NATIONAL STUDBOOK

RED PANDA *(Ailurus fulgens fulgens)*

Published as a part of the Central Zoo Authority sponsored project titled
Development and maintenance of studbooks for selected endangered species in Indian zoos

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Central Zoo Authority

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FOREWORD

For species threatened with extinction in their natural habitats, ex-situ conservation offers an opportunity for ensuring their long-term survival. Maintaining genetically viable and demographically stable populations in captivity can ensure their sustained survival. This can be ensured by using pedigree information contained in studbooks that form the key to understanding the demographic and genetic structure of populations and taking corrective actions as required for effective management of captive populations. Studbooks also provide an insight into the mating choices that can be exercised to maximize retention of genetic diversity.

The Central Zoo Authority (CZA) 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 an updated National studbook for Red panda *(Ailurus fulgens fulgens)* in Indian zoos. The population management recommendations contained in the studbook should 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.

(B.S. Bonal, I.F.S.)
Member Secretary
Central Zoo Authority

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1. Himalayan Zoological Park, Gangtok
2. Kamla Nehru Zoological Garden, Ahmedabad
3. Kanpur Zoological Park
4. Padmaja Naidu Himalayan Zoological Park, Darjeeling

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Red Panda (*Ailurus fulgens fulgens)*

The first recorded entry of a Red panda in captivity in India was in 1977 at Kanpur zoo. However, a planned *ex-situ* conservation effort for the species was initiated in 1991 at Padmaja Naidu Himalayan Zoological Park, Darjeeling with 4 wild-born and 5 captive-born individuals from zoos outside India. Subsequently in 1994, Himalayan Zoological Park, Gangtok became a partner in India s effort of maintaining a viable captive population of the species. In 2003, two females were released in Singalila National Park.

Species biology
Taxonomy

Kingdom: Animalia
Phylum: Chordata
Class: Mammalia
Order: Carnivora
Family: Ailuridae
Genus: *Ailurus*
Species: *Ailurus fulgens*
Sub-species: *Ailurus fulgens fulgens*
Species Authority: F. Cuvier, 1825
Common names- Lesser panda, Red cat-bear, Red panda

Red panda is a monotypic species in the family Ailuridae. There are two subspecies of Red panda *A. F. fulgens* and *A. F. styani* (Wei *et. al*. 1999a).

General characteristics
The species is characterized by a brown reddish-orange pelage of coarse guard hairs across its body, with a soft, dense woolly undercoat. The species has a rounded head and a shortened rostrum with large, erect and pointed ears (Miles and Gittleman 1984).

Morphometry (Miles and Gittleman 1984)

Weight	Males- 5.0 kg (range: 3.7-6.2 kg) Females-4.9 kg (range 4.2-6.0 kg)
Length of head and body	560-625 mm
Length of tail	370-472 mm

Red pandas reach sexual maturity at the age of 18 20 months, and are seasonally polyestrous and induced ovulators (Wei *et. al.* 2005). The estrous season occurs over the period of mid-January to mid-March (Spanner *et. al*.1997 and Li *et. al.* 2005). Parturition occurs in June and July following 111 145 days gestation (Roberts and Kessler 1979). Nowak (2005) and Roberts (1981) noted a mean gestation

length of 132 (range=114 to 145) and 133 (range=115 158) days respectively. The high variability of gestation length suggests the Red panda has a period of diapause or a delay in implantation, as suggested by Nowak (1991).

Habitat

The species is endemic to the temperate montane forests in the eastern Himalayas. Their habitat type is characterized by mixed deciduous and conifer forests having an understory of bamboo and hollow trees (Glatston 1994; Roberts and Gittleman 1984). They inhabit an altitudinal gradient between 1500 4800 m (Roberts and Gittleman 1984). Williams (2003) observed highest concentration of the species between 2800 3000 m.

Feeding ecology

Red pandas have a simple stomach, a short gastrointestinal tract and lack cecum (Stevens and Hume 1995). The simple structure of their digestive system limits the ability to process their low protein and fibre rich diet. In order to meet its nutritional requirements and to cope with this herbivorous diet while retaining the unspecialized digestive tract of a carnivore, it has evolved different morphological, physiological and behavioural strategies to deal with limitations of its diet:

1) Skull and teeth adaptations for effective mastication,
2) Ability to select the most nutritious parts of bamboo,
3) Daily consumption of large amounts of food and rapid passage time of digesta to maximize the rate of energy intake, and
4) Low metabolic rate that reduces energy requirements (Wei et al.1999b).

Red pandas are specialized bamboo-feeders like the giant panda (Roberts and Gittleman 1984; Glatston 1989, 1994; Wei *et al.* 1999a) with a diet consisting of bamboo leaves throughout the year, bamboo shoots during spring and fruits and mushrooms during autumn (Johnson *et. al.*1988; Yonzon 1989; Reid *et. al.* 1991; Yonzon and Hunter 1991a, b; Hu and Wei 1992; Wei *et. al.* 1995). Bamboo leaves and shoots account for >95% of the annual diets (Reid *et. al.* 1991; Wei *et. al.* 1995 and Wei 1997).

Activity pattern

In captivity Red pandas are nocturnal and crepuscular and exhibit a polyphasic activity pattern throughout the night. The activity patterns vary according to the temperature, feeding regimes and presence of young (Keller 1977 and Roberts 1981); however they have been reported to be most active during dusk, night and at dawn (Anon 1978). They are arboreal, living mostly in trees (Glatston 1994). In the wild, they rest and sleep on trees or elevated surfaces and can be located in steep slopes where fallen logs, scrubs and bamboo are common (Wei *et. al.* 2000a). They are scansorial but foraging is done primarily on the ground. Their behavioural repertoire includes scent marking behaviour, a tendency to maintain personal distance except during breeding season, the propensity to climb and hide from disturbances such as loud noises, natural foraging feeding activities, breeding associated activities, young rearing behaviours, and sleep.

Social and breeding behaviour

Red pandas lead a solitary life during the non-breeding season and are found in small groups during the breeding season (Hu 1991 in Wei *et. al.* 2005). Although little is known about their natural mating system, in captivity it has been observed that, at the onset of the mating season, both males and females rest, move and eat in close proximity. Due to their crepuscular behaviour, even in captivity, it is quite rare to observe the mating of Red pandas. A noticeable change in the behaviour of the animals can signify that a mating has occurred. Scent-marking rates increase in both the sexes and males spend significantly greater time examining trails and fecal and urine markings of females. Copulation takes place on the ground following a mount invitation by the female and lasts for 3-39 minutes. At the end of the copulation males and females separate and engage in long bouts of genital auto grooming (Keller 1977; Roberts 1980 and Roberts and Kessler 1979). After mating has occurred the animals often separate and stay away from each other.

Distribution

The Red pandas present distribution extends from Nepal through Bhutan, India, Burma and Myanmar in the Himalayas, to China (Roberts and Gittleman 1984 and Glatston 1994). The subspecies *A. f. fulgens* is distributed all over Himalaya: in Nepal, India, Bhutan, northern Myanmar and the southwest of China, and the subspecies *A.f. styani* is found in south-central China (Choudhury 2001).

Figure 1: Geographic range of Red panda (Wang *et al.* 2008)

The distribution of Red pandas is restricted to temperate forests at an altitude between 1500-4800 m. (Roberts and Gittleman 1984 and Glatston 1994). However, Yonzon and Hunter (1991b) only found the species at an altitude between 2800-3900 m. The same observations were made by Pradhan *et. al.* (2001) who observed the species more frequently at an altitude of 2800-3600 m and Williams (2003) who found that the concentration of Red pandas were higher at an altitude between 2800-3000 m.

Status in the wild

The species is in danger of extinction due habitat loss caused by deforestation (Glatston 1994 and Wei *et. al.* 1999a). The declining panda population is also vulnerable to poaching and illegal trade (Glatston 1994 and Wei *et. al.* 1999a). In 2001 the wild population was estimated to 16.000-20.000 individuals (Choudhury 2001).

The species is therefore listed in the IUCN red list as an endangered species with a very high risk of extinction in the wild (Wang *et. al.* 2008). Since 1995 the species is also listed by CITES as an Appendix I species (Duckworth *et. al.* 1999). The species enjoys legal protection across its range. In India it is listed in the Wildlife Protection Act as a Schedule I species and in China as Category II species under the Chinese Wild Animal Protection Law.

An effort at reintroduction of the species was initiated in August 2003 with the release of two females in Singalila National Park. One of the females reproduced in 2004 and they were last recorded a month after this event (Glatston and Leus 2005). The other female was killed by a clouded leopard. In November 2003 two more captive females were released at the same site.

Status in captivity

The management of the global captive population of Red panda was initiated in five regions: Australasia, British Isles, Continental Europe, North America and a rest population (mainly Asia) (Glatston 1982) which are currently being coordinated as a global management program under the auspices of the International Studbook and the International Red panda management group. Currently coordinated breeding programmes across 5 regions are being implemented with the objective of maintaining self-sustaining populations for educational purposes and insurance.

A total of 448 Red pandas (208 males, 232 females, 8 unknown) are currently maintained in captivity in 177 institutions across 5 continents (downloaded on 12th March 2014). In India the species is currently housed in two institutions namely Padmaja Naidu Himalayan Zoological Park, Darjeeling and Himalayan Zoological Park, Gangtok.

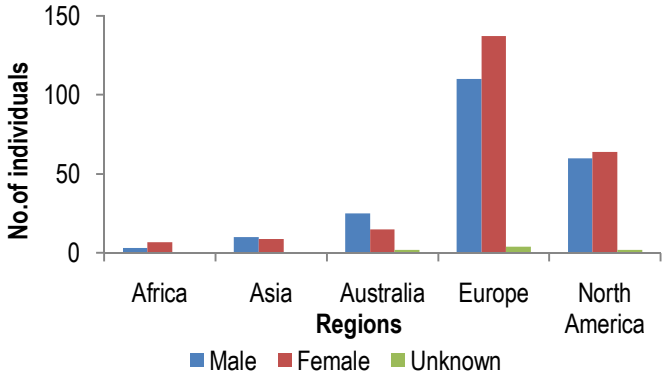


Figure 2: Global status of captive Red panda as on March, 2014

The first Indian National Studbook for Red panda *(A. f. fulgens)* was published in 2009 (Srivastav *et. al.* 2009) and was later updated in 2011 (Nigam *et. al.* 2012). As on December 2013, a total of 90 (45.44.1) individuals have been recorded.

Table 1: Status of Red panda in Indian zoos (December 2013)

Location	Total no. of individuals (M.F.U)	Living individuals (M.F.U)	Time span during which Red pandas were kept (years)	Births (M.F.U)	Deaths (M.F.U)
Ahmedabad	0.1.0	0.0.0	1990-93 (4)	0.0.0	0.1.0
Darjeeling	28.30.1	10.6.1	1991-14 (24)	21.23.1	15.20.0
Gangtok	18.11.0	7.6.0	1997-14 (18)	13.8.0	6.4.0
Kanpur	3.3.0	0.0.0	1977-85 (9)	1.1.0	3.3.0

This includes animals that have been transferred from one location to another

METHODS

Data on individual history was collected by means of questionnaires, zoo visits and from the websites of CZA and ZIMS (Zoological Information Management System). Questionnaires were sent to the four institutions to have housed Red pandas in India, requesting information for each captive specimen either housed at present or in the past. Data was entered in the Single Population Analysis and Records Keeping System (SPARKS *v* 1.66) (ISIS 2004) and subsequently exported to population management program PMx *v* 1.2 (Ballou *et. al.* 2010). Data was exported from SPARKS and used as input files in PMx for further analysis. Further visualization and analysis of pedigree data was performed using the program Lineage *v* 1.06 (Pollak *et. al.* 2001).

Scope, assumptions of the studbook and data quality

This edition of the Indian Red panda studbook contains data current through 31 December 2013. . The studbook contains all information received from institutions on captive individuals held currently or in the past and also includes individuals from zoo populations outside India that had been introduced in the Indian population. In some cases birth dates are estimated, *e.g.* wild-born individuals, where the exact birth dates are unknown; the institution s estimated birth dates have been used. The analysis of data is based on the total number of individuals, parentage records and life-history records of each individual.

The quality of data used for performing the analysis is presented in Figure 3. Birth date estimates were available for 12 of the 15 wild born individuals. Information on dates of entry through births, acquisitions from zoos outside India and wild captures were available for all the individuals included in the studbook. Parentage details were available for 66 of the 75 captive born individuals. Information on dates of exit of specimens by way of death, escape, release and transfer were available for all such events.

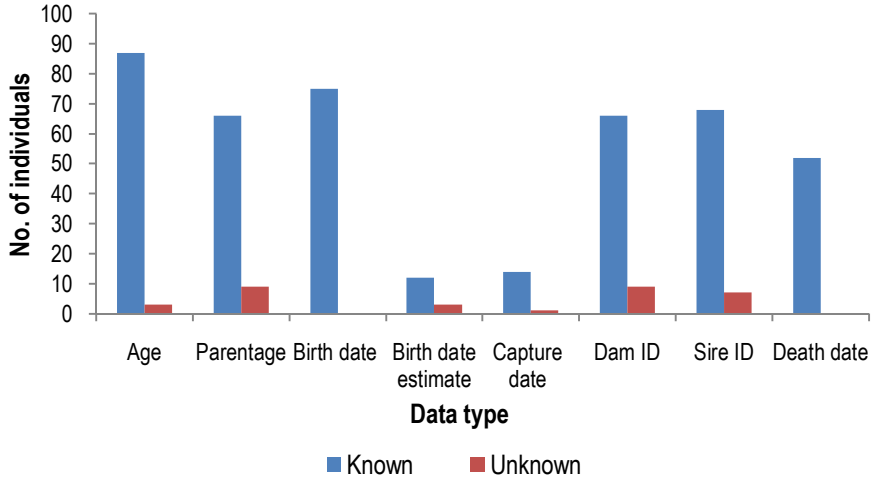


Figure 3: Data quality of captive population of *Ailurus fulgens fulgens*

Analysis

DEMOGRAPHY

In India, Red pandas (2.2.0) were first housed at Kanpur zoo in 1977. Over the next 7 years the numbers declined due to mortalities and no individuals were present in captivity during 1985-1990. During 1977-1985, births were recorded in Kanpur but they survived for less than 30 days in captivity. In 1991, four wild-born individuals were brought into captivity at Darjeeling and the captive birth occurred in 1994. There was a period of rapid decline in the population size during 2001-2004 resulting from an increase in the number of mortalities (N=13).

Table 2: Summary of the historical population

	Males	Females	Unknown	Total
Total studbook size	45	44	1	90
Total number of acquisitions from wild	7	8	0	15
Total number of births	34	33	1	68
Total number of imports	3	4	0	7
Total number of deaths	24	28	0	52
Total number of breeding individuals	13	14		27
Wild-born that have bred	5	4		9
Captive-born that have bred	5	9		14
Unknown origin	3	1		4

CENSUS TRENDS

The captive population consists of 90 individuals (45.44.1), recorded over 1977- 2013. These include 15 (7.8.0) were wild-born and 75 (38.36.1) captive-born individuals. Among the captive-born individuals 68 (34.33.1) were born in Indian zoos while 7 (3.4.0) were imported from institutions outside India. An overview of the captive population is provided in Table 2 and the census trends of this population are presented in the figures 4 and 5.

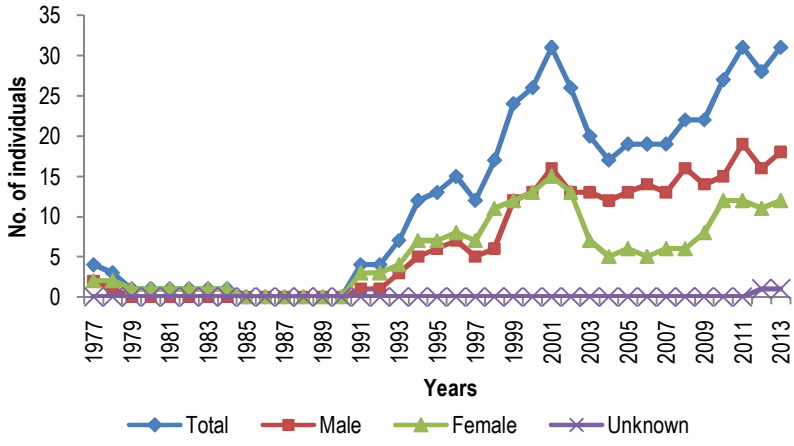


Figure 4: Sex-based census trends of captive Red panda population

As inferred from Figure 4 the sex ratio was equitable till 2001, however; it became male-biased subsequently resulting in reduced reproductive output and population growth.

Analysis of the origin-based census trends of the population (Figure 5) indicates that the growth in population since 1994 was mainly due to captive births and no wild-born individuals were brought into captivity during 1994-2004. It suggests that the population includes limited number of wild-born individuals resulting in a reduced genetic diversity in the captive population.

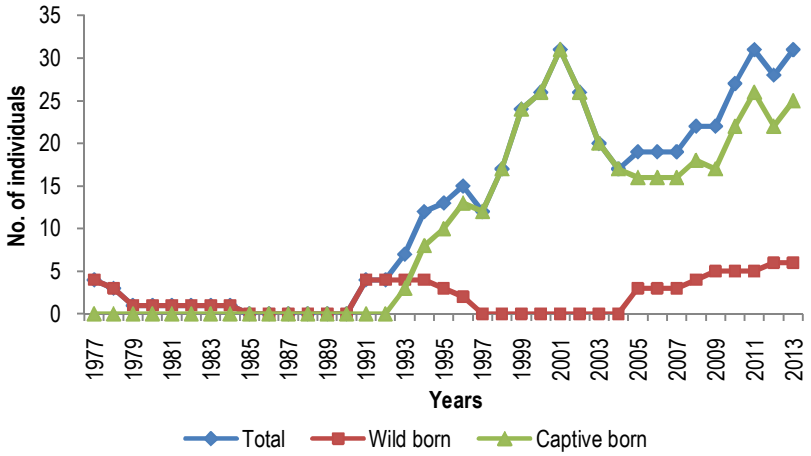


Figure 5: Origin-based census trends of captive Red panda population

BIRTH SEASONALITY

Free-ranging Red pandas are seasonal breeders with reproductive activity being initiated from end of January to beginning of February with cubs being born in June. Similar trends were observed in the Indian captive population. Figure 6 shows the seasonality of births with 78.5% of births occurring in June.

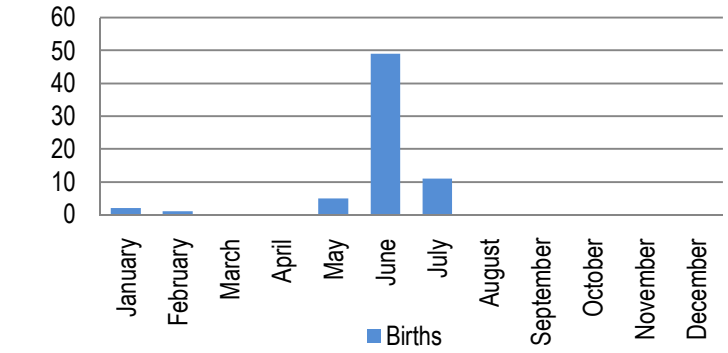


Figure 6: Birth seasonality of the captive Red panda population

Age-sex structure

The age structure of 28 known age individuals in the current population is presented in Figure 7. Birth dates for all the captive-born individuals and birth date estimates for 4 wild-born individuals were available. The median age of these individuals was 5.7 years (6.44Mean±4.12SD). Gaps are present in several age-classes and most age-classes have only one

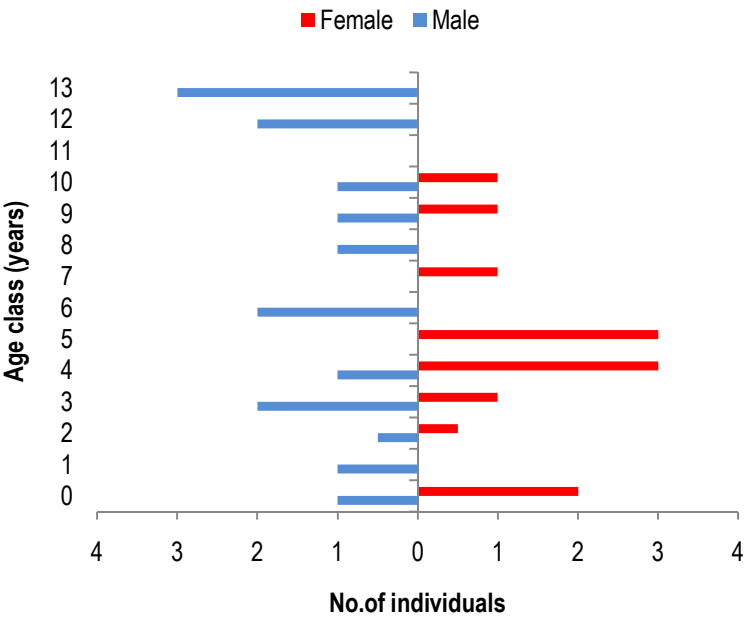


Figure 7: Age- sex structure of the living Red panda population (including NSN 42 that was transferred to Auckland zoo)

individual of each sex. The population includes 6 males and 8 females in the reproductively active age-classes and 5 individuals (2.2.1) in the pre-reproductive age. This indicates that the population can increase at a higher rate.

BREEDING POPULATION

A total of 27 (14.13) animals contributed to the 68 births recorded in captivity. Figure 8 shows the breeding population in proportion to the total population over the years. Since the first birth recorded in Darjeeling in 1994, the breeding population corresponded to a median of 17.1% (18.9$_{Mean}$±9.7$_{SD}$) of the total population. Highest breeding was recorded during 1996-2000 when the breeding population corresponded to 23-33% of the total. No breeding was recorded for 2 years (2004-2005). The graph shows that overall a very small number of individuals have bred in the population (Median= 4; 3.75$_{Mean}$±2.27$_{SD}$). Moreover, majority of the births were contributed by parental (F_0) and first generation (F_1) individuals. F_0 and F_1 generation females contributed to 72.1% births. In males the F_0 and F_1 generation contributed to more than 80% of the births. The number of males and females contributing to the breeding population are summarized in Tables 3 and 4 respectively. Since breeding in the population has taken place between individuals of different generations, the infants contributed by parents of different generations are indicated by fractional numbers. Individuals of F_1, F_2 or F_3 generations indicate that both their parents belonged to the previous generation. The mean number of infants contributed by the reproducing females of the parental generation was 4.6 which increased to 8.66 infants in the F_1 generation.

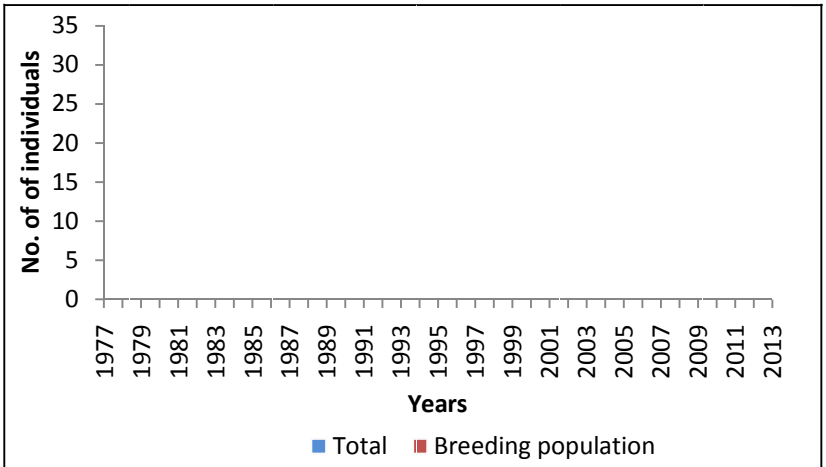


Figure 8: Breeding population in proportion to the total population

Table 3: Reproductive output per generation per male

Generation	No. of males	No. of reproducing males	No. of offspring/ generation/ male	Mean no of offspring/reproducing male
0	10	8	47	5.875
1	5	1	8	8
1.6	5	0	0	0
1.7	4	0	0	0
2	16	4	13	3.25
2.3	1	0	0	0
3	6	0	0	0

Table 4: Reproductive output per generation per female

Generation	No. of females	No. of reproducing females	No. of offspring/ generation/ female	Mean no of offspring/ reproducing female
0	12	5	23	4.6
1	6	3	26	8.66
1.6	4	3	8	2.66
1.7	3	0	0	0
2	16	3	9	3
2.3	1	0	0	0
2.8	1	0	0	0
3	1	0	0	0

POPULATION GROWTH PATTERNS

Species included in conservation breeding programmes are targeted at being managed as genetically viable and demographically stable populations. The initial objective is to achieve a rapid increase in the size of the population, so as to allow for standardization of husbandry techniques for the species and provides the number of specimens that are amenable to management interventions aimed at maintaining genetically viable populations capable of providing surpluses for reintroduction. A population s growth is determined by the interaction between its age-specific patterns of birth and death with its structure. These patterns are effectively summarized as life-tables. The two important components of a life table are the age specific fecundity and age specific mortality. The two together provide an insight to population growth rates.

LIFE TABLES

The mortality and fertility rates are based on data for 87 individuals with precise birth dates for 75 captive-born individuals (68 individuals born in Indian zoos and 7 born outside India), birth date estimates for 12 wild-born individuals and death dates of 52 recorded mortalities, as obtained from the holding zoos. All life-table calculations are based on a sample size of 1-16 individuals per age-class and hence should be viewed with caution.

Table 5: Life table of Red panda population in Indian zoos

Age (years)	Male		Female	
	Qx	Mx	Qx	Mx
0	0.15	0	0.16	0
1	0.1	0.036	0.1	0.142
2	0.1	0.129	0.07	0.135
3	0.08	0.117	0.04	0.263
4	0.09	0.352	0.21	0.267
5	0.06	0.287	0	0.142
6	0	0.206	0	0.449
7	0	0.258	0.1	0.428
8	0.07	0.286	0.22	0.114
9	0.08	0.083	0.14	0.064
10	0	0.054	0.13	0
11	0.1	0	0	0

Age (years)	Male		Female	
	Qx	Mx	Qx	Mx
12	0	0.134	0.17	0.171
13	0.4	0.213	0.4	0.205
14	0	0.265	0.33	0.256
15	1	0	0.83	0
16	1	0	0	0
17	1	0	0	0

Where Qx = Mortality; Mx = Fecundity

Age-specific fecundity

Age-specific fecundity for the Red panda population in Indian zoos is based on a small sample size of 27 (13.14). Females exhibit the onset of reproductive activity between 1-2 years of age with a peak in reproductive output in the 6th and 7th years. Figure 9 presents the fecundity rates of the species maintained in Indian zoos. In males reproductive activity is initiated after they are 2 years of age and continues till they are 8 years of age. The increase in reproductive activity observed during the 12th- 14th year for both males and females can be attributed to the proportion of reproductively active individuals surviving to these age-classes whereas the actual number of individuals is very low (N=2).

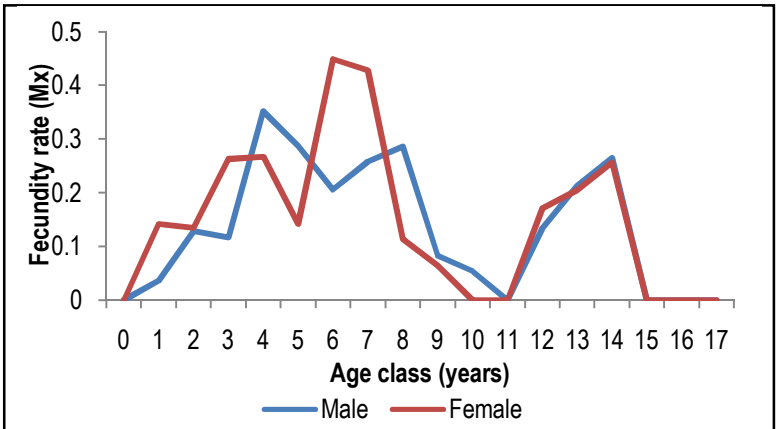


Figure 9: Fecundity rates in the captive population of Red panda

Mortality

A total of 52 (24. 28) mortalities with a median of 1 (1.41±1.8) death per year have been recorded. Around 26.5% (N=18) of the captive-born individuals died before reaching the age of sexual maturity (22 months). Figure 10 represents the mortality rates in *A. f. fulgens*. The mortality rate (Q*x*) of an age class is the proportion of individuals belonging to that age class that die before reaching the next age class. Mortality in the first year (age class 0) is close to 16% (0.16 and 0.15 for females and males, respectively) of which 55% occurred within a period of 30 days from birth. High mortality in captive infant pandas has been reported by Yinghong (1994). As presented in Figure 9, mortality drops beyond the first year and lies at a mean of 6.8% for males and 9.2% for females until 11 years. After 12

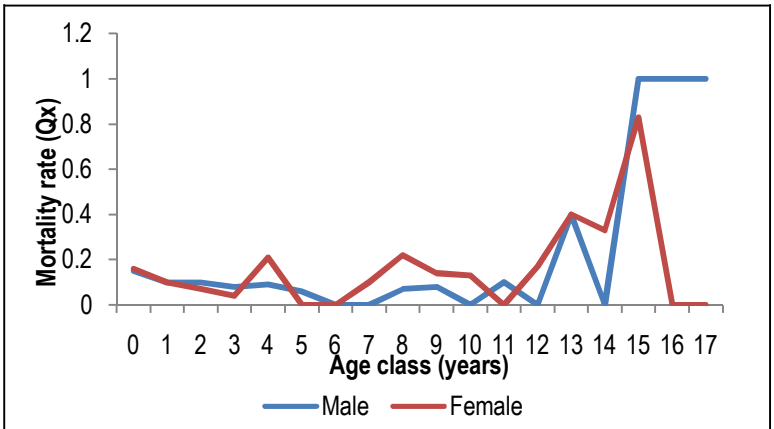


Figure 10: Mortality rate in the captive population of Red panda

years, mortality starts to increase. Of the seven captive-born individuals in the historical population to have lived for more than 11 years, only 2 survived till 15 years. The oldest captive-born male has lived for 15 ears, 8 months and 29 days. For females the corresponding age was 15 years, 2 months and 20 days.

Life-table summary

Table 6: Red panda life-table summary

	Male	Female	Total
Instantaneous rate of change (r)	0.029	0.042	0.036
Population growth rate (λ)	1.030	1.043	1.037
Mean generation time (T)	6.2	5.0	5.6

The parameters shown in table 6 indicate the rate of change in the population (r and λ), the mean generation time (T). The Red panda population has a growth of the 2.9% in males and 4.2% in females, while the lambda is also greater than one in both sexes. The values indicate a growing population. However the growth rates are inadequate to achieve the population goals.

Over the past years the mean generation time for males has been 6.2 years and 5 years for females. The animals are reproductively active at around two years of age and the longer generation times therefore ensure that loss of genetic diversity due to genetic drift is minimised. However it also limits the population growth rate.

Instantaneous rate of change (r): The rate of change in population size at any instant in time. Values of r > 0, indicates the population is increasing; if r = 0, the population is stable; if r < 0, the population is declining.

Population growth rate (λ): The proportional change in population size from one year to the next. The value of λ can be based on life table calculations (expected λ) or from observed changes in population size from year to year. If λ, > 1, the population is increasing; if λ = 1.0, the population is stable or sustaining; if λ < 1.0, the population is declining.

The mean generation time (T) reflects the relative size of intervals of offspring production. It is the average time elapsing from reproduction in one generation to the time the next generation reproduces.

Population projections

The population projections simulation (Figure 11) carried out suggests that the current population without supplement has the potential to increase to 62 individuals over the next 20 years. This increase in population size would however be accompanied by a reduction in genetic diversity due to genetic drift.

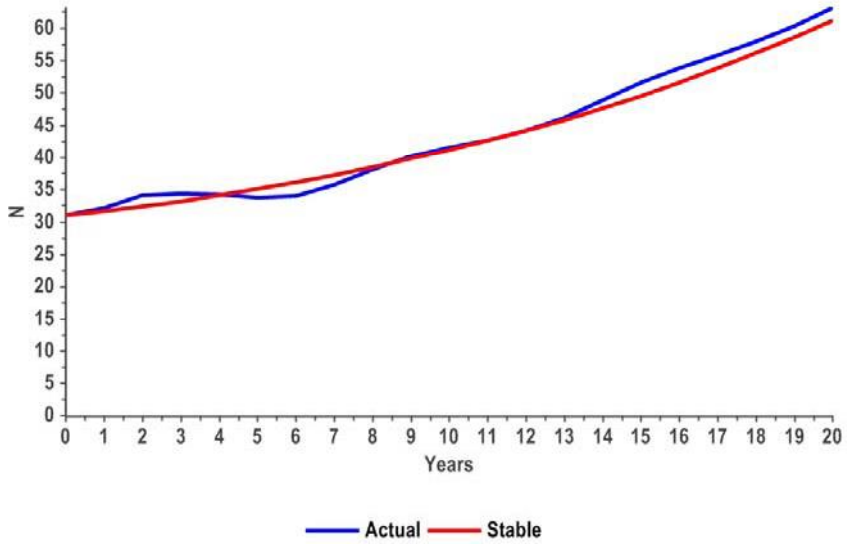


Figure 11: Population projections for 20 years

Living population

As on December 2013, the current captive population of Red panda comprises of 29 individuals (16.12.1) (excluding NSN 42) housed at two facilities, located in Darjeeling, West Bengal and Gangtok, Sikkim. Of these 6 (4.2.0) are wild-born and 23 (12.10.1) are captive-born individuals. An overview of the current captive population is provided in Table7 and the list of living individuals is provided in Appendix II.

Table 7: Summary of the living population

	Male	Female	Unknown	Total
Total number of individuals	16	12	1	29
Total number of wild-born individuals	4	2	0	6
Total number of captive-born individuals	12	10	1	23
Total number of breeding individuals	6	7	0	13
Wild-born that have bred	3	2	0	5
Captive-born that have bred	3	5	0	8

Population changes

A total of 15 (7.8.0) wild-born individuals were added to the population. The median age at capture, as available for 12 individuals was 1.71 years ($4.07_{Mean} \pm 4.18_{SD}$). The wild-born individuals spent a median of years 5.07 years ($5.12_{Mean} \pm 2.69_{SD}$) in captivity. During the last two decades (1995-2014), the number of imports from the wild has decreased with 6 wild-born individuals added to the captive population and only 1 individual imported from Auckland zoo in 2002 (Figure 12). While an average of 0.2 (N=2) cub were born each year during the first 10 years, this increased to 0.7 during 1987-1996, to culminate during 1997-2006 when a mean of 3.5 cubs were born each year. During the last seven years, the number of annually bred cubs has ranged from 2 to 6 with a mean of 3.42 cubs/ year.

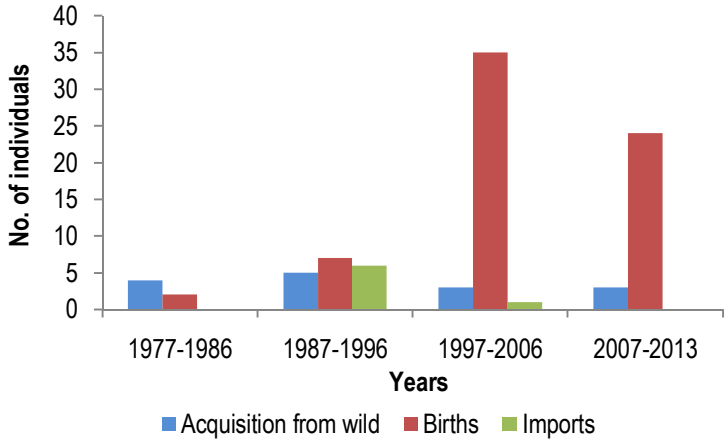


Figure 12: Decadal changes in the Red panda captive population

GENETIC ANALYSIS

Historical population

The Red panda population is characterized by overlap of generations, inbreeding and unequal family sizes as represented in Figure 13. A large number of individuals have not bred at all in each generation and there is a large variation in the reproductive output of the individuals (only 2 males and 2 females have contributed to more than 33% and 36% of total births respectively). A small proportion of breeding individuals and variation in the number of off springs has resulted in the low genetic diversity in the population. Another important consequence of small populations and few breeders in the Red panda captive population is increase in relatedness caused by the small number of individuals in the breeding pool (Figure 8; Tables 3 and 4), therefore limiting mating choices.

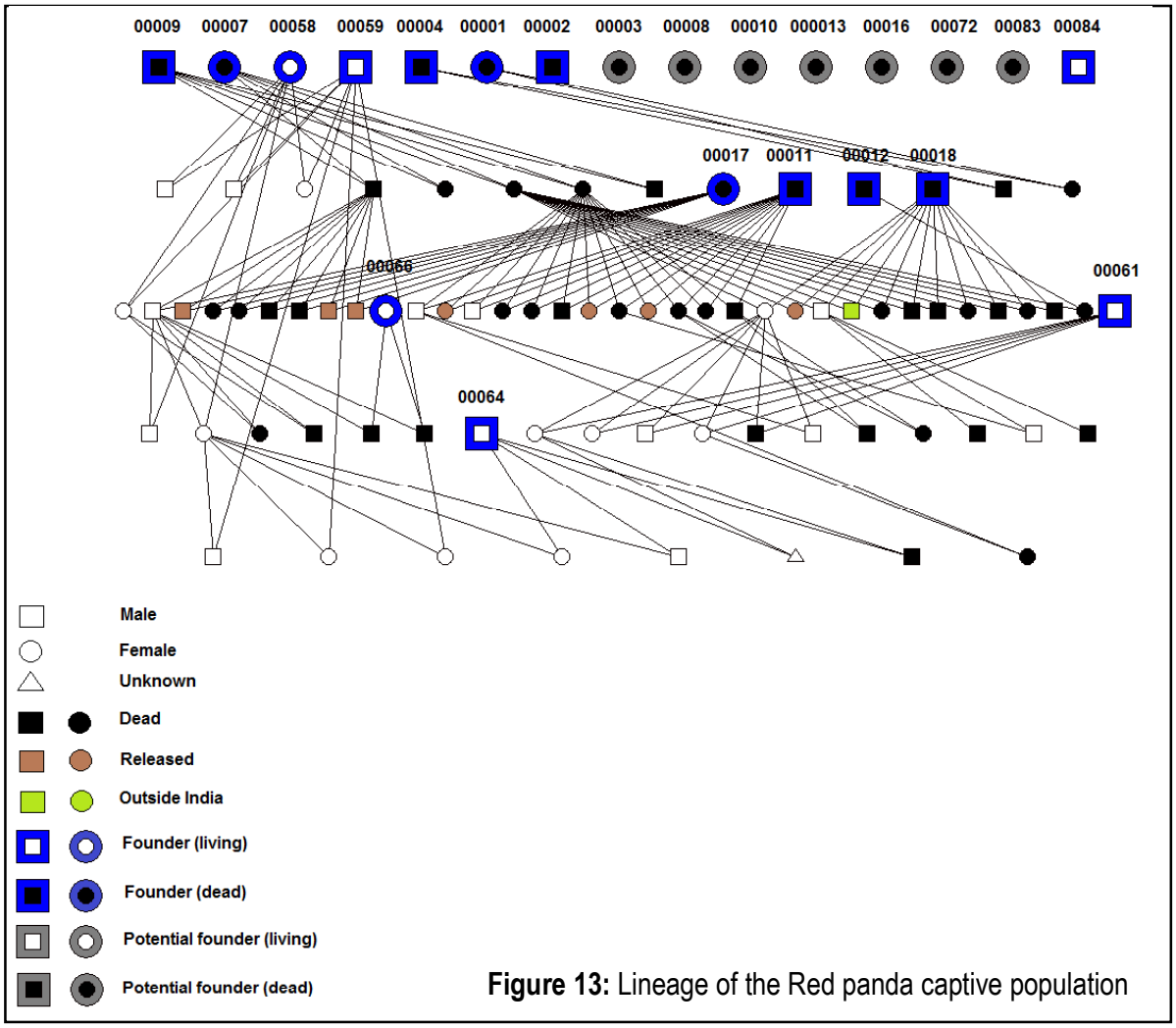


Figure 13: Lineage of the Red panda captive population

Living population

As on December 2013, the living population consists of 18 descendants from the historical population, 4 founders and 2 potential founders. 77% of the living individuals pedigree could be completely identified and traced back to known founders.

The current gene diversity is 0.8832. Majority of the current population is contributed by F_0 and F_1 generation individuals. Based on birth date estimates and dates of capture, the median age of the founders was 9.465 years ($9.41_{Mean} \pm 1.14_{SD}$) and among the two potential founders, one was 5 years old and the age estimate for the other was not available. The genetic status of the current population is summarized in Table 8.

Table 8: Genetic summary of the captive Red panda population

Founders	6
Potential founders	2
Founder genome equivalents (FGE)	3.85
Potential Founder genome equivalents (FGE)	7.53
Gene diversity	0.8703
Potential gene diversity	0.9333
Population mean kinship	0.1297
Mean inbreeding coefficient	0.0169

Gene diversity

Gene diversity is the principal measure of genetic diversity in populations and ranges between 0 and 1. The gene diversity retained in the current population is 0.8862 signifying that the population has retained only 88.62% of the founder gene diversity. There is a further likelihood of loss of genetic diversity with each subsequent generation. An equitable representation of founder genome can raise the genetic diversity in the population to 93.33%. This will also ensure an improved FGE from the current level of 3.85 to almost double.

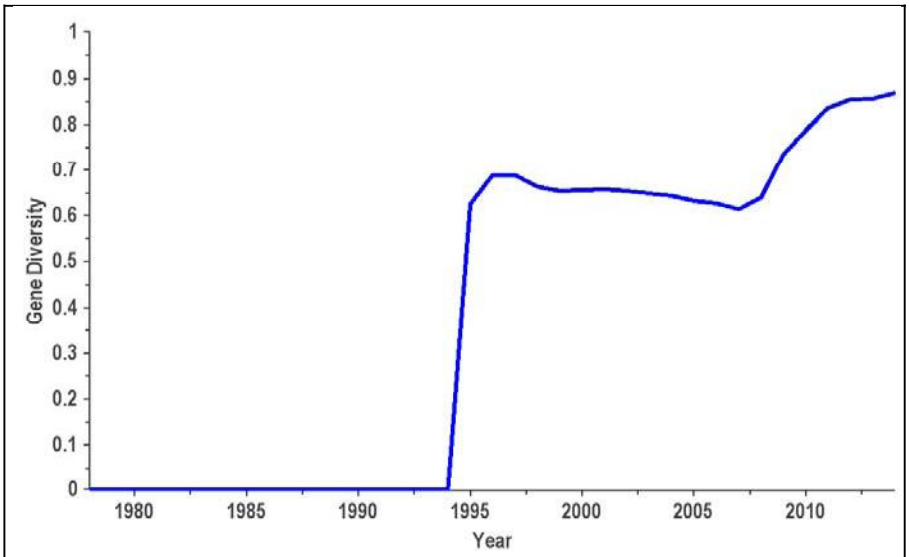


Figure 14: Gene diversity retained in the Red panda population over time

The genetic diversity retained over time in the captive population shows that initially due to an absence of captive births all the genetic diversity brought into captivity were lost. However subsequent to the first surviving captive birth in 1994 the population started retaining the genetic diversity introduced by way of founders. From 1996 2008 the genetic diversity retained by the population remained in the range of

60 70% of that introduced by way of founders. After 2008 intensive population management efforts have once again raised the genetic diversity to the current level of approximately 87%. This is also below the desired 90% - 100 year rule as populations tend to lose genetic diversity due to genetic drift with each generation.

Founder representation

The population includes 15 wild-born individuals, of these 9 have contributed to the gene pool (Table 7), 4 died without breeding and 2 individuals are yet to breed. Of the 7 individuals to have been added from zoos outside India, 4 contributed to breeding while 3 died without breeding. Of the 9 wild-born Red pandas which have bred, breeding success has been variable. Due to varying breeding success, the founder representation among the Red pandas is therefore highly skewed. Some individuals are over-represented at the expense of others that remain underrepresented or find no representation at all in the gene pool of the captive population.

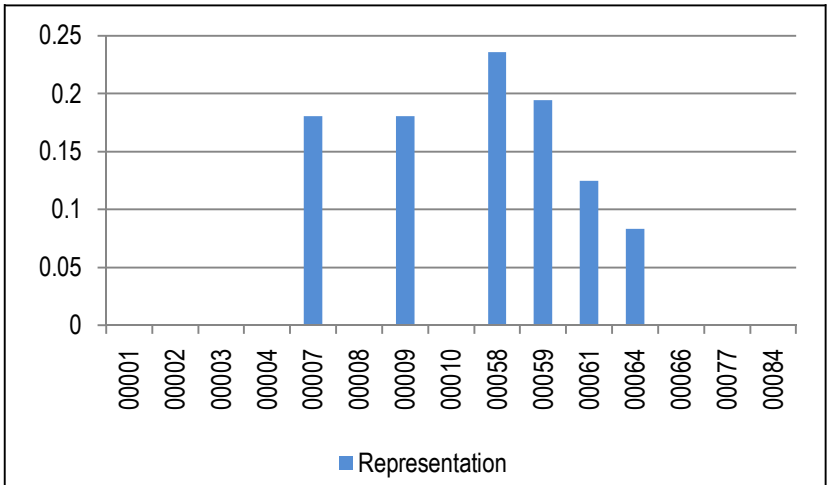


Figure 15: Founder representation

Population Mean kinship

Mean kinship (MK) is a measure for assessing the relatedness of an individual to all other individuals in the population. Individuals with mean kinship value of zero have no living relatives in the population. They are either wild-caught or single descendants from founders. Table 9 presents the mean-kinship values of the living individuals in the *A. f. fulgens* population as on December 2013. The high values of MK are a result of the small population size resulting in limited mating choices. This has also resulted in reducing the genetic diversity retained by the population. The mean kinship values of all individuals are above 0.1 indicating breeding between closely related individuals. The two wild-born individuals with no living descendants (Studbook No. 00066 and 00084) have MK value of 0. The population mean kinship also has a high value of 0.1138 and may result from the small population size resulting in limited mating choices, therefore reducing the genetic diversity retained by the population.

Inbreeding coefficient

Breeding between closely related individuals results in inbreeding. The degree to which an animal is inbred is measured by its inbreeding coefficient (F), which is the probability of receiving the same allele from each parent. Only 2 animals in the living population (NSN 00060 and 00063) are inbred with an inbreeding coefficient of 0.0625. In all other animals inbreeding has been avoided by regulated mating choices.

Table 9: Inbreeding coefficients and mean kinship values of captive Red panda population (living)

Studbook ID	Location	Sex	F	MK
00042	Auckland	Male	0	0.1461
00046	Darjeeling	Male	0	0.1232
00048	Darjeeling	Male	0	0.1532
00052	Darjeeling	Male	0	0.1567
00054	Darjeeling	Male	0	0.1303
00057	Darjeeling	Female	0	0.1849
00058	Gangtok	Female	0	0.1197
00059	Gangtok	Male	0	0.0986
00060	Darjeeling	Male	0.0625	0.1347
00061	Darjeeling	Male	0	0.0634
00062	Darjeeling	Female	0	0.1649
00063	Darjeeling	Male	0.0625	0.1576
00064	Darjeeling	Male	0	0.0423
00065	Gangtok	Male	0	0.1414
00066	Gangtok	Female	0	0
00067	Gangtok	Female	0	0.1232
00068	Gangtok	Male	0	0.1391
00069	Gangtok	Female	0	0.1232
00070	Gangtok	Female	0	0.1391
00071	Gangtok	Female	0	0.1391
00073	Darjeeling	Female	0	0.118
00075	Darjeeling	Female	0	0.1133
00076	Darjeeling	Male	0	0.1133
00078	Gangtok	Male	0	0.1232
00084	Gangtok	Male	0	0
00086	Darjeeling	Unknown	0	0.0868
00087	Gangtok	Male	0	0.1232
00088	Darjeeling	Male	0	0.1069
00089	Darjeeling	Female	0	0.1069
00090	Darjeeling	Female	0	0.1133

BREEDING RECOMMENDATIONS

The pairing options for the *A. f. fulgens* population as on December 2013 have been presented in Table 10. The pairing options for all dams alive have been obtained by using mate suitability index scores, inbreeding coefficients (F) and mean kinship (Mk) that would occur in progeny. The most preferred mating choices are the ones with lowest MSI, F and Mk values. It is suggested that for deciding the pairing the zoos may use the additional criteria of age and location. Attempts to pair animals approaching reproductive senescence should be avoided. Since the small size of the population limits the mating choices, even animals with scores of MSI below 5 can be used for pairing if the F and Mk values are low to rapidly increase the population size.

Table 10: Pairing options for the captive Red panda population

Possible Dam	Possible Sires	MSI	F	MK
00057	00061, 00085, 00090	5	0.0000	0.0000
	00059, 00064, 00084, 00068, 00080, 00065	6	0.0000	0.0000
00058	00059, 00061	4	0.0000	0.0000
	00046, 00048, 00052, 00054, 00060, 00063, 00076	5	0.0000	0.0000
	00055, 00064, 00084	6	0.0000	0.0000
00062	00061	4	0.0000	0.0000
	00076	5	0.0278	0.0278
	00059, 00064, 00084	6	0.0000	0.0000
	00046, 00048, 00054, 00055, 00060, 00063	6	0.0833	0.0833
00066	00046, 00048, 00052, 00054, 00055, 00059, 00060, 00061, 00063, 00064, 00065, 00068, 00076, 00080, 00084, 00085, 00090	1	0.0000	0.0000
00067	00061, 00064, 00076	4	0.0000	0.0000
	00080	4	0.0714	0.0714
	00046, 00048, 00052, 00054, 00060, 00063	5	0.0000	0.0000
	00055, 00084	6	0.0000	0.0000
00069	00061	4	0.0000	0.0000
	00046, 00048, 00052, 00054, 00060, 00063, 00076	5	0.0000	0.0000
	00080	5	0.0714	0.0714
	00055, 00064, 00084	6	0.0000	0.0000
00070	00061, 00064	4	0.0000	0.0000
	00076	5	0.0119	0.0119
	00084	6	0.0000	0.0000
	00046, 00048, 00054, 00055, 00060, 00063	6	0.0357	0.0357
00071	00061, 00064	4	0.0000	0.0000
	00076	5	0.0119	0.0119
	00084	6	0.0000	0.0000
	00046, 00048, 00054, 00055, 00060, 00063	6	0.0357	0.0357
00073	00064, 00084	6	0.0000	0.0000
	00046, 00054	6	0.0357	0.0833
00075	00059	4	0.0000	0.0000
	00085, 00090	5	0.0000	0.0000
	00068, 00080	5	0.0119	0.0119
	00065	5	0.0278	0.0278
	00064, 00084	6	0.0000	0.0000
	00046, 00052, 00054	6	0.0833	0.0833
00081	00061	2	0.0000	0.0000
	00059	3	0.0000	0.0000
	00085, 00090	4	0.0714	0.0714
	00076	5	0.0119	0.0119
	00084	6	0.0000	0.0000
	00046, 00048, 00054, 00055, 00060, 00063	6	0.0357	0.0357
00082	00059, 00064, 00085, 00090	4	0.0000	0.0000
	00068, 00080	5	0.0119	0.0119
	00065	5	0.0278	0.0278
	00084	6	0.0000	0.0000
	00046, 00052, 00054	6	0.0833	0.0833

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.

These variables are combined using a default set of definitions (that can be modified on the genetic **Settings** tab) to assign a *MSI* score of 1 to 6 for each pair, which can be thought of as follows:

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.

POPULATION MANAGEMENT GOALS

The species is listed as endangered in the IUCN Red list of threatened species and is vulnerable to extinction due to habitat fragmentation and poaching. Maintenance of genetically viable and demographically stable populations thus offers an option for their long term survival. The maintenance of sustainable captive populations is dependent on our capability to identify the minimum size required to be maintained in captivity and the supplementation by wild origin animals required to maintain genetic viability. Multiple simulations were run using the goals tab of the PMx Software (Ballou *et. al.* 2011).

The simulations included a baseline scenario utilizing the existing population and allowing for a maximum size of 100 individuals. Supplementation with wild origin animals was not included in the input variables. The results obtained show that the population retains only 53.1% of the genetic diversity.

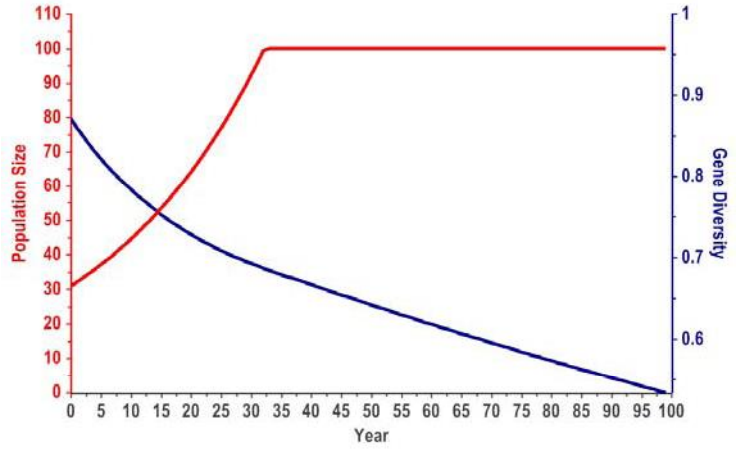
Simulation Output	Input variables
	**Population Variables:** Generation Length; 5.6 Maximum potential lambda; 1.0371 Current N; 31 Current Ne; 7.4 Ne/N; 0.24 Current Gene Diversity; 0.8703 Maximum N; 100 No founders added **Results:** Goal not possible - Can maintain only 53.1%.

Figure 16: Population management goals for Red panda captive population

The scenario providing the desired level of genetic diversity included supplementation by one wild origin animal every second year (Figure 17). This led to the maintenance of 90.4% genetic diversity and met the desired threshold of populations in ex-situ conservation.

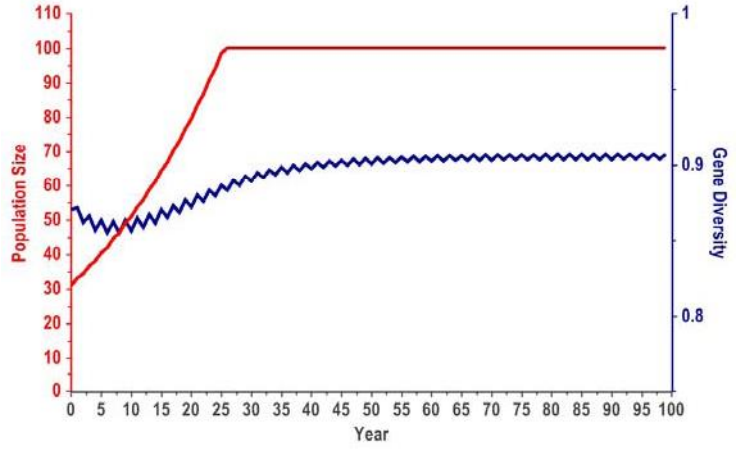
Simulation Output	Input variables
	**Population Variables:** Generation Length; 5.6 Maximum potential lambda; 1.0371 Current N; 31 Current Ne; 7.4 Ne/N; 0.24 Current Gene Diversity; 0.8703 Maximum N; 100 **Founder Related Variables** New founders per Addition event; 1 Year to start adding founders; 0 Years between events; 2 Year to stop adding founders; 100 FGE per Founder; 0.40 N per Founder; 1 **Results:** Can exceed goals and maintain 90.4% Can maintain over 90.0% for up to 103 years

Figure 17: Population management goals for Red panda captive population

This is however a minimalistic scenario and additional founders may be needed in the event of some of the founders not reproducing or making insufficient contributions to the captive gene pool. It is therefore suggested that any wild origin animals entering captivity by way of rescue be used for augmenting the captive population.

CONCLUSIONS AND RECOMMENDATIONS

The living population of Red panda in Indian zoos comprises of 29 (16.12.1) individuals including 6 (4.2) animals of wild origin. The population size is small and has a male biased sex ratio. The mean population growth rate (λ) of the population is 1.037 and the mean generation time is 5.6 years. The mean inbreeding coefficient of the population is 0.0169 with population mean kinship of 0.1297. The population has retained 87.03% of the genetic diversity from 6 (4.2) founders. The salient findings are listed below:

- The Red panda captive population in Indian zoos has only a small percentage of both wild origin and captive born individuals in the reproductive pool. The relatively long mean generation time (the animals become reproductively active by two years of age) together with the low population growth rate makes the population vulnerable to random demographic events and catastrophes and limits mating choices
- High values of the population mean kinship are indicative of a close relationship between individuals and poor retention of genetic diversity. This is further reduced by the small number of founders included and has resulted in low genetic diversity.

The above factors limit the rapid growth of the population essential for the long term survival of the species in captivity. This can however; be achieved by the acquisition of animals in the reproductive age classes from zoos outside India. Once demographic stability is attained further genetic principles can be used to enhance genetic diversity for ensuring the long term survival of the species in captivity. The genetic concerns can be addressed by supplementation with animals of wild origin.

References

Ballou, J.D., Lacy, R.C. and Pollak, J.P. 2011. PMx: software for demographic and genetic analysis and management of pedigreed populations (version 1.2). Chicago Zoological Society, Brookfield, IL, USA. Available from: http://www.vortex10.org/PMx.html.

Choudhury, A. 2001. An overview of the status and conservation of the Red panda *Ailurus fulgens* in India, with reference to its global status Oryx 35, 250-259.

Glatston, A. R. 1982. The Red or Lesser Panda Studbook. Stitchting Koninklijke Rotterdamse Diergaarde, Rotterdam.

Glatston, A. R. 1989. Red panda biology. Netherlands: SPB Academic Publishing.

Glatston, A. R. 1994. Status survey and conservation action plan for Procyonids and Ailurids: the Red panda, Olingos, Coatis, Raccoons and their Relatives. Switzerland: IUCN, Gland.

*Hu, J.C. 1991. Reproductive biology of the Red panda [in Chinese]. J Sich Norm Coll 12:1 5.

Hu, J. and Wei, F. 1992. Feeding ecology of Red pandas. J. Sichuan Norm. Coll. 13: 83±87 (in Chinese with an English abstract).

ISIS (International Species Information System) 2004. SPARKS 1.54: Single Population Analysis and Records Keeping System. Eagan, MN: International Species Information System. Available from: www.isis.org

Johnson, K. G., Schaller G. B. and Hu, J. 1988. Comparative behavior of Red and Giant pandas in the Wolong Reserve, China. J. Mammal. 69: 552±564.

Keller, R. 1977. Beitrag zur ethologie des kleinen Pandas (*Ailurus fulgens*, Cuvier, 1825). Unpublished Ph.D dissertation., University of Zurich, Switzerland, 122 pp.

Leus, K., Traylor-Holzer, K. and Lacy, R.C. 2011. Genetic and demographic population management in zoos and aquariums: recent developments, future challenges and opportunities for scientific research. International Zoo Yearbook. 45: 213 225.

Li, C., Wei, F.W. & Hu, J.C. 2005. Relationship between fecal estradiol and progesterone concentrations and reproductive startup in female Red pandas (*Ailurus fulgens*). Zoological Research 26: 147 151.

Nigam, P., Srivastav, A. and Tyagi, P.C. 2012. Development and maintenance of studbooks of selected endangered faunal types in Indian zoos. Final Project Report (No. TR-2012/001). Wildlife Institute of India and Central Zoo Authority. Pp. 106.

Nowak RM. 1991. Walker s mammals of the world. Baltimore, Maryland: John Hopkins Press. p 1097 8.

Nowak, R. M. 2005. Walker s Carnivores of the world. Baltimore, MD: The Johns Hopkins University Press.

Pollak, J.P., Egan, K., Raman, Y., Pollak, E.J. 2001. Lineage: Pedigree analysis and visualization (version 1.06). Ithaca, NY, USA: Cornell University.

Pradhan, S., Saha, G.K. and Khan, J.A. 2001. Ecology of the Red panda *Ailurus fulgens* in the Singalila National Park, Darjeeling, India. Biological Conservation 98, 11-18.

Reid, D. G., Hu, J. and Huang, Y. 1991. Ecology of the Red panda in the Wolong Reserve, China. J. Zool. (Lond.) 225: 347±364.

Roberts, M.S. 1980. Breeding the Red panda (*Ailurus fulgens*) at the National Zoological Park, Zoological Garten, 50: 253-263.

Roberts, M.S. 1981. The reproductive biology of the Red panda, *Ailurus fulgens* in captivity. Unpublished M.Sc. thesis, University of Maryland, 202 pp.

Roberts, M.S. and Kessler, D.S. 1979. Reproduction in Red pandas *Ailurus fulgens* (Carnivora: Ailuropodidae). Journal of Zoology, 188: 235-249.

Roberts, M. S. and Gittleman, J. L. 1984. *Ailurus fulgens*. Mammalian Species 222: 1-8.

Spanner A, Stone GM, and Schultz D. 1997. Excretion profiles of some reproductive steroids in the faeces of the captive Nepalese Red panda (*Ailurus fulgens fulgens*). Reprod Fertil Dev 9:565 70.

Srivastav, A., Nigam. P., Chakraborty, D. and Nayak, A.K. 2009. National Studbook of Red Panda (*Ailurus fulgens*). Wildlife Institute of India, Dehradun and Central Zoo Authority, New Delhi.

Stevens, C.E. and Hume, I.D. 1995. Comparative physiology of the vertebrate digestive system, 2nd ed. Cambridge University Press, New York.

Traylor-Holzer, K. (ed.). 2011. PMx Users Manual, Version 1.0. IUCN SSC Conservation Breeding Specialist Group, Apple Valley, MN, USA.

Wang, X., Choudhury, A., Yonzon, P., Wozencraft, C. and Than Zaw 2008. *Ailurus fulgens*. In: IUCN 2014. IUCN Red List of Threatened Species. Version 2014.1. <www.iucnredlist.org>. Downloaded on 18 June 2014.

Wei, F., Wang, W., Zhou, A., Hu, J. and Wei, Y. 1995. Preliminary study on food selection and feeding strategy of Red pandas. Acta Theriol. Sin. 15: 259±266 (in Chinese with an English abstract).

Wei, F. 1997. Habitat selection, foraging and energetic strategies of giant and Red pandas in Xiangling Mountains. PhD dissertation, Institute of Zoology, The Chinese Academy of Sciences, Beijing, China (in Chinese with an English abstract).

Wei, F., Feng, Z., Wang, Z. and Hu, J. 1999a. Current distribution, status and conservation of wild Red pandas *Ailurus fulgens* in China. Biological Conservation 89, 285-291.

Wei, F., Feng, Z., Wang, Z., Zhou, A. and Hu, J. 1999b. Use of the nutrients in bamboo by The Red panda (*Ailurus fulgens*). Journal of Zoology London 148, 535-541.

Wei, F., Feng, Z., Wang, Z. and Hu, J. 2000a. Habitat use and separation between the Giant panda and the Red panda. Journal of Mammalogy 81, 448-455.

Wei, F., Lu, X., Li, C., Li, M., Ren, B. and Hu, J. 2005. Influences of mating groups on the reproductive success of the southern Sichuan Red panda (*Ailurus fulgens styani*). Zoo Biology 24: 169 176.

Williams, B.H. 2003. Red panda in eastern Nepal: how do they fit into ecoregional conservation of the eastern Himalaya. Conservation Biology in Asia 16, 236-250.

Yonzon, P. B. 1989. Ecology and conservation of Red panda in Nepal Himalayas. PhD thesis, University of Maine, Orono,U.S.A.

Yonzon, P. B. and Hunter, M. L. Jr 1991a. Cheese, tourists, and Red pandas in the Nepal Himalayas. Conserv. Biol. 5: 196±202.

Yonzon, P.B. and Hunter, M.L. 1991b. Conservation of the Red panda *Ailurus fulgens*. Biological conservation 5, 1-11.

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* Not referred in original

Appendix I

Historical population
(Ailurus fulgens fulgens)

Sl. No.	National Studbook No	International Studbook No.	House name Local ID. Transponder No.	Sex	Birth date	Sire	Dam	Location	Date	Event
1	0001	7725	Unm1	F	~ 1975	Wild	Wild	India Kanpur	17-Mar-77 17-Mar-77 07-Aug-79	Capture Transfer Death
2	0002	7726	Unm2	M	~ 1975	Wild	Wild	India Kanpur	~ 1977 17-Mar-77 06-Aug-79	Capture Transfer Death
3	0003	7727	Unm3	F	~ 1975	Wild	Wild	India Kanpur	17-Mar-77 17-Mar-77 19-Jan-85	Capture Transfer Death
4	0004	7728	Unm4	M	~ 1975	Wild	Wild	India Kanpur	17-Mar-77 17-Mar-77 06-Dec-78	Capture Transfer Death
5	0005	7894	Unm5	M	31-May-78	00004	00001	Kanpur	31-May-78 06-Jun-78	Birth Death
6	0006	7895	Unm6	F	31-May-78	00004	00001	Kanpur	31-May-78 15-Jun-78	Birth Death
7	0007	8221	Anita	F	~ 1982	Wild	Wild	Singalila Darjeeling	~ 1991 ~ 1991 02-Jul-97	Capture Transfer Death
8	0008	8222	Chanda	F	~ 1982	Wild	Wild	Singalila Darjeeling	~ 1991 31-Dec-91 10-Oct-95	Capture Transfer Death

Sl. No.	National Studbook No	International Studbook No.	House name Local ID. Transponder No.	Sex	Birth date	Sire	Dam	Location	Date	Event
9	0009	8649	Basant	M	~ 1982	Wild	Wild	Singalila Darjeeling	~ 1991 ~ 1991 04-Jul-97	Capture Transfer Death
10	00010	8648	Divya	F	~ 1982	Wild	Wild	Singalila Darjeeling	~ 1991 ~ 1991 10-Jul-96	Capture Transfer Death
11	00011	9305	Gora	M	25-Jun-93	Unk	Unk	Koln Darjeeling	25-Jun-93 10-Nov-94 24-Mar-09	Birth Transfer Death
12	00012	9302	Hari	M	30-Jun-93	Unk	Unk	Rotterdam Darjeeling	30-Jun-93 10-Nov-94 27-Nov-97	Birth Transfer Death
13	00013	9330	Indira	F	26-Jun-93	Unk	Unk	Madrid Z Darjeeling	26-Jun-93 10-Nov-94 15-Sep-08	Birth Transfer Death
14	00014	94100	Friend 00-0610-FEE2	M	20-Jun-94	00009	00007	Darjeeling	20-Jun-94 03-Nov-02	Birth Death
15	00015	94101	Ekta	F	20-Jun-94	00009	00007	Darjeeling	20-Jun-94 23-Jul-06	Birth Death
16	00016	9430	Prity	F	26-Jun-94	Unk	Unk	Holland Darjeeling	26-Jun-94 25-Dec-96 14-Mar-97	Birth Transfer Death
17	00017		Preety	F	26-Jun-94	Unk	Unk	Rotterdam Gangtok	26-Jun-94 14-Mar-97 23-Mar-03	Birth Transfer Death
18	00018	9404	Omin	M	17-Jul-94	Unk	Unk	Belgium Darjeeling	17-Jul-94 25-Dec-96 25-Oct-07	Birth Transfer Death

Sl. No.	National Studbook No	International Studbook No.	House name Local ID. Transponder No.	Sex	Birth date	Sire	Dam	Location	Date	Event
19	00019	95126	Jugul	M	21-Jun-95	00009	00007	Darjeeling Gangtok	21-Jun-95 14-Mar-97 22-Feb-07	Birth Transfer Death
20	00020	95127	Kalita	F	21-Jun-95	00009	00007	Darjeeling	21-Jun-95 01-Feb-04	Birth Death
21	00021	9650	Lalit	M	08-Jun-96	00011	00015	Darjeeling	08-Jun-96 09-Nov-09	Birth Death
22	00022	9651	Mohini	F	08-Jun-96	00011	00015	Darjeeling	08-Jun-96 28-Aug-97	Birth Death
23	00023	9654	Neera	F	14-Jul-96	00009	00007	Darjeeling	14-Jul-96 15-Jul-97	Birth Death
24	00024	97120	Queeny	F	15-Jun-97	00012	00020	Darjeeling	15-Jun-97 11-Feb-02	Birth Death
25	00025	97116	Rani	F	25-Jun-97	00011	00015	Darjeeling	25-Jun-97 14-Sep-04	Birth Death
26	00026	97117	Sweety 00-0617-ECA6	F	25-Jun-97	00011	00015	Darjeeling Singalila	25-Jun-97 15-Aug-03	Birth Release
27	00027	9879	Anne 00-0612-5AC9	F	17-Jun-98	00011	00015	Darjeeling	17-Jun-98 07-Jul-11	Birth Death
28	00028	9880	Mini 00-0617-D11A	F	17-Jun-98	00011	00015	Darjeeling Singalila	17-Jun-98 15-Aug-03	Birth Release
29	00029	9875	Ravi	M	29-Jun-98	00018	00020	Darjeeling	29-Jun-98 01-Feb-02	Birth Death
30	00030	9878	Rosy	F	29-Jun-98	00018	00020	Darjeeling	29-Jun-98 11-Jun-03	Birth Death
31	00031	9877	Tony	M	29-Jun-98	00018	00020	Darjeeling	29-Jun-98 01-Sep-98	Birth Death
32	00032	9876	Uma	F	29-Jun-98	00018	00020	Darjeeling	29-Jun-98	Birth

Sl. No.	National Studbook No	International Studbook No.	House name Local ID. Transponder No.	Sex	Birth date	Sire	Dam	Location	Date	Event
									11-Jun-03	Death
33	00033	99105	Mitra	M	30-May-99	00021	00025	Darjeeling	30-May-99 18-Jan-02	Birth Death
34	00034	99110	Mikhi	F	30-May-99	00021	00025	Darjeeling	30-May-99 11-Dec-99	Birth Death
35	00035	99106	Sibu	M	18-Jun-99	00011	00015	Darjeeling	18-Jun-99 04-Feb-02	Birth Death
36	00036	99111	Tania	F	18-Jun-99	00011	00015	Darjeeling	18-Jun-99 06-Dec-99	Birth Death
37	00037	99113	Shera	M	22-Jun-99	00019	00017	Gangtok Unknown	22-Jun-99 29-Dec-03	Birth Itf
38	00038	99114	Mickey	M	22-Jun-99	00019	00017	Gangtok Unknown	22-Jun-99 29-Dec-03	Birth Itf
39	00039	98108	Kanu	M	15-Jul-99	00018	00020	Darjeeling	15-Jul-99 30-Jan-00	Birth Death
40	00040	99107	Goutam	M	15-Jul-99	00018	00020	Darjeeling	15-Jul-99 10-Feb-02	Birth Death
41	00041	99109	Mili 00-0611-0597	F	15-Jul-99	00018	00020	Darjeeling	15-Jul-99 25-Sep-02	Birth Death
42	00042	00121	Sagar 00-0611-1058	M	26-Jun-00	00018	00020	Darjeeling Auckland	26-Jun-00 30-Oct-10	Birth Transfer
43	00043	00122	Priyanka	F	30-Jun-00	00011	00015	Darjeeling	30-Jun-00 16-Sep-02	Birth Death
44	00044	00124	Ricky	M	04-Jul-00	00019	00017	Gangtok	04-Jul-00 11-Oct-00	Birth Death
45	00045	00125	Nickey	M	04-Jul-00	00019	00017	Gangtok	04-Jul-00 19-Nov-05	Birth Death
46	00046	01128	Pokhraj	M	18-Jun-01	00011	00015	Darjeeling	18-Jun-01	Birth

Sl. No.	National Studbook No	International Studbook No.	House name Local ID. Transponder No.	Sex	Birth date	Sire	Dam	Location	Date	Event
			86 00-0610-FD19							
47	00047	01129	Neelam 00-0611-956B	F	18-Jun-01	00011	00015	Darjeeling Singalila	18-Jun-01 06-Nov-03	Birth Release
48	00048	01127	Shakya 89 00-0611-30B3	M	28-Jun-01	00018	00020	Darjeeling	28-Jun-01	Birth
49	00049	01131	Dolma 00-0611-4CD8	F	28-Jun-01	00018	00020	Darjeeling Singalila	28-Jun-01 06-Nov-03	Birth Release
50	00050	01132	Unnamed	F	29-Jun-01	00019	00017	Gangtok	29-Jun-01 14-Jul-01	Birth Death
51	00051	01133	Unnamed	F	29-Jun-01	00019	00017	Gangtok	29-Jun-01 15-Jul-01	Birth Death
52	00052	02111	Rahul RP9 255 0006-B74-A7F	M	20-Jun-02	00019	00017	Gangtok Darjeeling	20-Jun-02 31-Oct-11	Birth Transfer
53	00053	02112	Kiran	M	20-Jun-02	00019	00017	Gangtok Unknown	20-Jun-02 24-Dec-04	Birth Itf
54	00054	01130	Siddhartha 00-0611-5CCB	M	18-Jun-01	00011	00015	Darjeeling	18-Jun-01	Birth
55	00055	0359	Nakul 0006-B74-149	M	22-Jun-03	00048	Unk	Darjeeling Gangtok	22-Jun-03 03-Apr-07 31-May-09	Birth Transfer Death
56	00056	0358	Sahadev 000618278C	M	22-Jun-03	00048	Unk	Darjeeling	22-Jun-03 26-Nov-12	Birth Death
57	00057	0356	Sheetal 91 981098102055661	F	02-Jul-03	00018	00020	Darjeeling	02-Jul-03	Birth
58	00058		Lucky RP12	F	~ Jan 2005	Wild	Wild	India Gangtok	24-Jan-05 24-Jan-05	Capture Transfer

Sl. No.	National Studbook No	International Studbook No.	House name Local ID. Transponder No.	Sex	Birth date	Sire	Dam	Location	Date	Event
			0006-B73-47C							
59	00059		Ram RP13	M	~ Jan 2005	Wild	Wild	India Gangtok	24-Jan-05 24-Jan-05	Capture Transfer
60	00060	0600	Shainee 94 98109810256336	M	05-Jun-06	00048	00027	Darjeeling	05-Jun-06	Birth
61	00061		John	M	????	Wild	Wild	India Gangtok Darjeeling	24-Jan-05 24-Jan-05 03-Apr-07	Capture Transfer Transfer
62	00062	0798	Rigsel RP15 0006-B71-07E 256	F	28-May-07	00052	00058	Gangtok Darjeeling	28-May-07 31-Oct-11	Birth Transfer
63	00063	0788	Shaan 95 0006B71789	M	04-Jul-07	00054	00057	Darjeeling	04-Jul-07	Birth
64	00064		Kaijale	M	~ 2004	Wild	Wild	India Darjeeling	08-Mar-08 08-Mar-08	Capture Transfer
65	00065		Simon RP16 0006-B73-87C	M	13-Jun-08	00052	00058	Gangtok	13-Jun-08	Birth
66	00066		Doma RP17 0006-B71-A9F	F	~ 2009	Wild	Wild	India Gangtok	~ 2009 12-Feb-09	Capture Transfer
67	00067		Nidhi RP18 6836 14 D	F	13-Jun-09	00059	00058	Gangtok	13-Jun-09	Birth
68	00068		Sonam RP19 6 B 711 CA	M	02-Jul-09	00059	00062	Gangtok	02-Jul-09	Birth

Sl. No.	National Studbook No	International Studbook No.	House name Local ID. Transponder No.	Sex	Birth date	Sire	Dam	Location	Date	Event
69	00069		Karma RP20	F	03-Jun-10	00059	00058	Gangtok	03-Jun-10	Birth
70	00070		Susan RP21	F	20-Jun-10	00059	00062	Gangtok	20-Jun-10	Birth
71	00071		Chen Chen RP22	F	20-Jun-10	00059	00062	Gangtok	20-Jun-10	Birth
72	00072		Durga 00062E087C	F	18-Dec-02	Unk	Unk	Auckland Darjeeling	18-Dec-02 09-Oct-10 01-Mar-13	Birth Transfer Death
73	00073	0886	Samridhi 234 98109810205573	F	06-Jul-08	00061	00057	Darjeeling	06-Jul-08	Birth
74	00074		Unnamed	M	06-Jul-08	00061	00057	Darjeeling	06-Jul-08 12-Jan-09	Birth Death
75	00075	1089	Janaki 217 0006B7428B	F	22-Jun-10	00061	00057	Darjeeling	22-Jun-10	Birth
76	00076	1088	Ram 216 0006B82659	M	22-Jun-10	00061	00057	Darjeeling	22-Jun-10	Birth
77	00077		Unnamed	F	????	Wild	Wild	India Ahmedabad	~ 1990 ~ 1990 10-Jun-93	Capture Transfer Death
78	00078		Unnamed RP23	M	07-Jun-11	00059	00058	Gangtok	07-Jun-11	Birth
79	00079		Unnamed RP24	M	10-Jun-11	00052	00066	Gangtok	10-Jun-11 08-Aug-12	Birth Death

Sl. No.	National Studbook No	International Studbook No.	House name Local ID. Transponder No.	Sex	Birth date	Sire	Dam	Location	Date	Event
80	00080		Unnamed RP25	M	10-Jun-11	00052	00066	Gangtok	10-Jun-11 14-Aug-12	Birth Death
81	00081		Unnamed RP26	M	11-Jun-11	00052	00067	Gangtok	10-Jun-11 11-Aug-12	Birth Death
82	00082		Unnamed RP27	F	11-Jun-11	00052	00067	Gangtok	10-Jun-11 13-Aug-12	Birth Death
83	00083		Unnamed	M	25-Jun-11	00064	00073	Darjeeling	25-Jun-11 03-Jul-11	Birth Death
84	00084		Unnamed RP28	M	????	Wild	Wild	India Gangtok	07-May-12 07-May-12	Capture Transfer
85	00085		Unnamed	F	23-May-12	00054	00075	Darjeeling	23-May-12 25-May-12	Birth Death
86	00086		Smile 272 95600000215937	?	19-Jun-12	00064	00073	Darjeeling	19-Jun-12	Birth
87	00087		Unnamed RP29	M	10-Jun-13	00059	00058	Gangtok	10-Jun-13	Birth
88	00088		Shifu RP0002	M	27-Jun-13	00064	00062	Darjeeling	27-Jun-13	Birth
89	00089		Kitchi RP0001	F	27-Jun-13	00064	00062	Darjeeling	27-Jun-13	Birth
90	00090		Sonam RP0003	F	28-Jun-13	00061	00057	Darjeeling	28-Jun-13	Birth
Totals: 45.44.1 (90)										

Appendix II

Living population – location-wise

Ailurus fulgens fulgens

Sl. No.	National Studbook No.	International Studbook No.	House Name Local ID Transponder No.	Sex	Birth Date	Sire	Dam	Location	Date	Event
Himalayan Zoological Park, Gangtok, Sikkim										
1.	00058		Lucky RP12 0006-B73-47C	F	~ Jan 2005	Wild	Wild	India Gangtok	24-Jan-05 24-Jan-05	Capture Transfer
2.	00059		Ram RP13	M	~ Jan 2005	Wild	Wild	India Gangtok	24-Jan-05 24-Jan-05	Capture Transfer
3.	00065		Simon RP16 0006-B73-87C	M	13-Jun-08	00052	00058	Gangtok	13-Jun-08	Birth
4.	00066		Doma RP17 0006-B71-A9F	F	~ 2009	Wild	Wild	India Gangtok	~ 2009 12-Feb-09	Capture Transfer
5.	00067		Nidhi RP18 6836 14 D	F	13-Jun-09	00059	00058	Gangtok	13-Jun-09	Birth
6.	00068		Sonam RP19 6 B 711 CA	M	02-Jul-09	00059	00062	Gangtok	02-Jul-09	Birth
7.	00069		Karma RP20	F	03-Jun-10	00059	00058	Gangtok	03-Jun-10	Birth
8.	00070		Susan RP21	F	20-Jun-10	00059	00062	Gangtok	20-Jun-10	Birth
9.	00071		Chen Chen RP22	F	20-Jun-10	00059	00062	Gangtok	20-Jun-10	Birth

10.	00084		Unnamed RP28	M	????	Wild	Wild	India Gangtok	07-May-12 07-May-12	Capture Transfer
11.	00078		Unnamed RP23	M	07-Jun-11	00059	00058	Gangtok	07-Jun-11	Birth
12.	00087		Unnamed RP29	M	10-Jun-13	00059	00058	Gangtok	10-Jun-13	Birth
Totals: 6.6.0 (12)										
Padmaja Naidu Himalayan Zoological Park, Darjeeling										
1.	00046	01128	Pokhraj 86 00-0610-FD19	M	18-Jun-01	00011	00015	Darjeeling	18-Jun-01	Birth
2.	00048	01127	Shakya 89 00-0611-30B3	M	28-Jun-01	00018	00020	Darjeeling	28-Jun-01	Birth
3.	00052	02111	Rahul RP9 255 0006-B74-A7F	M	20-Jun-02	00019	00017	Gangtok Darjeeling	20-Jun-02 31-Oct-11	Birth Transfer
4.	00054	01130	Siddhartha 00-0611-5CCB	M	18-Jun-01	00011	00015	Darjeeling	18-Jun-01	Birth
5.	00057	0356	Sheetal 91 981098102055661	F	02-Jul-03	00018	00020	Darjeeling	02-Jul-03	Birth
6.	00060	0600	Shainee 94 98109810256336	M	05-Jun-06	00048	00027	Darjeeling	05-Jun-06	Birth
7.	00061		John	M	????	Wild	Wild	India Gangtok Darjeeling	24-Jan-05 24-Jan-05 03-Apr-07	Capture Transfer Transfer
8.	00062	0798	Rigsel RP15 0006-B71-07E	F	28-May-07	00052	00058	Gangtok Darjeeling	28-May-07 31-Oct-11	Birth Transfer

9.	00063	0788	Shaan 95 0006B71789	M	04-Jul-07	00054	00057	Darjeeling	04-Jul-07	Birth
10.	00064		Kaijale	M	~ 2004	Wild	Wild	India Darjeeling	08-Mar-08 08-Mar-08	Capture Transfer
11.	00073	0886	Samridhi 234 98109810205573	F	06-Jul-08	00061	00057	Darjeeling	06-Jul-08	Birth
12.	00075	1089	Janaki 217 0006B7428B	F	22-Jun-10	00061	00057	Darjeeling	22-Jun-10	Birth
13.	00076	1088	Ram 216 0006B82659	M	22-Jun-10	00061	00057	Darjeeling	22-Jun-10	Birth
14.	00086		Smile 272 95600000215937	?	19-Jun-12	00064	00073	Darjeeling	19-Jun-12	Birth
15.	00088		Shifu RP0002	M	27-Jun-13	00064	00062	Darjeeling	27-Jun-13	Birth
16.	00089		Kitchi RP0001	F	27-Jun-13	00064	00062	Darjeeling	27-Jun-13	Birth
17.	00090		Sonam RP0003	F	28-Jun-13	00061	00057	Darjeeling	28-Jun-13	Birth
Totals: 10.6.1 (17)										

Appendix III

```
                        Pedigree Chart Report
                         RED PANDA Studbook
===========================================================================
Taxon Name: AILURUS FULGENS                       Studbook Number:  00001
===========================================================================
                 WILD                                 WILD
                                  \          /           Sex: Female
                                   \        /      Birth Date:      ~ 1975
                                    \      Last Location: KANPUR    (dead)
                                  dam\    /sire    House Name:
                                      \  /             Tattoo:
                                       \/            Tag/Band:
                                     00001


===========================================================================
Taxon Name: AILURUS FULGENS                       Studbook Number:  00002
===========================================================================
                 WILD                                 WILD
                                  \          /           Sex: Male
                                   \        /      Birth Date:      ~ 1975
                                    \      Last Location: KANPUR    (dead)
                                  dam\    /sire    House Name:
                                      \  /             Tattoo:
                                       \/            Tag/Band:
                                     00002

===========================================================================
Taxon Name: AILURUS FULGENS                       Studbook Number:  00003
===========================================================================
                 WILD                                 WILD
                                  \          /           Sex: Female
                                   \        /      Birth Date:      ~ 1975
                                    \     Last Location: KANPUR    (dead)
                                  dam\    /sire    House Name:
                                      \  /             Tattoo:
                                       \/            Tag/Band:
                                     00003

===========================================================================
Taxon Name: AILURUS FULGENS                       Studbook Number:  00004
===========================================================================
                 WILD                                 WILD
                                  \          /           Sex: Male
                                   \        /      Birth Date:      ~ 1975
                                    \     Last Location: KANPUR    (dead)
                                  dam\    /sire    House Name:
                                      \  /             Tattoo:
                                       \/            Tag/Band:
                                     00004
```

```
==========================================================================
Taxon Name: AILURUS FULGENS                       Studbook Number:  00005
==========================================================================
       WILD                 WILD                 WILD                 WILD
             dam\    /sire                              dam\    /sire
                 \  /                                       \  /
                  \/                                         \/
                00001  +                                   00004  +
                                  \          /              Sex: Male
                                   \        /      Birth Date: 31 May 1978
                                    \     Last Location: KANPUR    (dead)
                                  dam\    /sire    House Name:
                                      \  /             Tattoo:
                                       \/            Tag/Band:
                                     00005
+ Wild-caught...

==========================================================================
Taxon Name: AILURUS FULGENS                       Studbook Number:  00006
==========================================================================
       WILD                 WILD                 WILD                 WILD
             dam\    /sire                              dam\    /sire
                 \  /                                       \  /
                  \/                                         \/
                00001  +                                   00004  +
                                  \          /              Sex: Female
                                   \        /      Birth Date: 31 May 1978
                                    \     Last Location: KANPUR    (dead)
                                  dam\    /sire    House Name:
                                      \  /             Tattoo:
                                       \/            Tag/Band:
                                     00006
+ Wild-caught...

==========================================================================
Taxon Name: AILURUS FULGENS                       Studbook Number:  00007
==========================================================================
                WILD                                       WILD
                                  \          /              Sex: Female
                                   \        /      Birth Date:      ~ 1982
                                    \     Last Location: DARJEELIN (dead)
                                  dam\    /sire    House Name:
                                      \  /             Tattoo:
                                       \/            Tag/Band:
                                     00007

==========================================================================
Taxon Name: AILURUS FULGENS                       Studbook Number:  00008
==========================================================================
                WILD                                       WILD
                                  \          /              Sex: Female
                                   \        /      Birth Date:      ~ 1982
                                    \     Last Location: DARJEELIN (dead)
                                  dam\    /sire    House Name:
                                      \  /             Tattoo:
                                       \/            Tag/Band:
                                     00008
```

```
==========================================================================
Taxon Name: AILURUS FULGENS                    Studbook Number:  00009
==========================================================================
                 WILD                                     WILD
                                  \          /            Sex: Male
                                   \        /      Birth Date:      ~ 1982
                                    \      Last Location: DARJEELIN (dead)
                                  dam\    /sire    House Name:
                                      \  /             Tattoo:
                                       \/            Tag/Band:
                                     00009

==========================================================================
Taxon Name: AILURUS FULGENS                       Studbook Number:  00010
==========================================================================
                 WILD                                     WILD
                                  \          /            Sex: Female
                                   \        /      Birth Date:      ~ 1982
                                    \       Last Location: DARJEELIN (dead)
                                  dam\    /sire    House Name:
                                      \  /             Tattoo:
                                       \/            Tag/Band:
                                     00010

==========================================================================
Taxon Name: AILURUS FULGENS                     Studbook Number:  00011
==========================================================================
                 UNK                                      UNK
                                  \          /            Sex: Male
                                   \        /      Birth Date: 25 Jun 1993
                                    \       Last Location: DARJEELIN (dead)
                                  dam\    /sire    House Name:
                                      \  /             Tattoo:
                                       \/            Tag/Band:
                                     00011

==========================================================================
Taxon Name: AILURUS FULGENS                    Studbook Number:  00012
==========================================================================
                 UNK                                      UNK
                                  \          /            Sex: Male
                                   \        /      Birth Date: 30 Jun 1993
                                    \       Last Location: DARJEELIN (dead)
                                  dam\    /sire    House Name:
                                      \  /             Tattoo:
                                       \/            Tag/Band:
                                     00012

==========================================================================
Taxon Name: AILURUS FULGENS                     Studbook Number:  00013
==========================================================================
                 UNK                                      UNK
                                  \          /            Sex: Female
                                   \        /      Birth Date: 26 Jun 1993
                                    \       Last Location: DARJEELIN (dead)
                                  dam\    /sire    House Name:
                                      \  /             Tattoo:
                                       \/            Tag/Band:
                                     00013
```

```
================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00014
================================================================================
       WILD                 WILD                 WILD                 WILD
             dam\    /sire                              dam\    /sire
                 \  /                                       \  /
                  \/                                         \/
                00007  +                                   00009  +
                                  \          /               Sex: Male
                                   \        /      Birth Date: 20 Jun 1994
                                    \      Last Location: DARJEELIN (dead)
                                  dam\    /sire    House Name:
                                      \  /            Tattoo:
                                       \/           Tag/Band:
                                     00014
+ Wild-caught...

================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00015
================================================================================
       WILD                 WILD                 WILD                 WILD
             dam\    /sire                              dam\    /sire
                 \  /                                       \  /
                  \/                                         \/
                00007  +                                   00009  +
                                  \          /               Sex: Female
                                   \        /      Birth Date: 20 Jun 1994
                                    \      Last Location: DARJEELIN (dead)
                                  dam\    /sire    House Name:
                                      \  /            Tattoo:
                                       \/           Tag/Band:
                                     00015
+ Wild-caught...

================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00016
================================================================================
                UNK                                        UNK
                                  \          /               Sex: Female
                                   \        /      Birth Date: 26 Jun 1994
                                    \    Last Location: DARJEELIN (dead)
                                  dam\    /sire    House Name:
                                      \  /            Tattoo:
                                       \/           Tag/Band:
                                     00016

================================================================================
Taxon Name: AILURUS FULGENS                       Studbook Number:  00017
================================================================================
                UNK                                        UNK
                                  \          /               Sex: Female
                                   \        /      Birth Date: 26 Jun 1994
                                    \      Last Location: GANGTOK   (dead)
                                  dam\    /sire    House Name:
                                      \  /            Tattoo:
                                       \/           Tag/Band:
                                     00017
```

```
==========================================================================
Taxon Name: AILURUS FULGENS                      Studbook Number:  00018
==========================================================================
                 UNK                                        UNK
                                  \          /              Sex: Male
                                   \        /       Birth Date: 17 Jul 1994
                                    \      /   Last Location: DARJEELIN (dead)
                                  dam\    /sire    House Name:
                                      \  /             Tattoo:
                                       \/            Tag/Band:
                                     00018

==========================================================================
Taxon Name: AILURUS FULGENS                      Studbook Number:  00019
==========================================================================
       WILD                WILD                WILD                WILD
             dam\    /sire                              dam\    /sire
                 \  /                                       \  /
                  \/                                         \/
               00007  +                                   00009  +
                                  \          /              Sex: Male
                                   \        /       Birth Date: 21 Jun 1995
                                    \  Last Location: GANGTOK   (dead)
                                  dam\    /sire    House Name:
                                      \  /             Tattoo:
                                       \/            Tag/Band:
                                     00019
+ Wild-caught...

==========================================================================
Taxon Name: AILURUS FULGENS                      Studbook Number:  00020
==========================================================================
       WILD                WILD                WILD                WILD
             dam\    /sire                              dam\    /sire
                 \  /                                       \  /
                  \/                                         \/
               00007  +                                   00009  +
                                  \          /              Sex: Female
                                   \        /       Birth Date: 21 Jun 1995
                                    \     Last Location: DARJEELIN (dead)
                                  dam\    /sire    House Name:
                                      \  /             Tattoo:
                                       \/            Tag/Band:
                                     00020
+ Wild-caught...
```

```
================================================================================
Taxon Name: AILURUS FULGENS                          Studbook Number:  00021
================================================================================
  WILD      WILD      WILD      WILD
   dam\    /sire       dam\    /sire
       \  /                \  /
        \/                  \/
      00007  +            00009  +             UNK                   UNK
             dam\    /sire                            dam\    /sire
                 \  /                                     \  /
                  \/                                       \/
                00015                                    00011
                                  \          /             Sex: Male
                                   \        /      Birth Date:  8 Jun 1996
                                    \      /Last Location: DARJEELIN(dead)
                                  dam\    /sire    House Name:
                                      \  /             Tattoo:
                                       \/            Tag/Band:
                                     00021
+ Wild-caught...

================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00022
================================================================================
  WILD      WILD      WILD      WILD
   dam\    /sire       dam\    /sire
       \  /                \  /
        \/                  \/
      00007  +            00009  +             UNK                   UNK
             dam\    /sire                            dam\    /sire
                 \  /                                     \  /
                  \/                                       \/
                00015                                    00011
                                  \          /             Sex: Female
                                   \        /      Birth Date:  8 Jun 1996
                                    \      /Last Location: DARJEELIN (dead)
                                  dam\    /sire    House Name:
                                      \  /             Tattoo:
                                       \/            Tag/Band:
                                     00022
+ Wild-caught...

================================================================================
Taxon Name: AILURUS FULGENS                          Studbook Number:  00023
================================================================================
       WILD                WILD                WILD                  WILD
             dam\    /sire                            dam\    /sire
                 \  /                                     \  /
                  \/                                       \/
                00007  +                                 00009  +
                                  \          /             Sex: Female
                                   \        /      Birth Date: 14 Jul 1996
                                    \      /Last Location: DARJEELIN(dead)
                                  dam\    /sire    House Name:
                                      \  /             Tattoo:
                                       \/            Tag/Band:
                                     00023
+ Wild-caught...
```

```
================================================================================
Taxon Name: AILURUS FULGENS                          Studbook Number:  00024
================================================================================
  WILD      WILD      WILD      WILD
   dam\    /sire      dam\    /sire
       \  /               \  /
        \/                 \/
      00007  +           00009  +            UNK                  UNK
             dam\    /sire                        dam\    /sire
                 \  /                                \  /
                  \/                                  \/
                00020                               00012
                                  \          /        Sex: Female
                                   \        /     Birth Date: 15 Jun 1997
                                    \      /Last Location: DARJEELIN(dead)
                                  dam\    /sire   House Name: Queeny
                                      \  /           Tattoo:
                                       \/          Tag/Band:
+ Wild-caught...                     00024

================================================================================
Taxon Name: AILURUS FULGENS                          Studbook Number:  00025
================================================================================
  WILD      WILD      WILD      WILD
   dam\    /sire      dam\    /sire
       \  /               \  /
        \/                 \/
      00007  +           00009  +            UNK                  UNK
             dam\    /sire                        dam\    /sire
                 \  /                                \  /
                  \/                                  \/
                00015                               00011
                                  \          /        Sex: Female
                                   \        /     Birth Date: 25 Jun 1997
                                    \      Last Location: DARJEELIN (dead)
                                  dam\    /sire   House Name:
                                      \  /           Tattoo:
                                       \/          Tag/Band:
+ Wild-caught...                     00025

================================================================================
Taxon Name: AILURUS FULGENS                          Studbook Number:  00026
================================================================================
  WILD      WILD      WILD      WILD
   dam\    /sire      dam\    /sire
       \  /               \  /
        \/                 \/
      00007  +           00009  +            UNK                  UNK
             dam\    /sire                        dam\    /sire
                 \  /                                \  /
                  \/                                  \/
                00015                               00011
                                  \          /        Sex: Female
                                   \        /     Birth Date: 25 Jun 1997
                                    \      /    Last Location: SINGALILA
                                  dam\    /sire   House Name:
                                      \  /           Tattoo:
                                       \/          Tag/Band:
 + Wild-caught...                    00026
```

```
================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00027
================================================================================
  WILD      WILD      WILD      WILD
   dam\    /sire      dam\    /sire
       \  /               \  /
        \/                 \/
      00007  +           00009  +            UNK                  UNK
             dam\    /sire                        dam\    /sire
                 \  /                                \  /
                  \/                                  \/
                00015                               00011
                                  \          /        Sex: Female
                                   \        /     Birth Date: 17 Jun 1998
                                    \      /Last Location: DARJEELIN(dead)
                                  dam\    /sire   House Name:
                                      \  /           Tattoo:
                                       \/          Tag/Band:
+ Wild-caught...                     00027

================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00028
================================================================================
  WILD      WILD      WILD      WILD
   dam\    /sire      dam\    /sire
       \  /               \  /
        \/                 \/
      00007  +           00009  +            UNK                  UNK
             dam\    /sire                        dam\    /sire
                 \  /                                \  /
                  \/                                  \/
                00015                               00011
                                  \          /        Sex: Female
                                   \        /     Birth Date: 17 Jun 1998
                                    \      /   Last Location: SINGALILA
                                  dam\    /sire   House Name:
                                      \  /           Tattoo:
                                       \/          Tag/Band:
+ Wild-caught...                     00028

================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00029
================================================================================
  WILD      WILD      WILD      WILD
   dam\    /sire      dam\    /sire
       \  /               \  /
        \/                 \/
      00007  +           00009  +            UNK                  UNK
             dam\    /sire                        dam\    /sire
                 \  /                                \  /
                  \/                                  \/
                00020                               00018
                                  \          /        Sex: Male
                                   \        /     Birth Date: 29 Jun 1998
                                    \     Last Location: DARJEELIN (dead)
                                  dam\    /sire   House Name:
                                      \  /           Tattoo:
                                       \/          Tag/Band:
+ Wild-caught...                     00029
```

```
================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00030
================================================================================
  WILD      WILD      WILD      WILD
   dam\    /sire      dam\    /sire
       \  /               \  /
        \/                 \/
      00007  +           00009  +            UNK                  UNK
             dam\    /sire                        dam\    /sire
                 \  /                                \  /
                  \/                                  \/
                00020                               00018
                                  \          /            Sex: Female
                                   \        /     Birth Date: 29 Jun 1998
                                    \      /  Last Location: DARJEELIN (dead)
                                  dam\    /sire    House Name: ROSY
                                      \  /            Tattoo:
                                       \/           Tag/Band:
+ Wild-caught...                     00030

================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00031
================================================================================
   WILD     WILD      WILD      WILD
   dam\    /sire      dam\    /sire
       \  /               \  /
        \/                 \/
      00007  +           00009  +            UNK                  UNK
             dam\    /sire                        dam\    /sire
                 \  /                                \  /
                  \/                                  \/
                00020                               00018
                                  \          /            Sex: Male
                                   \        /     Birth Date: 29 Jun 1998
                                    \      /  Last Location: DARJEELIN (dead)
                                  dam\    /sire    House Name:
                                      \  /            Tattoo:
                                       \/           Tag/Band:
+ Wild-caught...                     00031

================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00032
================================================================================
  WILD      WILD      WILD      WILD
   dam\    /sire      dam\    /sire
       \  /               \  /
        \/                 \/
      00007  +           00009  +            UNK                  UNK
             dam\    /sire                        dam\    /sire
                 \  /                                \  /
                  \/                                  \/
                00020                               00018
                                  \          /            Sex: Female
                                   \        /     Birth Date: 29 Jun 1998
                                    \      /Last Location: DARJEELIN(dead)
                                  dam\    /sire    House Name:
                                      \  /            Tattoo:
                                       \/           Tag/Band:
+ Wild-caught...                     00032
```

```
================================================================================
Taxon Name: AILURUS FULGENS                          Studbook Number:  00033
================================================================================
     ^         ^                                       ^         ^
     |         |                                       |         |
 00007 *+  00009 *+   UNK       UNK      00007 *+  00009 *+   UNK       UNK
   dam\    /sire       dam\    /sire       dam\    /sire       dam\    /sire
       \  /                \  /                \  /                \  /
        \/                  \/                  \/                  \/
      00015 *             00011 *             00015 *             00011 *
             dam\    /sire                               dam\    /sire
                 \  /                                       \  /
                  \/                                         \/
                00025                                      00021
                                    \          /            Sex: Male
                                     \        /      Birth Date: 30 May 1999
                                      \      Last Location: DARJEELIN (dead)
                                    dam\    /sire    House Name:
                                        \  /            Tattoo:
                                         \/           Tag/Band:
                                       00033
+ Wild-caught... * Appear more than once...
^ Pedigree continues beyond top of page...

================================================================================
Taxon Name: AILURUS FULGENS                          Studbook Number:  00034
================================================================================
     ^         ^                                       ^         ^
     |         |                                       |         |
 00007 *+  00009 *+   UNK       UNK      00007 *+  00009 *+   UNK       UNK
   dam\    /sire       dam\    /sire       dam\    /sire       dam\    /sire
       \  /                \  /                \  /                \  /
        \/                  \/                  \/                  \/
      00015 *             00011 *             00015 *             00011 *
             dam\    /sire                               dam\    /sire
                 \  /                                       \  /
                  \/                                         \/
                00025                                      00021
                                    \          /            Sex: Female
                                     \        /      Birth Date: 30 May 1999
                                      \      Last Location: DARJEELIN (dead)
                                    dam\    /sire    House Name:
                                        \  /            Tattoo:
                                         \/           Tag/Band:
                                       00034

+ Wild-caught... * Appear more than once...
^ Pedigree continues beyond top of page...
```

```
==========================================================================Tax
on Name: AILURUS FULGENS                        Studbook Number:  00035
==========================================================================
WILD      WILD      WILD      WILD
   dam\    /sire       dam\    /sire
       \  /                \  /
        \/                  \/
      00007  +            00009  +             UNK                  UNK
             dam\    /sire                            dam\    /sire
                 \  /                                     \  /
                  \/                                       \/
               00015                                    00011
                                    \          /            Sex: Male
                                     \        /     Birth Date: 18 Jun 1999
                                      \     Last Location: DARJEELIN (dead)
                                    dam\    /sire    House Name:
                                        \  /             Tattoo:
                                         \/            Tag/Band:
+ Wild-caught...                      00035

==========================================================================
Taxon Name: AILURUS FULGENS                       Studbook Number:  00036
==========================================================================
WILD      WILD      WILD      WILD
   dam\    /sire       dam\    /sire
       \  /                \  /
        \/                  \/
      00007  +            00009  +             UNK                  UNK
             dam\    /sire                            dam\    /sire
                 \  /                                     \  /
                  \/                                       \/
               00015                                    00011
                                    \          /            Sex: Female
                                     \        /     Birth Date: 18 Jun 1999
                                      \      / Last Location: DARJEELIN (dead)
                                    dam\    /sire    House Name:
                                        \  /             Tattoo:
                                         \/            Tag/Band:
+ Wild-caught...                      00036

==========================================================================
Taxon Name: AILURUS FULGENS                       Studbook Number:  00037
==========================================================================
                                        WILD      WILD      WILD      WILD
                                         dam\    /sire       dam\    /sire
                                             \  /                \  /
                                              \/                  \/
       UNK                  UNK               00007  +            00009  +
             dam\    /sire                            dam\    /sire
                 \  /                                     \  /
                  \/                                       \/
               00017                                    00019
                                    \          /            Sex: Male
                                     \        /     Birth Date: 22 Jun 1999
                                      \      /    Last Location: UNKNOWN
                                    dam\    /sire    House Name:
                                        \  /             Tattoo:
                                         \/            Tag/Band:
                                      00037

+ Wild-caught...
```

```
================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00038
================================================================================
                                       WILD      WILD      WILD      WILD
                                        dam\    /sire       dam\    /sire
                                            \  /                \  /
                                             \/                  \/
       UNK                  UNK             00007  +             00009  +
             dam\    /sire                              dam\    /sire
                 \  /                                       \  /
                  \/                                         \/
                00017                                      00019
                                  \          /             Sex: Male
                                   \        /      Birth Date: 22 Jun 1999
                                    \      /    Last Location: UNKNOWN
                                  dam\    /sire    House Name:
                                      \  /             Tattoo:
                                       \/            Tag/Band:
                                     00038
+ Wild-caught...

================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00039
================================================================================
  WILD      WILD      WILD      WILD
   dam\    /sire       dam\    /sire
       \  /                \  /
        \/                  \/
      00007  +            00009  +             UNK                  UNK
             dam\    /sire                              dam\    /sire
                 \  /                                       \  /
                  \/                                         \/
                00020                                      00018
                                  \          /             Sex: Male
                                   \        /      Birth Date: 15 Jul 1999
                                    \      Last Location: DARJEELIN (dead)
                                  dam\    /sire    House Name:
                                      \  /             Tattoo:
                                       \/            Tag/Band:
                                     00039
+ Wild-caught...

================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00040
================================================================================
  WILD      WILD      WILD      WILD
   dam\    /sire       dam\    /sire
       \  /                \  /
        \/                  \/
      00007  +            00009  +             UNK                  UNK
             dam\    /sire                              dam\    /sire
                 \  /                                       \  /
                  \/                                         \/
                00020                                      00018
                                  \          /             Sex: Male
                                   \        /      Birth Date: 15 Jul 1999
                                    \      Last Location: DARJEELIN (dead)
                                  dam\    /sire    House Name:
                                      \  /             Tattoo:
                                       \/            Tag/Band:
+ Wild-caught...                     00040
```

```
================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00041
================================================================================
  WILD      WILD      WILD      WILD
   dam\    /sire       dam\    /sire
       \  /                \  /
        \/                  \/
      00007  +            00009  +            UNK                  UNK
             dam\    /sire                          dam\    /sire
                 \  /                                   \  /
                  \/                                     \/
                00020                                  00018
                                  \          /            Sex: Female
                                   \        /      Birth Date: 15 Jul 1999
                                    \      /  Last Location: DARJEELIN (dead)
                                  dam\    /sire    House Name:
                                      \  /            Tattoo:
                                       \/           Tag/Band:
                                     00041
+ Wild-caught...

================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00042
================================================================================
  WILD      WILD      WILD      WILD
   dam\    /sire       dam\    /sire
       \  /                \  /
        \/                  \/
      00007  +            00009  +            UNK                  UNK
             dam\    /sire                          dam\    /sire
                 \  /                                   \  /
                  \/                                     \/
                00020                                  00018
                                  \          /            Sex: Male
                                   \        /      Birth Date: 26 Jun 2000
                                    \      /    Last Location: AUCKLAND
                                  dam\    /sire    House Name:
                                      \  /            Tattoo:
                                       \/           Tag/Band:
                                     00042
+ Wild-caught...

================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00043
================================================================================
  WILD      WILD      WILD      WILD
   dam\    /sire       dam\    /sire
       \  /                \  /
        \/                  \/
      00007  +            00009  +            UNK                  UNK
             dam\    /sire                          dam\    /sire
                 \  /                                   \  /
                  \/                                     \/
                00015                                  00011
                                  \          /            Sex: Female
                                   \        /      Birth Date: 30 Jun 2000
                                    \     Last Location: DARJEELIN (dead)
                                  dam\    /sire    House Name: Priyanka
                                      \  /            Tattoo:
                                       \/           Tag/Band:
+ Wild-caught...                     00043
```

```
================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00044
================================================================================
                                  WILD      WILD      WILD      WILD
                                    dam\    /sire       dam\    /sire
                                        \  /                \  /
                                         \/                  \/
       UNK                  UNK         00007  +             00009  +
             dam\    /sire                             dam\    /sire
                 \  /                                      \  /
                  \/                                        \/
                00017                                     00019
                                \           /             Sex: Male
                                 \         /      Birth Date:  4 Jul 2000
                                  \       Last Location: GANGTOK   (dead)
                                dam\    /sire    House Name:
                                    \  /             Tattoo:
                                     \/            Tag/Band:
                                   00044
+ Wild-caught...

================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00045
================================================================================
                                     WILD      WILD      WILD      WILD
                                       dam\    /sire       dam\    /sire
                                           \  /                \  /
                                            \/                  \/
       UNK                  UNK              00007  +             00009  +
             dam\    /sire                             dam\    /sire
                 \  /                                      \  /
                  \/                                        \/
                00017                                     00019
                                \           /             Sex: Male
                                 \         /      Birth Date:  4 Jul 2000
                                  \       Last Location: GANGTOK   (dead)
                                dam\    /sire    House Name:
                                    \  /             Tattoo:
                                     \/            Tag/Band:
                                   00045
+ Wild-caught...

================================================================================
Taxon Name: AILURUS FULGENS                           Number:  00046
================================================================================
  WILD      WILD      WILD      WILD
   dam\    /sire       dam\    /sire
       \  /                \  /
        \/                  \/
      00007  +            00009  +            UNK                  UNK
             dam\    /sire                             dam\    /sire
                 \  /                                      \  /
                  \/                                        \/
                00015                                     00011
                                \           /             Sex: Male
                                 \         /      Birth Date: 18 Jun 2001
                                  \       /    Last Location: DARJEELIN
                                dam\    /sire    House Name: POKHRAJ
                                    \  /             Tattoo:
                                     \/            Tag/Band:
+ Wild-caught...                   00046
```

```
================================================================================
Taxon Name: AILURUS FULGENS                          Studbook Number:  00047
================================================================================
  WILD      WILD      WILD      WILD
   dam\    /sire       dam\    /sire
       \  /                \  /
        \/                  \/
      00007  +            00009  +             UNK                   UNK
             dam\    /sire                            dam\    /sire
                 \  /                                     \  /
                  \/                                       \/
               00015                                    00011
                                  \          /            Sex: Female
                                   \        /      Birth Date: 18 Jun 2001
                                    \      /    Last Location: SINGALILA
                                   dam\    /sire    House Name: NEELAM
                                       \  /             Tattoo:
                                        \/            Tag/Band:
                                     00047
+ Wild-caught...

================================================================================
Taxon Name: AILURUS FULGENS                          Studbook Number:  00048
================================================================================
  WILD      WILD      WILD      WILD
   dam\    /sire       dam\    /sire
       \  /                \  /
        \/                  \/
      00007  +            00009  +             UNK                   UNK
             dam\    /sire                            dam\    /sire
                 \  /                                     \  /
                  \/                                       \/
               00020                                    00018
                                  \          /            Sex: Male
                                   \        /      Birth Date: 28 Jun 2001
                                    \      /    Last Location: DARJEELIN
                                   dam\    /sire    House Name: SHAKYA
                                       \  /             Tattoo:
                                        \/            Tag/Band:
                                     00048
+ Wild-caught...

================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00049
================================================================================
  WILD      WILD      WILD      WILD
   dam\    /sire       dam\    /sire
       \  /                \  /
        \/                  \/
      00007  +            00009  +             UNK                   UNK
             dam\    /sire                            dam\    /sire
                 \  /                                     \  /
                  \/                                       \/
               00020                                    00018
                                  \          /            Sex: Female
                                   \        /      Birth Date: 28 Jun 2001
                                    \      /    Last Location: SINGALILA
                                   dam\    /sire    House Name: Dolma
                                       \  /             Tattoo:
                                        \/            Tag/Band:
+ Wild-caught...                     00049
```

```
================================================================================
Taxon Name: AILURUS FULGENS                          Studbook Number:  00050
================================================================================
                                      WILD      WILD      WILD      WILD
                                       dam\    /sire       dam\    /sire
                                           \  /                \  /
                                            \/                  \/
       UNK                  UNK             00007  +             00009  +
             dam\    /sire                             dam\    /sire
                 \  /                                      \  /
                  \/                                        \/
                00017                                     00019
                                  \          /              Sex: Female
                                   \        /       Birth Date: 29 Jun 2001
                                    \      Last Location: GANGTOK   (dead)
                                  dam\    /sire    House Name:
                                      \  /             Tattoo:
                                       \/            Tag/Band:
                                     00050
+ Wild-caught...

================================================================================
Taxon Name: AILURUS FULGENS                          Studbook Number:  00051
================================================================================
                                    WILD      WILD      WILD      WILD
                                      dam\    /sire       dam\    /sire
                                          \  /                \  /
                                           \/                  \/
       UNK                  UNK             00007  +             00009  +
             dam\    /sire                             dam\    /sire
                 \  /                                      \  /
                  \/                                        \/
                00017                                     00019
                                  \          /              Sex: Female
                                   \        /       Birth Date: 29 Jun 2001
                                    \      Last Location: GANGTOK   (dead)
                                  dam\    /sire    House Name:
                                      \  /             Tattoo:
                                       \/            Tag/Band:
                                     00051
+ Wild-caught...

================================================================================
Taxon Name: AILURUS FULGENS                          Studbook Number:  00052
================================================================================
                                      WILD      WILD      WILD      WILD
                                      dam\    /sire       dam\    /sire
                                          \  /                \  /
                                           \/                  \/
       UNK                  UNK             00007  +             00009  +
             dam\    /sire                             dam\    /sire
                 \  /                                      \  /
                  \/                                        \/
                00017                                     00019
                                  \          /              Sex: Male
                                   \        /       Birth Date: 20 Jun 2002
                                    \      /    Last Location: DARJEELIN
                                  dam\    /sire    House Name: RAHUL
                                      \  /             Tattoo:
                                       \/            Tag/Band:
+ Wild-caught...                     00052
```

```
================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00053
================================================================================
                                      WILD      WILD      WILD      WILD
                                        dam\    /sire       dam\    /sire
                                            \  /                \  /
                                             \/                  \/
       UNK                  UNK              00007  +             00009  +
              dam\    /sire                           dam\    /sire
                  \  /                                    \  /
                   \/                                      \/
                 00017                                   00019
                                  \          /            Sex: Male
                                   \        /      Birth Date: 20 Jun 2002
                                    \      /    Last Location: UNKNOWN
                                  dam\    /sire    House Name:
                                      \  /            Tattoo:
                                       \/           Tag/Band:
+ Wild-caught...                    00053
================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00054
================================================================================
  WILD      WILD      WILD      WILD
   dam\    /sire       dam\    /sire
       \  /                \  /
        \/                  \/
      00007  +            00009  +            UNK                  UNK
              dam\    /sire                           dam\    /sire
                  \  /                                    \  /
                   \/                                      \/
                 00015                                   00011
                                  \          /            Sex: Male
                                   \        /      Birth Date: 18 Jun 2001
                                    \      /    Last Location: DARJEELIN
                                  dam\    /sire    House Name: SIDDHARTA
                                      \  /            Tattoo:
                                       \/           Tag/Band:
+ Wild-caught...                    00054
================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00055
================================================================================
                                        ^       ^
                                        |       |
                                     00007  +  00009  +   UNK       UNK
                                      dam\    /sire       dam\    /sire
                                          \  /                \  /
                                           \/                  \/
                                         00020               00018
                                                  dam\    /sire
                                                      \  /
                                                       \/
                 UNK                                 00048
                                                      SHAKYA
                                  \          /            Sex: Male
                                   \        /      Birth Date: 22 Jun 2003
                                    \      / Last Location: GANGTOK   (dead)
                                  dam\    /sire    House Name:
                                      \  /            Tattoo:
                                       \/           Tag/Band:
+ Wild-caught...                    00055   ^ Pedigree continues beyond top
of page...
```

```
================================================================================
Taxon Name: AILURUS FULGENS                          Studbook Number:  00056
================================================================================
                                          ^         ^
                                          |         |
                                       00007  +  00009  +   UNK       UNK
                                        dam\    /sire       dam\    /sire
                                            \  /                \  /
                                             \/                  \/
                                             00020               00018
                                                       dam\    /sire
                                                           \  /
                                                            \/
                  UNK                                      00048
                                                            SHAKYA
                                      \          /          Sex: Male
                                       \        /      Birth Date: 22 Jun 2003
                                        \      /  Last Location: DARJEELIN (dead)
                                      dam\    /sire    House Name:
                                          \  /            Tattoo:
                                           \/           Tag/Band:
                                         00056
+ Wild-caught...
^ Pedigree continues beyond top of page...

================================================================================Tax
on Name: AILURUS FULGENS                          Studbook Number:  00057
================================================================================
WILD      WILD      WILD      WILD
   dam\    /sire       dam\    /sire
       \  /                \  /
        \/                  \/
      00007  +            00009  +            UNK                   UNK
             dam\    /sire                          dam\    /sire
                 \  /                                   \  /
                  \/                                     \/
                00020                                  00018
                                      \          /          Sex: Female
                                       \        /      Birth Date:  2 Jul 2003
                                        \      /    Last Location: DARJEELIN
                                      dam\    /sire    House Name: Sheetal
                                          \  /            Tattoo:
                                           \/           Tag/Band:
                                         00057
+ Wild-caught...

================================================================================
Taxon Name: AILURUS FULGENS                          Studbook Number:  00058
================================================================================
                  WILD                                     WILD
                                      \          /          Sex: Female
                                       \        /      Birth Date:  ~ Jan 2005
                                        \      /    Last Location: GANGTOK
                                      dam\    /sire    House Name: LUCKY
                                          \  /            Tattoo:
                                           \/           Tag/Band:
                                         00058
```

```
==========================================================================
Taxon Name: AILURUS FULGENS                      Studbook Number:  00059
==========================================================================
                 WILD                                        WILD
                                 \          /                Sex: Male
                                  \        /          Birth Date:  ~ Jan 2005
                                   \      /    Last Location: GANGTOK
                                 dam\    /sire    House Name: Ram
                                     \  /                 Tattoo:
                                      \/                Tag/Band:
                                    00059

==========================================================================
Taxon Name: AILURUS FULGENS                      Studbook Number:  00060
==========================================================================
     ^         ^                              ^         ^
     |         |                              |         |
 00007 *+  00009 *+   UNK       UNK      00007 *+  00009 *+ UNK       UNK
  dam\    /sire       dam\    /sire       dam\    /sire      dam\    /sire
      \  /                \  /                \  /               \  /
       \/                  \/                  \/                 \/
      00015               00011               00020              00018
             dam\    /sire                              dam\    /sire
                 \  /                                       \  /
                  \/                                         \/
                00027                                      00048
                                                            SHAKYA
                                 \          /                Sex: Male
                                  \        /          Birth Date:  5 Jun 2006
                                   \      /    Last Location: DARJEELIN
                                 dam\    /sire    House Name: Shainee
                                     \  /                 Tattoo:
                                      \/                Tag/Band:
                                    00060
+ Wild-caught... * Appear more than once...

==========================================================================
Taxon Name: AILURUS FULGENS                       Studbook Number:  00061
==========================================================================
                 WILD                                        WILD
                                 \          /                Sex: Male
                                  \        /          Birth Date:    ????
                                   \      /    Last Location: DARJEELIN
                                 dam\    /sire    House Name: John
                                     \  /                 Tattoo:
                                      \/                Tag/Band:
                                    00061
```

```
=========================================================================
Taxon Name: AILURUS FULGENS                      Studbook Number:  00062
=========================================================================
                                                          ^         ^
                                                          |         |
                                    UNK       UNK      00007  +  00009  +
                                      dam\    /sire       dam\    /sire
                                          \  /                \  /
                                           \/                  \/
       WILD                WILD           00017               00019
             dam\    /sire                            dam\    /sire
                 \  /                                     \  /
                  \/                                       \/
                00058  +                                00052
                 LUCKY                                   RAHUL
                                 \          /            Sex: Female
                                  \        /      Birth Date: 28 May 2007
                                   \      /    Last Location: DARJEELIN
                                 dam\    /sire    House Name: RIGSEL
                                     \  /             Tattoo:
                                      \/            Tag/Band:
                                    00062
+ Wild-caught...
^ Pedigree continues beyond top of page...
```

```
=========================================================================
Taxon Name: AILURUS FULGENS                       Studbook Number:  00063
=========================================================================
   ^         ^                             ^         ^
   |         |                             |         |
 00007 *+  00009 *+   UNK       UNK      00007 *+  00009 *+ UNK       UNK
   dam\    /sire       dam\    /sire       dam\    /sire    dam\    /sire
       \  /                \  /                \  /             \  /
        \/                  \/                  \/               \/
      00020               00018               00015             00011
               \      /                                \      /
             dam\    /sire                            dam\    /sire
                 \  /                                     \  /
                  \/                                       \/
                00057                                   00054
                Sheetal                                 SIDDHART
                                 \          /            Sex: Male
                                  \        /      Birth Date:  4 Jul 2007
                                   \      /    Last Location: DARJEELIN
                                 dam\    /sire    House Name: SHAAN
                                     \  /             Tattoo:
                                      \/            Tag/Band:
                                    00063
+ Wild-caught...
^ Pedigree continues beyond top of page...
```

```
=========================================================================
Taxon Name: AILURUS FULGENS                      Studbook Number:  00064
=========================================================================
                 WILD                                    WILD
                                 \          /            Sex: Male
                                  \        /      Birth Date:      ~ 2004
                                   \      /    Last Location: DARJEELIN
                                 dam\    /sire    House Name: Kaijale
                                     \  /             Tattoo:
                                      \/            Tag/Band:
                                    00064
```

```
================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00065
================================================================================
                                                          ^         ^
                                                          |         |
                                        UNK       UNK     00007  +  00009  +
                                        dam\    /sire      dam\    /sire
                                            \  /               \  /
                                             \/                 \/
       WILD                WILD             00017               00019
             dam\    /sire                              dam\    /sire
                 \  /                                       \  /
                  \/                                         \/
                 00058  +                                   00052
                  LUCKY                                      RAHUL
                                  \          /              Sex: Male
                                   \        /      Birth Date: 13 Jun 2008
                                    \      /    Last Location: GANGTOK
                                  dam\    /sire    House Name: SIMON
                                      \  /             Tattoo:
                                       \/            Tag/Band:
                                     00065
+ Wild-caught...

================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00066
================================================================================
                  WILD                                      WILD
                                  \          /              Sex: Female
                                   \        /      Birth Date:      ~ 2009
                                    \      /    Last Location: GANGTOK
                                  dam\    /sire    House Name: DOMA
                                      \  /             Tattoo:
                                       \/            Tag/Band:
                                     00066
================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00067
================================================================================
       WILD                WILD                WILD                WILD
             dam\    /sire                              dam\    /sire
                 \  /                                       \  /
                  \/                                         \/
                 00058  +                                   00059  +
                  LUCKY                                      Ram
                                  \          /              Sex: Female
                                   \        /      Birth Date: 13 Jun 2009
                                    \      /    Last Location: GANGTOK
                                  dam\    /sire    House Name: NIDHI
                                      \  /             Tattoo:
                                       \/            Tag/Band:
                                     00067
+ Wild-caught...
```

```
================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00068
================================================================================
                          ^       ^
                          |       |
  WILD      WILD     00017     00019
   dam\    /sire       dam\    /sire
        \  /              \  /
         \/                \/
      00058  +            00052                WILD                WILD
       LUCKY                RAHUL
             dam\    /sire                            dam\    /sire
                 \  /                                    \  /
                  \/                                      \/
                00062                                   00059  +
                 RIGSEL                                   Ram
                                  \          /            Sex: Male
                                   \        /      Birth Date:  2 Jul 2009
                                    \      /    Last Location: GANGTOK
                                  dam\    /sire    House Name: SONAM
                                      \  /             Tattoo:
                                       \/            Tag/Band:
+ Wild-caught...                    00068
================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00069
================================================================================
       WILD                WILD                WILD     WILD
           dam\    /sire                       dam\    /sire
               \  /                                \  /
                \/                                  \/
                00058  +                               00059  +
                 LUCKY                                   Ram
                                  \          /            Sex: Female
                                   \        /      Birth Date:  3 Jun 2010
                                    \      /    Last Location: GANGTOK
                                  dam\    /sire    House Name: KARMA
                                      \  /             Tattoo:
                                       \/            Tag/Band:
+ Wild-caught...                     00069
================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00070
================================================================================
                          ^       ^
                          |       |
  WILD      WILD     00017     00019
  dam\    /sire      dam\    /sire
       \  /               \  /
        \/                 \/
      00058  +            00052                WILD                WILD
       LUCKY                RAHUL
             dam\    /sire                            dam\    /sire
                 \  /                                    \  /
                  \/                                      \/
                00062                                   00059  +
                 RIGSEL                                   Ram
                                  \          /            Sex: Female
                                   \        /      Birth Date: 20 Jun 2010
                                    \      /    Last Location: GANGTOK
                                  dam\    /sire    House Name: SUSAN
                                      \  /             Tattoo:
                                       \/            Tag/Band:
+ Wild-caught...                    00070
```

```
================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00071
================================================================================
                           ^         ^
                           |         |
  WILD      WILD     00017     00019
   dam\    /sire       dam\    /sire
       \  /                \  /
        \/                  \/
      00058  +            00052                WILD                WILD
       LUCKY               RAHUL
             dam\    /sire                            dam\    /sire
                 \  /                                    \  /
                  \/                                      \/
                00062                                   00059  +
                 RIGSEL                                   Ram
                                \           /             Sex: Female
                                 \         /      Birth Date: 20 Jun 2010
                                  \       /    Last Location: GANGTOK
                                dam\    /sire    House Name: CHEN CHEN
                                    \  /             Tattoo:
                                     \/            Tag/Band:
                                   00071
+ Wild-caught...

================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00072
================================================================================
                  UNK                                     UNK
                                \           /             Sex: Female
                                 \         /      Birth Date: 18 Dec 2002
                                  \       Last Location: DARJEELIN (dead)
                                dam\    /sire    House Name: DURGA
                                    \  /             Tattoo:
                                     \/            Tag/Band:
                                   00072

================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00073
================================================================================
     ^         ^
     |         |
 00007  +  00009  +   UNK       UNK
   dam\    /sire       dam\    /sire
       \  /                \  /
        \/                  \/
      00020               00018                WILD                WILD
             dam\    /sire                            dam\    /sire
                 \  /                                    \  /
                  \/                                      \/
                00057                                   00061  +
                Sheetal                                  John
                                \           /             Sex: Female
                                 \         /      Birth Date:  6 Jul 2008
                                  \       /    Last Location: DARJEELIN
                                dam\    /sire    House Name: SAMRIDHI
                                    \  /             Tattoo:
                                     \/            Tag/Band:
                                   00073
+ Wild-caught...
^ Pedigree continues beyond top of page...
```

```
================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00074
================================================================================
     ^         ^
     |         |
 00007  +  00009  +   UNK       UNK
   dam\    /sire       dam\    /sire
       \  /                \  /
        \/                  \/
      00020                00018                WILD                 WILD
             dam\    /sire                             dam\    /sire
                 \  /                                     \  /
                  \/                                       \/
               00057                                    00061  +
               Sheetal                                    John
                                \          /            Sex: Male
                                 \        /      Birth Date:  6 Jul 2008
                                  \      /  Last Location: DARJEELIN (dead)
                                dam\    /sire    House Name:
                                    \  /            Tattoo:
                                     \/           Tag/Band:
                                  00074
+ Wild-caught...

================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00075
================================================================================
     ^         ^
     |         |
 00007  +  00009  +   UNK       UNK
   dam\    /sire       dam\    /sire
       \  /                \  /
        \/                  \/
      00020                00018                WILD                 WILD
             dam\    /sire                             dam\    /sire
                 \  /                                     \  /
                  \/                                       \/
               00057                                    00061  +
               Sheetal                                    John
                                \          /            Sex: Female
                                 \        /      Birth Date: 22 Jun 2010
                                  \      /    Last Location: DARJEELIN
                                dam\    /sire    House Name: JANAKI
                                    \  /            Tattoo:
                                     \/           Tag/Band:
                                  00075
+ Wild-caught...
```

```
================================================================================
Taxon Name: AILURUS FULGENS                          Studbook Number:  00076
================================================================================
     ^         ^
     |         |
 00007  +  00009  +   UNK       UNK
   dam\    /sire       dam\    /sire
       \  /                \  /
        \/                  \/
      00020               00018                WILD                  WILD
            dam\    /sire                             dam\    /sire
                \  /                                     \  /
                 \/                                       \/
               00057                                    00061  +
               Sheetal                                    John
                                \          /             Sex: Male
                                 \        /      Birth Date: 22 Jun 2010
                                  \      /    Last Location: DARJEELIN
                                dam\    /sire    House Name: RAM
                                    \  /             Tattoo:
                                     \/            Tag/Band:
                                   00076
+ Wild-caught...
^ Pedigree continues beyond top of page...

================================================================================
Taxon Name: AILURUS FULGENS                          Studbook Number:  00077
================================================================================
                 WILD                                     WILD
                                \          /             Sex: Female
                                 \        /      Birth Date:    ????
                                  \      Last Location: AHMEDABAD (dead)
                                dam\    /sire    House Name:
                                    \  /             Tattoo:
                                     \/            Tag/Band:
                                   00077

================================================================================
Taxon Name: AILURUS FULGENS                          Studbook Number:  00078
================================================================================
       WILD                WILD                WILD                  WILD
            dam\    /sire                             dam\    /sire
                \  /                                     \  /
                 \/                                       \/
               00058  +                                 00059  +
                LUCKY                                     Ram
                                \          /             Sex: Male
                                 \        /      Birth Date:  7 Jun 2011
                                  \      /    Last Location: GANGTOK
                                dam\    /sire    House Name:
                                    \  /             Tattoo:
                                     \/            Tag/Band:
                                   00078

+ Wild-caught...
```

```
=========================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00079
=========================================================================
                                                            ^         ^
                                                            |         |
                                    UNK       UNK      00007  +  00009  +
                                       dam\    /sire       dam\    /sire
                                           \  /                \  /
                                            \/                  \/
       WILD               WILD             00017               00019
             dam\    /sire                               dam\    /sire
                 \  /                                        \  /
                  \/                                          \/
                00066  +                                    00052
                  DOMA                                        RAHUL
                                 \          /                  Sex: Male
                                  \        /      Birth Date: 10 Jun 2011
                                   \      Last Location: GANGTOK   (dead)
                                 dam\    /sire    House Name:
                                     \  /             Tattoo:
                                      \/            Tag/Band:
                                    00079
+ Wild-caught...
=========================================================================
Taxon Name: AILURUS FULGENS                       Studbook Number:  00080
=========================================================================
                                                            ^         ^
                                                            |         |
                                    UNK       UNK      00007  +  00009  +

                                       dam\    /sire       dam\    /sire
                                           \  /                \  /
                                            \/                  \/
       WILD               WILD             00017               00019
             dam\    /sire                               dam\    /sire
                 \  /                                        \  /
                  \/                                          \/
                00066  +                                    00052
                  DOMA                                        RAHUL
                                 \          /                  Sex: Male
                                  \        /      Birth Date: 10 Jun 2011
                                   \      Last Location: GANGTOK   (dead)
                                 dam\    /sire    House Name:
                                     \  /             Tattoo:
                                      \/            Tag/Band:
                                    00080
+ Wild-caught...
^ Pedigree continues beyond top of page...
```

```
================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00081
================================================================================
                                                                ^         ^
                                                                |         | WILD
WILD      WILD      WILD      UNK       UNK   00007  +  00009 +
dam\    /sire       dam\    /sire       dam\    /sire       dam\   /sire
     \  /                \  /                \  /                \  /
      \/                  \/                  \/                  \/
      00058  +            00059  +            00017               00019
       LUCKY                Ram
             dam\    /sire                           dam\    /sire
                 \  /                                    \  /
                  \/                                      \/
                 00067                                   00052
                  NIDHI                                   RAHUL
                                  \          /            Sex: Male
                                   \        /      Birth Date: 10 Jun 2011
                                    \     Last Location: GANGTOK   (dead)
                                  dam\    /sire    House Name:
                                      \  /            Tattoo:
                                       \/           Tag/Band:
                                      00081
+ Wild-caught...
^ Pedigree continues beyond top of page...

================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00082
================================================================================
                                                                ^         ^
                                                                |         |
  WILD      WILD      WILD      WILD      UNK      UNK 00007  +  00009  +
   dam\    /sire       dam\    /sire       dam\    /sire      dam\   /sire
        \  /                \  /                \  /               \  /
         \/                  \/                  \/                 \/
      00058  +            00059  +            00017               00019
       LUCKY                Ram
             dam\    /sire                           dam\    /sire
                 \  /                                    \  /
                  \/                                      \/
                 00067                                   00052
                  NIDHI                                   RAHUL
                                  \          /            Sex: Female
                                   \        /      Birth Date: 10 Jun 2011
                                    \      /  Last Location: GANGTOK   (dead)
                                  dam\    /sire    House Name:
                                      \  /            Tattoo:
                                       \/           Tag/Band:
                                      00082
+ Wild-caught...
^ Pedigree continues beyond top of page...
```

```
================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00083
================================================================================
    ^       ^
    |       |
 00020     00018      WILD      WILD
   dam\    /sire       dam\    /sire
       \  /               \  /
        \/                 \/
      00057               00061  +            WILD                WILD
      Sheetal              John
             dam\    /sire                            dam\    /sire
                 \  /                                     \  /
                  \/                                       \/
               00073                                    00064  +
               SAMRIDHI                                 Kaijale
                                  \          /           Sex: Male
                                   \        /      Birth Date: 25 Jun 2011
                                    \      / Last Location: DARJEELIN (dead)
                                  dam\    /sire    House Name:
                                      \  /            Tattoo:
                                       \/           Tag/Band:
+ Wild-caught...                    00083
^ Pedigree continues beyond top of page...

================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00084
================================================================================
                WILD                                      WILD
                                  \          /           Sex: Male
                                   \        /      Birth Date:    ????
                                    \      /    Last Location: GANGTOK
                                  dam\    /sire    House Name:
                                      \  /            Tattoo:
                                       \/           Tag/Band:
                                    00084

================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00085
================================================================================
  ^       ^                                 ^       ^
  |       |                                 |       |
 00020     00018    WILD      WILD     00007 *+  00009 *+   UNK       UNK
dam\    /sire       dam\    /sire       dam\    /sire       dam\    /sire
    \  /               \  /               \  /               \  /
     \/                 \/                 \/                 \/
      00057              00061  +           00015              00011
      Sheetal             John
             dam\    /sire                            dam\    /sire
                 \  /                                     \  /
                  \/                                       \/
               00075                                    00054
                JANAKI                                  SIDDHART

                                  \          /           Sex: Female
                                   \        /      Birth Date: 23 May 2012
                                    \      /  Last Location: DARJEELIN (dead)
                                  dam\    /sire    House Name:
                                      \  /            Tattoo:
                                       \/           Tag/Band:
+ Wild-caught...                    00085   * Appear more than once...
^ Pedigree continues beyond top of page...
```

```
================================================================================
Taxon Name: AILURUS FULGENS                          Studbook Number:  00086
================================================================================
     ^         ^
     |         |
 00020     00018      WILD      WILD
   dam\    /sire       dam\    /sire
       \  /                \  /
        \/                  \/
      00057                00061  +            WILD                WILD
      Sheetal               John
             dam\    /sire                            dam\    /sire
                 \  /                                    \  /
                  \/                                      \/
               00073                                   00064  +
               SAMRIDHI                                Kaijale
                                  \          /            Sex: Unknown
                                   \        /      Birth Date: 19 Jun 2012
                                    \      /    Last Location: DARJEELIN
                                  dam\    /sire    House Name: SMILE
                                      \  /            Tattoo:
                                       \/           Tag/Band:
+ Wild-caught...                    00086
^ Pedigree continues beyond top of page...

================================================================================
Taxon Name: AILURUS FULGENS                        Studbook Number:  00087
================================================================================
       WILD                WILD                WILD                WILD
             dam\    /sire                           dam\    /sire
                 \  /                                    \  /
                  \/                                      \/
               00058  +                                00059  +
                LUCKY                                    Ram
                                  \          /            Sex: Male
                                   \        /      Birth Date: 10 Jun 2013
                                    \      /    Last Location: GANGTOK
                                  dam\    /sire    House Name:
                                      \  /            Tattoo:
                                       \/           Tag/Band:
+ Wild-caught...                    00087
```

```
================================================================================
Taxon Name: AILURUS FULGENS                          Studbook Number:  00088
================================================================================
                           ^         ^
                           |         |
  WILD      WILD     00017     00019
   dam\    /sire       dam\    /sire
       \  /                \  /
        \/                  \/
      00058  +            00052                WILD                WILD
       LUCKY               RAHUL
             dam\    /sire                              dam\    /sire
                 \  /                                       \  /
                  \/                                         \/
                00062                                      00064  +
                 RIGSEL                                    Kaijale
                                \          /               Sex: Male
                                 \        /      Birth Date: 27 Jun 2013
                                  \      /    Last Location: DARJEELIN
                                dam\    /sire    House Name: SHIFU
                                    \  /             Tattoo:
                                     \/            Tag/Band:
+ Wild-caught...                   00088
 ^ Pedigree continues beyond top of page...

================================================================================
Taxon Name: AILURUS FULGENS                          Studbook Number:  00089
================================================================================
                           ^         ^
                           |         |
  WILD      WILD     00017     00019
   dam\    /sire       dam\    /sire
       \  /                \  /
        \/                  \/
      00058  +            00052                WILD                WILD
       LUCKY               RAHUL
             dam\    /sire                              dam\    /sire
                 \  /                                       \  /
                  \/                                         \/
                00062                                      00064  +
                 RIGSEL                                    Kaijale
                                \          /               Sex: Female
                                 \        /      Birth Date: 27 Jun 2013
                                  \      /    Last Location: DARJEELIN
                                dam\    /sire    House Name: KITCHI
                                    \  /             Tattoo:
                                     \/            Tag/Band:
                                   00089
+ Wild-caught...
^ Pedigree continues beyond top of page...
```

```
================================================================================
Taxon Name: AILURUS FULGENS                          Studbook Number:  00090
================================================================================
     ^         ^
     |         |
 00007  +  00009  +   UNK       UNK
   dam\    /sire       dam\    /sire
       \  /                \  /
        \/                  \/
      00020                00018                WILD                  WILD
             dam\    /sire                             dam\    /sire
                 \  /                                     \  /
                  \/                                       \/
               00057                                    00061  +
               Sheetal                                    John
                                \          /             Sex: Female
                                 \        /      Birth Date: 28 Jun 2013
                                  \      /    Last Location: DARJEELIN
                                dam\    /sire    House Name: SONAM
                                    \  /             Tattoo:
                                     \/            Tag/Band:
                                   00090
+ Wild-caught...
^ Pedigree continues beyond top of page...
```