

# NATIONAL STUDBOOK

## Pig Tailed Macaque (*Macaca leonina*) II Edition

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# National Studbook of Pig Tailed Macaque (*Macaca leonina*) II Edition

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## FOREWORD

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Pig-tailed macaque, a primate species inhabits a variety of forest types in north-east India is threatened with extinction in its natural habitat. Ex-situ conservation offers an opportunity for ensuring their long-term survival. This can be ensured by scientific management to ensure their long term genetic viability and demographic stability. Pedigree information contained in studbooks forms the basis for this management.

The Central Zoo Authority (CZA) in collaboration with zoos in India has initiated a conservation breeding program for threatened species in Indian zoos. As a part of this endeavor a Memorandum of Understanding has been signed with the Wildlife Institute of India for compilation and update of studbooks of identified species in Indian zoos.

As part of the project outcomes the WII has compiled the studbook for Pig tailed macaque (*Macaca leonina*) in Indian zoos. The recommendations contained in the studbook will form the basis for the long term management of the species in captivity. It is hoped that the zoos will adopt the recommendations and keep the WII informed of changes in their populations on a regular basis to enable the timely update of the studbook.

**(Dr. D. N. Singh, I.F.S.)**  
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## ACKNOWLEDGEMENTS

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Lucknow Zoological Garden, Lucknow  
Mahendra Chaudhury Zoological Park, Chhatbir  
Nagaland Zoological Garden, Dimapur  
National Zoological Park, New Delhi  
Nehru Zoological Park, Hyderabad  
Sepahijala Zoological Park, Agartala  
Sayajibaug Zoo, Vadodara





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## PIG TAILED MACAQUE

(*Macaca leonina*)

### Species Information

#### Taxonomy

Phylum	Chordata
Sub-phylum	Vertebrata
Class	Mammalia
Order	Primates
Family	Cercopithecidae
Sub- family	Cercopithecinae
Genus	Macaca
Species	<i>Macaca leonina</i>



Species of *Macaca* have been variously separated into several species groups according to different authors (Fooden 1976; Delson 1980; Fa 1989; Groves 2001). On the basis of male genitalia morphology, Fooden (1976) classified the macaques into four species groups: the *silenus-sylvanus* group, the *fascicularis* group, the *sinica* group, and the *arctoides* group. Pig tailed macaques were classified under the *silenus-sylvanus* group. The *silenus* group which consists of *Macaca silenus*, *Macaca nemestrina* and *Macaca nigra* forms a monophyletic clad and this group is considered the most diverse lineage within the macaque genus.

Based on morphological characteristics, such as pelage color, pattern, and tail morphology Fooden (1975) recognized three subspecies of pigtail macaques (*nemestrina*, *leonina*, *pagensis*), although he was not fully conclusive about the subspecies status of the three forms (Gippoliti 2001). Groves (1996) confirmed Fooden's conclusion but later recognised *M. Pagensis* (the Mentawai macaque) as a full species. Until recently, *M. nemestrina* included *M. Leonine* and the nominal form as sub species. Based on genetic evidences (Evans *et al.* 1999; Morales and Melnick 1998; Tosi *et al.* 2002) and sexual swelling distinctions, Groves (2001) proposed treating *Macaca leonine* and *Macaca nemestrina* as distinct species, accordingly they are now recognized as two species of pig tailed macaques, *Macaca nemestrina*, or the southern pig tailed macaque and the northern pig tailed macaque *Macaca leonina*. The two species are known to hybridize in a small area of southern peninsular Thailand, as well as on the islands of Phuket and Yao Yai (Groves 2001).

## Morphology

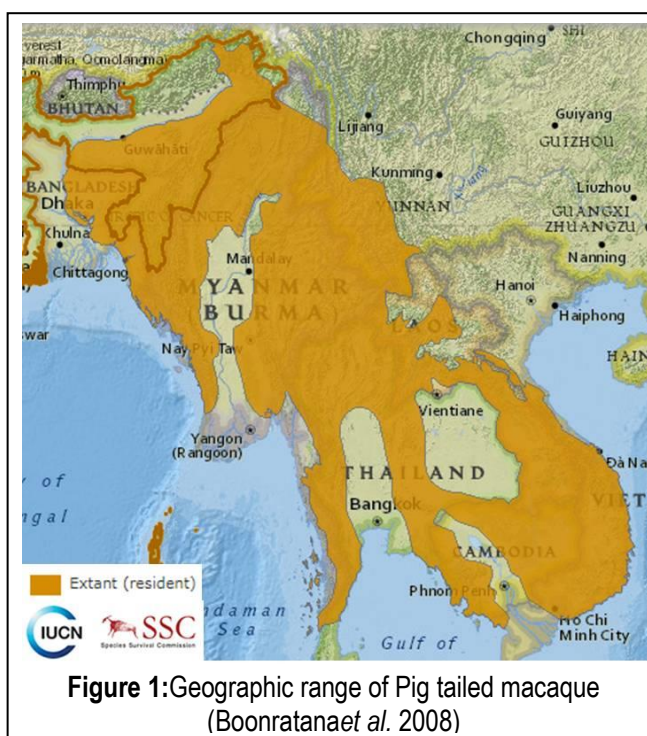
The macaques are characterised by their short, 'pig-like' tail, with the tip partially resting on the rump. The macaque possesses a relatively long, uniformly agouti golden-brown coat, with markings confined only to the brown crown, buff-coloured cheek whiskers and the red streak extending from the outer corner of each eye.

*Macaca leonina* and *Macaca nemestrina* differ in morphological characters such as the crown patch, the white color of the triangle above the eyes, the red streak at the external rim of the eyes, pelage color, ischial callosity, tail length and carriage, facial height, and limb length in both sexes, and patterns of sex skin swelling and reddening in females.

In particular, there are differences in the sexual swellings in the two species (Gippoliti 2001). Sexual-skin swelling during and after the menstrual period is particularly developed in the macaques of the *silenus-sylvanus* group (Fa 1989). In *M. nemestrina* the swelling forms a "continuous pillow like mass" while in *M. leonina* (like *silenus*) the development of the swelling is mainly limited under the tail. Gippoliti (2001) observed that adult female *Macaca leonina* in captivity demonstrate a highly developed subcaudal swelling resembling that of *Macaca silenus*.

## Distribution

The northern pig tailed macaque (*Macaca leonina*) is distributed throughout northeastern India (Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura), eastern Bangladesh, Cambodia, southern China (southwestern Yunnan), Lao PDR, Myanmar, Thailand (from about 8°N and including adjacent islands), and central and southern Vietnam (Boonratana *et al.* 2008). In India it is found towards north of the Brahmaputra river (Groves 2001). Recently it has also been recorded from Namdapha National Park in Arunachal Pradesh (Chetry *et al.* 2003). In central and northeastern Myanmar, it has not been recorded between 20 and 25°N except on the coast at Arakan.



The precise taxonomic boundary between *M. leonina* and *M. nemestrina* is not well defined. There are populations of the two species found on either side of the distribution limits in the Isthmus of Kra, but many of these populations might be due to release by humans. In Vietnam, there are historical records

from the Nghe An province, but there is uncertainty as to whether the species was ever found north of this province in areas of human settlements (Boonratana *et al.* 2008)

### **Habitat**

It occupies tropical evergreen and semi-evergreen forest, tropical wet evergreen forest, tropical moist deciduous forest, coastal forest, swamp forest, low elevation pine forests (in Lao PDR and China) and montane forest, including degraded forests. In China the species occupies elevations between 50-2,000 m (Molur *et al.* 2003; Choudhury 2003). In Lao PDR and Vietnam the species is associated with lowlands, usually below 500 m.

### **Behavioural ecology**

#### ***Activity patterns***

Pig tailed macaques are diurnal. While northern pig tailed macaques (*Macaca leonina*) are predominantly arboreal (Gipoliti 2001, Feeroz 2012), the southern pigtailed (*Macaca nemestrina*) spend most of their time on the ground, and ascend to trees to escape predators or to sleep (Caldecott 1986). Because of their large group size, pigtail macaques often split up into foraging groups to decrease direct competition for fruit at feeding sites (Crockett & Wilson 1980; Caldecott 1986). Their arboreal time is also divided between different canopy levels, with most time spent in the middle canopy (47.4%), followed by the lower canopy (33.8%), and finally the least in the upper canopy (10.4%) (Rowe 1996).

The altitudinal range occupied varies between 825 and 2964 meters, depending on weather conditions and seasonal fruit availability (Caldecott 1986). In Bangladesh the altitudinal range of *M. leonina* was reported to vary between 950 to 3340 meters (mean=1746±527.8) (Feeroz 2012). Although *M. leonina* are chiefly arboreal, the macaques of the Nambor and Garampani Wildlife Sanctuaries of central Assam come down to the ground and frequent the highway in search of sugarcane left over by the elephants (Choudhury 2010).

#### ***Foraging and feeding behaviour***

Pigtail macaques are primarily frugivorous, with 74% of their diet consisting of fruits, but they also consume a wide variety of food including insects, seeds, young leaves, leaf stems, dirt, and fungus (Crockett & Wilson 1980; Caldecott 1986). They also feed on nestling birds, termite eggs and larvae, and river crabs (Rowe, 1996). Northern pigtailed (*Macaca leonina*) were reported to spend most of their feeding time in the middle canopy (Feeroz 2012). While foraging they may divide into groups of 2-6, but remain in close contact with other groups through vocalizations. Southern pig tailed macaques being ground foragers also raid crops particularly during rainstorms, when most farmers are inside (Crockett & Wilson 1980). In a study on captive pig tail macaques, it was found that they preferred food rich in carbohydrates and fructose over food that is low in these nutrients and they also tend to prefer foods that are low in zinc (Laska 2001).

**Social and breeding behaviour**

Macaques live in female-bonded, multimale-multifemale groups (containing both adult males and females, with their dependent offspring) with the adult sex ratio biased towards females, who are usually philopatric. Females form kin-bonded subgroups (matrilines) within their natal groups and most males usually disperse at sexual maturity (Thierry 2007). The basic social unit of pigtails consists of an average of 20-40 individuals. The male to female sex ratio is about 1:8 (Caldecott 1986) and mean ratios of immature to mature animals (adult and adolescent, juvenile and infant) is 1:1.2 (Oi 1990 a and b). Most adult males live as peripherals or solitaries. Caldecott (1986) suggested the mechanism for this 'shedding' of males from groups in pig-tails involves displays and antagonism by the group-living adult males towards adolescent and other adult males. Pigtail juveniles and adolescent males associate with one another.

Males leave the natal group at the age of 5-6 years either roam independently as solitaries or try joining another group first as the lowest-ranking male and then work their way up through competition with other males (Oi 1990 a and b). Males of 5-6 years of age live as temporal troop individuals, not yet as complete solitaries. After repeating temporal stays, they may become complete solitaries at an older age (Oi 1990 a and b). Immigration into and emigration from the troop is mainly restricted to males, and is never observed in females (Oi 1990 a and b). The dominant male pig tail is responsible for group defence and control of internal disturbance and aggression (Sackett, *et al.* 1975; Erwin 1976). They are known to be more sociable toward humans and less aggressive than other related species (Sussman *et al.* 2013) and can also be easily trained to perform certain tasks (picking coconuts) (Crockett & Wilson 1980).

Sackett, *et al.* (1975) found that all-female groups in captivity exhibited more aggression than groups containing an adult male. Female pig tails are known to spend more time in social interactions, including agonistic as well grooming behaviour (Bernstein 1972). The species is reported to make use of a large range of affiliative behaviors (Maestriperi 2005; Oi 1990a, b; Thierry 2000). Females both groom as well as receive more grooming than male pig tails (Bernstein 1972). High-ranking males tend to associate with females by grooming and agonistic alliances, while low-ranking males do not get this chance, and frequently suffer from allied attacks involving females and juveniles (Oi 1990a, b).

Pig-tail macaques are non-seasonal breeders. Estrus in females occurs throughout the year, with a peak from November to January (Oi 1990a, b). The males compete for mating partners. Wild troops show a tendency towards mate monopolisation by a few top-ranking males. The tendency to mate monopolisation by pig tail males was also reported from a laboratory study (Tokuda *et al.* 1968). Sexual access by subordinate males to the females in estrus is restricted by the presence of dominant males. The monopoly of copulation by the dominant males is achieved by the presence of only a few females in estrus with conspicuous sexual signs at a given time. The smaller the number of females in estrus, the more conspicuous is the mate monopolisation by the dominant males. However, as the number of females in estrus increases, the rates of copulation by the subordinate males also increase. Females

solicit even the lower-ranking males and tend to copulate with many males and sometimes they may reject attempts by top ranking males to copulate. Hence, female choice counteracts the monopolistic tendency of the dominant males. The mating relationship is rightly called a superficial promiscuous state, because of the inability of the dominant males to exert mate monopolisation at times when too many females are in estrus.

When a female reaches sexual maturity at 3 years of age, she starts cycling and might present herself to males with her ano-genital swelling for reproduction. It has been studied in captivity that females showing delayed swelling are usually of lower weight (Erwin and Erwin 1976). In females, an external indicator of ovarian condition is provided by the swelling of the perineal or sexual skin (Bullock *et al.* 1972), particularly prominent during the middle 12 days of the 32 day cycle. Laboratory studies have shown that pig-tails are multi mount ejaculators (Tokuda *et al.* 1968; Nadler and Rosenblum 1973). Pigtail males are known to use elaborate non-copulatory mounting for conciliatory purpose more frequently than other macaque males (Oi 1990b). Among males, non-copulatory mounting tend to be performed in the direction from the subordinate to the dominant, while among females, it tends to be in the reverse direction; and grooming is an important form of conciliation among females. Male infant pigtails attain independence from their mothers earlier and to a greater extent than female infants and mothers play a major role in developing the male's greater independence (Mitchell 1979). Adult males are indifferent to infants but will protect them when they are attacked (Mitchell 1977).

**Table 1:** Life history traits of Pig tailed macaque (*Macaca leonina*)

Mating system	Promiscuous or polygynandrous
Breeding season	Non seasonal (Bernstein and Gordon, 1977)
Inter birth interval	2 years (Bernstein 1967)
Maximum lifespan in captivity	26 years (Ha <i>et al.</i> 2000)
Age at sexual maturity	3-4 years (Erwin & Erwin 1976)
Average gestation period	170±8.5 days (Sirianni and Swindler 1985)
Number of offspring	1 (twinning is rare)

### Population status in the wild

Although there is no precise information available on the total number of individuals in India or Myanmar, but populations have been reported to decline in both the countries (Boonratana *et al.* 2008). A group density of 0.07 individuals/km<sup>2</sup> was recorded in Namdapha National Park, India, by Chetry *et al.* (2003). In China, the species' population is estimated to be less than 1,000 individuals (Zhang *et al.* 2002). No information is available on the status of the population, but is thought to be declining rapidly. A small isolated population occurs in Bangladesh, whose habitat is degrading rapidly, thereby leading to the continuous decline in the number of mature individuals in the country (Molur *et al.* 2003). In Thailand the populations have been reported to be stable. During the last 30-35 years more than 30% of the population has been reported to decline in countries like India, Bangladesh, China, Vietnam and Myanmar (Boonratana *et al.* 2008). In Lao PDR and Cambodia, there has been perceptible decline in population size but the rates are close to or lower than 30% (Boonratana *et al.* 2008). In most of the countries, the species is predicted to decline at a rate higher than 30% over the next three generations.

**Threats and conservation measures**

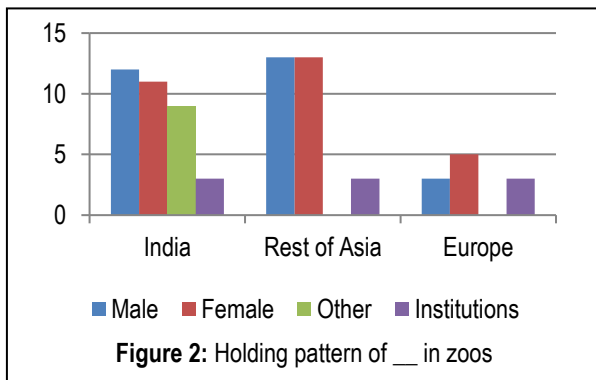
The species is threatened by habitat disturbances such as selective logging; timber and firewood collection for making charcoal; building roads, dams, power lines; and deliberately setting fires. Deterioration in habitat quality due to the loss of fruiting trees and sleeping sites through monocultures and plantations, selective felling, and a subsequent increase in the canopy gaps lead to forest fragmentation and soil erosion

Other threats include hunting and trade for food, sport and traditional “medicine”, and accidental mortality due to trapping occurs. There is a local trade for bones, meat for food and the live animals as pets (Molur *et al.* 2003). Habitat loss and poaching are the major threats in India and Bangladesh. There has been a reduction in forest cover in Assam by over 10% in two years between 2001 and 2003 (Forest Survey of India 2003).

It is listed under Schedule II in India in the Indian Wildlife (Protection) Act, 1972 (Chetry *et al.* 2003) amended up to 2002. Moreover, the Central Zoo Authority (CZA), India has identified Pig tailed macaque among the 73 critically endangered species for planned and coordinated conservation breeding in Indian zoos.

**Status in Captivity**

The species is held at 9 institutions globally with a total of 66 (28.29.9) specimens, while 3 institutions house 32(12.11.9) specimens in India according to the ZIMS database. The CZA inventory (Table 2) indicates the presence of 63 (29.23.11) specimens, at 9 Indian zoos while the data that was made available by holding zoos for the compilation of the studbook includes 64 (29.23.12) specimens at 8 locations.



**Table 2:** Status of Pig-tailed macaque in Indian zoos

Zoo Name	Species360				CZA Inventory				Studbook			
	Male	Female	Unsexed	Total	Male	Female	Unsexed	Total	Male	Female	Unsexed	Total
Assam State Zoo and Botanical Garden, Guwahati	1	1	0	2	1	1	0	2	1	1	0	2
Bannerghatta Zool Garden National Park, Bangalore	1	2	0	3	4	2	0	6	4	2	0	6



Zoo Name	Species360				CZA Inventory				Studbook			
	Male	Female	Unsexed	Total	Male	Female	Unsexed	Total	Male	Female	Unsexed	Total
Sepahijala Zoological Park, Agartala *	10	8	9	27	7	10	10	27	8	9	11	28
Aizawl Zoological Park *	--	--	--	--	8	4	0	12	8	5	0	13
Mahendra Chaudhary Zoological Park, Mohali !	--	--	--	--	2	2	0	4	1	2	2	5
Nagaland Zoological Park, Rangapahar	--	--	--	--	3	0	0	3	3	0	0	3
Nehru Zoological Park, Hyderabad	--	--	--	--	0	1	0	1	0	1	0	1
SayajiBaug Zoo, Vadodra	--	--	--	--	3	2	1	6	3	3	0	6
Nehru Park Zoo, Danakgre, Tura !	--	--	--	--	1	1	0	2	--	--	--	--
<b>Total</b>	<b>12</b>	<b>11</b>	<b>9</b>	<b>32</b>	<b>29</b>	<b>23</b>	<b>11</b>	<b>63</b>	<b>29</b>	<b>23</b>	<b>12</b>	<b>64</b>

\* Based on data made available by holding zoo

! Updated data not received from zoo

## Methods

Data on individual history was collected by means of questionnaires, zoo visits and from the websites of CZA and Species360. Questionnaires were sent to the institutions housing Pig-tailed macaque in India, requesting information for each captive specimen. Data was entered in the Single Population Analysis and Records Keeping System (SPARKS v 1.66) (ISIS 2004) and subsequently exported to population management programme PMxv 1.2 (Ballou *et al.*, 2011) for further analysis.

## Scope of the Studbook

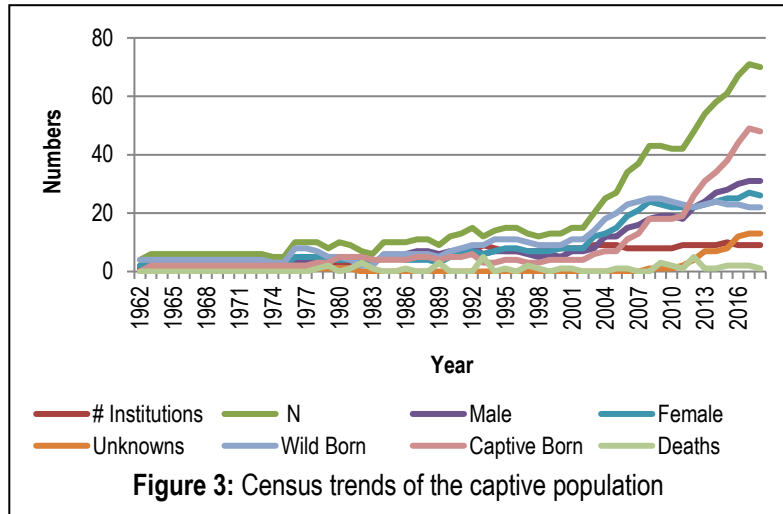
- The studbook includes all specimens present in Indian zoos for which records were available from holding institutions. Efforts were made to validate information on their holding from ZIMS Platform of the Species360 website.
- The CZA inventory was used as a benchmark for population estimates and deviations from the same (Table 2) are based on the data made available by holding zoos.
- The mnemonics present in the SPARKS software were used as names for individual institutions; while for those institutions for which mnemonics were not present in the SPARKS Software, the same were assigned based on their location listed on the CZA Website and the same are listed in the location glossary (Appendix IV). The mnemonic India was used for all specimens acquired from the wild.

## Analysis

### Demographic Status

#### Historical Population

The studbook includes a total of 117(54.48.15) specimens that have been housed at 16 Indian zoos. The first recorded entry of the species in captivity was at National Zoological Park, Delhi in 1962, with two pairs of wild origin specimens being acquired by the zoo. Growth in the population has been primarily due to captive births with wild origin specimens; [47 (24.22.1)] forming approximately 41% of the captive population. A total of 67 (29.25.13) births have occurred in captivity accounting for approximately 59% of the total population. The captive births are attributed to 41(15.25.1) i.e. approximately 36% of the captive population is reproductively active. The population since its inception has also witnessed 48(24.22.2) deaths. Figure 3 and Table 3 summarize the trends of the historical population while Annexure I includes detailed event-wise information on individual specimens.



**Table 3:** Summary of the Historical Population

	Males	Females	Unknown	Total
<b>Studbook size</b>	53	47	14	114
<b>Acquisition from wild</b>	24	22	1	47
<b>Captive Born</b>	29	25	13	67
<b>Deaths</b>	24	22	2	48
<b>Breeding individuals</b>	15	25	1	41
<b>Lost to follow up/ released</b>	0	2	0	2

#### Living Population

The living population includes 64 (29.23.12) specimens housed at 9 institutions; with 19 (12.7.0) wild origin specimens. Approximately 46% or [26 (9.16.1)] animals are proven breeders in the living population. Table 4 summarizes the status of the living population while Annexure II provides location-wise specimen details of the living individuals. A perusal of Table 2 and Annexure II reveals the presence of 42% of the population at Sepahijala Zoological Park.

**Table 4:** Summary of living population

	Males	Females	Unknown	Total
<b>Living</b>	29	23	12	64
<b>Wild-born</b>	12	7	0	19
<b>Captive-born</b>	17	16	12	45
<b>Breeding</b>	9	16	1	26

**Population Vital Rates**

The population is currently increasing at a rate of approximately 6% annually with males showing a marginally faster increase of approximately 1%.

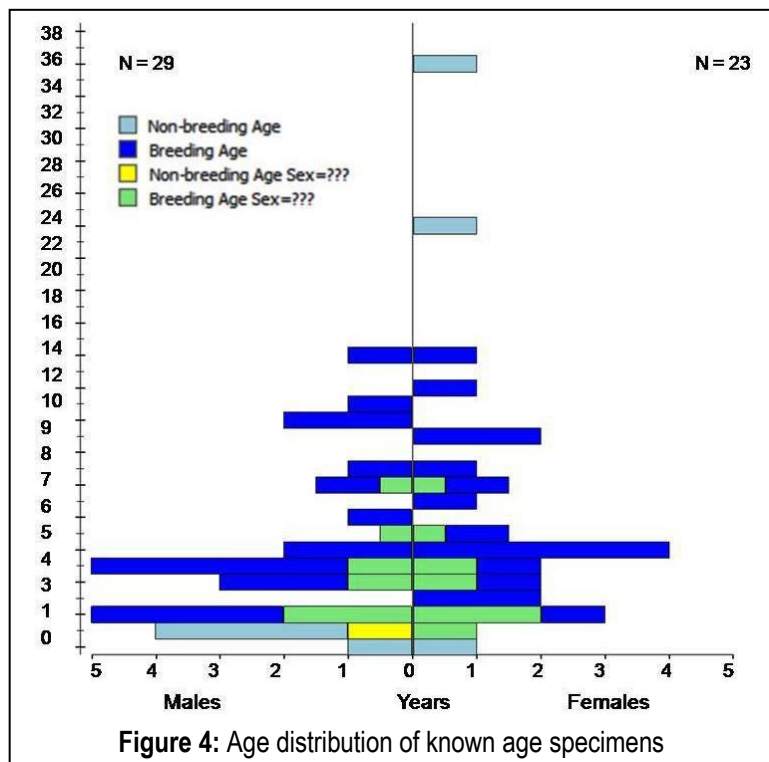
**Table 5:** Vital rates of the captive population

	Males	Females	Total
$\lambda$ : Population growth rate	1.069	1.059	1.064
T: Generation time	9.0 Yrs	8.6Yrs	8.8 Yrs
N 20: Projected population after 20 yrs	78.6	93.8	172.5

The captive population has a generation time of 8.8 years. The increasing population trend is also reflected in the projected population after 20 years with an increase of 108 individuals in the population. The accuracy of the life table analysis carried out to arrive at the conclusions is limited by the small number of known age and sex specimens in the population.

**Age Distribution**

Age distribution of 52 (29.23) known age living specimens indicates a male bias (Figure 4). The living population includes 35(18.17) animals of known age and in reproductively active age classes and 15 (11.4) specimens that are yet to become reproductively mature. An, additional 12 specimens of unknown sex are also present in the reproductively active age classes. It also shows the presence of 2 (0.2) specimens in the post reproductive age class. Age distribution of the captive pig-tailed macaque indicates a



growing population as the number of specimens in pre-reproductive and reproductive age classes ensures adequate recruitment to offset losses due to mortality.

**Genetic Status**

Table 6 summarizes the genetic status of the living population. Analysis indicates that it originates from 21 founders while the living population includes 19 (12.7) wild origin specimens. The living population of 64 specimens retains a significant proportion of the genetic diversity (95.74%) brought in by these 21 founders. Effective record keeping for individual specimens is reflected in 95% of the specimens having known pedigrees. The population retains the founder genome of a significant proportion (FGE = 11.73) of the 21 founders that have contributed to the growth of the population. Specimens in the population share relatedness at the levels that range between first to second cousins as is indicated by the values of population mean kinship (0.0426) and mean inbreeding (0.375).

**Table 6:** Genetic Summary of the current population

Genetic parameters	Current
Founders	21
Living Animals	64
Percent Ancestry Known	95%
Gene Diversity (GD)	0.9574
Founder Genome Equivalent (FGE)	11.73
Mean Inbreeding (F)	0.0375
Population mean kinship (Mk)	0.0426
Ne/N	0.1239

## Pairing Recommendations

The pairing recommendations (table 7) for Pig-tailed macaque are based on 'Mate Suitability Index' (Box 1 for details) that assesses changes in genetic diversity, differences in mean kinship and inbreeding coefficient as result of each pairing choice being exercised. Pairing recommendations could be made for only 10 pairs though the population includes 37 (20.17) specimens of known sex and 13 animals of unknown sex in the reproductively active

**Table 7:** Pairing recommendations

Dam	Dam Location	Sire	Sire Location	F	dGD	MSI
40	Chatbir	37	Aizawl	0.0000	0.0016	1
48	Aizawl	49	Sepahijala	0.0000	0.0020	2
52	Sepahijala	47	Sepahijala	0.0000	0.0023	2
55	Aizawl	92	Sepahijala	0.0000	0.0033	1
62	Sepahijala	47	Sepahijala	0.0000	0.0030	4
67	Bannerghata	54	Vadodara	0.0000	0.0029	4
71	Sepahijala	41	Aizawl	0.0000	0.0026	4
77	Sepahijala	103	Sepahijala	0.0000	0.0023	4
78	Aizawl	79	Aizawl	0.0000	0.0025	3
86	Bannerghata	91	Sepahijala	0.0000	0.0023	4
90	Sepahijala	103	Sepahijala	0.0000	0.0023	2
93	Sepahijala	56	Aizawl	0.0000	0.0035	1
95	Sepahijala	116	Dimapur	0.0000	0.0044	2
111	Vadodara	121	Aizawl	0.0000	0.0043	4
113	Vadodara	123	Aizawl	0.0000	0.0041	4
119	Aizawl	73	Vadodara	0.0000	0.0039	4

age classes as the relatedness between individuals limits pairing choices that can be exercised. Additionally, the same sires have been paired with multiple females as limited mate choice is available in the current population. Sires paired with multiple dams should be first mated with the dam that is closest and then transferred to the next closest location. Wild origin specimens that are included in the course of the breeding programme should be paired with specimens that are descendants of over-represented lineages.

**Box 1: Mate Suitability Index (MSI)**

It is a numerical genetic assessment of a male-female pair that incorporates several variables into one ranking (MSI range is 1 to 7, with 1 being the most genetically beneficial).

The default value in the table is the *MSI* (Mate Suitability Index) value for each male –female pair. *MSI* is a composite score that integrates four genetic components into a single index:

**Delta GD (dGD):** Change in gene diversity (GD) of the population if one offspring is produced by the pair. Positive dGD increases the GD of the population, while negative dGD decreases GD.

**Differences in MK values (MKDiff):** Difference in the genetic value (mean kinship value) of the male and female. Breeding a pair with a large MKDiff is detrimental because it combines under-represented and over-represented genetic lines.

**Inbreeding coefficient (F):** Inbreeding coefficient of any offspring resulting from the pair (i.e., the kinship value for the pair). Inbreeding is considered to be detrimental to the fitness of the resulting offspring.

**Unknown ancestry:** The amount of unknown ancestry in the male and female. Incomplete pedigree information means that the genetic value and relatedness of a pair cannot be accurately calculated.

- 1 = very beneficial (genetically) to the population;
- 2 = moderately beneficial,
- 3 = slightly beneficial;
- 4 = slightly detrimental,
- 5 = detrimental, should only be used if demographically necessary
- 6 = very detrimental (should be considered only if demographic considerations override preservation of genetic diversity)
- “-“= very highly detrimental (should not be paired, due to high level of kinship of pair)

**Using Pairwise Info**

The default table of *MSI* values for pairs can be used to quickly assess the relative genetic value of a pair, subset of pairs, potential mates for one individual, and many other valuable data when making breeding recommendations. This can be especially helpful to quickly explore options for pairing individuals at one facility that houses numerous individuals of each sex or to quickly identify an alternative suitable mate if a recommended breeding fails.

**Source:** Traylor-Holzer, K. (ed.). 2011.

## Targets for Population Management

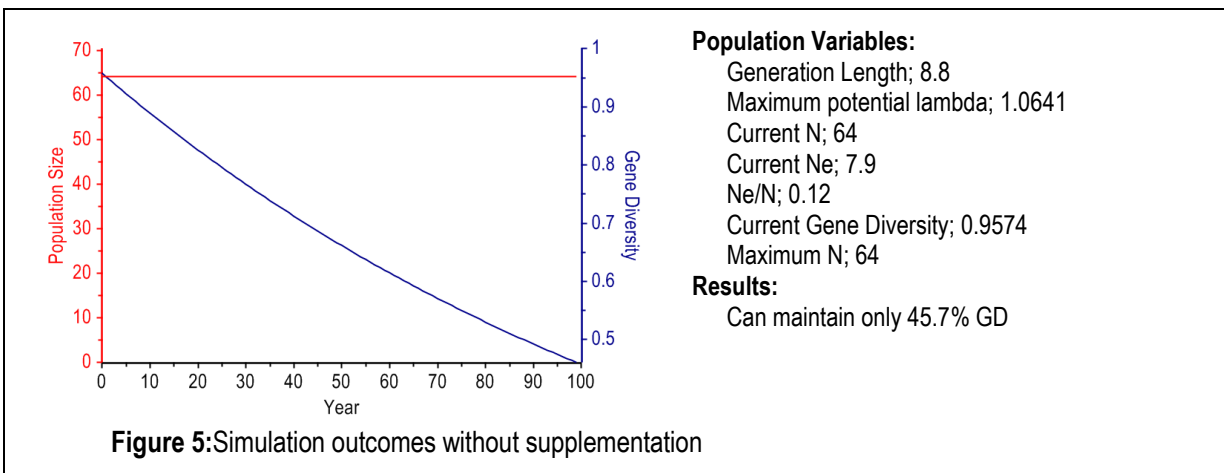
The current captive population of Pig-tailed macaque includes 64 (29.23.12) individuals. It includes 19 (12.7.0) wild origin specimens. The population is currently increasing at the rate of 6.1% per annum ( $\lambda = 1.061$ ). Specimens in the living population are descendants of 21 effective founders and retain a large proportion of genetic diversity (95.74%). The population includes 26 (9.16.1) specimens that are reproductively active. Specimens in the population are not closely related to each other (Mean Inbreeding: 0.0357 and Population mean kinship: 0.0429).

Multiple simulations were run using PMx to determine the fate of the current population for assessing the effect of management interventions that result in an increased population growth rate desired for achieving demographic stability and supplementation with effective founders for ensuring genetic viability; over the next 100 years. The outcomes of the scenarios that were run without change and with changes (supplementation with effective founders and increasing the population growth rate) that

ensure a genetically viable and demographically stable population over the next 100 years are presented below.

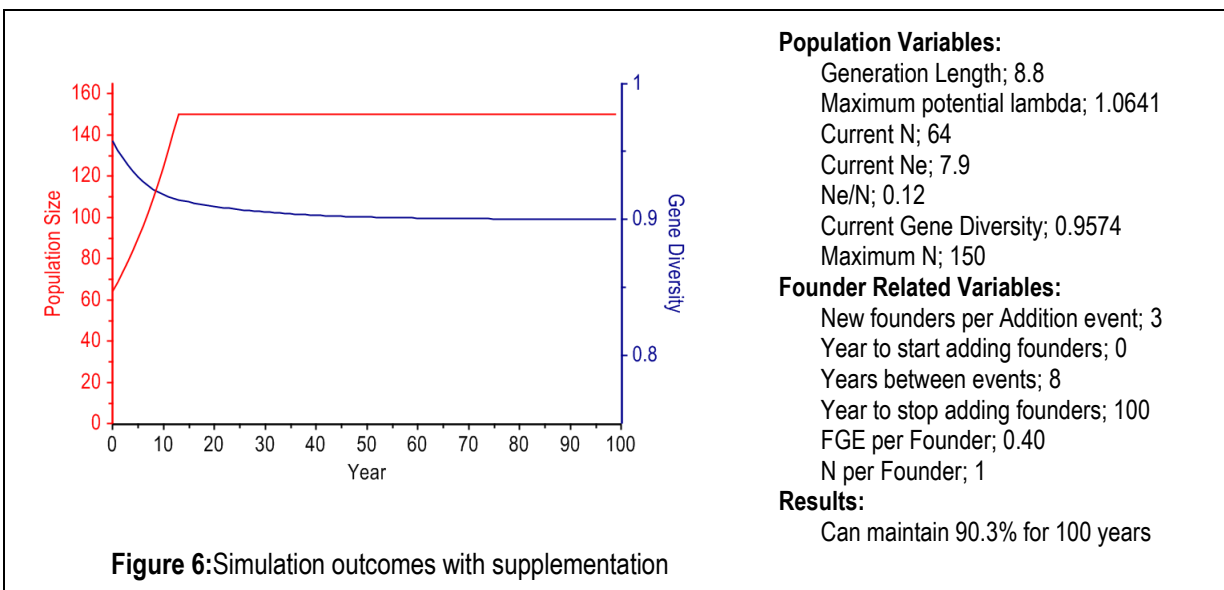
**Scenario I:**

The simulation run using the current population variables without supplementation with additional animals while retaining the current population size (64). The outcomes indicate that the population in captivity is likely to persist at the current level; however, it would be unable to meet the genetic goals and lose a large proportion of the genetic diversity that it currently retains. The population variables used and the outcomes of the simulation are presented in Figure 5.



**Scenario II**

The outcomes of the simulation that was run using a maximum population size of 150 specimens with supplementation by 3 effective founder every 8 years provided a population that was able to achieve the goals of maintaining 90% of the genetic diversity and a demographically stable population. The population and founder related variables, and the simulation outcome are presented as Figure 6.



The increase in population growth rate can be achieved by ensuring that all reproductively active specimens get an opportunity to contribute to the growth of the population. The inclusion of additional effective founders should target lineages that are over-represented to ensure maximum genetic diversity in the captive population.

## Conclusions and Recommendations

Pig tailed macaque continues to face threats to its long term survival in the wild across its distribution range and is accordingly listed in the Schedule I of the Wildlife Protection Act of India. The threats faced by the species remain operational and the populations across their range are showing declining trend. Maintenance of demographically stable and genetically viable *ex-situ* populations is thus crucial for ensuring the continued survival of the species.

A review of the status of the current captive population in Indian zoos based on analysis of available pedigree records indicates that the population is increasing at a rate of approximately 6%. The population retains significant proportion of the genetic diversity (95.74%) originating from 21 founders. It retains the representation of 11.73 founders and has a low level of relatedness ( $F = 0.0675$ ;  $MK = 0.426$ ).

Simulations run using PMx software indicate that supplementation with 3 effective founders every 8 years while maintaining the current population growth rate to increase the population size to 150 specimens can ensure that the population remains viable over the next 100 years. The captive population of Pig-tailed macaque therefore requires intensive management efforts towards ensuring achievement of *ex-situ* conservation goals to address the following concerns:

Specimens at four locations are maintained in inappropriate social groups [Assam State Zoo 2 (1.1.0) and Bannerghata Biological Park 6 (4.2.0)]; two of these locations maintain single sex animals [Nagaland Zoological Park 3 (3.0.0) and Nehru Zoological Park 1 (0.1.0)].

Pooling of single sex animals with appropriate socialization and additional wild origin specimens to address social concerns can ensure formation of additional socially viable groups that can further increase the population growth and ensure maintenance of a demographically stable population in Indian Zoos.

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Historical population of *Macaca leonina* in Indian Zoos

Stud# Local ID Name Transponder	Sex	Birth Date	Sire	Dam	Location	Date	Event
1	F	????	WILD	WILD	INDIA DELHI	~ 1962 ~ 1962 30-Oct-79	Capture Transfer Death
2	M	????	WILD	WILD	INDIA DELHI	~ 1962 ~ 1962 05-Jan-78	Capture Transfer Death
3	M	????	WILD	WILD	INDIA DELHI	~ 1962 ~ 1962 ~ 1995	Capture Transfer Death
4	F	????	WILD	WILD	INDIA DELHI BHILAI	~ 1962 ~ 1962 07-Aug-74	Capture Transfer Ltf
5	F	07-Mar-63	2	1	DELHI	07-Mar-63 11-Jan-86	Birth Death
6	?	07-Mar-63	2	1	DELHI	07-Mar-63 08-Sep-82	Birth Death
7	M	????	WILD	WILD	INDIA KANPUR	~ 1976 01-Apr-76 23-Apr-81	Capture Transfer Death
8	F	????	WILD	WILD	INDIA LUCKNOW	~ 1976 ~ 1976 31-Jan-09	Capture Transfer Death
9	M	????	WILD	WILD	INDIA KANPUR	~ 1976 01-Apr-76 23-Feb-79	Capture Transfer Death
10	F	????	WILD	WILD	INDIA KANPUR	~ 1976 01-Apr-76 07-Jul-82	Capture Transfer Death
11	F	????	WILD	WILD	INDIA KANPUR	~ 1976 01-Apr-76 13-Jul-82	Capture Transfer Death
12	?	????	WILD	WILD	INDIA LUCKNOW	???? ???? 30-Nov-89	Capture Transfer Death
13	M	~ Apr 1978	UNK	11	KANPUR	~ Apr 1978 23-Aug-89	Birth Death
14	M	01-Mar-80	UNK	UNK	KANPUR DELHI INDIA	01-Mar-80 10-Mar-83 20-Nov-91	Birth Transfer Release
15	M	10-Jul-80	UNK	11	KANPUR	10-Jul-80 20-Mar-83	Birth Death
16	F	~ 1980	WILD	WILD	INDIA VOC PKZOO MADRAS	???? ???? 06-Dec-03	Capture Transfer Transfer
17	F	20-Mar-82	UNK	11	KANPUR CHATBIR Z	20-Mar-82 14-Jul-00	Birth Transfer
18	F	????	WILD	WILD	INDIA CHHAT BIR	~ Feb 1984 01-Apr-84 ~ 2006	Capture Transfer Death
19	M	????	WILD	WILD	INDIA	~ Feb 1984	Capture

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Stud# Local ID Name Transponder	Sex	Birth Date	Sire	Dam	Location	Date	Event
					CHHAT BIR	01-Apr-84 ~ 2000	Transfer Death
20	M	????	WILD	WILD	BURMA YANGON ZO CALCUTTA	~ 1984 ~ 1984 ~ Apr 1985 01-Oct-05	Capture Transfer Transfer Death
21	F	????	WILD	WILD	BURMA YANGON ZO CALCUTTA	~ 1984 ~ 1984 ~ Apr 1985 ~ Jan 1989	Capture Transfer Transfer Death
22	M	10-Jun-86	UNK	17	KANPUR	10-Jun-86 16-Jun-93	Birth Death
23	M	07-Aug-87	UNK	17	KANPUR	07-Aug-87 12-Jul-93	Birth Death
24	F	????	WILD	WILD	INDIA AHMEDABAD	~ 1990 ~ 1990 12-Mar-97	Capture Transfer Death
25	F	????	WILD	WILD	INDIA AHMEDABAD	~ 1990 ~ 1990 11-Jan-01	Capture Transfer Death
26 PMSP-2 BEJOY	M	????	WILD	WILD	INDIA SEPAHIJAL CHATBIR Z	10-Apr-93 10-Apr-93 15-Dec-06	Capture Transfer Transfer
27	M	????	WILD	WILD	INDIA HYDERABAD AHMEDABAD	???? ???? 26-Oct-94 02-May-98	Capture Transfer Transfer Death
28	M	????	WILD	WILD	INDIA CALCUTTA	~ Aug 1992 ~ Aug 1992 01-Jul-93	Capture Transfer Death
29	M	07-Oct-90	UNK	17	KANPUR	07-Oct-90 12-Jul-93	Birth Death
30	F	????	WILD	WILD	INDIA CALCUTTA	~ Oct 1991 ~ Oct 1991 ~ Jun 1993	Capture Transfer Death
31 OPTM01 SITA	F	29-Oct-91	UNK	UNK	ASSAM	29-Oct-91	Birth
32	M	~ 1992	UNK	17	KANPUR	~ 1992 02-Sep-97	Birth Death
33 PMSP11 SWAPAN 0006B72F99	M	14-Apr-93	WILD	WILD	INDIA SEPAHIJAL	14-Jun-93 10-Jun-94 26-Jul-15	Capture Transfer Death
34 PMSP10 AAISHARIYA 0006B71222	F	10-May-93	WILD	WILD	SEPAHIJAL INDIA SEPAHIJAL	20-Jul-94 10-May-99 17-Apr-16	Transfer Capture Death
35 PMSP-5 PTM-2 USHA 0006B722E1	F	????	WILD	WILD	INDIA SEPAHIJAL HYDERABAD	14-Apr-95 14-Apr-95 18-Mar-11	Capture Transfer Transfer
36	M	25-Nov-95	UNK	UNK	ASSAM	25-Nov-95	Birth
37	M	????	WILD	WILD	INDIA	12-Apr-01	Capture

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Stud# Local ID Name Transponder	Sex	Birth Date	Sire	Dam	Location	Date	Event
PATEA 89102058423					AIZAWL	13-Apr-01	Transfer
38 PMSP12 MILLI 0006B722C3	F	~ May 2000	WILD	WILD	INDIA SEPAHIJAL	20-Aug-00 20-Aug-00	Capture Transfer
39 PMSP11 PTM-1 AMIT/SEPAHI J0006B727B5	M	????	WILD	WILD	INDIA SEPAHIJAL HYDERABAD	16-Mar-01 16-Mar-01 18-Mar-11 01-Jul-11	Capture Transfer Transfer Death
40 SONALI	F	23-Oct-01	WILD	WILD	INDIA SEPAHIJAL CHATBIR Z	23-Oct-01 23-Oct-01 15-Dec-06	Capture Transfer Transfer
41 HUNTER 89102058423	M	????	WILD	WILD	INDIA AIZAWL	09-May-03 10-May-03	Capture Transfer
44 PMSP27 KAJALI 000658EF7E	F	~ 2003	WILD	WILD	INDIA SEPAHIJAL	16-Mar-05 10-Mar-08 06-Nov-12	Capture Transfer Death
45 PMSP-6 SARABANI	F	12-Jul-03	33	34	SEPAHIJAL	12-Jul-03	Birth
46 PMSP7 CHITRA	F	~ Oct 2003	WILD	WILD	INDIA SEPAHIJAL	23-Oct-03 23-Oct-03 06-Jul-10	Capture Transfer Death
47 PMSP14 SUDHIR 0006B7EB25	M	~ Jan 2004	WILD	WILD	INDIA SEPAHIJAL	09-May-04 09-May-04	Capture Transfer
48 NUTEI 89102058424	F	????	WILD	WILD	INDIA AIZAWL	10-Jun-04 11-Jun-04	Capture Transfer
49 PMSP13 MANISH 0006B74444	M	20-Mar-04	WILD	WILD	INDIA SEPAHIJAL	21-May-04 21-May-04	Capture Transfer
50 PMSP15 PRADIP 0006B8A2E7	M	23-Mar-04	33	40	SEPAHIJAL	23-Mar-04 07-Dec-09	Birth Death
52 RINA 0006B88519	F	~ Sep 2004	WILD	WILD	INDIA SEPAHIJAL	16-Dec-06 16-Dec-06	Capture Transfer
53 BABALI	F	????	WILD	WILD	INDIA VADODARA	21-Apr-05 21-Apr-05 31-May-14	Capture Transfer Death
54 BUNTY	M	????	WILD	WILD	INDIA VADODARA	21-Apr-05 21-Apr-05	Capture Transfer
55 GORI 89102058425	F	????	WILD	WILD	INDIA AIZAWL	03-May-06 06-May-06	Capture Transfer
56	M	????	WILD	WILD	INDIA	19-Mar-08	Capture

Stud# Local ID Name Transponder	Sex	Birth Date	Sire	Dam	Location	Date	Event
TEA 98102058427					AIZAWL	20-Mar-08	Transfer
57 PMSP20 BURI 0006B72F3A	F	22-Jul-06	26	45	SEPAHIJAL	22-Jul-06 07-Jan-15	Birth Death
58 PMSP-9 MINU 0006B89508	F	22-Jul-06	26	34	SEPAHIJAL	22-Jul-06 02-Feb-10	Birth Death
60 PMSP21 KUMAR 0006B74968	M	18-Oct-06	39	35	SEPAHIJAL	18-Oct-06 30-Aug-16	Birth Death
61 PMSP15 MIR 956000002161041	M	02-Jan-07	WILD	WILD	INDIA SEPAHIJAL	02-Jan-07 15-Jun-09	Capture Transfer
62 PMSP23 SHASHI 0006B72897	F	23-Jan-07	33	38	SEPAHIJAL	23-Jan-07	Birth
63 GEETA	F	04-Aug-07	54	53	VADODARA	04-Aug-07 30-Apr-12	Birth Death
64 BUDA	M	~ 2008	WILD	WILD	INDIA DIMAPUR	???? 17-May-09	Capture Transfer
65	?	~ 2008	26	UNK	CHATBIR Z	~ 2008	Birth
66 PMSP18 MISTHU 00065659038F	F	16-Mar-08	33	35	SEPAHIJAL	16-Mar-08 27-Aug-12	Birth Death
67 PTM3 MAMAN 0006590471	F	05-Jun-08	49	34	SEPAHIJAL BANNERGHA	05-Jun-08 04-Aug-15	Birth Transfer
68 SITA SITA	F	19-Jun-06	54	53	VADODARA	19-Jun-06 13-Sep-09	Birth Death
69 PMSP26 MANIK 0006B72897	M	02-Jul-08	49	57	SEPAHIJAL	02-Jul-08 22-May-13	Birth Death
70 JANKI	F	16-Aug-08	54	53	VADODARA	16-Aug-08 27-Feb-12	Birth Death
71 PMSP24 TRISHA 0006584D34	F	12-Mar-09	33	44	SEPAHIJAL	12-Mar-09	Birth
72 OPTM02 KUSHA 0006590EA8	M	24-Sep-99	UNK	UNK	ASSAM	24-Sep-99	Birth
73 JUGNU	M	03-Dec-09	54	53	VADODARA	03-Dec-09	Birth
74	?	22-Feb-11	69	57	SEPAHIJAL	22-Feb-11	Birth

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Stud# Local ID Name Transponder	Sex	Birth Date	Sire	Dam	Location	Date	Event
PMSP30 NOOR							
75 PMSP29	?	11-Feb-12	47	71	SEPAHIJAL	11-Feb-12	Birth
76 PMSP31 KAJALI-2 9570000002162680	F	05-Mar-12	59	52	SEPAHIJAL	05-Mar-12 03-Feb-18	Birth Death
77 PMSP32 BANI 0006585526	F	19-Apr-12	61	34	SEPAHIJAL	19-Apr-12	Birth
79 PAPUIA 89102058428	M	07-Aug-12	41	55	AIZAWL	07-Aug-12	Birth
80	?	~ 2012	26	UNK	CHATBIR Z	~ 2012	Birth
81 PTM02	M	~ Dec 2012	WILD	WILD	INDIA DIMAPUR	17-Oct-13 17-Oct-13 ~2015	Capture Transfer Death
86 PTM1 DEBJANI 956000002173197	F	21-May-12	49	38	SEPAHIJAL BANNERGHA	21-May-12 27-Jul-15	Birth Transfer
87 PTM2 JELHAZ 956000002170182	M	25-Jul-12	47	71	SEPAHIJAL BANNERGHA	25-Jul-12 04-Aug-15	Birth Transfer
89 RITESH	M	~ 2006	WILD	WILD	INDIA SEPAHIJAL	25-Aug-06 25-Aug-06 06-Apr-17	Capture Transfer Death
90 KANIKA	F	02-Jun-13	89	52	SEPAHIJAL	02-Jun-13	Birth
91 PMSP35 SAMRAT	M	05-May-13	61	34	SEPAHIJAL	05-May-13	Birth
92 PMSP17 HIRAN 9560000002447304	M	19-Oct-02	WILD	WILD	SEPAHIJAL	20-Jan-14 20-Jan-14	Capture Transfer
93 PMSP16 SHASHIKALA 0006B88C3F	F	~ 2004	WILD	WILD	INDIA SEPAHIJAL	14-Jan-14 14-Jan-14	Capture Transfer
94 KAUSHIK	M	17-Jun-14	89	34	SEPAHIJAL	17-Jun-14	Birth
95 PMSP39 MADHUMITA	F	19-Jan-15	92	93	SEPAHIJAL	19-Jan-15	Birth
96 PMSP40 SHANKARI	F	28-Jun-15	89	34	SEPAHIJAL	28-Jun-15	Birth
97 PMSP41	?	17-Jul-15	61	52	SEPAHIJAL	17-Jul-15	Birth
98	?	25-May-16	61	93	SEPAHIJAL	25-May-16	Birth

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Stud# Local ID Name Transponder	Sex	Birth Date	Sire	Dam	Location	Date	Event
PMSP42							
99 PMSP43	?	28-May-16	61	52	SEPAHIJAL	28-May-16	Birth
100 PMSP44	?	10-Jun-16	89	77	SEPAHIJAL	10-Jun-16	Birth
101 PMSP45	?	16-Jul-16	74	90	SEPAHIJAL	16-Jul-16	Birth
102 PMSP34	?	05-May-13	60	67	SEPAHIJAL	05-May-13	Birth
103 PMSP33 GAFUR 956000002179325	M	02-Jun-13	47	66	SEPAHIJAL	02-Jun-13	Birth
104 PMSP25 ABU 956000002150421	M	15-Mar-12	33	62	SEPAHIJAL	15-Mar-12	Birth
105 PMSP36	?	19-Oct-13	33	38	SEPAHIJAL	19-Oct-13	Birth
106 PMSP37	?	24-Oct-13	47	62	SEPAHIJAL	24-Oct-13	Birth
107 PTM4 VINCE	M	07-Dec-15	87	67	BANNERGHA	07-Dec-15	Birth
108 PTM5 UTKARSH	M	28-Nov-16	87	86	BANNERGHA	28-Nov-16	Birth
109 PMSP46	?	02-May-17	61	52	SEPAHIJAL	02-May-17	Birth
111 RANI	F	16-Oct-10	54	53	VADODARA	16-Oct-10	Birth
112	M	29-Apr-12	54	63	VADODARA	29-Apr-12 08-Oct-12	Birth Death
113	F	25-Apr-14	54	53	VADODARA	25-Apr-14	Birth
114	M	07-Nov-15	54	111	VADODARA	07-Nov-15	Birth
115 PTM6	F	03-Sep-17	87	86	BANNERGHA	03-Sep-17	Birth
116 BAB00	M	????	WILD	WILD	INDIA DIMAPUR	???? 25-Jun-16	Capture Transfer
117 BORA	M	????	WILD	WILD	INDIA DIMAPUR	???? 24-Jul-17	Capture Transfer
118	F	04-Aug-17	54	111	VADODARA	04-Aug-17	Birth
119 LATEI 89102058426	F	06-Jun-12	41	48	AIZAWL	06-Jun-12	Birth
121 PTAZP8 PUIA	M	06-Apr-14	41	48	AIZAWL	06-Apr-14	Birth
122 PTAZP9	F	15-Feb-16	41	55	AIZAWL	15-Feb-16	Birth
123 AZP10	M	20-Feb-16	41	119	AIZAWL	20-Feb-16	Birth
124	M	21-Jan-17	41	55	AIZAWL	21-Jan-17	Birth



NATIONAL STUDBOOK PIG TAILED MACAQUE (*MACACA LEONINA*) II EDITION

Stud# Local ID Name Transponder	Sex	Birth Date	Sire	Dam	Location	Date	Event
AZP11 FAKA							
125 AZP12 KIMA	M	13-Feb-17	41	119	AIZAWL	13-Feb-17	Birth
<b>TOTALS: 115 (53.47.14)</b>							

Annexure II

Living population of *Macaca leonina* in Indian Zoos

Stud# Local ID Name Transponder	Sex	Birth Date	Sire	Dam	Location	Date	Event
<b>Aizawl Zoological Park, Aizawl</b>							
37 PATEA 89102058423	M	????	WILD	WILD	INDIA AIZAWL	12-Apr-01 13-Apr-01	Capture Transfer
41 HUNTER 89102058423	M	????	WILD	WILD	INDIA AIZAWL	09-May-03 10-May-03	Capture Transfer
48 NUTEI 89102058424	F	????	WILD	WILD	INDIA AIZAWL	10-Jun-04 11-Jun-04	Capture Transfer
55 GORI 89102058425	F	????	WILD	WILD	INDIA AIZAWL	03-May-06 06-May-06	Capture Transfer
56 TEA 98102058427	M	????	WILD	WILD	INDIA AIZAWL	19-Mar-08 20-Mar-08	Capture Transfer
78 LATEI 089102058426	F	06-Jun-12	37	48	Aizawl	06-Jun-12	Birth
79 PAPUIA 89102058428	M	07-Aug-12	41	55	AIZAWL	07-Aug-12	Birth
119 LATEI 89102058426	F	06-Jun-12	41	48	AIZAWL	06-Jun-12	Birth
121 PTAZP8 PUIA	M	06-Apr-14	41	48	AIZAWL	06-Apr-14	Birth
122 PTAZP9	F	15-Feb-16	41	55	AIZAWL	15-Feb-16	Birth
123 AZP10	M	20-Feb-16	41	119	AIZAWL	20-Feb-16	Birth
124 AZP11 FAKA	M	21-Jan-17	41	55	AIZAWL	21-Jan-17	Birth
125 AZP12 KIMA	M	13-Feb-17	41	119	AIZAWL	13-Feb-17	Birth
<b>Total: 13 (8.5.0)</b>							
<b>Assam State Zoo cum Botanical Garden, Guwahati</b>							
31 OPTM01 SITA	F	29-Oct-91	UNK	UNK	ASSAM	29-Oct-91	Birth
72 OPTM02 KUSHA 0006590EA8	M	24-Sep-99	UNK	UNK	ASSAM	24-Sep-99	Birth
<b>Total: 2 (1.1.0)</b>							
<b>Bannerghata Biological Park, Banagaluru</b>							
67	F	05-Jun-08	49	34	SEPAHIJAL	05-Jun-08	Birth

NATIONAL STUDBOOK PIG TAILED MACAQUE (*MACACA LEONINA*) II EDITION

Stud# Local ID Name Transponder	Sex	Birth Date	Sire	Dam	Location	Date	Event
PTM3 MAMAN 0006590471					BANNERGHA	04-Aug-15	Transfer
86 PTM1 DEBJANI 956000002173197	F	21-May-12	49	38	SEPAHIJAL BANNERGHA	21-May-12 27-Jul-15	Birth Transfer
87 PTM2 JELHAZ 956000002170182	M	25-Jul-12	47	71	SEPAHIJAL BANNERGHA	25-Jul-12 04-Aug-15	Birth Transfer
107 PTM4 VINCE	M	07-Dec-15	87	67	BANNERGHA	07-Dec-15	Birth
108 PTM5 UTKARSH	M	28-Nov-16	87	86	BANNERGHA	28-Nov-16	Birth
115 PTM6	M	03-Sep-17	87	86	BANNERGHA	03-Sep-17	Birth
<b>Total: 6 (4.2.0)</b>							
<b>Mahendra Chaudhary Zoological Park, Mohali</b>							
17	F	20-Mar-82	UNK	11	KANPUR CHATBIR Z	20-Mar-82 14-Jul-00	Birth Transfer
26 PMSP-2 BEJOY	M	????	WILD	WILD	INDIA SEPAHIJAL CHATBIR Z	10-Apr-93 10-Apr-93 15-Dec-06	Capture Transfer Transfer
40 SONALI	F	23-Oct-01	WILD	WILD	INDIA SEPAHIJAL CHATBIR Z	23-Oct-01 23-Oct-01 15-Dec-06	Capture Transfer Transfer
65	?	~ 2008	26	UNK	CHATBIR Z	~ 2008	Birth
80	?	~ 2012	26	UNK	CHATBIR Z	~ 2012	Birth
<b>Total: 5 (1.2.2)</b>							
<b>Nagaland Zoological Park, Dimapur</b>							
64 BUDA	M	~ 2008	WILD	WILD	INDIA DIMAPUR	???? 17-May-09	Capture Transfer
116 BAB00	M	????	WILD	WILD	INDIA DIMAPUR	???? 25-Jun-16	Capture Transfer
117 BORA	M	????	WILD	WILD	INDIA DIMAPUR	???? 24-Jul-17	Capture Transfer
<b>Total: 3 (3.0.0)</b>							
<b>Nehru Zoological Park, Hyderabad</b>							
35 PMSP-5 PTM-2 USHA 0006B722E1	F	????	WILD	WILD	INDIA SEPAHIJAL HYDERABAD	14-Apr-95 14-Apr-95 18-Mar-11	Capture Transfer Transfer
<b>Total: 1 (0.1.0)</b>							
<b>Sepahijala Zoological Park, Agartala</b>							
38 PMSP12 MILLI	F	~ May 2000	WILD	WILD	INDIA SEPAHIJAL	20-Aug-00 20-Aug-00	Capture Transfer

NATIONAL STUDBOOK PIG TAILED MACAQUE (*MACACA LEONINA*) II EDITION

Stud# Local ID Name Transponder	Sex	Birth Date	Sire	Dam	Location	Date	Event
0006B722C3							
47 PMSP14 SUDHIR 0006B7EB25	M	~ Jan 2004	WILD	WILD	INDIA SEPAHIJAL	09-May-04 09-May-04	Capture Transfer
49 PMSP13 MANISH 0006B74444	M	20-Mar-04	WILD	WILD	INDIA SEPAHIJAL	21-May-04 21-May-04	Capture Transfer
52 RINA 0006B88519	F	~ Sep 2004	WILD	WILD	INDIA SEPAHIJAL	16-Dec-06 16-Dec-06	Capture Transfer
61 PMSP15 MIR 956000002161041	M	02-Jan-07	WILD	WILD	INDIA SEPAHIJAL	02-Jan-07 15-Jun-09	Capture Transfer
62 PMSP23 SHASHI 0006B72897	F	23-Jan-07	33	38	SEPAHIJAL	23-Jan-07	Birth
71 PMSP24 TRISHA 0006584D34	F	12-Mar-09	33	44	SEPAHIJAL	12-Mar-09	Birth
74 PMSP30 NOOR	?	22-Feb-11	69	57	SEPAHIJAL	22-Feb-11	Birth
75 PMSP29	?	11-Feb-12	47	71	SEPAHIJAL	11-Feb-12	Birth
77 PMSP32 BANI 0006585526	F	19-Apr-12	61	34	SEPAHIJAL	19-Apr-12	Birth
90 KANJIKA	F	02-Jun-13	89	52	SEPAHIJAL	02-Jun-13	Birth
91 PMSP35 SAMRAT	M	05-May-13	61	34	SEPAHIJAL	05-May-13	Birth
92 PMSP17 HIRAN 9560000002447304	M	19-Oct-02	WILD	WILD	SEPAHIJAL	20-Jan-14 20-Jan-14	Capture Transfer
93 PMSP16 SHASHIKALA 0006B88C3F	F	~ 2004	WILD	WILD	INDIA SEPAHIJAL	14-Jan-14 14-Jan-14	Capture Transfer
94 KAUSHIK	M	17-Jun-14	89	34	SEPAHIJAL	17-Jun-14	Birth
95 PMSP39 MADHUMITA	F	19-Jan-15	92	93	SEPAHIJAL	19-Jan-15	Birth
96 PMSP40 SHANKARI	F	28-Jun-15	89	34	SEPAHIJAL	28-Jun-15	Birth
97	?	17-Jul-15	61	52	SEPAHIJAL	17-Jul-15	Birth

NATIONAL STUDBOOK PIG TAILED MACAQUE (*MACACA LEONINA*) II EDITION

Stud# Local ID Name Transponder	Sex	Birth Date	Sire	Dam	Location	Date	Event
PMSP41							
98 PMSP42	?	25-May-16	61	93	SEPAHIJAL	25-May-16	Birth
99 PMSP43	?	28-May-16	61	52	SEPAHIJAL	28-May-16	Birth
100 PMSP44	?	10-Jun-16	89	77	SEPAHIJAL	10-Jun-16	Birth
101 PMSP45	?	16-Jul-16	74	90	SEPAHIJAL	16-Jul-16	Birth
102 PMSP34	?	05-May-13	60	67	SEPAHIJAL	05-May-13	Birth
103 PMSP33 GAFUR 956000002179325	M	02-Jun-13	47	66	SEPAHIJAL	02-Jun-13	Birth
104 PMSP25 ABU 956000002150421	M	15-Mar-12	33	62	SEPAHIJAL	15-Mar-12	Birth
105 PMSP36	?	19-Oct-13	33	38	SEPAHIJAL	19-Oct-13	Birth
106 PMSP37	?	24-Oct-13	47	62	SEPAHIJAL	24-Oct-13	Birth
109 PMSP46	?	02-May-17	61	52	SEPAHIJAL	02-May-17	Birth
<b>Total: 28 (8.9.11)</b>							
<b>Sayaji Baug Zoo, Vadodara</b>							
54 BUNTY	M	????	WILD	WILD	INDIA VADODARA	21-Apr-05 21-Apr-05	Capture Transfer
73 JUGNU	M	03-Dec-09	54	53	VADODARA	03-Dec-09	Birth
111 RANI	F	16-Oct-10	54	53	VADODARA	16-Oct-10	Birth
113	F	25-Apr-14	54	53	VADODARA	25-Apr-14	Birth
114	M	07-Nov-15	54	111	VADODARA	07-Nov-15	Birth
118	F	04-Aug-17	54	111	VADODARA	04-Aug-17	Birth
<b>Total: 6 (3.3.0)</b>							
<b>Total Living: 64 (29.23.12)</b>							

**Pedigree Chart Report of Pig Tailed Macaque Studbook**

=====

Taxon Name: MACACA LEONINA Studbook Number: 1

=====

WILD		WILD	
	\	/	
	dam \	/sire	
	\	/	
	1		

Sex: Female	
Birth Date: ????	
Last Location: DELHI	(dead)
House Name:	
Tattoo:	
Tag/Band:	

=====

Taxon Name: MACACA LEONINA Studbook Number: 2

=====

WILD		WILD	
	\	/	
	dam \	/sire	
	\	/	
	2		

Sex: Male	
Birth Date: ????	
Last Location: DELHI	(dead)
House Name:	
Tattoo:	
Tag/Band:	

=====

Taxon Name: MACACA LEONINA Studbook Number: 3

=====

WILD		WILD	
	\	/	
	dam \	/sire	
	\	/	
	3		

Sex: Male	
Birth Date: ????	
Last Location: DELHI	(dead)
House Name:	
Tattoo:	
Tag/Band:	

=====

Taxon Name: MACACA LEONINA Studbook Number: 4

=====

WILD		WILD	
	\	/	
	dam \	/sire	
	\	/	
	4		

Sex: Female	
Birth Date: ????	
Last Location: BHILAI	
House Name:	
Tattoo:	
Tag/Band:	

=====

Taxon Name: MACACA LEONINA Studbook Number: 5

=====

WILD		WILDWILDWILD	
	dam \		dam \
	\		/sire
	1	+	2
			+
			Sex: Female
			Birth Date: 7 Mar 1963
			Last Location: DELHI (dead)
			House Name:
			Tattoo:
			Tag/Band:

	\	/	
	dam \	/sire	
	\	/	
	5		

+ Wild-caught...



NATIONAL STUDBOOK PIG TAILED MACAQUE (*MACACA LEONINA*) II EDITION

```

=====
WILD                                     WILD
                                     Sex: Female
                                     Birth Date:   ????
                                     Last Location: KANPUR   (dead)
dam \                               /sire
   \                               /
    \                             /
     \                           /
      \                         /
       \                       /
        \                     /
         \                   /
          \                 /
           \               /
            \             /
             \           /
              \         /
               \       /
                \     /
                 \   /
                  \ /
                   V
                    11
=====

```

Taxon Name: MACACA LEONINA Studbook Number: 12

```

=====
WILD                                     WILD
                                     Sex: Unknown
                                     Birth Date:   ????
                                     Last Location: LUCKNOW   (dead)
dam \                               /sire
   \                               /
    \                             /
     \                           /
      \                         /
       \                       /
        \                     /
         \                   /
          \                 /
           \               /
            \             /
             \           /
              \         /
               \       /
                \     /
                 \   /
                  \ /
                   V
                    12
=====

```

Taxon Name: MACACA LEONINA Studbook Number: 13

```

=====
WILD                                     WILD
dam \                               /sire
   \                               /
    \                             /
     \                           /
      \                         /
       \                       /
        \                     /
         \                   /
          \                 /
           \               /
            \             /
             \           /
              \         /
               \       /
                \     /
                 \   /
                  \ /
                   V
                    11  +
=====
WILD                                     UNK
dam \                               /sire
   \                               /
    \                             /
     \                           /
      \                         /
       \                       /
        \                     /
         \                   /
          \                 /
           \               /
            \             /
             \           /
              \         /
               \       /
                \     /
                 \   /
                  \ /
                   V
                    13
=====
+ Wild-caught...
=====

```

Taxon Name: MACACA LEONINA Studbook Number: 14

```

=====
UNK                                     UNK
                                     Sex: Male
                                     Birth Date:  1 Mar 1980
                                     Last Location: INDIA
dam \                               /sire
   \                               /
    \                             /
     \                           /
      \                         /
       \                       /
        \                     /
         \                   /
          \                 /
           \               /
            \             /
             \           /
              \         /
               \       /
                \     /
                 \   /
                  \ /
                   V
                    14
=====

```

Taxon Name: MACACA LEONINA Studbook Number: 15

```

=====
WILD                                     WILD
dam \                               /sire
   \                               /
    \                             /
     \                           /
      \                         /
       \                       /
        \                     /
         \                   /
          \                 /
           \               /
            \             /
             \           /
              \         /
               \       /
                \     /
                 \   /
                  \ /
                   V
                    11  +
=====
WILD                                     UNK
dam \                               /sire
   \                               /
    \                             /
     \                           /
      \                         /
       \                       /
        \                     /
         \                   /
          \                 /
           \               /
            \             /
             \           /
              \         /
               \       /
                \     /
                 \   /
                  \ /
                   V
                    15
=====
+ Wild-caught...
=====

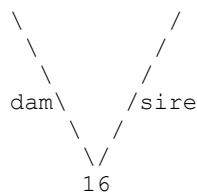
```

Taxon Name: MACACA LEONINA Studbook Number: 16



NATIONAL STUDBOOK PIG TAILED MACAQUE (*MACACA LEONINA*) II EDITION

WILD



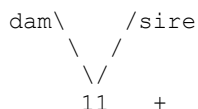
WILD

Sex: Female  
 Birth Date: ~ 1980  
 Last Location: MADRAS  
 House Name:  
 Tattoo:  
 Tag/Band:

=====  
 Taxon Name: MACACA LEONINA

=====  
 Studbook Number: 17

WILD

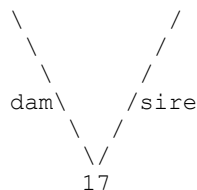


WILD

UNK

Sex: Female  
 Birth Date: 20 Mar 1982  
 Last Location: CHATBIR Z  
 House Name:  
 Tattoo:  
 Tag/Band:

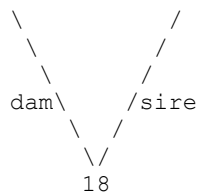
+ Wild-caught...



=====  
 Taxon Name: MACACA LEONINA

=====  
 Studbook Number: 18

WILD



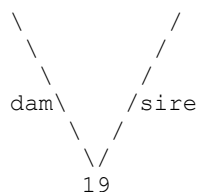
WILD

Sex: Female  
 Birth Date: ????  
 Last Location: CHHAT BIR (dead)  
 House Name:  
 Tattoo:  
 Tag/Band:

=====  
 Taxon Name: MACACA LEONINA

=====  
 Studbook Number: 19

WILD



WILD

Sex: Male  
 Birth Date: ????  
 Last Location: CHHAT BIR (dead)  
 House Name:  
 Tattoo:  
 Tag/Band:

=====  
 Taxon Name: MACACA LEONINA

=====  
 Studbook Number: 20

WILD



WILD

Sex: Male  
 Birth Date: ????  
 Last Location: CALCUTTA (dead)  
 House Name:  
 Tattoo:  
 Tag/Band:

=====  
 Taxon Name: MACACA LEONINA

=====  
 Studbook Number: 21

WILD

WILD

NATIONAL STUDBOOK PIG TAILED MACAQUE (*MACACA LEONINA*) II EDITION

```

      \      /
      dam\  /sire
         \  /
          21
  
```

Sex: Female  
 Birth Date: ????  
 Last Location: CALCUTTA (dead)  
 House Name:  
 Tattoo:  
 Tag/Band:

=====  
 Taxon Name: MACACA LEONINA

Studbook Number: 22  
 =====

```

WILD      WILD
dam\     /sire
  \     /
   11  +
      dam\  /sire      UNK
         \  /
          17
  
```

```

      \      /
      dam\  /sire
         \  /
          22
  
```

UNK  
 Sex: Male  
 Birth Date: 10 Jun 1986  
 Last Location: KANPUR (dead)  
 House Name:  
 Tattoo:  
 Tag/Band:

+ Wild-caught...

=====  
 Taxon Name: MACACA LEONINA

Studbook Number: 23  
 =====

```

WILD      WILD
dam\     /sire
  \     /
   11  +
      dam\  /sire      UNK
         \  /
          17
  
```

```

      \      /
      dam\  /sire
         \  /
          23
  
```

UNK  
 Sex: Male  
 Birth Date: 7 Aug 1987  
 Last Location: KANPUR (dead)  
 House Name:  
 Tattoo:  
 Tag/Band:

+ Wild-caught...

=====  
 Taxon Name: MACACA LEONINA

Studbook Number: 24  
 =====

WILD

```

      \      /
      dam\  /sire
         \  /
          24
  
```

WILD  
 Sex: Female  
 Birth Date: ????  
 Last Location: AHMEDABAD (dead)  
 House Name:  
 Tattoo:  
 Tag/Band:

=====  
 Taxon Name: MACACA LEONINA

Studbook Number: 25  
 =====

WILD

```

      \      /
      dam\  /sire
         \  /
          25
  
```

WILD  
 Sex: Female

NATIONAL STUDBOOK PIG TAILED MACAQUE (*MACACA LEONINA*) II EDITION

```

      \      /
      dam\  /sire
           \ /
            25
  
```

Birth Date: ????

Last Location: AHMEDABAD (dead)

House Name:

Tattoo:

Tag/Band:

=====  
 Taxon Name: MACACA LEONINA

=====  
 Studbook Number: 26

=====  
 WILD

```

      \      /
      dam\  /sire
           \ /
            26
  
```

=====  
 WILD  
 Sex: Male  
 Birth Date: ????

Last Location: CHATBIR Z

House Name: BEJOY

Tattoo:

Tag/Band:

=====  
 Taxon Name: MACACA LEONINA

=====  
 Studbook Number: 27

=====  
 WILD

```

      \      /
      dam\  /sire
           \ /
            27
  
```

=====  
 WILD  
 Sex: Male  
 Birth Date: ????

Last Location: AHMEDABAD (dead)

House Name:

Tattoo:

Tag/Band:

=====  
 Taxon Name: MACACA LEONINA

=====  
 Studbook Number: 28

=====  
 WILD

```

      \      /
      dam\  /sire
           \ /
            28
  
```

=====  
 WILD  
 Sex: Male  
 Birth Date: ????

Last Location: CALCUTTA (dead)

House Name:

Tattoo:

Tag/Band:

=====  
 Taxon Name: MACACA LEONINA

=====  
 Studbook Number: 29

=====  
 WILD dam\ /sire

```

      \      /
      11 + dam\ /sire UNK
           \ /
            17
  
```

```

      \      /
      dam\  /sire
           \ /
            29
  
```

=====  
 UNK  
 Sex: Male  
 Birth Date: 7 Oct 1990

Last Location: KANPUR (dead)

House Name:

Tattoo:

Tag/Band:

+ Wild-caught...

=====  
 Taxon Name: MACACA LEONINA

=====  
 Studbook Number: 30

=====  
 WILD

```

      \      /
      dam\  /sire
           \ /
            30
  
```

=====  
 WILD  
 Sex: Female  
 Birth Date: ????

```

      \      /
      dam\  /sire
           \ /
            30
    
```

Last Location: CALCUTTA (dead)  
 House Name:  
 Tattoo:  
 Tag/Band:

=====  
 Taxon Name: MACACA LEONINA Studbook Number: 31  
 =====

UNK

```

      \      /
      dam\  /sire
           \ /
            31
    
```

UNK

Sex: Female  
 Birth Date: 29 Oct 1991  
 Last Location: ASSAM  
 House Name: SITA  
 Tattoo:  
 Tag/Band:

=====  
 Taxon Name: MACACA LEONINA Studbook Number: 32  
 =====

```

    WILD      WILD
    dam\     /sire
       \   /
        11  +
           dam\  /sire
              \ /
               17
    
```

UNK

```

      \      /
      dam\  /sire
           \ /
            32
    
```

UNK

Sex: Male  
 Birth Date: ~ 1992  
 Last Location: KANPUR (dead)  
 House Name:  
 Tattoo:  
 Tag/Band:

+ Wild-caught...

=====  
 Taxon Name: MACACA LEONINA Studbook Number: 33  
 =====

WILD

```

      \      /
      dam\  /sire
           \ /
            33
    
```

WILD

Sex: Male  
 Birth Date: 14 Apr 1993  
 Last Location: SEPAHIJAL (dead)  
 House Name: SWAPAN  
 Tattoo:  
 Tag/Band:

=====  
 Taxon Name: MACACA LEONINA Studbook Number: 34  
 =====

WILD

```

      \      /
      dam\  /sire
           \ /
            34
    
```

WILD

Sex: Female  
 Birth Date: 10 May 1993  
 Last Location: SEPAHIJAL (dead)  
 House Name: AAISHARIYA  
 Tattoo:  
 Tag/Band:

=====  
 Taxon Name: MACACA LEONINA Studbook Number: 35  
 =====

WILD

```

      \      /
      dam\  /sire
           \ /
            35
    
```

WILD

Sex: Female  
 Birth Date: ????  
 Last Location: HYDERABAD

NATIONAL STUDBOOK PIG TAILED MACAQUE (*MACACA LEONINA*) II EDITION

```

dam\      /sire
 \      /
  \    /
   \  /
    \ /
     V
    35
    
```

House Name: USHA  
Tattoo:  
Tag/Band:

=====  
Taxon Name: MACACA LEONINA  
=====

Studbook Number: 36  
=====

UNK

UNK

```

\      /
 \    /
  \  /
   \ /
    V
   dam\ /sire
    
```

Sex: Male  
Birth Date: 25 Nov 1995  
Last Location: ASSAM  
House Name:  
Tattoo:  
Tag/Band:

=====  
Taxon Name: MACACA LEONINA  
=====

Studbook Number: 37  
=====

WILD

WILD

```

\      /
 \    /
  \  /
   \ /
    V
   dam\ /sire
    
```

Sex: Male  
Birth Date: ????  
Last Location: AIZAWL  
House Name: PATEA  
Tattoo:  
Tag/Band:

=====  
Taxon Name: MACACA LEONINA  
=====

Studbook Number: 38  
=====

WILD

WILD

```

\      /
 \    /
  \  /
   \ /
    V
   dam\ /sire
    
```

Sex: Female  
Birth Date: ~ May 2000  
Last Location: SEPAHIJAL  
House Name: MILLI  
Tattoo:  
Tag/Band:

=====  
Taxon Name: MACACA LEONINA  
=====

Studbook Number: 39  
=====

WILD

WILD

```

\      /
 \    /
  \  /
   \ /
    V
   dam\ /sire
    
```

Sex: Male  
Birth Date: ????  
Last Location: HYDERABAD (dead)  
House Name: AMIT/SEPAHIJALA  
Tattoo:  
Tag/Band:

=====  
Taxon Name: MACACA LEONINA  
=====

Studbook Number: 40  
=====

WILD

WILD

```

\      /
 \    /
  \  /
   \ /
    V
   dam\ /sire
    
```

Sex: Female  
Birth Date: 23 Oct 2001  
Last Location: CHATBIR Z  
House Name:

NATIONAL STUDBOOK PIG TAILED MACAQUE (*MACACA LEONINA*) II EDITION

\ /  
 \ /  
 40

Tattoo:  
Tag/Band:

=====  
Taxon Name: MACACA LEONINA  
=====

=====  
Studbook Number: 41  
=====

WILD

WILD

\ /  
 \ /  
 dam \ /sire  
 \ /  
 41

Sex: Male  
Birth Date: ????  
Last Location: AIZAWL  
House Name: HUNTER  
Tattoo:  
Tag/Band:

=====  
Taxon Name: MACACA LEONINA  
=====

=====  
Studbook Number: 44  
=====

WILD

WILD

\ /  
 \ /  
 dam \ /sire  
 \ /  
 44

Sex: Female  
Birth Date: ~ 2003  
Last Location: SEPAHIJAL (dead)  
House Name: KAJALI  
Tattoo:  
Tag/Band:

=====  
Taxon Name: MACACA LEONINA  
=====

=====  
Studbook Number: 45  
=====

WILD

WILDWILDWILD

dam \ /sire  
 \ /  
 34 +  
 AAISHARI

dam \ /sire  
 \ /  
 33 +  
 SWAPAN

\ /  
 \ /  
 dam \ /sire  
 \ /  
 45

Sex: Female  
Birth Date: 12 Jul 2003  
Last Location: SEPAHIJAL  
House Name: SARABANI  
Tattoo:  
Tag/Band:

+ Wild-caught...

=====  
Taxon Name: MACACA LEONINA  
=====

=====  
Studbook Number: 46  
=====

WILD

WILD

\ /  
 \ /  
 dam \ /sire  
 \ /  
 46

Sex: Female  
Birth Date: ~ Oct 2003  
Last Location: SEPAHIJAL (dead)  
House Name: CHITRA  
Tattoo:  
Tag/Band:

=====  
Taxon Name: MACACA LEONINA  
=====

=====  
Studbook Number: 47  
=====

WILD

WILD

\ /  
 \ /  
 dam \ /sire  
 \ /

Sex: Male  
Birth Date: ~ Jan 2004  
Last Location: SEPAHIJAL  
House Name: SUDHIR  
Tattoo:







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```

      \/\
      45
    SARABANI

      \  \
      dam\  /sire
      \  \
      57

      \/\
      26 +
    BEJOY
    Sex: Female
    Birth Date: 22 Jul 2006
    Last Location: SEPAHIJAL (dead)
    House Name: BURI
    Tattoo:
    Tag/Band:
  
```

+ Wild-caught...

=====  
 Taxon Name: MACACA LEONINA Studbook Number: 58  
 =====

```

    WILD WILDWILDWILD
      dam\  /sire
      \  \
      34 +
    AAISHARI

      \  \
      dam\  /sire
      \  \
      26 +
    BEJOY
    Sex: Female
    Birth Date: 22 Jul 2006
    Last Location: SEPAHIJAL (dead)
    House Name: MINU
    Tattoo:
    Tag/Band:
  
```

+ Wild-caught...

=====  
 Taxon Name: MACACA LEONINA Studbook Number: 60  
 =====

```

    WILD WILDWILDWILD
      dam\  /sire
      \  \
      35 +
    USHA

      \  \
      dam\  /sire
      \  \
      39 +
    AMIT/SEP
    Sex: Male
    Birth Date: 18 Oct 2006
    Last Location: SEPAHIJAL (dead)
    House Name: KUMAR
    Tattoo:
    Tag/Band:
  
```

+ Wild-caught...

=====  
 Taxon Name: MACACA LEONINA Studbook Number: 61  
 =====

```

    WILD WILD
      \  \
      dam\  /sire
      \  \
      61

      \  \
      dam\  /sire
      \  \
      Sex: Male
    Birth Date: 2 Jan 2007
    Last Location: SEPAHIJAL
    House Name: MIR
    Tattoo:
    Tag/Band:
  
```

=====  
 Taxon Name: MACACA LEONINA Studbook Number: 62  
 =====

```

    WILD WILDWILDWILD
      dam\  /sire
      \  \
      38 +
    MILLI

      \  \
      dam\  /sire
      \  \
      33 +
    SWAPAN
    Sex: Female
    Birth Date: 23 Jan 2007
    Last Location: SEPAHIJAL
  
```

NATIONAL STUDBOOK PIG TAILED MACAQUE (*MACACA LEONINA*) II EDITION

dam\ /sire House Name: SHASHI  
 \ / Tattoo:  
 62 \ / Tag/Band:

+ Wild-caught...

===== Taxon Name: MACACA LEONINA Studbook Number: 63 =====

WILD dam\ /sire WILDWILDWILD dam\ /sire  
 \ / \ /  
 53 + 54 +  
 BABALI BUNTY  
 Sex: Female  
 Birth Date: 4 Aug 2007  
 Last Location: VADODARA (dead)  
 House Name: GEETA  
 Tattoo:  
 Tag/Band:  
 dam\ /sire  
 \ /  
 63

+ Wild-caught...

===== Taxon Name: MACACA LEONINA Studbook Number: 64 =====

WILD dam\ /sire WILD dam\ /sire  
 \ / \ /  
 64  
 Sex: Male  
 Birth Date: ~ 2008  
 Last Location: DIMAPUR  
 House Name: BUDA  
 Tattoo:  
 Tag/Band:

===== Taxon Name: MACACA LEONINA Studbook Number: 65 =====

UNK dam\ /sire WILD dam\ /sire WILD  
 \ / \ /  
 26 +  
 BEJOY  
 Sex: Unknown  
 Birth Date: ~ 2008  
 Last Location: CHATBIR Z  
 House Name:  
 Tattoo:  
 Tag/Band:  
 dam\ /sire  
 \ /  
 65

+ Wild-caught...

===== Taxon Name: MACACA LEONINA Studbook Number: 66 =====

WILD dam\ /sire WILDWILDWILD dam\ /sire  
 \ / \ /  
 35 + 33 +  
 USHA SWAPAN  
 Sex: Female  
 Birth Date: 16 Mar 2008  
 Last Location: SEPAHIJAL (dead)  
 House Name: MISTHU  
 dam\ /sire  
 \ /

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+ Wild-caught... \ / Tattoo:  
\ / Tag/Band:  
66

=====

Taxon Name: MACACA LEONINA Studbook Number: 67

=====

WILD WILDWILDWILD

dam\ dam\ /sire /sire

\ \ / /

34 + 49 +

AAISHARI MANISH

Sex: Female

Birth Date: 5 Jun 2008

Last Location: BANNERGHA

House Name: MAMAN

Tattoo:

Tag/Band:

+ Wild-caught... \ /  
\ /  
67

=====

Taxon Name: MACACA LEONINA Studbook Number: 68

=====

WILD WILDWILDWILD

dam\ dam\ /sire /sire

\ \ / /

53 + 54 +

BABALI BUNTY

Sex: Female

Birth Date: 19 Jun 2006

Last Location: VADODARA (dead)

House Name: SITA

Tattoo:

Tag/Band:

+ Wild-caught... \ /  
\ /  
68

=====

Taxon Name: MACACA LEONINA Studbook Number: 69

=====

^ ^

| |

34 + 33 + WILD WILD

AAISHARI SWAPAN

dam\ dam\ /sire /sire

\ \ / /

45 26 + WILD WILD

SARABANI BEJOY

dam\ dam\ /sire /sire

\ \ / /

NATIONAL STUDBOOK PIG TAILED MACAQUE (*MACACA LEONINA*) II EDITION

57  
BURI



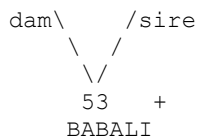
49 +  
MANISH  
Sex: Male  
Birth Date: 2 Jul 2008  
Last Location: SEPAHIJAL (dead)  
House Name: MANIK  
Tattoo:  
Tag/Band:

+ Wild-caught...  
^ Pedigree continues beyond top of page...

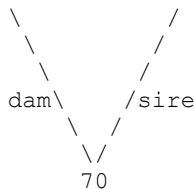
=====  
Taxon Name: MACACA LEONINA

=====  
Studbook Number: 70  
=====

WILD



WILDWILDWILD



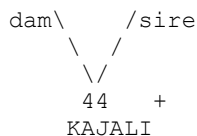
54 +  
BUNTY  
Sex: Female  
Birth Date: 16 Aug 2008  
Last Location: VADODARA (dead)  
House Name: JANKI  
Tattoo:  
Tag/Band:

+ Wild-caught...

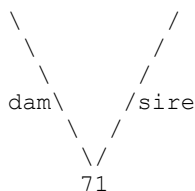
=====  
Taxon Name: MACACA LEONINA

=====  
Studbook Number: 71  
=====

WILD



WILDWILDWILD



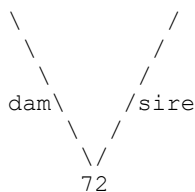
33 +  
SWAPAN  
Sex: Female  
Birth Date: 12 Mar 2009  
Last Location: SEPAHIJAL  
House Name: TRISHA  
Tattoo:  
Tag/Band:

+ Wild-caught...

=====  
Taxon Name: MACACA LEONINA

=====  
Studbook Number: 72  
=====

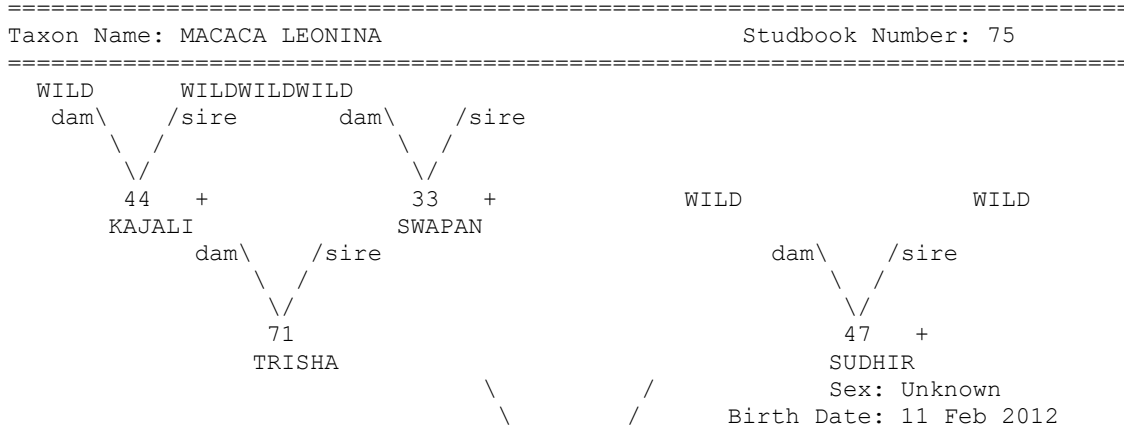
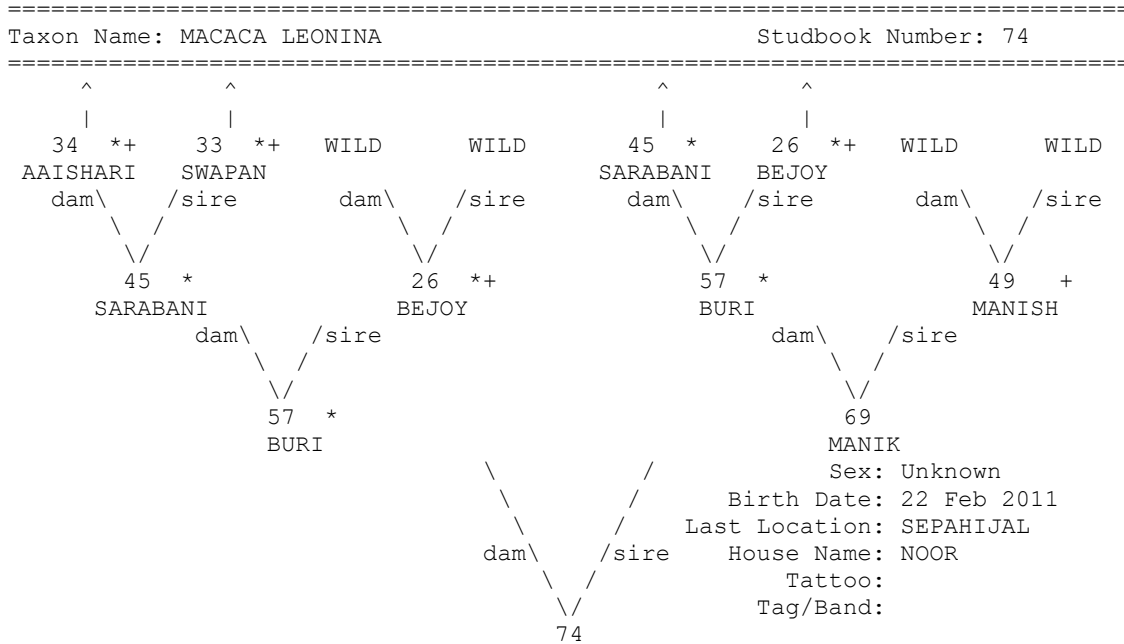
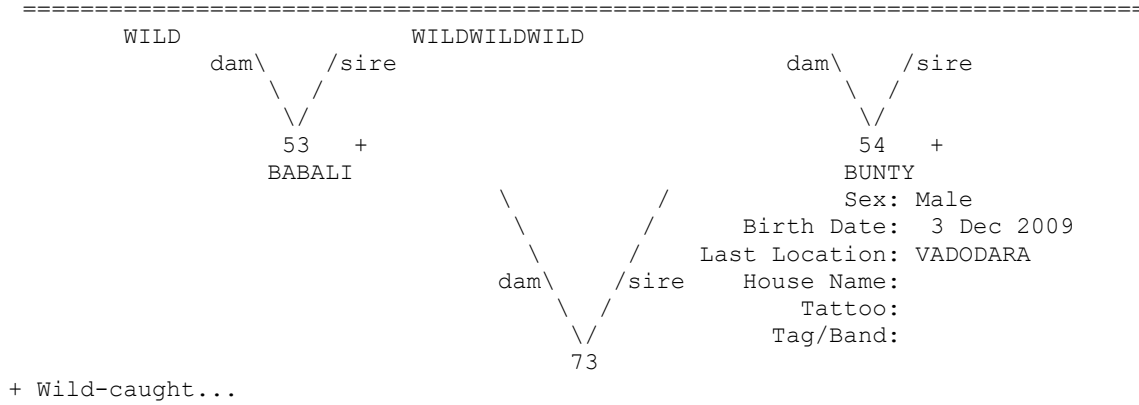
UNK



UNK  
Sex: Male  
Birth Date: 24 Sep 1999  
Last Location: ASSAM  
House Name: KUSHA  
Tattoo:  
Tag/Band:

=====  
Taxon Name: MACACA LEONINA

=====  
Studbook Number: 73  
=====



```

      \      /
     dam\  /sire
        \  /
         75
    
```

Last Location: SEPAHIJAL  
 House Name:  
 Tattoo:  
 Tag/Band:

+ Wild-caught...

```

=====
Taxon Name: MACACA LEONINA                      Studbook Number: 76
=====
    
```

```

WILD      WILDWILDWILD
dam\      /sire
  \      /
   52   +
   RINA
    
```

```

      \      /
     dam\  /sire
        \  /
         59   +
         RITESH
         Sex: Female
         Birth Date: 5 Mar 2012
         Last Location: SEPAHIJAL (dead)
         House Name: KAJALI-2
         Tattoo:
         Tag/Band:
    
```

```

      \      /
     dam\  /sire
        \  /
         76
    
```

+ Wild-caught...

```

=====
Taxon Name: MACACA LEONINA                      Studbook Number: 77
=====
    
```

```

WILD      WILDWILDWILD
dam\      /sire
  \      /
   34   +
   AAISHARI
    
```

```

      \      /
     dam\  /sire
        \  /
         61   +
         MIR
         Sex: Female
         Birth Date: 19 Apr 2012
         Last Location: SEPAHIJAL
         House Name: BANI
         Tattoo:
         Tag/Band:
    
```

```

      \      /
     dam\  /sire
        \  /
         77
    
```

+ Wild-caught...

```

=====
Taxon Name: MACACA LEONINA                      Studbook Number: 79
=====
    
```

```

WILD      WILDWILDWILD
dam\      /sire
  \      /
   55   +
   GORI
    
```

```

      \      /
     dam\  /sire
        \  /
         41   +
         HUNTER
         Sex: Male
         Birth Date: 7 Aug 2012
         Last Location: AIZAWL
         House Name: PAPUIA
         Tattoo:
         Tag/Band:
    
```

```

      \      /
     dam\  /sire
        \  /
         79
    
```

+ Wild-caught...

```

=====
Taxon Name: MACACA LEONINA                      Studbook Number: 80
=====
                                WILD              WILD
                                dam\              /sire
                                \                /
                                26 +
                                BEJOY
                                Sex: Unknown
                                Birth Date: ~ 2012
                                Last Location: CHATBIR Z
                                House Name:
                                Tattoo:
                                Tag/Band:

UNK
                                \                /
                                dam\              /sire
                                \                /
                                80
    
```

+ Wild-caught...

```

=====
Taxon Name: MACACA LEONINA                      Studbook Number: 81
=====
                                WILD              WILD
                                \                /
                                dam\              /sire
                                \                /
                                81
                                Sex: Male
                                Birth Date: ~ Dec 2012
                                Last Location: DIMAPUR
                                House Name:
                                Tattoo:
                                Tag/Band:
    
```

```

=====
Taxon Name: MACACA LEONINA                      Studbook Number: 86
=====
                                WILD              WILDWILDWILD
                                dam\              /sire
                                \                /
                                38 +
                                MILLI
                                \                /
                                dam\              /sire
                                \                /
                                86
                                dam\              /sire
                                \                /
                                49 +
                                MANISH
                                Sex: Female
                                Birth Date: 21 May 2012
                                Last Location: BANNERGHA
                                House Name: DEBJANI
                                Tattoo:
                                Tag/Band:
    
```

+ Wild-caught...

```

=====
Taxon Name: MACACA LEONINA                      Studbook Number: 87
=====
                                WILD              WILDWILDWILD
                                dam\              /sire
                                \                /
                                44 +
                                KAJALI
                                dam\              /sire
                                \                /
                                71
                                TRISHA
                                dam\              /sire
                                \                /
                                33 +
                                SWAPAN
                                dam\              /sire
                                \                /
                                47 +
                                SUDHIR
                                Sex: Male
                                Birth Date: 25 Jul 2012
                                Last Location: BANNERGHA
                                House Name: JELHAZ
                                WILD              WILD
                                dam\              /sire
                                \                /
                                87
    
```

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+ Wild-caught... \ / Tattoo:  
\ / Tag/Band:  
87

=====  
 Taxon Name: MACACA LEONINA Studbook Number: 89  
 =====

WILD WILD

dam \ / Sex: Male  
 \ / Birth Date: ~ 2006  
 89 Last Location: SEPAHIJAL (dead)  
House Name: RITESH  
Tattoo:  
Tag/Band:

=====  
 Taxon Name: MACACA LEONINA Studbook Number: 90  
 =====

WILD WILDWILDWILD

dam \ / dam \ /  
 \ / \ /  
 52 + 89 +  
 RINA RITESH  
Sex: Female  
Birth Date: 2 Jun 2013  
Last Location: SEPAHIJAL  
House Name: KANIKA  
Tattoo:  
Tag/Band:

+ Wild-caught... \ /  
\ /  
90

=====  
 Taxon Name: MACACA LEONINA Studbook Number: 91  
 =====

WILD WILDWILDWILD

dam \ / dam \ /  
 \ / \ /  
 34 + 61 +  
 AAISHARI MIR  
Sex: Male  
Birth Date: 5 May 2013  
Last Location: SEPAHIJAL  
House Name: SAMRAT  
Tattoo:  
Tag/Band:

+ Wild-caught... \ /  
\ /  
91

=====  
 Taxon Name: MACACA LEONINA Studbook Number: 92  
 =====

WILD WILD

dam \ / Sex: Male  
 \ / Birth Date: 19 Oct 2002  
 92 Last Location: SEPAHIJAL  
House Name: HIRAN  
Tattoo:  
Tag/Band:

=====  
 Taxon Name: MACACA LEONINA Studbook Number: 93  
 =====

WILD WILD

dam \ / Sex: Female  
 \ / Birth Date: ~ 2004  
Last Location: SEPAHIJAL



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dam\ /sire House Name: SHASHIKALA  
 \ / Tattoo:  
 93 \ / Tag/Band:

=====  
 Taxon Name: MACACA LEONINA Studbook Number: 94  
 =====

WILD WILDWILDWILD

dam\ /sire dam\ /sire  
 \ / \ /  
 34 + 89 +  
 AAISHARI RITESH  
 Sex: Male  
 Birth Date: 17 Jun 2014  
 Last Location: SEPAHIJAL  
 House Name: KAUSHIK  
 Tattoo:  
 Tag/Band:

dam\ /sire  
 \ /  
 94

+ Wild-caught...

=====  
 Taxon Name: MACACA LEONINA Studbook Number: 95  
 =====

WILD WILDWILDWILD

dam\ /sire dam\ /sire  
 \ / \ /  
 93 + 92 +  
 SHASHIKA HIRAN  
 Sex: Female  
 Birth Date: 19 Jan 2015  
 Last Location: SEPAHIJAL  
 House Name: MADHUMITA  
 Tattoo:  
 Tag/Band:

dam\ /sire  
 \ /  
 95

+ Wild-caught...

=====  
 Taxon Name: MACACA LEONINA Studbook Number: 96  
 =====

WILD WILDWILDWILD

dam\ /sire dam\ /sire  
 \ / \ /  
 34 + 89 +  
 AAISHARI RITESH  
 Sex: Female  
 Birth Date: 28 Jun 2015  
 Last Location: SEPAHIJAL  
 House Name: SHANKARI  
 Tattoo:  
 Tag/Band:

dam\ /sire  
 \ /  
 96

+ Wild-caught...

=====  
 Taxon Name: MACACA LEONINA Studbook Number: 97  
 =====

```

WILD          WILDWILDWILD
dam\         /sire
  \         /
   \       /
    52   +
    RINA

          \         /
           \       /
            61   +
            MIR
            Sex: Unknown
            Birth Date: 17 Jul 2015
            Last Location: SEPAHIJAL
            House Name:
            Tattoo:
            Tag/Band:

+ Wild-caught...

=====
Taxon Name: MACACA LEONINA          Studbook Number: 98
=====

```

```

WILD          WILDWILDWILD
dam\         /sire
  \         /
   \       /
    93   +
    SHASHIKA

          \         /
           \       /
            61   +
            MIR
            Sex: Unknown
            Birth Date: 25 May 2016
            Last Location: SEPAHIJAL
            House Name:
            Tattoo:
            Tag/Band:

+ Wild-caught...

=====
Taxon Name: MACACA LEONINA          Studbook Number: 99
=====

```

```

WILD          WILDWILDWILD
dam\         /sire
  \         /
   \       /
    52   +
    RINA

          \         /
           \       /
            61   +
            MIR
            Sex: Unknown
            Birth Date: 28 May 2016
            Last Location: SEPAHIJAL
            House Name:
            Tattoo:
            Tag/Band:

+ Wild-caught...

=====
Taxon Name: MACACA LEONINA          Studbook Number: 100
=====

```

```

WILD          WILDWILDWILD
dam\         /sire
  \         /
   \       /
    34   +
    AAISHARI

          \         /
           \       /
            61   +
            MIR

WILD          WILD
dam\         /sire
  \         /
   \       /
    77   +
    BANI

          \         /
           \       /
            89   +
            RITESH
            Sex: Unknown
            Birth Date: 10 Jun 2016
            Last Location: SEPAHIJAL
            House Name:
            Tattoo:
            Tag/Band:

+ Wild-caught...

=====
Taxon Name: MACACA LEONINA          Studbook Number: 100
=====

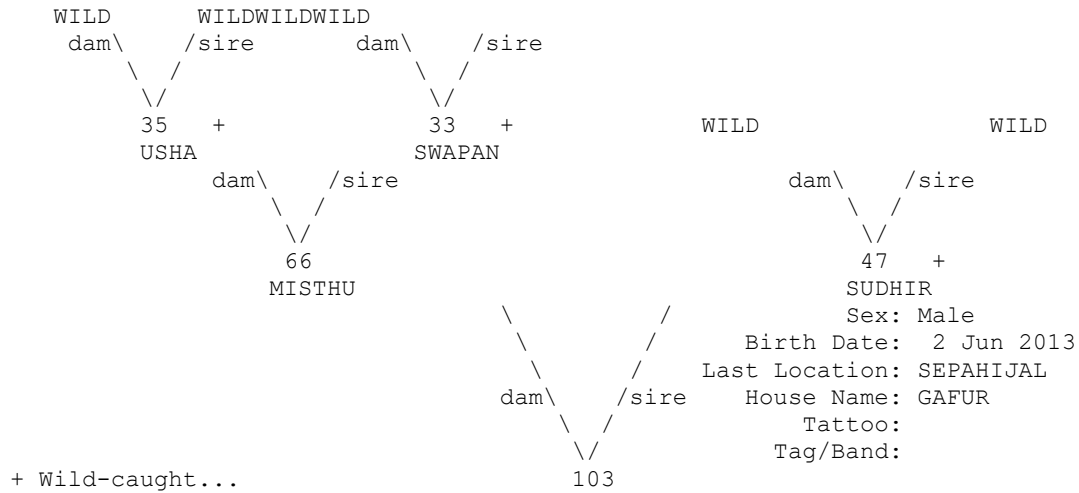
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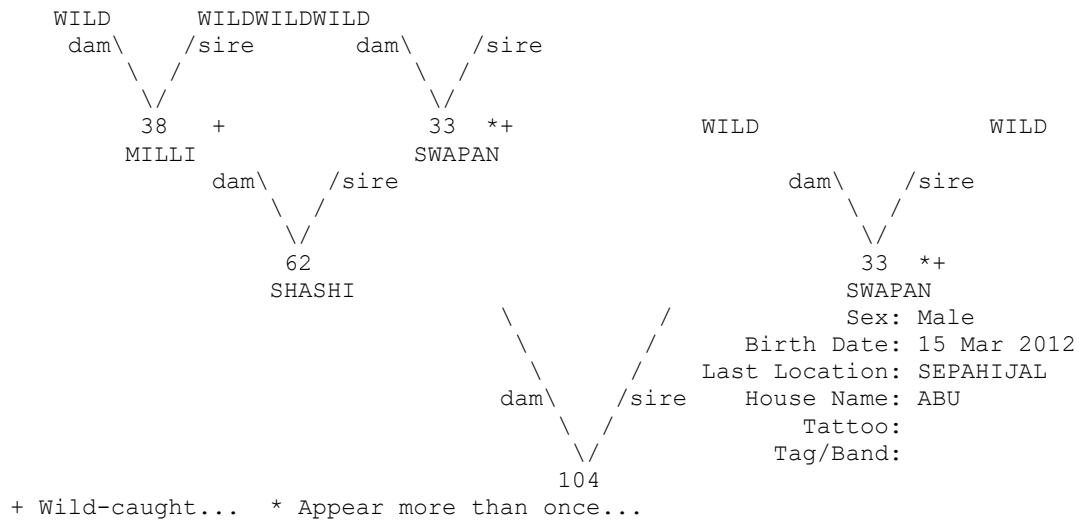
=====  
 Taxon Name: MACACA LEONINA

Studbook Number: 103  
 =====



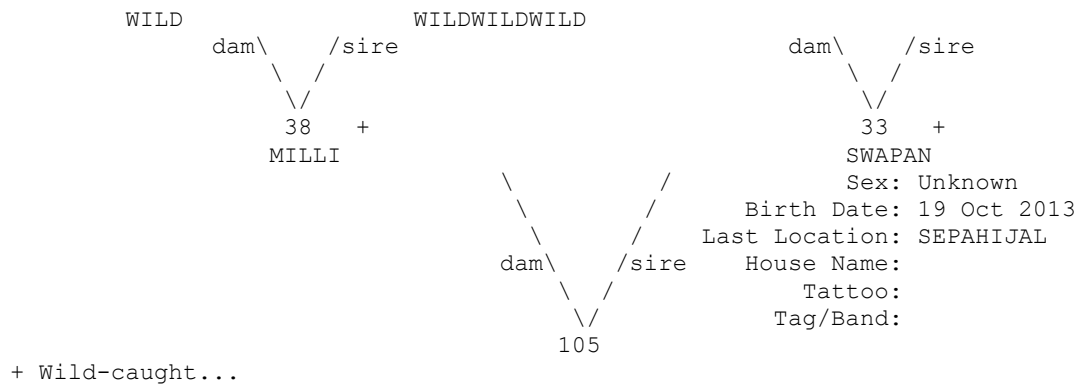
=====  
 Taxon Name: MACACA LEONINA

Studbook Number: 104  
 =====



=====  
 Taxon Name: MACACA LEONINA

Studbook Number: 105  
 =====



=====  
 Taxon Name: MACACA LEONINA

Studbook Number: 106  
 =====

WILD                      WILDWILDWILD



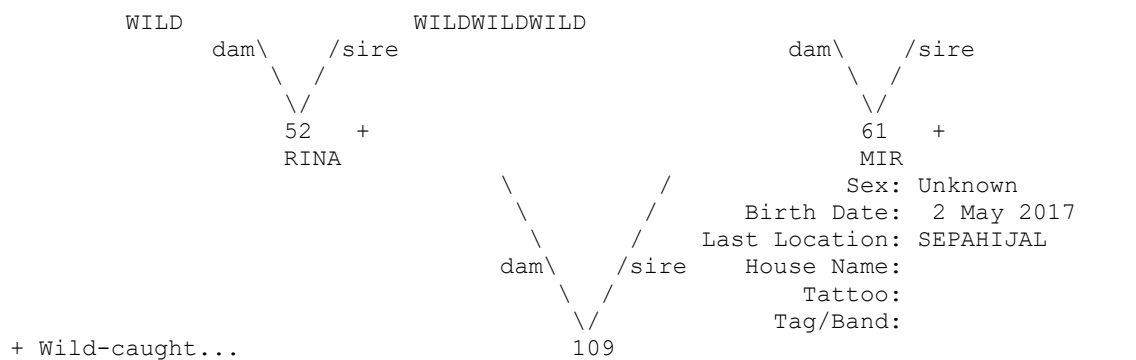
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+ Wild-caught...  
 ^ Pedigree continues beyond top of page...

=====

Taxon Name: MACACA LEONINA Studbook Number: 109

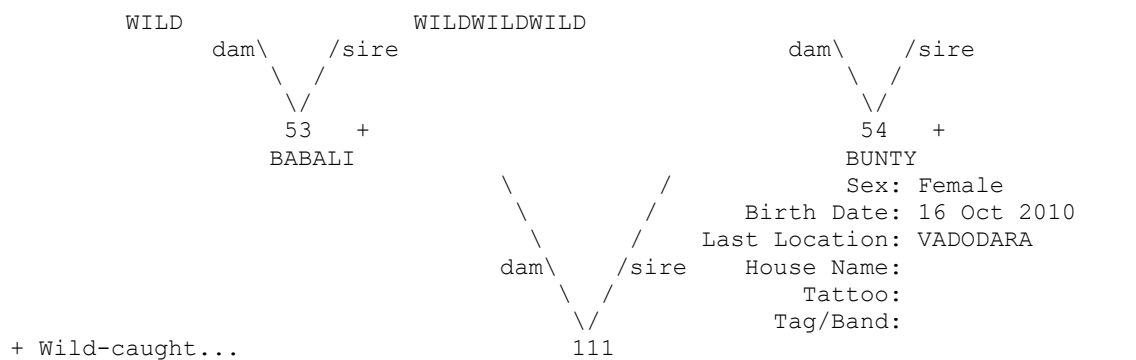
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=====

Taxon Name: MACACA LEONINA Studbook Number: 111

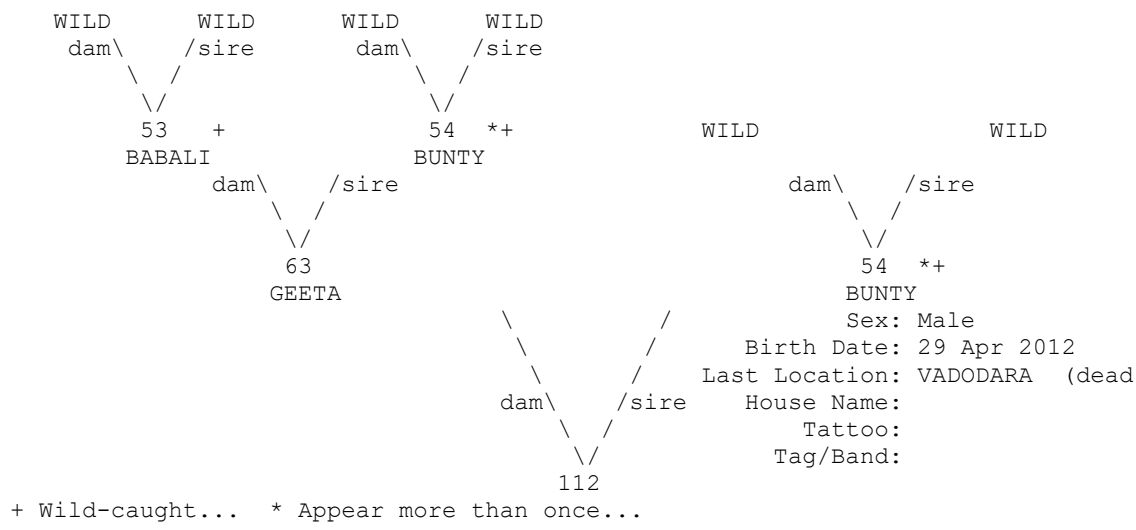
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Taxon Name: MACACA LEONINA Studbook Number: 112

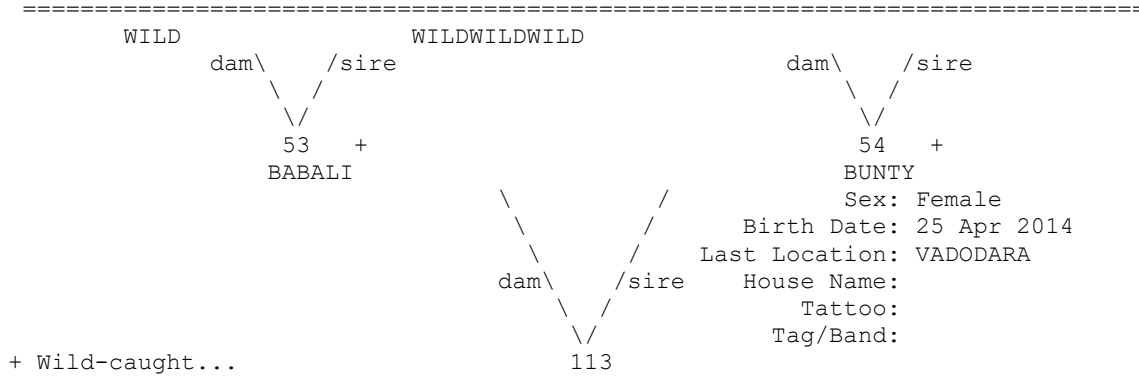
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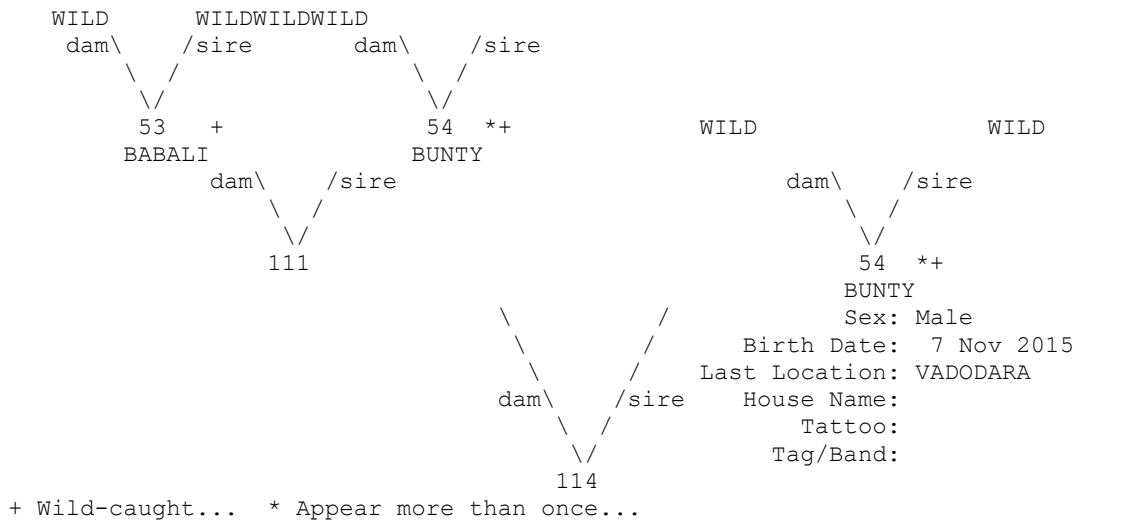
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Taxon Name: MACACA LEONINA Studbook Number: 113

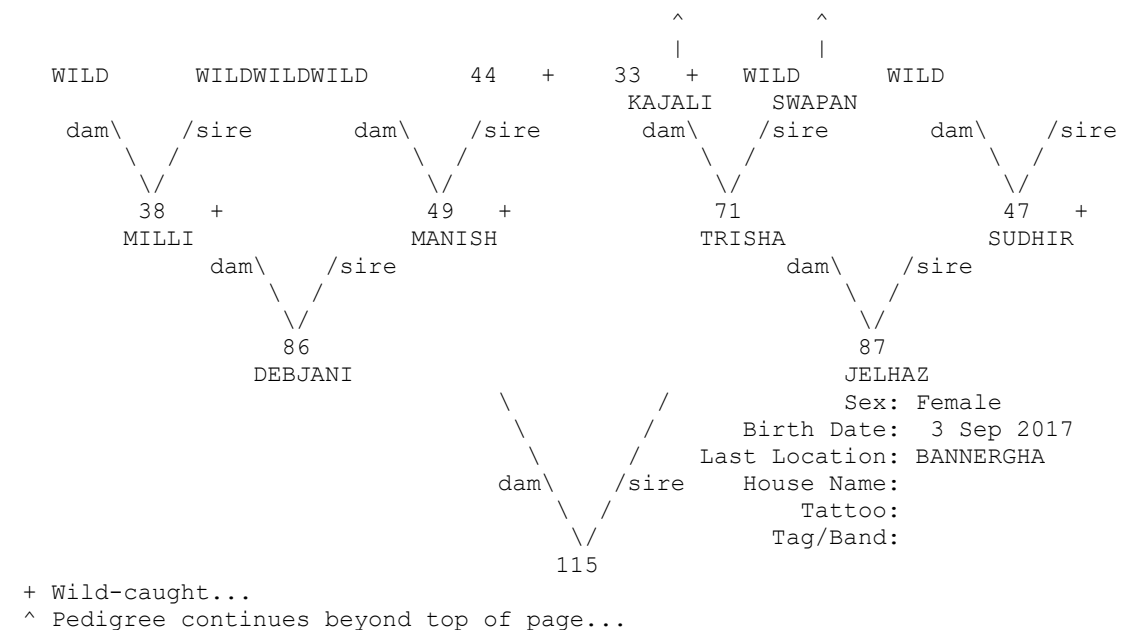
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Taxon Name: MACACA LEONINA Studbook Number: 114



Taxon Name: MACACA LEONINA Studbook Number: 115



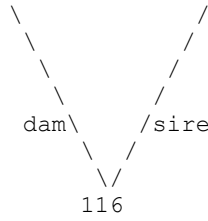
NATIONAL STUDBOOK PIG TAILED MACAQUE (*MACACA LEONINA*) II EDITION

=====  
 Taxon Name: MACACA LEONINA

Studbook Number: 116  
 =====

WILD

WILD



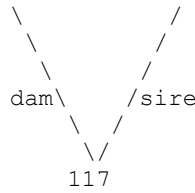
Sex: Male  
 Birth Date: ????  
 Last Location: DIMAPUR  
 House Name: BAB00  
 Tattoo:  
 Tag/Band:

=====  
 Taxon Name: MACACA LEONINA

Studbook Number: 117  
 =====

WILD

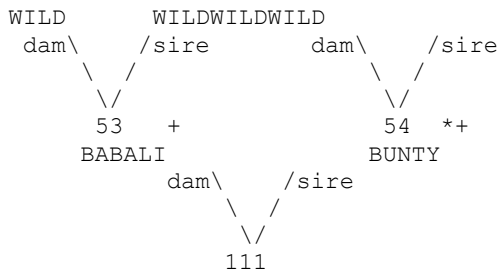
WILD



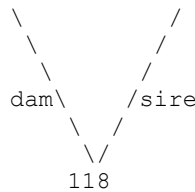
Sex: Male  
 Birth Date: ????  
 Last Location: DIMAPUR  
 House Name: BORA  
 Tattoo:  
 Tag/Band:

=====  
 Taxon Name: MACACA LEONINA

Studbook Number: 118  
 =====



WILD WILD
 dam\ /sire
 \ / \
 V V
 54 \*+
 BUNTY
 Sex: Female
 Birth Date: 4 Aug 2017
 Last Location: VADODARA
 House Name:
 Tattoo:
 Tag/Band:



+ Wild-caught... \* Appear more than once...

=====  
 Taxon Name: MACACA LEONINA

Studbook Number: 119  
 =====

WILD

WILDWILDWILD



NATIONAL STUDBOOK PIG TAILED MACAQUE (*MACACA LEONINA*) II EDITION

```

dam\      /sire
 \      /
  48  +
 NUTEI

dam\      /sire
 \      /
  41  +
 HUNTER
 Sex: Female
 Birth Date: 6 Jun 2012
 Last Location: AIZAWL
 House Name: LATEI
 Tattoo:
 Tag/Band:

+ Wild-caught...
dam\      /sire
 \      /
  119

```

=====

Taxon Name: MACACA LEONINA

Studbook Number: 121

=====

```

WILD      WILDWILDWILD
dam\      /sire
 \      /
  48  +
 NUTEI

dam\      /sire
 \      /
  41  +
 HUNTER
 Sex: Male
 Birth Date: 6 Apr 2014
 Last Location: AIZAWL
 House Name: PUIA
 Tattoo:
 Tag/Band:

+ Wild-caught...
dam\      /sire
 \      /
  121

```

=====

Taxon Name: MACACA LEONINA

Studbook Number: 122

=====

```

WILD      WILDWILDWILD
dam\      /sire
 \      /
  55  +
 GORI

dam\      /sire
 \      /
  41  +
 HUNTER
 Sex: Female
 Birth Date: 15 Feb 2016
 Last Location: AIZAWL
 House Name:
 Tattoo:
 Tag/Band:

+ Wild-caught...
dam\      /sire
 \      /
  122

```

=====

Taxon Name: MACACA LEONINA

Studbook Number: 123

=====

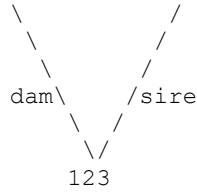
```

WILD      WILDWILDWILD
dam\      /sire      dam\      /sire
 \      /            \      /
  48  +              41  ++
 NUTEI              HUNTER
dam\      /sire
 \      /
WILD      WILD
dam\      /sire
 \      /

```

NATIONAL STUDBOOK PIG TAILED MACAQUE (*MACACA LEONINA*) II EDITION

\\  
119  
LATEI



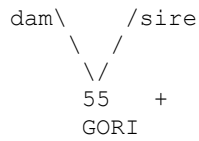
\\  
41 \*\*  
HUNTER  
Sex: Male  
Birth Date: 20 Feb 2016  
Last Location: AIZAWL  
House Name:  
Tattoo:  
Tag/Band:

+ Wild-caught... \* Appear more than once...

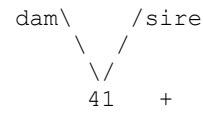
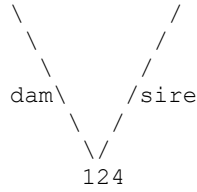
=====  
Taxon Name: MACACA LEONINA

=====  
Studbook Number: 124  
=====

WILD



WILDWILDWILD



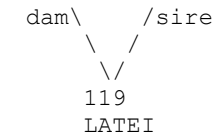
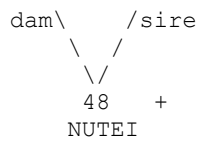
Sex: Male  
Birth Date: 21 Jan 2017  
Last Location: AIZAWL  
House Name: FAKA  
Tattoo:  
Tag/Band:

+ Wild-caught...

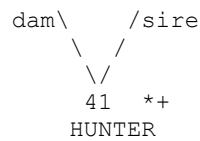
=====  
Taxon Name: MACACA LEONINA

=====  
Studbook Number: 125  
=====

WILD

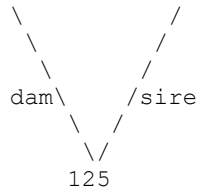


WILDWILDWILD



WILD

WILD



```

    dam\ /sire
        \ /
         41 **
        HUNTER
    Sex: Male
    Birth Date: 13 Feb 2017
    Last Location: AIZAWL
    House Name: KIMA
    Tattoo:
    Tag/Band:
    
```

+ Wild-caught... \* Appear more than once...

## Location Glossary

<b>AHMEDABAD</b>	<b>Kamla Nehru Zoological Garden, Ahmedabad</b>
AIZAWL	Aizawl Zoological Park, Aizawl
ASSAM	Assam State Zoo cum Botanical garden, Guwahati
BANNERGHA	Bannerghata Biological Park, Bengaluru
BHILAI	MaltriBagh Zoo, Bhilai
BURMA	Myanmar
CALCUTTA	Alipore Zoological Garden, Kolkatta
CHATBIR Z	M.C. Zoological Park, Chat-bir, Mohali
DELHI	National Zoological Park, New Delhi
DIMAPUR	Nagaland Zoological Park, Dimapur
HYDERABAD	Nehru Zoological Park, Hyderabad
INDIA	All animals of wild origin
KANPUR	Kanpur Zoological Park, Kanpur
LUCKNOW	NawabWazid Ali Shah Zoological Garden, Lucknow
MADRAS	Arignar Anna Zoological Park, Chennai
SEPAHIJAL	Sepahijal Zoological Park, Agartala
VADODARA	Sri SayajiBaug
VOC PKZOO	V.O.C. Park Zoo, Coimbatore
YANGON ZO	Zoological Gardens Union of Myanmar, Yangon