I. hexagonus* and *I. ricinus*, are found throughout Europe, though are less prevalent in more northerly locations. Local microclimates, vegetation and availability of natural host species are likely to be more significant factors when considering the risk of tick challenge than zoo location per se.

The descriptions of enclosure design, topography and vegetation cover were very similar across collections and it was not possible to draw any correlation between aspects of enclosure design and prevalence of tick attachments. A more detailed survey of microclimates within the enclosures would be useful to determine whether this is indeed a factor, particularly in the case of *I. ricinus* that is very sensitive to microclimatic conditions. Microclimatic conditions are less likely to be a factor for *I. hexagonus*, who will be relatively protected within the nests/burrows of the hosts when they are detached from the hosts and it is the prevalence of other natural host species in the vicinity of the wolverine enclosures that are more likely to be of significance for this species.

4.3. Treatment

Of the reported acaracide treatments used all were found to be effective, initially, to remove ticks that were already attached. However, most, especially in collections that reported high tick burdens, were not effective at preventing re-infestation for the length of time stated on the manufacturer's datasheets.

Table 5. Reported methods of tick control and their effectiveness

Drug (Brand name and active ingredient)	Dose	Method of administration	Treatment outcome? Time before effects seen?	Duration of treatment effect
Bravecto (Furalaner)1	500 mg	Orally - fed in specially prepared meatballs	Successful. All ticks removed within 4 days.	2 months shortest duration. Often longer.
Bravecto (Furalaner)2	500 mg	Orally - fed in fresh pieces of heart	Successful.	Not known as only just administered at time of survey response
Dectomax Injectable (Doramectin)1	0.5 mg/kg	Orally - injected into a mouse	Successful. All ticks removed within 3 days.	3 weeks shortest duration recorded.
Dectomax Pour-on (Doramectin)5	1.5 ml	On skin	Successful. Within 1 week.	Usually effective for duration of tick season.
Frontline (Fipronil)3	Appropriate size spot-on for weight	Spot-on applied to skin under anaesthesia	Only effective for a few days before re-infestation occurred	No longer than 7 - 10 days
Insecticide 2000 (Pyrethrum & Pyrethroides)4	10 sprays	Applied to skin and fur	Successful. Next day.	Duration of tick season.
Ivomec (Ivermectin)3	0.3 - 0.4 ml	Subcutaneous injection under anaesthesia	Only effective for a few days before re-infestation occurred	No longer than 7 - 10 days
Panomec (Ivermectin)1	0.4 mg/kg	Orally - injected into a mouse	Partially successful. Reduced but didn't always entirely eliminate burden.	Less than 2 weeks during times of heavy challenge.
ProMeris Duo (Amitraz & Metaflumizone)3	Appropriate size spot-on for weight	Spot-on applied to skin under anaesthesia	Only effective for a few days before re-infestation occurred	No longer than 7 - 10 days
Sebacil (Phoxim)3	1 - 2 % solution	Applied to skin under anaesthesia	Only effective for a few days before re-infestation occurred	No longer than 7 - 10 days

Two products, Dectomax pour-on (doramectin) and Insecticide 2000 (pyrethrum and pyrethroides), used at ZSL Whipsnade Zoo and Salzburg Zoo respectively, were reported to be effective for the duration of the tick season, following a single application. Caution is needed when interpreting these results, however, as the level of the tick challenge following application of these products is not known, meaning that the further tick attachments may have been prevented by the application of the product but equally there may have simply been no further tick challenges. Insecticide 2000 states a duration of efficacy of three to four weeks on its datasheet, so if no further tick attachments are seen after that time period it is likely to simply be reflective of a lack of tick challenge within the environment, rather than continued efficacy of the product. It is also interesting to note that Dectomax (doramectin) was used in two different formulations, both as a topical and an oral application, at ZSL Whipsnade Zoo and The Cotswold Wildlife Park respectively. The topical application used by ZSL Whipsnade was reported to be effective for the duration of the tick season, whereas, the oral application used by The Cotswold Wildlife Park was effective only for a period of 3 weeks during times of high tick challenge. This may reflect a greater efficacy of the topical formulation or again could simply be reflective of the level of tick challenge in these two locations, which is reportedly low at ZSL Whipsnade and high at The Cotswold Wildlife Park. Dectomax is not licenced in the European Union (EU) for the treatment of ticks therefore there is no information regarding duration of efficacy for this use, however, it is licenced for the treatment of mites (which are arachnids, in common with ticks) in cattle for a duration of 42 days.

Bravecto (Furalaner) is a relatively new product to the market, first becoming available in the EU in 2014. This product is licenced in the EU for the prevention of fleas and ticks on dogs for a duration of 12 weeks, making it the product with the longest licenced duration of efficacy against ticks currently available in the EU. It has been used at The Cotswold Wildlife Park in wolverine and found to have an efficacy in this species against ticks for a minimum duration of eight weeks, which makes it the product with the longest proven duration of efficacy in an area of relatively high tick challenge. Apart from the duration of efficacy, another advantage of Bravecto over the other products is its formulation and the fact that can be administered orally rather than topically or via injection. It is currently marketed as a palatable chewable tablet, which dogs will accept as a treat. This tablet can easily be placed inside a wolverine's favourite food item, and appears to be readily accepted and consumed. Being able to administer the treatment orally is a significant advantage as this should be easy to do at all collections holding wolverine, regardless of enclosure design. This is in contrast to topical or injectable formulations which would require anaesthesia or sophisticated handling and restraint facilities to allow administration. It has been proven to be safe at five times the maximum clinical dose in dogs (*Bravecto 2016*), giving it a reasonable safety margin in case of accidental overdose in this species. Although there is no safety data available specific to wolverine, extrapolating from the values given for dogs suggests that it should be safe if an animal consumes up to five times the intended dose, as may happen for example if one animal steals a medicated food item from another, having already consumed their own.

Given the advantages listed above and personal experience of the use of Bravecto in wolverine at The Cotswold Wildlife Park, this would be the author's first choice of acaracide, both for treatment and prevention of tick attachment, for captive wolverine. It has a rapid onset of action, beginning to kill within two hours and reaching maximum efficacy within 12 hours (*Bravecto 2016*), therefore, if used regularly in areas of high tick challenge it should help to break the cycle of re-infestation, by killing adult females before they get the chance to lay large numbers of eggs in the nests or enclosures of the wolverine.

Identification of the tick species involved at individual collections should also help guide the most appropriate supplementary measures taken to reduce the level of tick challenge, and the

reliance on medications to control. Habitat modification, such as removal of ground level vegetation where ticks will quest for hosts, may be useful if *I. ricinus* is the species involved. For *I. hexagonus* controlling tick numbers off the host may be harder, especially if access to nest/burrow sites is difficult or impossible, but the use of chemical sprays which will kill or inhibit development of the larval and nymph stages of the ticks may be a useful additional tool in enclosures where this is possible.

5. Summary

With the current changes in climatic conditions worldwide and the increased movement of animals from country to country resulting in the movement of tick species and tick-borne diseases into previously unseen areas, acaricidal treatments are likely to receive increasing interest amongst pharmaceutical companies and veterinary practitioners in the coming years which may result in the addition of further treatment options to our current repertoire.

Given the severity of the issues seen with ticks parasitising captive wolverine in several zoological collections over recent years, this is an important animal health issue and all collections holding wolverine are encouraged to share information and experiences regarding this issue with the EEP coordinator and other EEP holders of the species.

6. Acknowledgements

Firstly I would like to thank Jamie Craig and Leif Blomqvist for supporting this study and for providing very useful background information about the nature and the extent of the problem of ticks and captive wolverine.

I am also incredibly grateful to all those that took the time to complete and return the survey, without whom the work would not have been possible. These are, Tiina Sarkkinen (Ähtäri Zoo), Etienne Brunelle and Goulven Rigaux (Domaine des Grottes de Han), Matthias Hoff (Eberswalde Zoo), Minke Geense (Gaia Zoo), Vickie Larkin (Highland Wildlife Park), Konstantin Ruske and Pierre Grothmann (Magdeburg Zoo), Tanya Bondarenko (Nikolaev Zoo), Camilla Schratz (Nordens Ark), Pernilla Thalin (Orsa Bearpark), Mari Heikkilä (Rauna Wildlife Park), Dr Sandy Rödde (Sababurg Tierpark), Dr Miriam Wiesner (Salzburg Zoo) and Fieke Molenaar (ZSL Whipsnade Zoo).

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Living wolverine population by location as of 1.1.2016.

Reported changes taken place after 1.1.2016 are marked in red but have been excluded from the analyses in the text. Non EEP-participants marked in green.

Restricted to: (*Gulo gulo gulo*)
Status: Living on 1 Jan 2016
Report ordered by: current/last location (alphabetic)

Stud#	Sex	Birth Date	Sire	Dam	Location	Date	LocalID	Event	Name	Breeder#	Transponder
AHTARI - Zoo Ahtari (Ahtarin Elainpuisto Oy), Ahtari, Finland											
235	M	21 Feb 2000	203	202	HELSINKI	21 Feb 2000	200028	Birth	REIDAR	HKI 20	0001E57D5E
					AHTARI	12 Dec 2000	200001	Transfer			
						17 Jun 2016		Death			
260	F	10 Feb 2004	213	219	BERN	10 Feb 2004	A40026	Birth	ROOSA	BERN 5	00061F6218
					AHTARI	26 May 2005	205002	Transfer			
Totals: 1.1.0 (2)											
ANCHORAGE - Alaska Zoo, Anchorage, Alaska, United States											
405	F	12 Feb 2014	328	338	NOVOSIBRK	12 Feb 2014	123032	Birth	OLGA	NOVOSIB 2	643110000461989
					ANCHORAGE	16 Oct 2015	2015-23	Transfer			
Totals: 0.1.0 (1)											
BIELEFELZ - Heimattierpark Olderdissen, Bielefeld, Nordrhein-Westfalen, Germany											
228	F	4 Feb 1999	166	170	SPRINGE	4 Feb 1999	661	Birth	MIRA	SPRINGE 3	00000A55A7
					BIELEFELZ	11 Dec 2003	MIRA	Transfer			
Totals: 0.1.0 (1)											
BIG GAME - Alaska Wildlife Conservation Center, Portage Glacier, Alaska, United States											
393	M	25 Feb 2013	329	275	KRISTIANS	25 Feb 2013	GULGG016	Birth	KASPER	KRIST 10	578098100363548
					BIG GAME	14 Apr 2015	KASPER	Transfer			
407	F	16 Feb 2014	274	294	LUND	16 Feb 2014	407	Birth	KAYLA	HOOR 12	966000000215131
					BIG GAME	13 Dec 2015	KAYLA	Transfer			
Totals: 1.1.0 (2)											
BORAS - Boras Djurpark Zoo, Boras, Vastra Gotaland, Sweden											
281	M	~ Feb 2006	WILD13	WILD14	SWEDEN	23 Apr 2006	NONE	Capture	TJOKKO	LYCKS 11	968000003532282
					LYCKSELE	24 Apr 2006	LYCK11	Transfer			
					JARVZOO	28 Apr 2006	JZM06003	Transfer			
					BORAS	4 Dec 2006	RJ0028	Transfer			
					HUNBSTRND	3 May 2012	212026	Transfer			
					BORAS	15 May 2014	RJ0028	Transfer			
286	F	~ Mar 2006	WILD15	WILD 16	SWEDEN	28 May 2006	NONE	CAPTURE	PESSINA	LYCKS 14	968000003405967
					LYCKSELE	29 May 2006	LYCK14	Transfer			
					BORAS	2 Jun 2006	RJ0027	Transfer			
						27 Jan 2016		Death			
Totals: 1.1.0 (2)											
BRNO - Brno Zoo and Environmental Education Cen, Brno, Jihomoravskì Kraj , Czech Republic											
313	M	27 Feb 2008	190	275	KRISTIANS	27 Feb 2008	GULGG009	Birth	PHILIP	KRIST 6	57B098100300554
					BRNO	14 Sep 2010	ROE001	Transfer			
334	F	23 Jan 2010	230	264	MOSCOW	23 Jan 2010	100025	Birth		MOSCOW 12	
					BRNO	12 Nov 2010	ROE002	Transfer			
Totals: 1.1.0 (2)											
BUDAPEST - Budapest Zool & Botanical Garden, Budapest, Budapest, Hungary											
373	M	11 Feb 2012	230	263	MOSCOW	11 Feb 2012	120125	Birth		MOSCOW 20	
					BUDAPEST	8 Oct 2015	301089	Transfer			

402	F	23 Feb 2014	235	260	AHTARI	23 Feb 2014	214002	Birth	TUIJA	AHTARI 42	985170003021562	
					BUDAPEST	12 Oct 2015	301093	Transfer				

Totals: 1.1.0 (2)

BURFORD - Cotswold Wildlife Park and Gardens, Burford, Oxfordshire, United Kingdom

306	F	7 Feb 2008	230	263	MOSCOW	7 Feb 2008	70847	Birth	SHARAPOVA	MOSCOW 7		
					BURFORD	11 Apr 2009	MM1324	Transfer				
318	M	22 Feb 2009	240	285	HUNBSTRND	22 Feb 2009	209002	Birth	SARKA	HUNNEBO	13977200007244673	
					BURFORD	28 Oct 2009	MM1405	Transfer				
416	M	25 Jan 2015	318	306	BURFORD	25 Jan 2015	MM1951	Birth		COTSWOLD	4956000003722417	
					OSIJEK	5 May 2016	GG01	Transfer				
417	M	25 Jan 2015	318	306	BURFORD	25 Jan 2015	MM1952	Birth		COTSWOLD	5956000003651245	
					OSIJEK	5 May 2016	GG02	Transfer				
418	F	25 Jan 2015	318	306	BURFORD	25 Jan 2015	M1953	Birth		COTSWOLD 6		

Totals: 3.2.0 (5)

CALVIAC - Reserve Zoologique de Calviac, Calviac-en-Perigord, Dordogne, France

299	F	20 Feb 2007	205	204	MAGDEBURG	20 Feb 2007	281008	Birth	METTE MARIT	MAGDEB 6	276096900279305	
					CALVIAC	15 May 2008	204001	Transfer				
394	M	25 Feb 2013	329	275	KRISTIANS	25 Feb 2013	GULGG017	Birth	JESPER	KRIST 11	578098100363592	
					CALVIAC	14 Apr 2014	2015GG05	Transfer				

Totals: 1.1.0 (2)

CEZALIER - Parc Animalier D'Auvergne, Ardes-sur-Couze, Puy-de-Dome, France

369	F	24 Feb 2012	235	260	AHTARI	24 Feb 2012	212002	Birth	FIONA	AHTARI 41	985170002284634	
					CEZALIER	13 Mar 2013	C646	Transfer				
382	M	8 Feb 2013	273	286	BORAS	8 Feb 2013	RJ0030	Birth	ABBE	BORAS 18	968000005789709	
					CEZALIER	12 Dec 2013	C370	Transfer				

Total 1.1 (2)

CHOMUTOV - Podkrusnohorskì Zoopark Chomutov, Chomutov, Chomutov, Czech Republic

256	F	20 Feb 2003	207	185	RANUA	20 Feb 2003	203013	Birth		RANUA 7	985120022969184	
					CHOMUTOV	18 Mar 2005	ROS003	Transfer				

Totals: 0.1.0 (1)

COLUMBUS - Columbus Zoo and Aquarium, Powell, Ohio, United States

381	F	21 Jan 2013	217	299	CALVIAC	21 Jan 2013	204146	Birth	GUILLOTINE	CALVIAC 1		
					COLUMBUS	9 Oct 2014	214123	Transfer				
383	M	8 Feb 2013	273	286	BORAS	8 Feb 2013	RJ0031	Birth	ALVAR	BORAS 19	968000005790057	
					COLUMBUS	30 Apr 2014	214037	Transfer				

Totals: 1.1.0 (2)

DUISBURG - Zoo Duisburg Ag, Duisburg, Nordrhein-Westfalen, Germany

236	F	21 Feb 2000	203	202	HELSINKI	21 Feb 2000	200029	Birth	RONJA	HKI 21	0001BC9E9F	
					DUISBURG	19 Jan 2001	4212	Transfer				
295	M	15 Feb 2007	212	264	MOSCOW	15 Feb 2007	70126	Birth	VANUTSCHKA	MOSCOW 4		
					DUISBURG	13 Apr 2008	5606	Transfer				

Totals: 1.1.0 (2)

EBERSWALD - Tierpark Eberswalde, Eberswalde, Brandenburg, Germany

312	M	27 Feb 2008	190	275	KRISTIANS	27 Feb 2008	GULGG007	Birth	KONRAD	KRIST 5	578098100253079	
					EBERSWALD	21 Oct 2010	KONRAD	Transfer				
346	F	3 Feb 2010	295	236	DUISBURG	3 Feb 2010	5957	Birth		DUISBRG 6	276096909037883	
					EBERSWALD	27 Oct 2010	346	Transfer				

Totals: 1.1.0 (2)

FURSTENWA - Heimattiergarten Fuerstenwalde, Fuerstenwalde / Spre, Brandenburg, Germany

227	F	4 Feb 1999	166	170	SPRINGE	4 Feb 1999	660	Birth	MONA	SPRINGE 2	0000244F19	
					FURSTENWA	23 Jan 2001	MONA	Transfer				
322	M	14 Feb 2009	235	260	AHTARI	14 Feb 2009	209001	Birth	VALENTINO	AHTARI 36	985121006938269	
					FURSTENWA	15 Jun 2010	322	Transfer				

Totals: 1.1.0 (2)

HANSTEDT - Wildpark Lueneburger Heide, Hanstedt-Nindorf, Niedersachsen, Germany

367	M	24 Feb 2012	235	260	AHTARI	24 Feb 2012	212001	Birth	KATKA	AHTARI 39	985170002274019
					HANSTEDT	4 Mar 2014	KATKA	Transfer			
368	M	24 Feb 2012	235	260	AHTARI	24 Feb 2012	212003	Birth	KAMPPI	AHTARI 40	985170002273671
					HANSTEDT	4 Mar 2014	KAMPPI	Transfer			

Totals: 2.0.0 (2)

HANSURLES - Reserve d'Animaux Sauvage, Han-sur-Lesse Roche, Namur, Belgium

400	M	14 Feb 2014	273	286	BORAS	14 Feb 2014	RJ0033	Birth	VALLE	BORAS 21	968000010111657
					HANSURLES	26 Feb 2015	GR42	Transfer			
404	F	12 Feb 2014	328	338	NOVOSIBRK	12 Feb 2014	123031	Birth		NOVOSIB 1	643110000461974
					HANSURLES	13 Mar 2015	GR41	Transfer			

Totals: 1.1.0 (2)

HELSINKI - Helsinki Zoo, Helsinki, Finland

389	M	20 Feb 2013	319	324	KOLMARDEN	20 Feb 2013	12110	Birth	SAREK	KOL 31	968000005747809
					HELSINKI	28 May 2014	214029	Transfer			
403	F	23 Feb 2014	235	260	AHTARI	23 Feb 2014	214003	Birth	PINJA	AHTARI 43	985170003023832
					HELSINKI	25 Mar 2015	215003	Transfer			

Totals: 1.1.0 (2)

HLUBOKA - Zoologicka Zahrada Ohrada, Hluboka Nad Vltavou, Jihoceskì Kraj, Czech Republic

365	F	26 Jan 2012	318	306	BURFORD	26 Jan 2012	MM1652	Birth	NALKA	COTSWOLD	2956000001517477
					HLUBOKA	11 Jul 2013	M4100001	Transfer			
374	M	11 Feb 2012	230	263	MOSCOW	11 Feb 2012	120126	Birth	VASIL	MOSCOW 21	972270000020635
					HLUBOKA	3 Apr 2014	M4200002	Transfer			

Totals: 1.1.0 (2)

HUNBSTRND - Nordens Ark, Hunnebostrand, Vastra Gotaland, Sweden

273	M	22 Feb 2005	240	191	HUNBSTRND	22 Feb 2005	205009	Birth	RIFF	HUNNEBO	12977200004968595
					BORAS	3 May 2012	RJ0029	Transfer			
					HUNBSTRND	15 May 2014	205009	Transfer			
285	F	~ Mar 2006	WILD15	WILD16	SWEDEN	28 May 2006	NONE	Capture	VIDDJA	LYCKS 13	968000003398831
					LYCKSELE	29 May 2006	LYCK13	Transfer			
					BORAS	2 Jun 2006	RJ0026	Transfer			
					HUNBSTRND	4 Dec 2006	206072	Transfer			
290	F	11 Feb 2007	203	202	HELSINKI	11 Feb 2007	207003	Birth	ZALLA	HKI 27	968000004141752
					HUNBSTRND	23 Jan 2008	208002	Transfer			
356	M	17 Feb 2011	240	285	HUNBSTRND	17 Feb 2011	211009	Birth	EDISON	HUNNEBO17	977200007676513
419	M	8 Mar 2015	273	285	HUNBSTRND	8 Mar 2015	215004	Birth	ANGUS	HUNNEBO	24752098100704209
					KERKRADE	10 Apr 2016	M15078	Transfer			
420	M	8 Mar 2015	273	285	HUNBSTRND	8 Mar 2015	215005	Birth	MALCOLM	HUNNEBO	25752098100706451
					HERBERSTN	28 Jul 2016	101731	Transfer			

Totals: 4.2.0 (6)

IZHEVSK - Izhevsk Zoo, Izhevsk, Udmurtskaya Respubli, Russian Federation

244	F	17 Feb 2001	182	191	HUNBSTRND	17 Feb 2001	201007	Birth	SVAIPA	HUNNEBO 8	0604-35E9
					MOSCOW	5 Nov 2002	20765	Transfer			
					IZHEVSK	1 Sep 2008	SVAIPA	Transfer			
						30 May 2016		Death			
370	M	1 Feb 2012	212	264	MOSCOW	1 Feb 2012	120122	Birth		MOSCOW 17	
					IZHEVSK	26 Apr 2013	370	Transfer			

Totals: 1.1.0 (2)

JARVZOO - Jarvzoo, Jarvso, Gavleborg, Sweden

278	F	~ Feb 2005	WILD11	WILD12	NORRBOTTE	25 May 2005	NONE	Capture	BIANCA	LYCKS 10	977200004264006
					LYCKSELE	26 May 2005	LYCK10	Transfer			
					HUNBSTRND	30 May 2005	205031	Transfer			
					JARVZOO	14 Jun 2006	JZM06009	Transfer			
291	M	11 Feb 2007	203	202	HELSINKI	11 Feb 2007	207004	Birth	DIMO	HKI 28	968000004173825
					JARVZOO	23 Jan 2008	JZM08001	Transfer			
293	M	21 Feb 2007	221	197	JARVZOO	21 Feb 2007	JZM07005	Birth	DITO	JARVSO 6	968000003431477
345	F	3 Feb 2010	295	236	DUISBURG	3 Feb 2010	5958	Birth	FROSSA	DUISBRG 5	276096909040802
					JARVZOO	9 Feb 2011	FROSSA	Transfer			

391	M	7 Mar 2013	291	278	JARVZOO	7 Mar 2013	JZM13007	Birth	JUMBO	JARVSO 8	968000010080146
					ANCHORAGE	22 Jun 2016	2016-21	Transfer			
422	M	24 Feb 2015	291	278	JARVZOO	24 Feb 2015	JZM15016	Birth		JARVSO 9	968000010080458
423	M	24 Feb 2015	291	278	JARVZOO	24 Feb 2015	JZM15017	Birth		JARVSO 10	968000010079852

Totals: 5.2.0 (7)

KERKRADE - GaiaZoo Kerkrade, Kerkrade, Limburg, Netherlands

378	F	5 Feb 2012	295	236	DUISBURG	5 Feb 2012	6347	Birth	AHMA	DUISBRG 9	276096909211440
					KERKRADE	9 Apr 2013	M12146	Transfer			

Totals: 0.1.0 (1)

KINGUSSIE - Highland Wildlife Park, Kingussie, Highland, United Kingdom

267	M	10 Feb 2005	203	202	HELSINKI	10 Feb 2005	205007	Birth	XALE	HKI 25	968000002531309
					EDINBURGH	9 Aug 2006	M06H11	Transfer			
					KINGUSSIE	30 Apr 2013	5669	Transfer			
401	F	14 Feb 2014	273	286	BORAS	14 Feb 2014	RJ0034	Birth	TINA	BORAS 22	968000010079719
					KINGUSSIE	19 Feb 2015	5831	Transfer			

Totals: 1.1.0 (2)

KOLMARDEN - Kolmardens Djurpark Ab, Kolmarden, Ostergotland, Sweden

319	M	22 Feb 2009	240	285	HUNBSTRND	22 Feb 2009	209003	Birth	JOKK	HUNNEBO	14977200007248513
					KOLMARDEN	18 Mar 2010	11121	Transfer			
324	F	3 Feb 2009	217	211	KOLMARDEN	3 Feb 2009	10812	Birth	PIFF	KOL 29	968000000603355

Totals: 1.1.0 (2)

KRISTIANS - Kristiansand Dyrepark Asa, Kristiansand, Ostfold, Norway

275	F	4 Feb 2005	182	236	DUISBURG	4 Feb 2005	4880	Birth	BITTE	DUISBRG 2	000006643640
					KRISTIANS	20 Feb 2007	GULGG006	Transfer			
329	M	24 Feb 2010	273	290	HUNBSTRND	24 Feb 2010	210003	Birth	ZACK	HUNNEBO	15977200007465589
					KRISTIANS	28 Sep 2011	GULGG015	Transfer			
421	F	15 Feb 2015	329	275	KRISTIANS	15 Feb 2015	GULGG019	Birth	AKKA	KRIST 13	578098100363904
					BORAS	27 Apr 2016	RJ0035	Transfer			

Totals: 1.2.0 (3)

LIMPOPZOO - Nizhnii Novgorod Zoo “Limpopo “, Nizhny Novgorod, Nizhegorodskaya Obla, Russian Federation

307	F	7 Feb 2008	230	263	MOSCOW	7 Feb 2008	70848	Birth	ROXANE	MOSCOW 8
					LIMPOPZOO	18 Mar 2010	ROXANE	Transfer		
396	M	????	WILD	WILD	RUSSIA	????	NONE	Capture	YAKUT	
					LIMPOPZOO	20 May 2012	YAKUT	Transfer		

Totals: 1.1.0 (2)

LUND - Skanes Djurpark Resort Ab, Hoor, Skane, Sweden

274	M	4 Feb 2005	182	236	DUISBURG	4 Feb 2005	4879	Birth	LUNA	DUISBRG 1	000666F27A
					LUND	31 Jan 2006	LUNA	Transfer			
294	F	21 Feb 2007	221	197	JARVZOO	21 Feb 2007	JZM07004	Birth	DINA	JARVSO 7	968000003396831
					LUND	17 Apr 2008	DINA	Transfer			

Totals: 1.1.0 (2)

LYCKSELE - Lycksele Zoo, Lycksele, Vasterbotten, Sweden

343	F	~ 2010	WILD	WILD	SWEDEN	14 May 2010	NONE	Capture	THELMA	LYCKS 15	968000003533061
					LYCKSELE	15 May 2010	THELMA	Transfer			
348	M	31 Jan 2011	252	282	STOCKHOLM	31 Jan 2011	942233	Birth		SHOLM 10	968000005120697
					LYCKSELE	12 Mar 2013	348	Transfer			
353	M	9 Feb 2011	274	294	LUND	9 Feb 2011	HOOR10	Birth	LUDDE	HOOR 10	945000000830893
					LYCKSELE	29 Jan 2014	LUDDE	Transfer			

Totals: 2.1.0 (3)

MINNESOTA - Minnesota Zoological Garden, Apple Valley, Minnesota, United States

387	F	21 Feb 2013	281	290	HUNBSTRND	21 Feb 2013	213003	Birth	ZOLA	HUNNEBO	23968000010082383
					MINNESOTA	30 Oct 2013	13729	Transfer			

390	M	20 Feb 2013	319	324	KOLMARDEN	20 Feb 2013	12111	Birth	ABISKO	KOL 32	968000005737627
					MINNESOTA	30 Oct 2013	13728	Transfer			

Totals: 1.1.0 (2)

MOSCOW - Moscow Zoological Park, Moscow, Moskovskaya Oblast', Russian Federation

231	F	4 Feb 1999	188	183	SALZBURG	4 Feb 1999	M720	Birth	AGNETHA	SALZBURG	3985100006921902
					MOSCOW	27 Jul 2000	200541	Transfer			
263	F	~Feb 2004ñ1m	WILD9	WILD10	MURMANSK	18 Apr 2004	NONE	Capture	ROSA	MOSCOW 1	
					MOSCOW	8 Sep 2004	40874	Transfer			
264	F	~Feb 2004ñ1m	WILD9	WILD10	MURMANSK	18 Apr 2004	NONE	Capture	MAKHA	MOSCOW 2	
					MOSCOW	8 Sep 2004	40875	Transfer			
265	F	~Feb 2004ñ1m	WILD9	WILD10	MURMANSK	18 Apr 2004	NONE	Capture	BELCKA	MOSCOW 3	
					MOSCOW	8 Sep 2004	40876	Transfer			
						10 Jun 2016		Death			
331	M	23 Jan 2010	230	264	MOSCOW	23 Jan 2010	100022	Birth		MOSCOW 9	
332	M	23 Jan 2010	230	264	MOSCOW	23 Jan 2010	100023	Birth		MOSCOW 10	
336	M	22 Jan 2010	212	263	MOSCOW	22 Jan 2010	100067	Birth		MOSCOW 14	
379	F	~ 2012	WILD17	WILD18	KARELIYA	~ 2012	NONE	Capture		MOSCOW 23	
					MOSCOW	20 Sep 2012	120692	Transfer			
						18 Aug 2016		Death			
380	F	~ 2012	WILD17	WILD18	KARELIYA	~ 2012	NONE	Capture		MOSCOW 24	
					MOSCOW	20 Sep 2012	120693	Transfer			
424	F	~ Dec 2014	371	375	RUSSIA	~ Dec 2014	_____	Birth			
					MOSCOW	9 Sep 2015	150597	Transfer			

Totals: 3.7.0 (10)

MUNICH - Munchener Tierpark Hellabrunn, Munich, Bayern, Germany

360	F	8 Feb 2011	205	204	SPRINGE	8 Feb 2011	1241	Birth	LENA	SPRINGE 7	968000005349448
					MUNICH	23 Feb 2012	083009	Transfer			
364	M	26 Jan 2012	318	306	BURFORD	26 Jan 2012	MM1651	Birth	ENSIN	COTSWOLD	1956000001463810
					MUNICH	9 Feb 2013	083010	Transfer			

Totals: 1.1.0 (2)

NAMSKOGAN - Namsskogans Familiepark, Trones Namsskogan, Nord-Trondelag, Norway

325	M	16 Feb 2010	235	260	AHTARI	16 Feb 2010	210001	Birth		AHTARI 37	246098100276450
					NAMSKOGAN	7 Jul 2011	NIILA	Transfer			

Totals: 1.0.0 (1)

NIKOLAEV - Nikolaev Zoo, Nikolaev, Mykolavska Oblast, Ukraine

347	F	~ Mar 2001	WILD	WILD	RUSSIA	~ Jul 2003	NONE	Capture	PLOTINKA	EKATERIN 1	
					EKATERINB	~ Jul 2003	PLOTIN	Transfer			
					NIKOLAEV	12 Sep 2003	403055	Transfer			
371	M	1 Feb 2012	212	264	MOSCOW	1 Feb 2012	120123	Birth	VARYAG	MOSCOW 18	
					NIKOLAEV	22 Oct 2014	414048	Transfer			

Totals: 1.1.0 (2)

NOVOSIBRK - Novosibirsk Zoological Park, Novosibirsk, Novosibirskaya Oblas, Russian Federation

328	M	17 Feb 2010	255	251	KERKRADE	17 Feb 2010	M10016	Birth	TAPIO	GAIA 7	0006BB223
					NOVOSIBRK	19 Aug 2011	123026	Transfer			
338	F	22 Jan 2010	212	263	MOSCOW	22 Jan 2010	100069	Birth		MOSCOW 16	
					NOVOSIBRK	15 Jun 2011	123025	Transfer			
372	F	1 Feb 2012	212	264	MOSCOW	1 Feb 2012	120124	Birth		MOSCOW 19	
					NOVOSIBRK	29 Nov 2013	123028	Transfer			

Totals: 1.2.0 (3)

OPOLE - Ogrod Zoologiczny Opole, Opole, Opolskie, Poland

330	M	24 Feb 2010	273	290	HUNBSTRND	24 Feb 2010	210004	Birth	ZETH	HUNNEBO	16977200007464830
					OPOLE	25 Oct 2011	M11064	Transfer			
349	F	31 Jan 2011	252	282	STOCKHOLM	31 Jan 2011	942234	Birth		SHOLM 11	966000000046609
					OPOLE	3 Oct 2012	M12076	Transfer			

Totals: 1.1.0 (2)

ORSA - Orsa Gronklitt Bjornpark (Orsa Bear Pk), Orsa, Dalarna, Sweden

305	M	23 Feb 2008	235	260	AHTARI	23 Feb 2008	208006	Birth	RULLE	AHTARI 35	985121005558592
					ORSA	22 May 2009	WV2	Transfer			
399	F	27 Feb 2014	296	279	RANUA	27 Feb 2014	214010	Birth	KAAMOS	RANUA 9	981098104651355
					ORSA	9 May 2015	WV4	Transfer			

Totals: 1.1.0 (2)

OSNABRUCK - Zoo Osnabruck, Osnabruck, Niedersachsen, Germany

344	M	3 Feb 2010	295	236	DUISBURG	3 Feb 2010	5956	Birth	LOKI	DUISBRG 4	276096909034402
					OSNABRUCK	22 Mar 2011	2780	Transfer			
358	F	17 Feb 2011	240	285	HUNBSTRND	17 Feb 2011	211011	Birth	VILDA	HUNNEBO	19977200007668739
					OSNABRUCK	23 Oct 2011	3015	Transfer			

Totals: 1.1.0 (2)

PARIS ZOO - Parc Zoologique de Paris, Paris, France

366	F	26 Jan 2012	318	306	BURFORD	26 Jan 2012	MM1653	Birth	NIEMI	COTSWOLD	3956000001462215
					PARIS ZOO	7 Feb 2014	ZB4070	Transfer			
385	M	21 Feb 2013	281	290	HUNBSTRND	21 Feb 2013	213001	Birth	ZAKKO	HUNNEBO	21968000010082200
					PARIS ZOO	4 Feb 2014	ZB4055	Transfer			

Totals: 1.1.0 (2)

RANUA - Ranua Wildlife Park, Ranua, Lappland, Finland

279	F	21 Feb 2005	221	197	JARVZOO	21 Feb 2005	JZM5005	Birth	BATSI	JARVSO 5	9680000034302841
					RANUA	25 Jul 2006	206038	Transfer			
296	M	15 Feb 2007	212	264	MOSCOW	15 Feb 2007	70127	Birth	RASPUTIN	MOSCOW 5	643098100043761
					BERN	28 May 2008	A80113	Transfer			
					RANUA	28 Apr 2011	211002	Transfer			

Totals: 1.1.0 (2)

ROEVRUCHI - Municipal Independent Org "Roev Ruchei, Krasnoyarsk, Krasnoyarskiy Kray, Russian Federation

297	F	15 Feb 2007	212	264	MOSCOW	15 Feb 2007	70128	Birth	RIMMA	MOSCOW 6	
					ROEVRUCHI	22 May 2008	RIMMA	Transfer			

Totals: 0.1.0 (1)

SABABURG - Tierpark Sababurg, Hofgeismar-Sababurg, Hessen, Germany

257	M	25 Feb 2003	166	170	SPRINGE	25 Feb 2003	767	Birth	HAEGAR	SPRINGE 5	276098100370413
					SABABURG	12 Oct 2005	HAEGAR	Transfer			
276	F	4 Feb 2005	182	236	DUISBURG	4 Feb 2005	4881	Birth	HELGA II	DUISBRG 3	0006642C06
					SABABURG	3 Nov 2006	HELII	Transfer			

Totals: 1.1.0 (2)

SALZBURG - Salzburg Zoo Hellbrunn, Anif, Salzburg, Austria

317	F	27 Feb 2008	190	275	KRISTIANS	27 Feb 2008	GULGG008	Birth	DORTEA	KRIST 7	578098100269423
					SALZBURG	30 Mar 2010	S1050	Transfer			
406	M	16 Feb 2014	274	294	LUND	16 Feb 2014	406	Birth	LOGAN	HOOR 11	966000000225903
					SALZBURG	5 May 2015	S2085	Transfer			

Totals: 1.1.0 (2)

SPRINGE - Niedersachsische Landesforsten, Springe, Niedersachsen, Germany

204	F	21 Feb 1997	146	165	STOCKHOLM	21 Feb 1997	940953	Birth	ANNA-GRETA	SHOLM 3	00013CDF71
					MAGDEBURG	23 Apr 1998	281001	Transfer			
					SPRINGE	28 Oct 2009	1178	Transfer			

Totals: 0.1.0 (1)

ST FELICI - Zoo Sauvage de St-Felicien, St-Felicien, Quebec, Canada

395	M	25 Feb 2013	329	275	KRISTIANS	25 Feb 2013	GULGG018	Birth	JONATANN	KRIST 12	578098100367711
					COLUMBUS	9 Oct 2014	214124	Transfer			
					ST FELICI	16 Dec 2014	B14086	Transfer			
398	F	27 Feb 2014	296	279	RANUA	27 Feb 2014	214009	Birth	KURU	RANUA 8	981098104653747
					TEXAS	27 Feb 2015	398	Transfer			
					ST FELICI	26 Mar 2015	B14104	Transfer			

Totals: 1.1.0 (2)

STE CROIX - Parc Animalier De Sainte Croix, Rhodes Lorraine, Moselle, France

411	F	14 Feb 2015	319	324	KOLMARDEN	14 Feb 2015	12663	Birth	VIDJA	KOL 36	968000010161650
					STE CROIX	19 Dec 2015	1643	Transfer			
412	M	23 Feb 2015	252	282	STOCKHOLM	23 Feb 2015	942524	Birth	SAIVO	SHOLM 13	752015900007216
					STE CROIX	19 Dec 2015	1642	Transfer			

Totals: 1.1.0 (2)

STOCKHOLM - Skansen Foundation Zool Dept, Stockholm, Sweden

252	M	22 Feb 2003	203	202	HELSINKI	22 Feb 2003	203011	Birth	UNTAMO	HKI 23	0001BDD088
					STOCKHOLM	11 Feb 2004	941335	Transfer			
282	F	~ Feb 2006	WILD13	WILD14	SWEDEN	23 Apr 2006	NONE	Capture	JONNA	LYCKS 12	968000003398972
					LYCKSELE	24 Apr 2006	LYCK12	Transfer			
					JARVZOO	28 Apr 2006	JZM06002	Transfer			
					STOCKHOLM	4 Dec 2006	941520	Transfer			
413	M	23 Feb 2015	252	282	STOCKHOLM	23 Feb 2015	942525	Birth		SHOLM 14	
						9 Feb 2016		Death			
414	F	23 Feb 2015	252	282	STOCKHOLM	23 Feb 2015	942522	Birth	SUNNA	SHOLM 15	
					HERBERSTN	28 Jul 2016	101732	Transfer			

Totals: 2.2.0 (4)

SZEGED - Szeged Zoo, Szeged, Csongrad, Hungary

283	M	25 Feb 2006	205	204	MAGDEBURG	25 Feb 2006	281005	Birth	NARVITE	MAGDEB 2	968000002319621
					SZEGED	20 Mar 2007	2246	Transfer			
340	F	15 Feb 2010	252	282	STOCKHOLM	15 Feb 2010	942103	Birth	NAVARRANA	SHOLM 9	968000005142711
					SZEGED	25 Nov 2010	2746	Transfer			

Totals: 1.1.0 (2)

USTI - Usti Nad Labem Zoo, Usti Nad Labem, Czech Republic

266	F	10 Feb 2005	203	202	HELSINKI	10 Feb 2005	205006	Birth	XALA	HKI 24	968000002681480
					USTI	14 Dec 2006	UL0575	Transfer			
357	M	17 Feb 2011	240	285	HUNBSTRND	17 Feb 2011	211010	Birth	MARCO	HUNNEBO	18977200007668122
					USTI	26 Oct 2012	UL1998	Transfer			

Totals: 1.1.0 (2)

WHIPSNADE – ZSL, Whipsnade Zoo, Dunstable, Bedfordshire, United Kingdom

259	F	10 Feb 2004	213	219	BERN	10 Feb 2004	A40025	Birth	PIGE	BERN 4	00060D61D8
					EDINBURGH	20 Apr 2005	M05D03	Transfer			
					WHIPSNADE	20 May 2010	4110	Transfer			
323	M	3 Feb 2009	217	211	KOLMARDEN	3 Feb 2009	10813	Birth	PUFF	KOL 28	968000000569365
					LONDON RP	4 Mar 2010	8001	Transfer			
					WHIPSNADE	9 Apr 2010	4059	Transfer			

Totals: 1.1.0 (2)

ANIMALS IN EEP 2015: 54.54.0 (108)
in 44 Institutions

TOTAL ANIMALS 2015: 58.60 (118)
in 50 Institutions

Compiled by: Leif Blomqvist thru Nordens Ark
Data current thru: 1 Jan 2016 - European regional
Printed on 1 Oct 2016 using Sparks v1.65

Historical Listing of Wolverines, *Gulo g. gulo.*

Reported changes taken place after 1.1.2016 marked in red.

Historical listing of wolverines. Changes taking place after 1.1.2016 and reported cubs born 2016 marked in red.
Restricted to: (*Gulo gulo gulo*)
Dates: 1 Jan 1900 - 1 October 2016

Stud#	Sex	Birth Date	Sire	Dam	Location	Date	LocalID	Event	Name	Breeder#	Transponder
89	F	????	WILD	WILD	FINLAND	????		NONE	Capture		
					HELSINKI	~ 1958			Transfer		
					CHESTER	12 Dec 1958	H1652		Transfer		
						6 Jul 1968			Death		
90	M	????	WILD	WILD	FINLAND	????		NONE	Capture		
					HELSINKI	~ 1958			Transfer		
					CHESTER	12 Dec 1958	H1651		Transfer		
						18 Mar 1969			Death		
91	M	~ 1958	WILD	WILD	SWEDEN	~ 1958		NONE	Capture		
					STOCKHOLM	1 Jan 1959	941521		Transfer		
					PARIS JP	23 Dec 1959	941521		Transfer		
						8 Feb 1960			Death		
92	M	~ 1960	WILD	WILD	SWEDEN	~ 1960		NONE	Capture		
					STOCKHOLM	1 Jan 1961	940239		Transfer		
					PARIS JP	13 Feb 1963	M63012		Transfer		
						9 Feb 1967			Death		
93	M	~ 1969	WILD	WILD	FINLAND	~ 1969		NONE	Capture	MOSSE	
					HELSINKI	20 Oct 1969	690072		Transfer		
					VIENNA	9 Sep 1975	MOSSE		Transfer		
94	M	~ 1971	WILD	WILD	FINLAND	~ 1971		NONE	Capture	CASSIUS	
					HELSINKI	6 Oct 1971	710180		Transfer		
					HERBERSTN	27 May 1975	CASSIUS		Transfer		
						~ 1977			Death		
95	M	????	WILD	WILD	FINLAND	????		NONE	Capture		
					HELSINKI	????			Transfer		
					AMSTERDAM	????			Transfer		
					HANNOVER	2 Aug 1972	V76		Transfer		
						3 May 1973			Death		
96	F	~ 1972	WILD	WILD	SWEDEN	~ 1972		NONE	Capture		
					KOLMARDEN	~ 1972			Transfer		
					HANNOVER	18 Aug 1972	V79		Transfer		
						25 Mar 1981			Death		
97	F	????	WILD	WILD	FINLAND	????		NONE	Capture		
					TAMPEREZO	????			Transfer		
					HELSINKI	2 Oct 1972	720172		Transfer		
						4 Jul 1973			Death		
98	F	~ 1973	WILD	WILD	SWEDEN	~ 1973		NONE	Capture		
					KOLMARDEN	~ 1973			Transfer		
					HANNOVER	28 Jul 1973	V106		Transfer		
						1 Aug 1977			Death		
99	M	~ 1974	WILD	WILD	FINLAND	~ Mar 1974		NONE	Capture	TAHVO	
					HELSINKI	27 Mar 1974	740108		Transfer		
					DORTMUND	21 Nov 1974	TAHVO		Transfer		
					HANNOVER	15 Nov 1976	V1126		Transfer		
						14 May 1980			Death		
100	M	~ 1963	WILD	WILD	SWEDEN	????		NONE	Capture	LAPPO	BORAS 1
					BORAS	18 Apr 1963	RJ0001		Transfer		
						12 Apr 1976			Death		
101	F	????	WILD	WILD	SWEDEN	????		NONE	Capture	LAPPOLINA	BORAS 2
					BORAS	5 Apr 1963	RJ0002		Transfer		
						22 Oct 1972			Death		
102	F	16 Feb 1964	WILD	WILD	SWEDEN	????		NONE	Capture	KNURPAN 2	BORAS 4
					BORAS	24 Mar 1964	RJ0004		Transfer		
						12 Apr 1976			Death		
103	F	~ 1963	WILD	WILD	SWEDEN	????	RJ0003		Capture	KNURPAN 1	BOR†S 3
					BORAS	24 Mar 1963	RJ0003		Transfer		
						4 Mar 1967			Death		
104	F	????	WILD	WILD	SWEDEN	????		NONE	Capture	ARJA	HOOR 1

					LUND	????	ARJA	Transfer			
						????		Death			
105	F	????	WILD	WILD	SWEDEN	????	NONE	Capture		KOL 1	
					KOLMARDEN	1 Jan 1967	475	Transfer			
						26 Apr 1975		Death			
106	F	????	WILD	WILD	SWEDEN	????	NONE	Capture	STINA	KOL 2	
					KOLMARDEN	1 Jan 1968	474	Transfer			
						22 May 1979		Death			
107	F	22 Mar 1970	100	102	BORAS	22 Mar 1970	RJ0007	Birth	LILLKNURPAN	BORAS 5	
					SWEDEN	4 Apr 1973	LILLKN	Release			
						27 Sep 1973		Death			
108	F	22 Mar 1970	100	102	BORAS	22 Mar 1970	RJ0008	Birth	KNURPELINA	BORAS 6	
						24 Jun 1976		Death			
109	M	????	WILD	WILD	FINLAND	????	NONE	Capture	PUTTE	KOL 3	
					TAMPEREZO	1 Feb 1971	_____	Transfer			
					HELSINKI	2 Oct 1972	720173	Transfer			
					KOLMARDEN	2 Nov 1972	476	Transfer			
						5 Dec 1978		Death			
110	M	1 Mar 1971	WILD1	WILD2	SAVUKOSKI	????	NONE	Capture	TEEMU	HKI 1	
					HELSINKI	29 Mar 1971	710001	Transfer			
						19 Jul 1984		Death			
111	F	1 Mar 1971	WILD1	WILD2	SAVUKOSKI	????	NONE	Capture	TAAVA	HKI 2	
					HELSINKI	29 Mar 1971	710002	Transfer			
						13 Jul 1983		Death			
112	M	12 Mar 1972	100	102	BORAS	12 Mar 1972	RJ0009	Birth	BOSSE	BORAS 7	
					LUND	28 Sep 1972	BOR7	Transfer			
						~ 1985		Death			
113	F	12 Mar 1972	100	102	BORAS	12 Mar 1972	RJ0010	Birth	KARIN	BORAS 8	
						30 Dec 1980		Death			
114	M	????	WILD	WILD	FINLAND	????	NONE	Capture	SVAGER	KOL 4	
					KOLMARDEN	30 Nov 1978	478	Transfer			
					HAMBURG	17 Sep 1979	_____	Transfer			
						3 Feb 1980		Death			
115	M	1 Mar 1974	WILD3	WILD4	INARI	????	NONE	Capture	OSKU	HKI 3	
					HELSINKI	27 Mar 1974	740003	Transfer			
						2 Jun 1988		Death			
116	F	1 Mar 1974	WILD3	WILD4	INARI	????	NONE	Capture	TELLU	HKI 4	
					HELSINKI	27 Mar 1974	740004	Transfer			
						10 Jun 1985		Death			
117	M	12 Feb 1975	112	104	LUND	12 Feb 1975	HOOR2	Birth		HOOR 2	
					BORAS	2 May 1976	RJ0011	Transfer			
						2 Jul 1978		Death			
118	M	~ 1978	WILD	WILD	SWEDEN	????	NONE	Capture	NISSE	BORAS 9	
					BORAS	10 May 1978	RJ0012	Transfer			
					LUND	22 Oct 1982	KVICK	Loan to			
					BORAS	15 Feb 1985	RJ0012	Transfer			
					HELSINKI	27 Mar 1985	850008	Loan to			
						20 Mar 1993		Death			
119	M	~ 1978	WILD	WILD	SWEDEN	1 Mar 1978	NONE	Capture	RIPSI	LYCKS 1	
					LYCKSELE	????	RIPSI	Transfer			
					BORAS	12 May 1982	RJ0013	Loan to			
						20 Apr 1994		Death			
120	M	~ 1978	WILD	WILD	SWEDEN	????	NONE	Capture	AKKA	FROSO 1	
					FROSON	10 Feb 1978	AKKA	Transfer			
					BORAS	11 May 1981	RJ0014	Transfer			
					LYCKSELE	2 Jan 1982	AKKA	Loan to			
					HUNBSTRND	14 Feb 1989	890001	Loan to			
						1 Mar 1991		Death			
121	F	1 Mar 1978	WILD	WILD	SKELDA	????	NONE	Capture		LYCKS 2	
					LYCKSELE	1 Apr 1978	LYCK2	Transfer			
						14 Feb 1994		Death			
122	M	1 Mar 1978	WILD	WILD	KABLA	1 Mar 1978	NONE	Capture	GRUFF	HOOR 3	00-004D-276E
					LUND	3 Mar 1978	GRUFF	Transfer			
					KOLMARDEN	28 May 1979	480	Loan to			
					HUNBSTRND	3 Jul 1990	900102	Loan to			
					KOLMARDEN	1 Dec 1993	GRUFF	Transfer			
						1 Dec 1993		Death			
123	M	~ 1978	WILD	WILD	SWEDEN	~ 1978	NONE	Capture		BORAS 10	
					BORAS	10 May 1978	RJ0015	Transfer			
					LYCKSELE	20 Nov 1978	_____	Loan to			
						????		Death			
124	F	~ 1978	WILD	WILD	SWEDEN	????	NONE	Capture		BORAS 11	
					BORAS	10 May 1978	RJ0016	Transfer			
						21 May 1983		Death			

125	F	????	WILD	WILD	KVIKKJOKK	????	NONE	Capture	ANNA	KOL 5		
					KOLMARDEN	23 May 1979	479	Transfer				
						11 Dec 1979		Death				
126	F	20 Feb 1980	112	104	LUND	20 Feb 1980	AINO	Birth	GUMMAN	HOOR 4		
					KOLMARDEN	9 Dec 1981	481	Loan to				
						3 Apr 1989		Death				
127	F	23 Feb 1981	128	124	BORAS	23 Feb 1981	RJ0017	Birth	RITVA	BORAS 12		
						28 Aug 1994		Death				
128	M	~ 1978	WILD	WILD	SWEDEN	????	NONE	Capture	LYCKE	LYCKS 3		
					LYCKSELE	1 Apr 1978	LYCKE	Transfer				
					BORAS	8 Nov 1978	RJ0018	Transfer				
						20 Jul 1981		Death				
129	M	????	WILD	WILD	KOMI	????	NONE	Capture	SERGEI	AHTARI 1		
					AHTARI	22 May 1981	SERGEI	Transfer				
						13 Apr 1983		Death				
130	F	~ 1978	WILD	WILD	PETSAMO	????	NONE	Capture	NADIA	AHTARI 2		
					AHTARI	22 May 1981	NADIA	Transfer				
					WILD	1 Jan 1987	_____	Release				
131	M	1 Mar 1981	WILD	130	PETSAMO	????	NONE	Capture	IIVARI	AHTARI 3	0000144F58	
					AHTARI	22 May 1981	KALLE	Transfer				
					HELSINKI	3 Oct 1989	890166	Transfer				
						4 Sep 2000		Death				
132	M	1 Mar 1981	WILD	WILD	SUOMUSSAL	????	NONE	Capture	ONNI	AHTARI 4	7F7F430F77	
					AHTARI	9 Jul 1981	810003	Transfer				
					RANUA	15 May 1985	850001	Loan to				
					AHTARI	27 Aug 1985	810003	Transfer				
					RANUA	2 Apr 1986	850001	Transfer				
						8 May 1998		Death				
133	M	1 Mar 1981	WILD	WILD	SUOMUSSAL	????	NONE	Capture	LOUIS	AHTARI 5		
					AHTARI	9 Jul 1981	MANNI	Transfer				
					BERN	23 Jun 1992	018002	Transfer				
						11 Sep 1998		Death				
134	F	15 Feb 1982	129	130	AHTARI	15 Feb 1982	MORRI	Birth	MORRI	AHTARI 6	7F7F427F67	
					RANUA	10 Jun 1983	830002	Transfer				
						5 Jun 1999		Death				
135	F	15 Feb 1982	129	130	AHTARI	15 Feb 1982	MOYKKY	Birth	ELLA	AHTARI 7		
					RANUA	9 Jun 1983	830001	Loan to				
					AHTARI	4 May 1988	MOYKKY	Transfer				
					BERN	23 Jun 1992	018001	Transfer				
						8 Oct 1998		Death				
136	M	19 Feb 1983	115	111	HELSINKI	19 Feb 1983	830004	Birth		HKI 5		
						19 Feb 1983		Death				
137	F	19 Feb 1983	115	111	HELSINKI	19 Feb 1983	830005	Birth		HKI 6		
						19 Feb 1983		Death				
138	M	22 Feb 1984	133	130	AHTARI	22 Feb 1984	SALTTU	Birth	NIILO	AHTARI 8		
					KOLMARDEN	1 Oct 1984	4002	Transfer				
					LUND	11 Jan 1985	NIILO	Loan to				
						1 May 1991		Death				
139	F	22 Feb 1984	133	130	AHTARI	22 Feb 1984	SENNI	Birth	SENNI	AHTARI 9		
					HELSINKI	23 Oct 1984	840072	Transfer				
						21 Jan 1997		Death				
140	F	1 Feb 1985	112	104	LUND	1 Feb 1985	HOOR5	Birth	KOLA	HOOR 5		
					STOCKHOLM	15 Apr 1986	940236	Loan to				
					HUNBSTRND	10 Jul 1994	940202	Loan to				
						13 Sep 1995		Death				
141	M	25 Feb 1985	133	130	AHTARI	22 Feb 1985	ASLAK	Birth	JUKKA	AHTARI 10		
					KOLMARDEN	10 Apr 1988	3871	Transfer				
						21 Jul 1989		Death				
142	M	~ 1985	WILD	WILD	KVIKKJOKK	????	NONE	Capture	LABBAS	SHOLM 1		
					STOCKHOLM	5 May 1985	940235	Transfer				
					LYCKSELE	11 Dec 1991	LABBAS	Loan to				
					JARVZOO	4 Dec 1997	JZM97043	Loan to				
						12 Sep 2000		Death				
143	M	13 Feb 1986	133	130	AHTARI	13 Feb 1986	NIKLAS	Birth	NIKLAS	AHTARI 11		
					KITEE	16 Jun 1997	NIKLAS	ltf				
144	M	13 Feb 1986	133	130	AHTARI	13 Feb 1986	NIKOLA	Birth	JUHA	AHTARI 12	1C381Q	
					KOLMARDEN	18 Jan 1990	4132	Transfer				
						24 May 2000		Death				
145	F	????	WILD	WILD	KIVINIEMI	????	NONE	Capture	PAMELA	AHTARI 13		
					AHTARI	15 Feb 1987	PAMELA	Transfer				
					WILD	15 Sep 1987	_____	Release				
146	M	2 Mar 1987	118	139	HELSINKI	2 Mar 1987	870015	Birth	EETU	HKI 7	0001311E02	
					LYCKSELE	21 Nov 1988	EETU	Transfer				
					STOCKHOLM	14 Apr 1992	940111	Loan to				

					JARVZOO	9 Apr 1997	JZM97004	Loan to				
					STOCKHOLM	7 Apr 1998	940111	Transfer				
						5 Mar 2002		Death				
147	F	2 Mar 1987	118	139	HELSINKI	2 Mar 1987	870016	Birth	EMMA	HKI 8		
					AHTARI	25 Nov 1988	EMMA	Transfer				
						28 Nov 2000		Death				
148	F	2 Mar 1987	118	139	HELSINKI	2 Mar 1987	870017	Birth		HKI 9		
						5 Mar 1987		Death				
149	F	8 Mar 1987	119	127	BORAS	8 Mar 1987	RJ0019	Birth	BIRKA	BORAS 13	00-0014-65D2	
					LUND	7 Dec 1987	BIRKA	Transfer				
					BORAS	7 Mar 1995	RJ0019	Transfer				
						22 May 2000		Death				
150	F	8 Mar 1987	119	127	BORAS	8 Mar 1987	RJ0020	Birth		BORAS 14		
						15 Oct 1988		Death				
151	F	15 Feb 1988	118	139	HELSINKI	15 Feb 1988	880001	Birth	FARAH	HKI 10		
						12 Jul 2001		Death				
152	F	15 Feb 1988	118	139	HELSINKI	15 Feb 1988	880002	Birth	FIONA	HKI 11	1D0CCB	
					KOLMARDEN	12 Mar 1989	4042	Loan to				
					LYCKSELE	21 Oct 1998	FIONA	Loan to				
						26 Jul 2000		Death				
153	F	15 Feb 1988	118	139	HELSINKI	15 Feb 1988	880003	Birth	FLORA	HKI 12	000015C48F	
					STOCKHOLM	21 Nov 1988	942026	Loan to				
					HUNBSTRND	14 Feb 1989	890002	Loan to				
						9 Jan 2002		Death				
154	M	28 Feb 1988	132	134	RANUA	28 Feb 1988	880001	Birth	GUS	RANUA 1	00-001C-94B0	
					JARVZOO	12 Mar 1991	JZM91001	Transfer				
						17 Oct 1996		Death				
155	M	15 Feb 1989	118	139	HELSINKI	15 Feb 1989	890007	Birth		HKI 13		
						25 Feb 1989		Death				
156	M	19 Feb 1990	118	139	HELSINKI	19 Feb 1990	900003	Birth	INGO	HKI 14	00001C8356	
					HUNBSTRND	20 Feb 1991	910011	Loan to				
					JARVZOO	2 Sep 1991	JZM91022	Transfer				
						17 Oct 1996		Death				
157	M	19 Feb 1990	118	139	HELSINKI	19 Feb 1990	900004	Birth	HESSU	HKI 15	000015C48F	
					HUNBSTRND	20 Feb 1991	910012	Loan to				
					JARVZOO	10 May 2000	JZM00023	Loan to				
					STOCKHOLM	16 Apr 2002	941259	Loan to				
						3 Nov 2002		Death				
158	M	19 Feb 1990	118	139	HELSINKI	19 Feb 1990	900005	Birth	HEMULEN	HKI 16	7F7F267A12	
					HUNBSTRND	20 Feb 1991	910013	Loan to				
					LUND	5 Sep 1991	HEMULI	Transfer				
						19 Mar 1993		Death				
159	F	2 Feb 1990	143	135	AHTARI	2 Feb 1990	AHT14	Birth		AHTARI 14		
						18 Feb 1990		Death				
160	M	15 Feb 1991	143	147	AHTARI	15 Feb 1991	TOPIAS	Birth	TOPIAS	AHTARI 15		
						26 Mar 2000		Death				
161	F	15 Feb 1991	143	147	AHTARI	15 Feb 1991	TESSI	Birth	TESSI	AHTARI 16	268030	
						15 Oct 2001		Death				
162	F	22 Feb 1991	144	152	KOLMARDEN	22 Feb 1991	4579	Birth		KOL 6		
						22 Feb 1991		Death				
163	F	22 Feb 1991	144	152	KOLMARDEN	22 Feb 1991	4297	Birth		KOL 7		
						22 Feb 1991		Death				
164	M	22 Feb 1991	144	152	KOLMARDEN	22 Feb 1991	4577	Birth	FRASSE	KOL 8	00-0025-9BFB	
					LUND	25 Mar 1993	FRASSE	Loan to				
						9 Dec 2003		Death				
165	F	22 Feb 1991	144	152	KOLMARDEN	22 Feb 1991	4580	Birth	FELICIA	KOL 9	1C9493	
					HUNBSTRND	1 Aug 1992	920154	Loan to				
					STOCKHOLM	11 Jul 1994	940110	Transfer				
						10 Apr 2000		Death				
166	M	17 Feb 1992	118	139	HELSINKI	17 Feb 1992	920026	Birth	JULLE	HKI 17	00000D3AF1	
					KRISTIANS	27 Jul 1993	GULGG010	Loan to				
					SPRINGE	20 Sep 1994	2	Transfer				
						23 Jun 2008		Death				
167	F	17 Feb 1992	118	139	HELSINKI	17 Feb 1992	920025	Birth	KITTY	HKI 18	00-001C-8377	
					JARVZOO	5 Nov 1992	JZM92023	Transfer				
					LUND	15 Apr 1997	KITTY	Loan to				
						9 Dec 2003		Death				
168	F	17 Feb 1992	118	139	HELSINKI	17 Feb 1992	920024	Birth	JUTTA	HKI 19	00004DE7A0	
					KRISTIANS	27 Jul 1993	GULGG001	Loan to				
						26 Feb 2007		Death				
169	F	17 Feb 1992	132	134	RANUA	17 Feb 1992	920001	Birth	SEIJA	RANUA 2	00-01DB-BB2C	
					LUND	15 Dec 1995	RAN2	Transfer				
						21 Feb 1997		Death				

170	F	14 Feb 1993	143	147	AHTARI	14 Feb 1993	AHT17	Birth	MIIA	AHTARI 17	7F7F 43221C
					SPRINGE	3 Mar 1994	1	Transfer			
						4 May 2012		Death			
171	F	14 Feb 1993	143	147	AHTARI	14 Feb 1993	AHT18	Birth	TIIA	AHTARI 18	
					BARDU	11 Jul 1994	TIA	Transfer			
					WILD	4 Aug 1994	_____	Release			
					BARDU	14 Aug 1994		Death			
172	F	14 Feb 1993	143	147	AHTARI	14 Feb 1993	AHT19	Birth	PIA	AHTARI 19	
					KRISTIANS	20 Jan 1995	GULGG011	Transfer			
						9 Nov 1996		Death			
173	M	24 Feb 1993	143	161	AHTARI	24 Feb 1993	AHT2	Birth	SEBASTIAN	AHTARI 20	
						18 Jan 1995		Death			
174	F	24 Feb 1993	143	161	AHTARI	24 Feb 1993	AHT21	Birth	SIRU	AHTARI 21	7F7F431C/D
					LYCKSELE	27 Jan 1994	SIRU	Transfer			
					WILD	2 May 1998	_____	ltf			
175	M	3 Mar 1993	144	152	KOLMARDEN	3 Mar 1993	5280	Birth	JUSSI	KOL 10	00-001C-FAC4
					HUNBSTRND	2 Dec 1993	930199	Loan to			
					BORAS	6 May 1994	RJ0021	Loan to			
					WILD	11 Apr 1996	NONE	Transfer			
					BORAS	1 Jan 1997	RJ0021	Transfer			
					KOLMARDEN	29 Jan 1997	5280	Transfer			
					BORAS	25 Mar 1997	RJ0021	Loan to			
						3 Apr 2009		Death			
176	F	3 Mar 1993	144	152	KOLMARDEN	3 Mar 1993	5281	Birth	LUNA	KOL 11	00001C96BE
					JARVZOO	31 Aug 1993	JZM93013	Transfer			
						24 Nov 1997		Death			
177	M	5 Feb 1994	133	135	BERN	5 Feb 1994	_____	Birth		BERN 1	
						6 Feb 1994		Death			
178	M	5 Feb 1994	133	135	BERN	5 Feb 1994	_____	Birth		BERN 2	
						6 Feb 1994		Death			
179	F	2 Mar 1994	143	147	AHTARI	2 Mar 1994	268029	Birth	EETLA	AHTARI 22	
					CHOMUTOV	30 Nov 1995	ROS001	Transfer			
						5 Aug 2011		Death			
180	F	2 Mar 1994	143	147	AHTARI	2 Mar 1994	268027	Birth	ELLI	AHTARI 23	967000000507414
					RHENEN	28 May 1996	M1024	Transfer			
					ROTTERDAM	23 Apr 2001	106262	Transfer			
					RIGA	13 May 2003	940500	Transfer			
						16 Apr 2013		Death			
181	F	2 Mar 1994	143	147	AHTARI	2 Mar 1994	940001	Birth	EVELIINA	AHTARI 24	
						19 Oct 2005		Death			
182	M	28 Feb 1994	144	152	KOLMARDEN	28 Feb 1994	5469	Birth	PORGAS	KOL 12	00004D0011
					HUNBSTRND	17 Nov 1994	940221	Loan to			
					DUISBURG	5 Oct 2001	4325	Loan to			
						18 Jul 2007		Death			
183	F	28 Feb 1994	144	152	KOLMARDEN	28 Feb 1994	5471	Birth	PORVOO	KOL 13	14-689A
					SALZBURG	27 Apr 1995	M298	Loan to			
						8 May 2007		Death			
184	F	28 Feb 1994	144	152	KOLMARDEN	28 Feb 1994	5470	Birth	PORI	KOL 14	D-8448
					SALZBURG	27 Apr 1995	M297	Loan to			
						17 May 2008		Death			
185	F	20 Feb 1994	132	134	RANUA	20 Feb 1994	940004	Birth	AMALIA	RANUA 3	
						8 Mar 2006		Death			
186	F	1 Mar 1995	143	172	KRISTIANS	1 Mar 1995	GULGG012	Birth		KRIST 1	
						7 Mar 1995		Death			
187	M	28 Feb 1995	143	161	AHTARI	28 Feb 1995	263004	Birth	EKI	AHTARI 25	
					CHOMUTOV	30 Nov 1995	ROS002	Transfer			
						10 May 2013		Death			
188	M	28 Feb 1995	143	161	AHTARI	28 Feb 1995	263003	Birth	MANDI	AHTARI 26	
					SALZBURG	25 Feb 1996	M398	Transfer			
						25 Sep 2001		Death			
189	F	28 Feb 1995	143	161	AHTARI	28 Feb 1995	263002	Birth	ENNI	AHTARI 27	8870-460
					KITEE	16 Jun 1997	ENNI	ltf			
190	M	4 Mar 1995	144	152	KOLMARDEN	4 Mar 1995	5592	Birth	RAUMA	KOL 15	4E-FCF4
					KRISTIANS	14 Nov 1995	GULGG002	Loan to			
						22 Dec 2010		Death			
191	F	4 Mar 1995	144	152	KOLMARDEN	4 Mar 1995	5593	Birth	LEIKSA	KOL 16	15-BEC2
					HUNBSTRND	22 Sep 1995	950213	Loan to			
						5 Oct 2005		Death			
192	F	4 Mar 1995	144	152	KOLMARDEN	4 Mar 1995	5594	Birth	PETRONEL	KOL 17	4D-60A3
					BARDU	14 Nov 1995	RUNNI	Transfer			
						21 May 2007		Death			
193	?	16 Feb 1996	157	153	HUNBSTRND	16 Feb 1996	960011	Birth		HUNNEBO 1	
						26 Feb 1996		Death			

194	?	16 Feb 1996	157	153	HUNBSTRND	16 Feb 1996	960012	Birth		HUNNEBO 2		
						26 Feb 1996		Death				
195	F	27 Feb 1996	156	176	JARVZOO	27 Feb 1996	JZM96005	Birth	OPAL	JARVSO 1	00001C8F33	
					BORAS	28 Apr 1999	RJ0025	Loan to				
						30 Sep 2009		Death				
196	F	27 Feb 1996	156	176	JARVZOO	27 Feb 1996	JZM96003	Birth	OONA	JARVSO 2	000025A6F2	
					MOSCOW	5 Jun 1997	970411	Transfer				
						8 Nov 2012		Death				
197	F	27 Feb 1996	156	176	JARVZOO	27 Feb 1996	JZM96004	Birth	OLIVIA	JARVSO 3	000025AEFF	
						8 Feb 2011		Death				
198	F	29 Feb 1996	175	149	BORAS	29 Feb 1996	RJ0022	Birth		BORAS 15		
						29 Feb 1996		Death				
199	F	29 Feb 1996	175	149	BORAS	29 Feb 1996	RJ0023	Birth		BORAS 16		
						29 Feb 1996		Death				
200	F	29 Feb 1996	175	149	BORAS	29 Feb 1996	RJ0024	Birth		BORAS 17		
						29 Feb 1996		Death				
201	M	~ Feb 1996	WILD	WILD	LIFJELLET	24 May 1996	NONE	Capture	GULO	BARDU 1		
					BARDU	25 May 1996	BARD1	Transfer				
					WILD	13 Apr 1998	_____	Release				
202	F	~ Feb 1996	WILD	WILD	LIFJELLET	24 May 1996	NONE	Capture	SALA	BARDU 2	4073053B63	
					BARDU	25 May 1996	SALA	Transfer				
					HELSINKI	10 Apr 1997	970020	Loan to				
						25 Sep 2013		Death				
203	M	21 Feb 1997	146	165	STOCKHOLM	21 Feb 1997	940952	Birth	ASANTE	SHOLM 2	00013CBDG9	
					HELSINKI	8 Apr 1998	980010	Loan to				
						27 May 2012		Death				
204	F	21 Feb 1997	146	165	STOCKHOLM	21 Feb 1997	940953	Birth	ANNA-GRETA	SHOLM 3	00013CDF71	
					MAGDEBURG	23 Apr 1998	281001	Loan to				
					SPRINGE	28 Oct 2009	1178	Loan to				
205	M	20 Feb 1997	144	152	KOLMARDEN	20 Feb 1997	6428	Birth	KARLCHEN	KOL 18	0000195C44	
					MAGDEBURG	23 Apr 1998	328002	Loan to				
					SPRINGE	28 Oct 2009	1177	Loan to				
						4 Feb 2015		Death				
206	M	20 Feb 1997	144	152	KOLMARDEN	20 Feb 1997	6429	Birth	KEMI	KOL 19	0015-850B	
					RHENEN	17 Nov 1997	M01141	Loan to				
					ROTTERDAM	23 Apr 2001	106261	Loan to				
					RIGA	13 May 2003	970725	Loan to				
						4 Jun 2008		Death				
207	M	20 Feb 1997	144	152	KOLMARDEN	20 Feb 1997	6430	Birth	KAINUU	KOL 20	0000143B25	
					RANUA	21 Apr 1998	980010	Loan to				
						28 Apr 2011		Death				
208	?	6 Mar 1997	157	153	HUNBSTRND	6 Mar 1997	970000	Birth		HUNNEBO 3		
						16 Mar 1997		Death				
209	?	6 Mar 1997	157	153	HUNBSTRND	6 Mar 1997	970001	Birth		HUNNEBO 4		
						16 Mar 1997		Death				
210	M	~ Mar 1997	WILD7	WILD8	SWEDEN	12 May 1997	NONE	Capture	GULO	LYCKS 4	00013B5E29	
					LYCKSELE	15 May 1997	MAVAS	Transfer				
						12 Jun 2012		Death				
211	F	~ Mar 1997	WILD7	WILD8	ARJEPLOG	12 May 1997	NONE	Capture	MAVA	LYCKS 5	13B45D1	
					LYCKSELE	15 May 1997	LYCK5	Transfer				
					KOLMARDEN	30 Sep 1997	6553	Transfer				
						19 May 2009		Death				
212	M	20 Feb 1997	143	161	AHTARI	20 Feb 1997	887047	Birth	HEMMO	AHTARI 28	8870457	
					MOSCOW	21 Jan 1999	990004	Transfer				
						23 Jul 2013		Death				
213	M	20 Feb 1997	143	161	AHTARI	20 Feb 1997	AHT29	Birth	HEMMINKI	AHTARI 29	968000004438616	
					BERN	1 Mar 1999	990002	Loan to				
					USTI	7 Nov 2007	UL0744	Transfer				
						29 Jul 2012		Death				
214	M	14 Feb 1998	182	191	HUNBSTRND	14 Feb 1998	980004	Birth	JARMO	HUNNEBO 5	0001BF2AO9	
					BARDU	29 Oct 1999	40000001	Transfer				
						3 Sep 2012		Death				
215	?	14 Feb 1998	182	191	HUNBSTRND	14 Feb 1998	980005	Birth				
						1 Mar 1998		Death				
216	?	1 Mar 1998	144	152	KOLMARDEN	1 Mar 1998	6635	Birth		KOL 21		
						19 Mar 1998		Death				
217	M	1 Mar 1998	144	152	KOLMARDEN	1 Mar 1998	6636	Birth	SAKARI	KOL 22	143BB3	
					CALVIAC	14 Jan 2010	204075	Transfer				
						13 Oct 2014		Death				
218	F	1 Mar 1998	144	152	KOLMARDEN	1 Mar 1998	6637	Birth	SIRKKA	KOL 23	OD5249	
					ORSA	8 Jun 2000	SIRKKA	Loan to				
						21 Oct 2003		Death				

219	F	1 Mar 1998	144	152	KOLMARDEN	1 Mar 1998	6638	Birth	SIRPA	KOL 24	ODE234	
					BERN	5 Feb 1999	980029	Loan to				
						24 Jun 2010		Death				
220	F	1 Mar 1998	WILD	WILD	TUORPON	27 Apr 1998	NONE	Capture	ROPPY	LYCKS 6	00012335E6	
					LYCKSELE	28 Apr 1998	TUORPA	Transfer				
					JARVZOO	7 May 1999	JZM99023	Loan to				
						28 May 2004		Death				
221	M	25 Feb 1998	190	168	KRISTIANS	25 Feb 1998	GULGG003	Birth	RUFUS	KRIST 2	578098100120883	
					JARVZOO	20 Jun 2000	JZM00025	Loan to				
						10 Oct 2007		Death				
222	F	25 Feb 1998	190	168	KRISTIANS	25 Feb 1998	GULGG004	Birth	BIRGIT	KRIST 3	578098100120372	
					STOCKHOLM	20 Jun 2000	941210	Loan to				
					LYCKSELE	28 Mar 2001	BIRGIT	Loan to				
						18 Aug 2002		Death				
223	F	1 Feb 1998	188	183	SALZBURG	1 Feb 1998	M645	Birth		SALZBURG 1		
						1 Feb 1998		Death				
224	?	24 Feb 1999	146	165	STOCKHOLM	24 Feb 1999	_____	Birth		SHOLM 4		
						24 Mar 1999		Death				
225	?	24 Feb 1999	146	165	STOCKHOLM	24 Feb 1999	_____	Birth		SHOLM 5		
						24 Mar 1999		Death				
226	M	4 Feb 1999	166	170	SPRINGE	4 Feb 1999	659	Birth	JOERG	SPRINGE 1	000025403B	
					DUISBURG	27 Jun 2001	4297	Loan to				
					SPRINGE	4 Jul 2001	659	Transfer				
					BIELEFELZ	11 Dec 2003	JOERG	Transfer				
						4 Nov 2015		Death				
227	F	4 Feb 1999	166	170	SPRINGE	4 Feb 1999	660	Birth	MONA	SPRINGE 2	0000244F19	
					FURSTENWA	23 Jan 2001	MONA	Transfer				
228	F	4 Feb 1999	166	170	SPRINGE	4 Feb 1999	661	Birth	MIRA	SPRINGE 3	00000A55A7	
					BIELEFELZ	11 Dec 2003	MIRA	Transfer				
229	F	4 Feb 1999	166	170	SPRINGE	4 Feb 1999	662	Birth	MAUSI	SPRINGE 4	0000254549	
					MUNICH	27 Feb 2002	083001	Loan to				
						16 Mar 2010		Death				
230	M	4 Feb 1999	188	183	SALZBURG	4 Feb 1999	M721	Birth	ARI	SALZBURG	2985100007057271	
					MOSCOW	27 Jul 2000	200540	Transfer				
						24 Oct 2013		Death				
231	F	4 Feb 1999	188	183	SALZBURG	4 Feb 1999	M720	Birth	AGNETHA	SALZBURG	3985100006921902	
					MOSCOW	27 Jul 2000	200541	Transfer				
232	F	9 Feb 1999	160	181	AHTARI	9 Feb 1999	990001	Birth	RAISA	AHTARI 30	8870469	
						19 Oct 2005		Death				
233	M	21 Feb 1999	160	161	AHTARI	21 Feb 1999	AHT31	Birth		AHTARI 31		
						24 Feb 1999		Death				
234	F	10 Feb 2000	144	211	KOLMARDEN	10 Feb 2000	7745	Birth	MAARIT	KOL 25	01DF-F2AC	
					STOCKHOLM	3 Apr 2001	941240	Loan to				
						15 Mar 2007		Death				
235	M	21 Feb 2000	203	202	HELSINKI	21 Feb 2000	200028	Birth	REIDAR	HKI 20	0001E57D5E	
					AHTARI	12 Dec 2000	200001	Transfer				
						17 Jun 2016		Death				
236	F	21 Feb 2000	203	202	HELSINKI	21 Feb 2000	200029	Birth	RONJA	HKI 21	0001BC9E9F	
					DUISBURG	19 Jan 2001	4212	Loan to				
237	M	16 Feb 2000	146	165	STOCKHOLM	16 Feb 2000	941222	Birth		SHOLM 6		
						27 Mar 2000		Death				
238	?	16 Feb 2000	146	165	STOCKHOLM	16 Feb 2000	941223	Birth		SHOLM 7		
						25 Mar 2000		Death				
239	M	20 Feb 2000	207	185	RANUA	20 Feb 2000	200018	Birth		RANUA 4		
						6 Jun 2000		Death				
240	M	14 Feb 2000	210	152	LYCKSELE	14 Feb 2000	LYCK7	Birth	MATTI	LYCKS 7	0002146321	
					JARVZOO	24 Jan 2001	JZM01036	Loan to				
					HUNBSTRND	31 Aug 2001	201213	Loan to				
						2 Jan 2012		Death				
241	F	14 Feb 2000	210	152	LYCKSELE	14 Feb 2000	LYCK8	Birth		LYCKS 8	00-01F0-BB31	
						30 Aug 2000		Death				
242	M	17 Feb 2001	182	191	HUNBSTRND	17 Feb 2001	201005	Birth	KILVO	HUNNEBO 6	00006042C52	
					SALZBURG	7 Mar 2002	995	Transfer				
						4 Mar 2015		Death				
243	M	17 Feb 2001	182	191	HUNBSTRND	17 Feb 2001	201006	Birth	AITIK	HUNNEBO 7	060435B1	
					MUNICH	6 Mar 2002	083002	Transfer				
						14 Jan 2013		Death				
244	F	17 Feb 2001	182	191	HUNBSTRND	17 Feb 2001	201007	Birth	SVAIPA	HUNNEBO 8	0604-35E9	
					MOSCOW	5 Nov 2002	20765	Transfer				
					IZHEVSK	1 Sep 2008	SVAIPA	Transfer				
						30 May 2016		Death				

245	F	28 Feb 2001	190	168	KRISTIANS	28 Feb 2001	GULGG005	Birth	KRISTINA	KRIST 4	578098100123559
					LYCKSELE	17 Jan 2003	KRISTI	Transfer			
						9 Mar 2015		Death			
246	F	11 Feb 2002	217	211	KOLMARDEN	11 Feb 2002	8452	Birth	MIKA	KOL 26	968000000770589
					LUND	1 Oct 2003	MIKA	Transfer			
						23 May 2008		Death			
247	M	7 Mar 2002	157	220	JARVZOO	7 Mar 2002	JZM02030	Birth	KUNO	JARVSO 4	
					LUND	26 Nov 2002	KUNO	Loan to			
						26 Apr 2003		Death			
248	F	15 Feb 2002	188	183	SALZBURG	15 Feb 2002	994	Birth	BELANA	SALZBURG	4496800000772646
					BERLIN TP	19 May 2004	M02692	Transfer			
						19 Jun 2015		Death			
249	M	20 Feb 2002	207	185	RANUA	20 Feb 2002	202049	Birth		RANUA 5	
						18 May 2002		Death			
250	M	1 Feb 2002	213	219	BERN	1 Feb 2002	A20011	Birth		BERN 3	000617CD81
					LUND	15 Apr 2003	250	Transfer			
					ORSA	18 Aug 2003	_____	Transfer			
						15 Oct 2007		Death			
251	F	22 Feb 2003	203	202	HELSINKI	22 Feb 2003	203010	Birth	UNELMA	HKI 22	000135CB86
					KERKRADE	17 Mar 2005	M03065	Transfer			
						23 Oct 2012		Death			
252	M	22 Feb 2003	203	202	HELSINKI	22 Feb 2003	203011	Birth	UNTAMO	HKI 23	0001BDD088
					STOCKHOLM	11 Feb 2004	941335	Transfer			
253	M	18 Feb 2003	240	191	HUNBSTRND	18 Feb 2003	203001	Birth	AKI	HUNNEBO 9	752098101094429
					JARVZOO	3 Dec 2003	JZM03030	Transfer			
						11 Oct 2007		Death			
254	F	18 Feb 2003	240	191	HUNBSTRND	18 Feb 2003	203002	Birth	KIRKA	HUNNEBO	10752098101086806
					EDINBURGH	22 Sep 2004	M04I07	Transfer			
					WHIPSNADE	8 Mar 2010	4039	Loan to			
					EDINBURGH	21 May 2010	M04I07	Transfer			
					KINGUSSIE	30 Apr 2013	5670	Transfer			
						21 Jul 2014		Death			
255	M	20 Feb 2003	207	185	RANUA	20 Feb 2003	203014	Birth	IVAR	RANUA 6	985120022055810
					KERKRADE	17 Mar 2005	M03064	Transfer			
						29 Sep 2015		Death			
256	F	20 Feb 2003	207	185	RANUA	20 Feb 2003	203013	Birth		RANUA 7	985120022969184
					CHOMUTOV	18 Mar 2005	ROS003	Transfer			
257	M	25 Feb 2003	166	170	SPRINGE	25 Feb 2003	767	Birth	HAEGAR	SPRINGE 5	276098100370413
					SABABURG	12 Oct 2005	HAEGAR	Transfer			
258	F	25 Feb 2003	166	170	SPRINGE	25 Feb 2003	766	Birth	HELGA	SPRINGE 6	276098100372319
					SABABURG	12 Oct 2005	HELGA	Transfer			
					SZEGED	21 Mar 2007	2247	Loan to			
						4 Oct 2010		Death			
259	F	10 Feb 2004	213	219	BERN	10 Feb 2004	A40025	Birth	PIGE	BERN 4	00060D61D8
					EDINBURGH	20 Apr 2005	M05D03	Transfer			
					WHIPSNADE	20 May 2010	4110	Transfer			
260	F	10 Feb 2004	213	219	BERN	10 Feb 2004	A40026	Birth	ROOSA	BERN 5	00061F6218
					AHTARI	26 May 2005	205002	Transfer			
261	F	24 Feb 2004	217	211	KOLMARDEN	24 Feb 2004	9060	Birth	MISA	KOL 27	968000001204907
					ORSA	4 May 2005	WV1	Loan to			
						5 Dec 2013		Death			
262	M	10 Feb 2004	205	204	MAGDEBURG	10 Feb 2004	281003	Birth	MANUEL	MAGDEB 1	96800000231113
					BERLIN TP	27 Jan 2005	M02857	Transfer			
						7 Jun 2015		Death			
263	F	~Feb 2004ñ1m	WILD9	WILD10	MURMANSK	18 Apr 2004	NONE	Capture	ROSA	MOSCOW 1	
					MOSCOW	8 Sep 2004	40874	Transfer			
264	F	~Feb 2004ñ1m	WILD9	WILD10	MURMANSK	18 Apr 2004	NONE	Capture	MAKHA	MOSCOW 2	
					MOSCOW	8 Sep 2004	40875	Transfer			
265	F	~Feb 2004ñ1m	WILD9	WILD10	MURMANSK	18 Apr 2004	NONE	Capture	BELCKA	MOSCOW 3	
					MOSCOW	8 Sep 2004	40876	Transfer			
						10 Jun 2016		Death			
266	F	10 Feb 2005	203	202	HELSINKI	10 Feb 2005	205006	Birth	XALA	HKI 24	968000002681480
					USTI	14 Dec 2006	UL0575	Transfer			
267	M	10 Feb 2005	203	202	HELSINKI	10 Feb 2005	205007	Birth	XALE	HKI 25	968000002531309
					EDINBURGH	9 Aug 2006	M06H11	Transfer			
					KINGUSSIE	30 Apr 2013	5669	Transfer			
268	?	10 Feb 2005	203	202	HELSINKI	10 Feb 2005	205008	Birth		HKI 26	
						26 Mar 2005		Death			
269	?	3 Feb 2005	235	181	AHTARI	3 Feb 2005	AHT32	Birth		AHTARI 32	
						10 Feb 2005		Death			

270	?	3 Feb 2005	235	181	AHTARI	3 Feb 2005	AHT33	Birth		AHTARI 33		
						10 Feb 2005		Death				
271	?	10 Feb 2005	235	232	AHTARI	10 Feb 2005	AHT34	Birth		AHTARI 34		
						11 Feb 2005		Death				
272	M	22 Feb 2005	240	191	HUNBSTRND	22 Feb 2005	205008	Birth	BORKUM	HUNNEBO 11	977200004948523	
						30 Sep 2005		Death				
273	M	22 Feb 2005	240	191	HUNBSTRND	22 Feb 2005	205009	Birth	RIFF	HUNNEBO 12	977200004968595	
					BORAS	3 May 2012	RJ0029	Loan to				
					HUNBSTRND	15 May 2014	205009	Transfer				
274	M	4 Feb 2005	182	236	DUISBURG	4 Feb 2005	4879	Birth	LUNA	DUISBRG 1	000666F27A	
					LUND	31 Jan 2006	LUNA	Transfer				
275	F	4 Feb 2005	182	236	DUISBURG	4 Feb 2005	4880	Birth	BITTE	DUISBRG 2	OOO6643640	
					KRISTIANS	20 Feb 2007	GULGG006	Transfer				
276	F	4 Feb 2005	182	236	DUISBURG	4 Feb 2005	4881	Birth	HELGA II	DUISBRG 3	0006642C06	
					SABABURG	3 Nov 2006	HELII	Transfer				
277	F	~ Feb 2005	WILD11	WILD12	NORRBOTTE	25 May 2005	NONE	Capture	TARRAS	LYCKS 9	0006044826	
					LYCKSELE	26 May 2005	LYCK9	Transfer				
					HUNBSTRND	30 May 2005	205030	Transfer				
						23 Jan 2007		Death				
278	F	~ Feb 2005	WILD11	WILD12	NORRBOTTE	25 May 2005	NONE	Capture	BIANCA	LYCKS 10	977200004264006	
					LYCKSELE	26 May 2005	LYCK10	Transfer				
					HUNBSTRND	30 May 2005	205031	Transfer				
					JARVZOO	14 Jun 2006	JZM06009	Transfer				
279	F	21 Feb 2005	221	197	JARVZOO	21 Feb 2005	JZM5005	Birth	BATSI	JARVSO 5	9680000034302841	
					RANUA	25 Jul 2006	206038	Transfer				
280	M	20 Feb 2006	257	258	SABABURG	20 Feb 2006	HAMLET	Birth	HAMLET	SABABRG 1	968000004446667	
						6 Dec 2006		Death				
281	M	~ Feb 2006	WILD13	WILD14	SWEDEN	23 Apr 2006	NONE	Capture	TJOKKO	LYCKS 11	968000003532282	
					LYCKSELE	24 Apr 2006	LYCK11	Transfer				
					JARVZOO	28 Apr 2006	JZM06003	Transfer				
					BORAS	4 Dec 2006	RJ0028	Transfer				
					HUNBSTRND	3 May 2012	212026	Loan to				
					BORAS	15 May 2014	RJ0028	Transfer				
282	F	~ Feb 2006	WILD13	WILD14	SWEDEN	23 Apr 2006	NONE	Capture	JONNA	LYCKS 12	968000003398972	
					LYCKSELE	24 Apr 2006	LYCK12	Transfer				
					JARVZOO	28 Apr 2006	JZM06002	Transfer				
					STOCKHOLM	4 Dec 2006	941520	Transfer				
283	M	25 Feb 2006	205	204	MAGDEBURG	25 Feb 2006	281005	Birth	NARVITE	MAGDEB 2	968000002319621	
					SZEGED	20 Mar 2007	2246	Loan to				
284	F	25 Feb 2006	205	204	MAGDEBURG	25 Feb 2006	281006	Birth	FINJA	MAGDEB 3	968000002310788	
					BARDU	1 Jun 2007	FINJA	Transfer				
						1 Jun 2009		Death				
285	F	~ Mar 2006	WILD15	WILD16	SWEDEN	28 May 2006	NONE	Capture	VIDDJA	LYCKS 13	968000003398831	
					LYCKSELE	29 May 2006	LYCK13	Transfer				
					BORAS	2 Jun 2006	RJ0026	Transfer				
					HUNBSTRND	4 Dec 2006	206072	Transfer				
286	F	~ Mar 2006	WILD15	WILD16	SWEDEN	28 May 2006	NONE	Capture	PESSINA	LYCKS 14	968000003405967	
					LYCKSELE	29 May 2006	LYCK14	Transfer				
					BORAS	2 Jun 2006	RJ0027	Transfer				
						27 Jan 2016		Death				
287	M	3 Mar 1967	100	102	BORAS	3 Mar 1967	RJ0006	Birth				
					UNKNOWN	10 Oct 1967	_____	ltf				
288	?	3 Mar 1967	100	102	BORAS	3 Mar 1967	RJ0005	Birth				
					UNKNOWN	10 Oct 1967	_____	ltf				
289	F	25 Feb 2006	205	204	MAGDEBURG	25 Feb 2006	281004	Birth		MAGDEB 4		
						16 Apr 2006		Death				
290	F	11 Feb 2007	203	202	HELSINKI	11 Feb 2007	207003	Birth	ZALLA	HKI 27	968000004141752	
					HUNBSTRND	23 Jan 2008	208002	Transfer				
291	M	11 Feb 2007	203	202	HELSINKI	11 Feb 2007	207004	Birth	DIMO	HKI 28	968000004173825	
					JARVZOO	23 Jan 2008	JZM08001	Transfer				
292	M	11 Feb 2007	203	202	HELSINKI	11 Feb 2007	207005	Birth	ZAMPO	HKI 29	968000004136103	
					CALVIAC	12 Jun 2008	204019	Transfer				
					FRANCE	22 Jun 2008	_____	ltf				
293	M	21 Feb 2007	221	197	JARVZOO	21 Feb 2007	JZM07005	Birth	DITO	JARVSO 6	968000003431477	
294	F	21 Feb 2007	221	197	JARVZOO	21 Feb 2007	JZM07004	Birth	DINA	JARVSO 7	968000003396831	
					LUND	17 Apr 2008	DINA	Transfer				
295	M	15 Feb 2007	212	264	MOSCOW	15 Feb 2007	70126	Birth	VANUTSCHKA	MOSCOW 4		
					DUISBURG	13 Apr 2008	5606	Transfer				
296	M	15 Feb 2007	212	264	MOSCOW	15 Feb 2007	70127	Birth	RASPUTIN	MOSCOW 5	643098100043761	
					BERN	28 May 2008	A80113	Transfer				
					RANUA	28 Apr 2011	211002	Loan to				

297	F	15 Feb 2007	212	264	MOSCOW	15 Feb 2007	70128	Birth	RIMMA	MOSCOW 6		
					ROEVRUCHI	22 May 2008	RIMMA	Transfer				
298	F	20 Feb 2007	205	204	MAGDEBURG	20 Feb 2007	281007	Birth		MAGDEB 5		
						25 Apr 2007		Death				
299	F	20 Feb 2007	205	204	MAGDEBURG	20 Feb 2007	281008	Birth	METTE MARIT	MAGDEB 6	276096900279305	
					CALVIAC	15 May 2008	204001	Transfer				
300	F	20 Feb 2007	205	204	MAGDEBURG	20 Feb 2007	281009	Birth	VICTORIA	MAGDEB 7	276096900281387	
						3 Dec 2007		Death				
301	?	29 Jan 2007	243	229	MUNICH	29 Jan 2007	083003	Birth		MUNCHEN 1		
						5 Feb 2007		Death				
302	?	29 Jan 2007	243	229	MUNICH	29 Jan 2007	083004	Birth		MUNCHEN 2		
						7 Feb 2007		Death				
303	?	3 Feb 2008	243	229	MUNICH	3 Feb 2008	083006	Birth		MUNCHEN 3		
						5 Feb 2008		Death				
304	?	3 Feb 2008	243	229	MUNICH	3 Feb 2008	083005	Birth		MUNCHEN 4		
						5 Feb 2008		Death				
305	M	23 Feb 2008	235	260	AHTARI	23 Feb 2008	208006	Birth	RULLE	AHTARI 35	985121005558592	
					ORSA	22 May 2009	WV2	Transfer				
306	F	7 Feb 2008	230	263	MOSCOW	7 Feb 2008	70847	Birth	SHARAPOVA	MOSCOW 7		
					BURFORD	11 Apr 2009	MM1324	Transfer				
307	F	7 Feb 2008	230	263	MOSCOW	7 Feb 2008	70848	Birth	ROXANE	MOSCOW 8		
					LIMPOPZOO	18 Mar 2010	ROXANE	Transfer				
308	M	14 Feb 2008	205	204	MAGDEBURG	14 Feb 2008	281010	Birth	SALTVIK	MAGDEB 8	276096900271860	
						27 Jul 2008		Death				
309	F	14 Feb 2008	205	204	MAGDEBURG	14 Feb 2008	281011	Birth	SENJA	MAGDEB 9	276096900278821	
						22 Aug 2008		Death				
310	?	14 Feb 2008	205	204	MAGDEBURG	14 Feb 2008	281012	Birth		MAGDEB 10		
						26 Apr 2008		Death				
311	?	14 Feb 2008	205	204	MAGDEBURG	14 Feb 2008	281013	Birth		MAGDEB 11		
						28 Feb 2008		Death				
312	M	27 Feb 2008	190	275	KRISTIANS	27 Feb 2008	GULGG007	Birth	KONRAD	KRIST 5	578098100253079	
					EBERSWALD	21 Oct 2010	KONRAD	Loan to				
313	M	27 Feb 2008	190	275	KRISTIANS	27 Feb 2008	GULGG009	Birth	PHILIP	KRIST 6	57B098100300554	
					BRNO	14 Sep 2010	ROE001	Transfer				
314	?	3 Mar 2008	255	251	KERKRADE	3 Mar 2008	M08009	Birth		GAIA 1		
						3 Mar 2008		Death				
315	?	3 Mar 2008	255	251	KERKRADE	3 Mar 2008	M08010	Birth		GAIA 2		
						3 Mar 2008		Death				
316	?	3 Mar 2008	255	251	KERKRADE	3 Mar 2008	M08011	Birth		GAIA 3		
						4 Mar 2008		Death				
317	F	27 Feb 2008	190	275	KRISTIANS	27 Feb 2008	GULGG008	Birth	DORTEA	KRIST 7	578098100269423	
					SALZBURG	30 Mar 2010	S1050	Transfer				
318	M	22 Feb 2009	240	285	HUNBSTRND	22 Feb 2009	209002	Birth	SARKA	HUNNEBO	13977200007244673	
					BURFORD	28 Oct 2009	MM1405	Transfer				
319	M	22 Feb 2009	240	285	HUNBSTRND	22 Feb 2009	209003	Birth	JOKK	HUNNEBO	14977200007248513	
					KOLMARDEN	18 Mar 2010	11121	Transfer				
320	?	27 Feb 2009	255	251	KERKRADE	27 Feb 2009	M09012	Birth		GAIA 4		
						27 Feb 2009		Death				
321	?	27 Feb 2009	255	251	KERKRADE	27 Feb 2009	M09013	Birth		GAIA 5		
						27 Feb 2009		Death				
322	M	14 Feb 2009	235	260	AHTARI	14 Feb 2009	209001	Birth	VALENTINO	AHTARI 36	985121006938269	
					FURSTENWA	15 Jun 2010	322	Transfer				
323	M	3 Feb 2009	217	211	KOLMARDEN	3 Feb 2009	10813	Birth	PUFF	KOL 28	968000000569365	
					LONDON RP	4 Mar 2010	8001	Transfer				
					WHIPSNADE	9 Apr 2010	4059	Transfer				
324	F	3 Feb 2009	217	211	KOLMARDEN	3 Feb 2009	10812	Birth	PIFF	KOL 29	968000000603355	
325	M	16 Feb 2010	235	260	AHTARI	16 Feb 2010	210001	Birth		AHTARI 37	246098100276450	
					NAMSKOGAN	7 Jul 2011	NIILA	Transfer				
326	F	16 Feb 2010	235	260	AHTARI	16 Feb 2010	210002	Birth	NAAVA	AHTARI 38	246098100279732	
					BARDU	9 Jul 2011	NAAVA	Transfer				
						2 Aug 2011		Death				
327	?	17 Feb 2010	255	251	KERKRADE	17 Feb 2010	M10015	Birth		GAIA 6		
						26 Feb 2010		Death				
328	M	17 Feb 2010	255	251	KERKRADE	17 Feb 2010	M10016	Birth	TAPIO	GAIA 7	0006BB223	
					NOVOSIBRK	19 Aug 2011	123026	Transfer				

329	M	24 Feb 2010	273	290	HUNBSTRND	24 Feb 2010	210003	Birth	ZACK	HUNNEBO	15977200007465589	
					KRISTIANS	28 Sep 2011	GULGG015	Transfer				
330	M	24 Feb 2010	273	290	HUNBSTRND	24 Feb 2010	210004	Birth	ZETH	HUNNEBO	16977200007464830	
					OPOLE	25 Oct 2011	M11064	Transfer				
331	M	23 Jan 2010	230	264	MOSCOW	23 Jan 2010	100022	Birth		MOSCOW 9		
332	M	23 Jan 2010	230	264	MOSCOW	23 Jan 2010	100023	Birth		MOSCOW 10		
333	M	23 Jan 2010	230	264	MOSCOW	23 Jan 2010	100024	Birth		MOSCOW 11		
						14 Oct 2010		Death				
334	F	23 Jan 2010	230	264	MOSCOW	23 Jan 2010	100025	Birth		MOSCOW 12		
					BRNO	12 Nov 2010	ROE002	Transfer				
335	M	22 Jan 2010	212	263	MOSCOW	22 Jan 2010	100026	Birth		MOSCOW 13		
						30 Jul 2012		Death				
336	M	22 Jan 2010	212	263	MOSCOW	22 Jan 2010	100067	Birth		MOSCOW 14		
337	F	22 Jan 2010	212	263	MOSCOW	22 Jan 2010	100068	Birth		MOSCOW 15		
						18 Jul 2012		Death				
338	F	22 Jan 2010	212	263	MOSCOW	22 Jan 2010	100069	Birth		MOSCOW 16		
					NOVOSIBRK	15 Jun 2011	123025	Transfer				
339	M	15 Feb 2010	252	282	STOCKHOLM	15 Feb 2010	942102	Birth	NANOK	SHOLM 8	968000005175836	
					LYCKSELE	11 Oct 2010	NANOK	Transfer				
						19 Nov 2010		Death				
340	F	15 Feb 2010	252	282	STOCKHOLM	15 Feb 2010	942103	Birth	NAVARRANA	SHOLM 9	968000005142711	
					SZEGED	25 Nov 2010	2746	Loan to				
341	M	8 Feb 2010	274	294	LUND	8 Feb 2010	HOOR6	Birth	DIMITRI	HOOR 6	977200007592450	
					LYCKSELE	6 Apr 2011	DIMITR	Transfer				
						17 Dec 2013		Death				
342	?	8 Feb 2010	274	294	LUND	8 Feb 2010	HOOR7	Birth		HOOR 7		
						1 Apr 2010		Death				
343	F	~ 2010	WILD	WILD	SWEDEN	14 May 2010	NONE	Capture	THELMA	LYCKS 15	968000003533061	
					LYCKSELE	15 May 2010	THELMA	Transfer				
344	M	3 Feb 2010	295	236	DUISBURG	3 Feb 2010	5956	Birth	LOKI	DUISBRG 4	276096909034402	
					OSNABRUCK	22 Mar 2011	2780	Loan to				
345	F	3 Feb 2010	295	236	DUISBURG	3 Feb 2010	5958	Birth	FROSSA	DUISBRG 5	276096909040802	
					JARVZOO	9 Feb 2011	FROSSA	Transfer				
346	F	3 Feb 2010	295	236	DUISBURG	3 Feb 2010	5957	Birth		DUISBRG 6	276096909037883	
					EBERSWALD	27 Oct 2010	346	Transfer				
347	F	~ Mar 2001	WILD	WILD	RUSSIA	~ Jul 2003	NONE	Capture	PLOTINKA	EKATERIN 1		
					EKATERINB	~ Jul 2003	PLOTIN	Transfer				
					NIKOLAEV	12 Sep 2003	403055	Transfer				
348	M	31 Jan 2011	252	282	STOCKHOLM	31 Jan 2011	942233	Birth		SHOLM 10	968000005120697	
					LYCKSELE	12 Mar 2013	348	Loan to				
349	F	31 Jan 2011	252	282	STOCKHOLM	31 Jan 2011	942234	Birth		SHOLM 11	966000000046609	
					OPOLE	3 Oct 2012	M12076	Transfer				
350	F	31 Jan 2011	252	282	STOCKHOLM	31 Jan 2011	942235	Birth		SHOLM 12	968000005243352	
					BARDU	14 Jun 2012	SALA	Transfer				
						15 Jan 2013		Death				
351	M	9 Feb 2011	274	294	LUND	9 Feb 2011	HOOR8	Birth		HOOR 8	945000000825510	
						13 Feb 2013		Death				
352	M	9 Feb 2011	274	294	LUND	9 Feb 2011	HOOR9	Birth		HOOR 9	945000000829659	
						22 Feb 2012		Death				
353	M	9 Feb 2011	274	294	LUND	9 Feb 2011	HOOR10	Birth	LUDDE	HOOR 10	945000000830893	
					LYCKSELE	29 Jan 2014	LUDDE	Transfer				
354	M	13 Feb 2011	190	275	KRISTIANS	13 Feb 2011	GULGG013	Birth		KRIST 8	578098100300069	
						29 Feb 2012		Death				
355	?	13 Feb 2011	190	275	KRISTIANS	13 Feb 2011	GULGG014	Birth		KRIST 9		
						29 Apr 2011		Death				
356	M	17 Feb 2011	240	285	HUNBSTRND	17 Feb 2011	211009	Birth	EDISON	HUNNEBO17	977200007676513	
357	M	17 Feb 2011	240	285	HUNBSTRND	17 Feb 2011	211010	Birth	MARCO	HUNNEBO	18977200007668122	
					USTI	26 Oct 2012	UL1998	Transfer				
358	F	17 Feb 2011	240	285	HUNBSTRND	17 Feb 2011	211011	Birth	VILDA	HUNNEBO	19977200007668739	
					OSNABRUCK	23 Oct 2011	3015	Transfer				
359	?	17 Feb 2011	240	285	HUNBSTRND	17 Feb 2011	211012	Birth		HUNNEBO 20		
						23 Mar 2011		Death				
360	F	8 Feb 2011	205	204	SPRINGE	8 Feb 2011	1241	Birth	LENA	SPRINGE 7	968000005349448	
					MUNICH	23 Feb 2012	083009	Transfer				

361	?	13 Mar 2011	255	251	KERKRADE	13 Mar 2011	M11013	Birth		GAIA 8	
						14 Mar 2011		Death			
362	?	13 Mar 2011	255	251	KERKRADE	13 Mar 2011	M11014	Birth		GAIA 9	
						16 Mar 2011		Death			
363	?	13 Mar 2011	255	251	KERKRADE	13 Mar 2011	M11015	Birth		GAIA 10	
						16 Mar 2011		Death			
364	M	26 Jan 2012	318	306	BURFORD	26 Jan 2012	MM1651	Birth	ENSIN	COTSWOLD	1956000001463810
					MUNICH	9 Feb 2013	083010	Transfer			
365	F	26 Jan 2012	318	306	BURFORD	26 Jan 2012	MM1652	Birth	NALKA	COTSWOLD	2956000001517477
					HLUBOKA	11 Jul 2013	M4100001	Transfer			
366	F	26 Jan 2012	318	306	BURFORD	26 Jan 2012	MM1653	Birth	NIEMI	COTSWOLD	3956000001462215
					PARIS ZOO	7 Feb 2014	ZB4070	Transfer			
367	M	24 Feb 2012	235	260	AHTARI	24 Feb 2012	212001	Birth	KATKA	AHTARI 39	985170002274019
					HANSTEDT	4 Mar 2014	KATKA	Transfer			
368	M	24 Feb 2012	235	260	AHTARI	24 Feb 2012	212003	Birth	KAMPPI	AHTARI 40	985170002273671
					HANSTEDT	4 Mar 2014	KAMPPI	Transfer			
369	F	24 Feb 2012	235	260	AHTARI	24 Feb 2012	212002	Birth	FIONA	AHTARI 41	985170002284634
					CEZALIER	13 Mar 2013	C646	Transfer			
370	M	1 Feb 2012	212	264	MOSCOW	1 Feb 2012	120122	Birth		MOSCOW 17	
					IZHEVSK	26 Apr 2013	370	Transfer			
371	M	1 Feb 2012	212	264	MOSCOW	1 Feb 2012	120123	Birth	VARYAG	MOSCOW 18	
					NIKOLAEV	22 Oct 2014	414048	Transfer			
372	F	1 Feb 2012	212	264	MOSCOW	1 Feb 2012	120124	Birth		MOSCOW 19	
					NOVOSIBRK	29 Nov 2013	123028	Loan to			
373	M	11 Feb 2012	230	263	MOSCOW	11 Feb 2012	120125	Birth		MOSCOW 20	
					BUDAPEST	8 Oct 2015	301089	Transfer			
374	M	11 Feb 2012	230	263	MOSCOW	11 Feb 2012	120126	Birth	VASIL	MOSCOW 21	972270000020635
					HLUBOKA	3 Apr 2014	M4200002	Transfer			
375	F	11 Feb 2012	230	263	MOSCOW	11 Feb 2012	120127	Birth		MOSCOW 22	
					RUSSIA	25 Aug 2014	375	ltf			
376	?	5 Feb 2012	295	236	DUISBURG	5 Feb 2012	6345	Birth		DUISBRG 7	
						6 Mar 2012		Death			
377	M	5 Feb 2012	295	236	DUISBURG	5 Feb 2012	6346	Birth	ARNE	DUISBRG 8	276096909211453
					BARDU	10 Oct 2013	ARNE	Transfer			
						17 Jun 2014		Death			
378	F	5 Feb 2012	295	236	DUISBURG	5 Feb 2012	6347	Birth	AHMA	DUISBRG 9	276096909211440
					KERKRADE	9 Apr 2013	M12146	Transfer			
379	F	~ 2012	WILD17	WILD18	KARELIYA	~ 2012	NONE	Capture		MOSCOW 23	
					MOSCOW	20 Sep 2012	120692	Transfer			
						18 Aug 2016		Death			
380	F	~ 2012	WILD17	WILD18	KARELIYA	~ 2012	NONE	Capture		MOSCOW 24	
					MOSCOW	20 Sep 2012	120693	Transfer			
381	F	21 Jan 2013	217	299	CALVIAC	21 Jan 2013	204146	Birth	GUILLOTINE	CALVIAC 1	
					COLUMBUS	9 Oct 2014	214123	Transfer			
382	M	8 Feb 2013	273	286	BORAS	8 Feb 2013	RJ0030	Birth	ABBE	BORAS 18	968000005789709
					CEZALIER	12 Dec 2013	C370	Transfer			
383	M	8 Feb 2013	273	286	BORAS	8 Feb 2013	RJ0031	Birth	ALVAR	BORAS 19	968000005790057
					COLUMBUS	30 Apr 2014	214037	Transfer			
384	F	8 Feb 2013	273	286	BORAS	8 Feb 2013	RJ0032	Birth	AGNES	BORAS 20	968000005790883
					ORSA	9 Dec 2013	AGNES	Transfer			
					SWEDEN	11 May 2014	AGNES	ltf			
385	M	21 Feb 2013	281	290	HUNBSTRND	21 Feb 2013	213001	Birth	ZAKKO	HUNNEBO	21968000010082200
					PARIS ZOO	4 Feb 2014	ZB4055	Transfer			
386	M	21 Feb 2013	281	290	HUNBSTRND	21 Feb 2013	213002	Birth		HUNNEBO	22968000010083250
						26 Apr 2013		Death			
387	F	21 Feb 2013	281	290	HUNBSTRND	21 Feb 2013	213003	Birth	ZOLA	HUNNEBO	23968000010082383
					MINNESOTA	30 Oct 2013	13729	Transfer			
388	?	20 Feb 2013	319	324	KOLMARDEN	20 Feb 2013	12109	Birth		KOL 30	
						20 Feb 2013		Death			
389	M	20 Feb 2013	319	324	KOLMARDEN	20 Feb 2013	12110	Birth	SAREK	KOL 31	968000005747809
					HELSINKI	28 May 2014	214029	Transfer			
390	M	20 Feb 2013	319	324	KOLMARDEN	20 Feb 2013	12111	Birth	ABISKO	KOL 32	968000005737627
					MINNESOTA	30 Oct 2013	13728	Transfer			
391	M	7 Mar 2013	291	278	JARVZOO	7 Mar 2013	JZM13007	Birth	JUMBO	JARVSO 8	968000010080146
					ANCHORAGE	22 Jun 2016	2016-21	Transfer			

392	M	~ 2006	WILD	WILD	RUSSIA	~ 2006	NONE	Capture				
					MOSCOW	23 Apr 2013	130064	Transfer				
						24 Dec 2014		Death				
393	M	25 Feb 2013	329	275	KRISTIANS	25 Feb 2013	GULGG016	Birth	KASPER	KRIST 10	578098100363548	
					BIG GAME	14 Apr 2015	KASPER	Transfer				
394	M	25 Feb 2013	329	275	KRISTIANS	25 Feb 2013	GULGG017	Birth	JESPER	KRIST 11	578098100363592	
					CALVIAC	14 Apr 2014	2015GG05	Transfer				
395	M	25 Feb 2013	329	275	KRISTIANS	25 Feb 2013	GULGG018	Birth	JONATANN	KRIST 12	578098100367711	
					COLUMBUS	9 Oct 2014	214124	Transfer				
					ST FELICI	16 Dec 2014	B14086	Transfer				
396	M	????	WILD	WILD	RUSSIA	????	NONE	Capture	YAKUT			
					LIMPOPZOO	20 May 2012	YAKUT	Transfer				
397	F	~ 2001	WILD	WILD	RUSSIA	~ 2001	NONE	Capture	SKARLET	EKATERIN	2643110000022584	
					EKATERINB	~ 2001	EKATER2	Transfer				
					NOVOSIBRK	19 Oct 2007	123022	Transfer				
						23 May 2014		Death				
398	F	27 Feb 2014	296	279	RANUA	27 Feb 2014	214009	Birth	KURU	RANUA 8	981098104653747	
					TEXAS	27 Feb 2015	398	Transfer				
					ST FELICI	26 Mar 2015	B14104	Transfer				
399	F	27 Feb 2014	296	279	RANUA	27 Feb 2014	214010	Birth	KAAMOS	RANUA 9	981098104651355	
					ORSA	9 May 2015	WV4	Transfer				
400	M	14 Feb 2014	273	286	BORAS	14 Feb 2014	RJ0033	Birth	VALLE	BORAS 21	968000010111657	
					HANSURLES	26 Feb 2015	GR42	Transfer				
401	F	14 Feb 2014	273	286	BORAS	14 Feb 2014	RJ0034	Birth	TINA	BORAS 22	968000010079719	
					KINGUSSIE	19 Feb 2015	5831	Transfer				
402	F	23 Feb 2014	235	260	AHTARI	23 Feb 2014	214002	Birth	TUIJA	AHTARI 42	985170003021562	
					BUDAPEST	12 Oct 2015	301093	Transfer				
403	F	23 Feb 2014	235	260	AHTARI	23 Feb 2014	214003	Birth	PINJA	AHTARI 43	985170003023832	
					HELSINKI	25 Mar 2015	215003	Transfer				
404	F	12 Feb 2014	328	338	NOVOSIBRK	12 Feb 2014	123031	Birth		NOVOSIB 1	643110000461974	
					HANSURLES	13 Mar 2015	GR41	Transfer				
405	F	12 Feb 2014	328	338	NOVOSIBRK	12 Feb 2014	123032	Birth	OLGA	NOVOSIB 2	643110000461989	
					ANCHORAGE	16 Oct 2015	2015-23	Transfer				
406	M	16 Feb 2014	274	294	LUND	16 Feb 2014	406	Birth	LOGAN	HOOR 11	966000000225903	
					SALZBURG	5 May 2015	S2085	Transfer				
407	F	16 Feb 2014	274	294	LUND	16 Feb 2014	407	Birth	KAYLA	HOOR 12	966000000215131	
					BIG GAME	13 Dec 2015	KAYLA	Transfer				
408	M	14 Feb 2015	319	324	KOLMARDEN	14 Feb 2015	12660	Birth	SALT	KOL 33	968000010167073	
						8 Jun 2015		Death				
409	M	14 Feb 2015	319	324	KOLMARDEN	14 Feb 2015	12661	Birth	REIVO	KOL 34	968000010161824	
						22 May 2015		Death				
410	F	14 Feb 2015	319	324	KOLMARDEN	14 Feb 2015	12662	Birth	LAVA	KOL 35	968000010160865	
						10 Jun 2015		Death				
411	F	14 Feb 2015	319	324	KOLMARDEN	14 Feb 2015	12663	Birth	VIDJA	KOL 36	968000010161650	
					STE CROIX	19 Dec 2015	1643	Transfer				
412	M	23 Feb 2015	252	282	STOCKHOLM	23 Feb 2015	942524	Birth	SAIVO	SHOLM 13	752015900007216	
					STE CROIX	19 Dec 2015	1642	Transfer				
413	M	23 Feb 2015	252	282	STOCKHOLM	23 Feb 2015	942525	Birth		SHOLM 14		
						9 Feb 2016		Death				
414	F	23 Feb 2015	252	282	STOCKHOLM	23 Feb 2015	942522	Birth	SUNNA	SHOLM 15		
					HERBERSTN	28 Jul 2016	101732	Transfer				
415	?	23 Feb 2015	252	282	STOCKHOLM	23 Feb 2015	942523	Birth		SHOLM 16		
						5 Mar 2015		Death				
416	M	25 Jan 2015	318	306	BURFORD	25 Jan 2015	MM1951	Birth		COTSWOLD	4956000003722417	
					OSIJEK	5 May 2016	GG01	Transfer				
417	M	25 Jan 2015	318	306	BURFORD	25 Jan 2015	MM1952	Birth		COTSWOLD	5956000003651245	
					OSIJEK	5 May 2016	GG02	Transfer				
418	F	25 Jan 2015	318	306	BURFORD	25 Jan 2015	M1953	Birth		COTSWOLD 6		
419	M	8 Mar 2015	273	285	HUNBSTRND	8 Mar 2015	215004	Birth	ANGUS	HUNNEBO	24752098100704209	
					KERKRADE	10 Apr 2016	M15078	Transfer				
420	M	8 Mar 2015	273	285	HUNBSTRND	8 Mar 2015	215005	Birth	MALCOLM	HUNNEBO	25752098100706451	
					HERBERSTN	28 Jul 2016	101731	Transfer				
421	F	15 Feb 2015	329	275	KRISTIANS	15 Feb 2015	GULGG019	Birth	AKKA	KRIST 13	578098100363904	
					BORAS	27 Apr 2016	RJ0035	Transfer				
422	M	24 Feb 2015	291	278	JARVZOO	24 Feb 2015	JZM15016	Birth		JARVSO 9	968000010080458	

423	M	24 Feb 2015	291	278	JARVZOO	24 Feb 2015	JZM15017	Birth			JARVSO 10	968000010079852
424	F	~ Dec 2014	371	375	RUSSIA	~ Dec 2014	_____	Birth				
					MOSCOW	9 Sep 2015	150597	Transfer				
425	M	21 Feb 2016	356	290	HUNBSTRND	21 Feb 2016	216004	Birth	SID		HUNNEBO26	752098100754932
426	?	21 Feb 2016	356	290	HUNBSTRND	21 Feb 2016	216005	Birth			HUNNEBO27	
						21 Mar 2016		Death				
427	?	21 Feb 2016	356	290	HUNBSTRND	21 Feb 2016	216006	Birth			HUNNEBO28	
						21 Mar 2016		Death				
428	M	13 Feb 2016	296	279	RANUA	13 Feb 2016	216003	Birth	AHMATTI		RANUA 10	
					AHTARI	7 Sep 2016	216049	Transfer				
429	F	13 Feb 2016	296	279	RANUA	13 Feb 2016	216004	Birth			RANUA 11	
430	M	2 Mar 2016	313	334	BRNO	2 Mar 2016	ROE003	Birth			BRNO 1	956000002932377
431	M	3 Mar 2016	319	324	KOLMARDEN	3 Mar 2016	12924	Birth	GIRON		KOL 37	968000010300213
432	M	3 Mar 2016	319	324	KOLMARDEN	3 Mar 2016	12925	Birth	KAITUM		KOL 38	9680000102948339
433	F	3 Mar 2016	319	324	KOLMARDEN	3 Mar 2016	12926	Birth	LAPONIA		KOL 39	968000010300123
434	?	7 Feb 2016	267	401	KINGUSSIE	7 Feb 2016	5926	Birth			HWP 1	
435	?	7 Feb 2016	267	401	KINGUSSIE	7 Feb 2016	5927	Birth			HWP 2	
436	M	7 Feb 2016	344	358	OSNABRUCK	7 Feb 2016	3836	Birth	FITTI		OSNABR 1	
437	M	4 Feb 2016	328	338	NOVOSIBRK	4 Feb 2016	123033	Birth			NOVOSIB 3	643099000152124
438	F	4 Feb 2016	328	338	NOVOSIBRK	4 Feb 2016	123034	Birth			NOVOSIB 4	643099000152135
439	M	13 Feb 2016	274	294	SKANE	13 Feb 2016	YAROSL	Birth	YAROSLAV		HOOR 13	941000018672201
440	F	13 Feb 2016	274	294	SKANE	13 Feb 2016	YARA	Birth	YARA		HOOR 14	941000018672196

TOTAL NUMBER OF REGISTERED ANIMALS ON 1.1.2016: 147.154.35 (336)

Compiled by: Leif Blomqvist thru Nordens Ark
Data current thru: 1 Oct 2016 - European regional
Printed on 1 Oct 2016 using Sparks v1.65

Location Glossary

AHTARI Zoo Ahtari (Ahtarin Elainpuisto Oy)
Karhunkierros 130, Ahtari, Finland, FI-63700
+358.6.5393.555 fax: +358.6.5393.611 mauno.seppakoski@ahtarizoo.fi
Contact: Mauno Seppakoski Data current to 10 Apr 2016

AMSTERDAM Artis Zoo
Plantage Kerklaan 38-40, Amsterdam, Netherlands, 1018 CZ
+31.20.5233.497 fax: +31.20.5233.419 j.bultstra@artis.nl

ANCHORAGE Alaska Zoo
4731 O'Malley Rd., Anchorage, Alaska, United States, 99516
+1.907.346.2133 fax: +1.907.346.2673 sjenseni@alaskazoo.org
Contact: Shannon Jensen Data current to 10 Apr 2016

BARDU Polar Park
Bonesveien, Bardu, Troms, Norway, N-9360
+47.77.91.25.21 stig@polarzoo.no
Contact: Stig Sletten Data current to 13 Apr 2016

BERLIN TP Tierpark Berlin-Friedrichsfelde GmbH
Am Tierpark 125, Berlin, Berlin , Germany, D-10307
+49.30.51531.111 fax: +49.30.512.4061 f.sicks@tierpark-berlin.de
Contact: Florian Sicks

BERN Tierpark Daehlholzli
Tierparkweg 1, Bern, Bern, Switzerland, CH-3005
+41.31.357.1518 fax: +41.31.357.1510 marc.rosset@bern.ch
Contact: Marc Rosset Data current to 10 Apr 2016

BIELEFELZ Heimattierpark Olderdissen
Dornberger Strasse 151, Bielefeld, Nordrhein-westfalen, Germany, D-33619
+49.521.512956 fax: +49.521.512958 katja.leszczynski@bielefeld.de
Contact: Katja Leszczynski Data current to 10 Apr 2016

BIG GAME Alaska Wildlife Conservation Center
PO Box 949, Portage Glacier, Alaska, United States, 99587
+1 907 783 2025 mike@alaskawildlife.org
Contact: Director Mike Miller Data current to 10 Apr 2016

BORAS Boras Djurpark Zoo
Box 502, Boras, Vastra Gotaland, Sweden, S-50313
+46.33.353273 fax: +46.33.105339 daniel.roth@boraszoo.se
Contact: Daniel Roth Data current to 10 Apr 2016

BRNO Brno Zoo and Environmental Education Cen
U Zoologicke Zahrady 46, Brno, Jihomoravskì Kraj Czech Republic, CZ-635 00
+420.725.326.555 gremlicova@zoobrno.cz
Contact: Curator Dobrota Gremlicova Data current to 7 Mar 2016

BUDAPEST Budapest Zool.& Botanical Garden
Allatkerti krt. 6-12, Budapest, Budapest, Hungary, H-1146
+36.1.273.4900 fax: +36.1363.2971 drsos@zoobudapest.com
Contact: Dr. Endre Sos Data current to 10 Apr 2016

BURFORD Cotswold Wildlife Park and Gardens
Bradwell Grove, Burford, Oxfordshire, United Kingdom, OX18 4JP

+44.1993.825722 fax: +44.1993.823908 jamiecraig@cotswoldwildlifepark.co.uk
Contact: Jamie Craig Data current to 10 Apr 2016

CALVIAC Reserve Zoologique de Calviac

Sous le Roc, Calviac-en-Perigord, Dordogne, France, F-24370
+33.5.5328.8408 contact@reserve-calviac.org
Contact: Emmanuel Mouton Data current to 20 May 2008

CEZALIER Parc Animalier d'Auvergne

Route d'Anzat Le Luguet, Ardes-sur-couze, Puy-de-dome, France, F-63420
pascal@parcanimalierdauvergne.fr
Contact: Pascal Damois Data current to 10 Apr 2016

CHESTER North of England Zoological Society

Caughall Road, Upton-by-Chester, Cheshire, United Kingdom, CH2 1LH
+44.1244.389745 fax: +44.1244.371273 d.brunger@chesterzoo.org
Contact: Mr. Dave Brunger Data current to 10 Apr 2016

CHOMUTOV Podkrusnohorskì Zoopark Chomutov

Premyslova 259, Chomutov, Chomutov, Czech Republic
+420.474.624.185 mengr@zoopark.cz
Contact: Jan Mengr Data current to 1 Sep 2016

COLUMBUS Columbus Zoo and Aquarium

PO Box 400, Powell, Ohio, United States, 43065-0400
+1.614.635.3429 dusty.lombardi@columbuszoo.org
Contact: Dusty Lombardi Data current to 10 Apr 2016

DORTMUND Zoo Dortmund

Mergelteichstr. 80, Dortmund, Nordrhein-Westfalen, Germany, 44225
+49.231.5028591 fax: +49.231.712175 i.schappert@stadtdo.de

DUISBURG Zoo Duisburg AG

Mulheimerstrasse 273, Duisburg, Nordrhein-Westfalen, Germany, D-47057
+49.203.305.5945 Pfeiderer@zoo-duisburg.de
Contact: Johannes Pfeiderer Data current to 10 Apr 2016

EBERSWALD Tierpark Eberswalde

Am Wasserfall 1, Eberswalde, Brandenburg, Germany, D-16225
+49 3334 22733 m.hoff@eberswalde.de
Contact: Matthias Hoff Data current to 10 Apr 2016

EDINBURGH Edinburgh Zoo - Scottish National Zoo

134 Corstorphine Road, Edinburgh, Scotland, United Kingdom, EH12 6TS
+44.131.314.0315 fax: +44.131.314.0376 lburrill@rzss.org.uk
Contact: Registrar Lynda Burrill Data current to 10 Apr 2016

EKATERINB Ekaterinburgskii Zoopark

ul. Mamina-Sibiryaka, 189, Ekaterinburg, Sverdlovskaya Oblast, Russia, 620026
zooekb@isnet.ru
Contact: Curator Svetlana Polents

FURSTENWA Heimattiergarten Fuerstenwalde

Im Stadtpark, Fuerstenwalde / Spre, Brandenburg, Germany, D-15517
+49.3361.4541 leitung@heimtiergarten-fuerstenwalde.de
Contact: Ranko Drewitz Data current to 10 Apr 2016

HAMBURG Tierpark Hagenbeck GmbH

PO Box 540 930, Hamburg, Hamburg, Germany, D-22509
+49.40.540001.50 fax: +49.40.54000132 michael.fluegger@hagenbeck.de
Contact: Dr. Michael Fluegger

HANNOVER Zoo Hannover GmbH
Adenauerallee 3, Hannover, Niedersachsen, Germany, 30175
+49.511.28074.152 fax: +49.511.28074.159 mueller-schilling@zoo-hannover.de

HANSTEDT Wildpark Lueneburger Heide
Tietz KG, Hanstedt-nindorf, Niedersachsen, Germany
+49.4184.8939.0 fax: +49.4184.8240 alexander.tietz@wild-park.de
Contact: Alexander Tietz Data current to 10 Apr 2016

HANSURLES Reserve d'Animaux Sauvage
Rue J. Lamotte 2, Han-sur-lesse, Roche, Namur, Belgium, B-5580
+32.84377213 fax: +32.84377712 akohler@grotte-de-han.be/ebrunelle@grotte-de-han.be
Contact: Anthony Kohler & Etienne Brunelle Data current to 10 Apr 2016

HELSINKI Helsinki Zoo
PO Box 4600, Helsinki, Finland, FI-00099
+358.8.169.5939 fax: +358.9.169.5990 nina.trontti@hel.fi
Contact: Nina Trontti Data current to 10 Apr 2016

HERBERSTN Tierwelt Herberstein
Steirischer Landestiergarten Gmb, Buchberg, Steiermark Austria, A-8223
+43.3176.80.777 fax: +43.3176.877.520 R.Pichler@tierwelt-herberstein.at
Contact Reinherd Pichler Data current to 10 Apr 2016

HLUBOKA Zoologicka Zahrada Ohrada
Hluboka Nad Vltavou, Jihoceskì Kraj, Czech Republic, CZ-37341
+420.602.624.092 kubat@zoo-ohrada.cz

HUNBSTRND Nordens Ark
Aby Saeteri, Hunnebostrand, Vastra Gotaland, Sweden, S-456 93
+46.523.79590 fax: +46.523.52087 leif.blomqvist@nordensark.se
Contact: Leif Blomqvist Data current to 10 Apr 2016

IZHEVSK Izhevsk Zoo
ul. Kirova, 8, Izhevsk, Udmurtskaya Respubli, Russian Federation, 426033
+7 3412.59.81.81 udmzoovet@mail.ru
Contact: Director Ekatherina Pchelnikova Data current to 11 Jan 2016

JARVZOO Jarvzoo
Box 17, Jarvso, Gavleborg, Sweden, S-82040
+46 651.411.25 jens@jarvzoo.se
Contact: Jens Larsson Data current to 10 Apr 2016

KERKRADE GaiaZoo, Kerkrade
PO Box 68, Kerkrade, Limburg, Netherlands, 6460 AB
+31.45.567.6070 fax: +31.45.567.6071 t.termeulen@gaiazoo.nl
Contact: Tjerk Ter Meulen Data current to 10 Apr 2016

KINGUSSIE Highland Wildlife Park
Kincraig, Kingussie, Highland, United Kingdom, PH21 1NL
+44.1540.651.970 drichardson@rzss.org.uk
Contact: Douglas Richardson Data current to 10 Apr 2016

KOLMARDEN Kolmardens Djurpark AB
Kolmarden, Ostergotland Sweden, S-61892
thomas.lind@kolmarden.com
Contact: Thomas Lind Data current to 10 Apr 2016

KRISTIANS Kristiansand Dyrepark ASA
Kardemomme By, Kristiansand, Ostfold, Norway, N-4609
+47.97.05.98.76 helene@dyreparken.no
Contact: Helene Axelsen Data current to 10 Apr 2016

LIMPOPZOO Nizhnii Novgorod Zoo "Limpopo "

ul. Yaroshenko, 7-b, Nizhny Novgorod, Nizhegorodskaya Obla, Russian Federation, limpopozoo@mail.ru

Contact: Curator Marina Maximkina Data current to 2 Dec 2013

LONDON RP ZSL London Zoo

Regent's Park, London, London, United Kingdom, NW1 4RY
+44.20.7449.6452 fax: +44.20.7722.2852 elspeth.chaplin@zsl.org
Contact: Ms. Elspeth Chaplin

LUND Skanes Djurpark Resort AB

Jularp 150, Hoor, Skan, Sweden, S-24393
carl@skanesdjurpark.se
Contact: Carl Bratt Data current to 10 Apr 2016

LYCKSELE Lycksele Djurpark/Zoo

Brannbergsvagen, Lycksele, Vasterbotten, Sweden, S-921 36
+46 950.163.63 carola.stalfjall@lycksele.se
Contact: Carola Stalfjall Data current to 10 Apr 2016

MAGDEBURG Zoologischer Garten Magdeburg

Zooallee 1, Magdeburg, Sachsen-Anhalt, Germany, 39124
+49.391.53.53.90.05 fax: +49.391.280.90.12 ruske@zoo-magdeburg.de
Contact: Curator Konstantin Ruske Data current to 10 Apr 2016

MINNESOTA Minnesota Zoological Garden

13000 Zoo Blvd, Apple Valley, Minnesota, United States, 55124
+1.952.431.9271 fax: +1.952.431.9367 tom.ness@state.mn.us
Contact: Tom Ness Data current to 10 Apr 2016

MONTEBELL Parc Omega

399 Route 323 Nord, Montebello, Quebec J0V 1LO, Canada
s.lussier@parcomega.ca
Contact: Serge Lussier Data current to 10 Apr 2016

MOSCOW Moscow Zoological Park

B. Gruzinskaya, 1, Moscow, Moskovskaya Oblast', Russian Federation
+7.95.252.1053 fax: +7.95.973.2056 t.kotova@moscowzoo.ru
Contact: Tatiana Kotova Data current to 10 Apr 2016

MUNICH Munchener Tierpark Hellabrunn

Tierparkstr. 30, Munchen / Munich, Bayern, Germany, 81543
+49.89.62.50816 fax: +49.89.62.50.852 carsten.zehrer@hellabrunn.de
Contact: Carsten Zehrer Data current to 10 Apr 2016

NAMSKOGAN Namsskogans Familiepark

Trones, Namsskogan, Nord-trondelag, Norway, N-7892
+47 74.33.37.00 kristin@familieparken.no
Contact: Kristin Meitz Bru Data current to 10 Apr 2016

NIKOLAEV Nikolaev Zoo of Nikolaev-City Council

pl. Nikolay Leontovich sq., 1, Nikolaev, Mykolavska Oblast, Ukraine, 54003
+380.512.246377 fax: +380.512.556045 yuri.kirichenkozoo@gmail.com
Contact: Yuri Kirichenko Data current to 10 Apr 2016

NOVOSIBRK Novosibirsk Zoological Park

Municipal Unitary Enterprise, Novosibirsk, Novosibirskaya Oblas, Russian Federation
+7.3832.209779 fax: +7.3832.24.87.66 zoo-nsk@ngs.ru
Contact: Olga Shilo, Curator

OPOLE Ogrod Zoologiczny Opole

Spacerowa 10, Opole, Opolskie, Poland, 45-094
+48.77.454.2858 fax: +48.77.456.4264 rolik@zoo.opole.pl
Contact: Curator Grzegorz Rolik

ORSA Orsa Gronklitt Bjornpark (Orsa Bear Park)

Box 133, Orsa, Dalarn, Sweden, S-794 22
+46.704.00.77.55 anette.olsson@orsarovdjurspark.se
Contact: Anette Olsson Data current to 10 Apr 2016

OSIJEK ZOO OSIJEK

Sjevernodravska obala 1, Osijek, Croatia
+385.9137.42129 tatjana@zoo-osijek.hr
Contact: Dvm Tatjana Salika-Todorovnic Data current to 20 Apr 2016

OSNABRUCK Zoo Osnabruck

Am Waldzoo 2/3, Osnabruck, Niedersachsen, Germany, D-49082
+49.541.95.1050 fax: +49.541.95.10.522 zoo@zoo-osnabrueck.de
Contact: Curator Tobias Klumpe Data current to 10 Apr 2016

PARIS JP Menagerie du Jardin des Plantes (MNHN)

57 rue Cuvier, Paris, Paris, France, F-75005
+33.14079.5784 fax: +33.14079.3816 bourgeois@mnhn.fr

PARIS ZOO Parc Zoologique de Paris (MNHN)

53, avenue de Saint Maurice, Paris, Paris, France, F-75012
+33.1.4475.2034 fax: +33.1.4343.5473 pzpveto@mnhn.fr
Contact: Alexis Lecu Data current to 8 Mar 2016

RANUA Ranua Wildlife Park

Rovaniementie 29, Ranua, Lappland, Finland, FI-97700
mari.hekkila@ranua.fi
Contact: Mari Heikkila Data current to 10 Apr 2016

RHENEN Ouwehand Zoo

PO Box 10, Rhenen, Utrecht, Netherlands, 3910AA
+31.317.650262 fax: +31.317.650251 gerard.meijer@ouwehand.nl
Contact: Gerard Meijer

RIGA Riga Zoo

Meza prospekts 1, Riga, Latvia, LV 1014
+371.6754.0444 fax: +371.6754.0011 guna.vitola@rigazoo.lv
Contact: Guna Vitola

ROEVRUCHI Municipal Independent Org. Roev Ruchei

ul. Sverdlovskaya, 293, Krasnoyarsk, Krasnoyarskiy Kray, Russian Federation, 660054
+7.391.2.299.064 roev-info@mail.ru
Contact: Nina Jakovleva Data current to 10 Apr 2016

ROTTERDAM Rotterdam Zoo

RotterdamZoo, Rotterdam, Netherlands, 3000 AM
+31.10.4431.411 fax: +31.10.4431.466

SABABURG Tierpark Sababurg

Hofgeismar-Sababurg, Hessen, Germany
+49 5678 1001 sandy.roedde@tierparkverwaltung.de
Contact: Sandy Roedde Data current to 10 Apr 2016

SALZBURG Salzburg Zoo Hellbrunn

Anifer Landesstr. 1, Anif, Salzburg, Austria, A-5081
+43.662.820176.12 fax: +43.662.820.1766 m.wiesner@salzburg-zoo.at
Contact: Miriam Wiesner Data current to 10 Apr 2016

SPRINGE Niedersachsische Landesforsten

Wisentgehege Springe, Springe, Niedersachsen, Germany, D-31832
+49.5041.5828 fax: +49.5041.640.765 thomas.hennig@nfa-saupark.niedersachsen.de
Contact: Thomas Hennig Data current to 10 Apr 2016

ST FELICI Zoo Sauvage de St-Felicien

2230 Boulevard du Jardin, St-Felicien, Quebec, Canada, G8K 2P8
+1.418.679.0543.x278 christine.gagnon@zoosauvage.org
Contact: Christine Gagnon Data current to 20 Apr 2016

STE CROIX Parc Animalier de Sainte Croix

Domaine de Sainte-Croix, Rhodes, Lorraine, Moselle, France
+33.3.87.03.92.05 fax: +33.3.87.03.95.36 jan.vermeer@parcsaintecroix.com
Contact: Jan Vermeer Data current to 10 Apr 2016

STOCKHOLM Skansen Foundation, Zool. Dept.

Stiftelsen Skansen, PO Box 27807, Stockholm, Sweden, S-115 93
+46.8.442.8174 fax: +46.8.442.8284 linda.torngren@skansen.se
Contact: Linda Torngren Data current to 11 Mar 2016

SZEGED Szeged Zoo

PO Box 724, Szeged, Csongrad, Hungary, H-6701
+36.62.542.530 fax: +36.62.445.299 info@zoo.szeged.hu
Contact: Robert Veprik Data current to 10 Apr 2016

USTI Usti nad Labem Zoo

Drazdanska 23, Usti Nad Labem, Czech Republic, CZ-400 07
+420.475.501.766 fax: +420.475.503.421 petra.padalikova@zoousti.cz
Contact: Petra Padalikova

VIENNA Schoenbrunner Tiergarten GmbH

Zoo Vienna, Wien, Austria, A-1130
+43.1.877.9294 fax: +43.1.877.9641 h.doppel@zoovienna.at
Contact: Mr. Hans Doppel, Data current to 10 Apr 2016

WHIPSNADE ZSL Whipsnade Zoo

Zoological Society of London, Dunstable, Bedfordshire, United Kingdom, LU6 2LF
+44.20.7449.6452 fax: +44.20.7722.2852 malcolm.fitzpatrick@zsl.org
Contact: Malcolm Fitzpatrick Data current to 10 Apr 2016