

NATIONAL STUDBOOK

One Horned Rhinoceros (*Rhinoceros unicornis*)

III Edition

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Central Zoo Authority

National Studbook of One Horned Rhinoceros (*Rhinoceros unicornis*) III Edition

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

PROJECT PERSONNEL

Junior Research Fellow
Ms. Neema Sangmo Lama

Project Consultant
Anupam Srivastav, Ph.D.

Project Investigator
Dr. Parag Nigam

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For correspondence:

Project Investigator, Studbook Project,
Wildlife Institute of India,
PO Box 18, Dehradun, 248001
Uttarakhand, India

FOREWORD

Habitat loss, fragmentation and degradation coupled with poaching have rendered One Horned Rhinoceros vulnerable to extinction. Intensive protection measures in recent times have led to the recovery of free ranging population; however, maintenance of viable *ex-situ* populations for insurance purposes remains imperative. Effective *ex-situ* conservation of the species can be ensured by scientific management to ensure their long term genetic viability and demographic stability. Pedigree information contained in studbooks forms the basis for this management.

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

As part of the project outcomes the WII has compiled the III edition of the National Studbook of One Horned Rhinoceros (*Rhinoceros unicornis*) in Indian zoos. The recommendations contained in the studbook will form the basis for the long term management of the species in captivity. It is hoped that the holding institutions will adopt the recommendations and keep the WII informed of changes in their populations on a regular basis to enable the timely update of the studbook.

(Dr. D.N. Singh, I.F.S.)
Member Secretary
Central Zoo Authority

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Nawab Wazid Ali Shah Zoological Garden, Lucknow
Indira Gandhi Zoological Park, Vishakhapatnam
Alipore Zoological Garden, Kolkata
Nandankanan Biological Park, Bhubaneswar
Assam State Zoo Cum Botanical Garden, Guwahati
Sanjay Gandhi Biological Park, Patna
National Zoological Park, Delhi
Sri Chamarajendra Zoological Gardens, Mysore
Thiruvananthapuram Zoo, Thiruvananthapuram
Kanpur Zoological Park, Kanpur
Nehru Zoological Park, Hyderabad

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Authors

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Greater One Horned Rhinoceros (*Rhinoceros unicornis*)

The Indian or greater one horned rhinoceros inhabits alluvial floodplain grasslands and riverine forests. The species is presently endemic to the Ganges – Brahmaputra River basins with a historical reported distribution from Brahmaputra valley in the east to Indus valley in the west. It is threatened by habitat loss, poaching and invasive plant species.

Taxonomy

Class: Mammalia
Order: Perissodactyla
Family: Rhinocerotidae
Genus: *Rhinoceros*
Species: *unicornis*



Classical taxonomy places the 17 extant species of perissodactyls (odd-toed ungulates) into two suborders: Ceratomorpha (rhinos and tapirs) and Hippomorpha (horses, asses and zebras) (Wood 1937). While, the tapirs and hippomorphs are reduced to a single genera each, the *Tapirus* and *Equus* respectively; the family rhinocerotidae comprising of five species has been further divided into four genera. These include the white (*Ceratotherium simum*) and black (*Diceros bicornis*) rhinoceroses in Africa and the Indian or greater one horned rhinoceros (*Rhinoceros unicornis*), Javan (*Rhinoceros sondaicus*), and Sumatran (*Dicerorhinus sumatrensis*) rhinoceroses in Asia.

Several contradictory phylogenies based on morphological evidence were proposed for the order Perissodactyla. These were resolved with the use of molecular genetics techniques; wherein the split into two sub-orders the Ceratomorpha and Hippomorpha with ceratomorpha being further subdivided into the families Rhinocerotidae, and Tapiridae was supported by various studies. Within the family Rhinocerotidae, Asian rhinoceroses (*R. unicornis* and *D. sumatrensis*) were suggested to have diverged prior to the African rhinoceroses (*Ceratotherium simum* and *Diceros bicornis*), with the Indian rhinoceros as the most basal lineage (Tougard et al. 2001; Willerslev 2009; Price & Bininda-Emonds 2009; Steiner & Ryder 2011). Willerslev (2009) further suggested the use of nuclear DNA based techniques for effective resolution of their phylogeny.

Species Biology

General characteristics

The species is characterized by the presence of a single nasal horn (Laurie et al. 1983) with limited sexual dimorphism (Berger 1986). The hide is grey brown in color with varying shades of pink in the skin folds; while the keratinized horn is black in colour. Scapular, pelvic, humeral, femoral, and subcaudal folds are present with males having a prominent development of neck-folds. Pedal scent glands are present in both hind and fore-feet (Laurie et al. 1983). Rivet like epidermal knobs (tubercles) are present all over the animal (Laurie et al. 1983) that emerge as the animals attain adulthood (Dinerstein and Price 1991).

Based on dental characters, horn length, body size and skin fold and tubercles Dinerstein (1991) proposed a method for identification of age and gender of free ranging specimens. Animals with their mothers considered as calves (\leq four years); animals between four to six years old considered as sub-adults and animals older than six years considered adults. Adult males were characterized by the extensive development of

Table 1: Morphometrics of One horned rhinoceros*

Features	Males	Females
Shoulder height	1.75 m (range 1.6 - 1.9m)	1.6 m (range 1.4 – 1.7m)
Head and body length	4.1 m	
Body weight	2000 kg	1600 kg

* (Laurie et al. 1983)

muscles of the neck and shoulder and secondary shoulder skin folds. Older males had a large horn base with signs of breakage and subsequent re-growth. Multiparous, older females have prominent pectoral and pelvic girdles and ribs. Further older males have a much larger body mass as compared to females (Laurie et al. 1983). Table 1 summarizes the morphometric measurements of the species.

Habitat

The species inhabits riverine grasslands in the alluvial floodplains throughout its range. The grasslands are interspersed with swamp patches dominated by emergent vegetation and riverine woodlands dominated by *Trewia*, *Bombax*, *Syzygium*, *Acacia*, *Dalbergia*, *Shorea* and *Terminalia* communities. Home range size varied proportionally to vegetation diversity of the area and ranged from two to more than 10 km². They wallow in mud-pools for cooling themselves and avoiding insect pests during summer (Laurie et al. 1983).

During summers, activity is limited to night, early morning and late afternoon while mid-day is also spent in feeding during the wetter and cooler days. Time spent on feeding varies seasonally with the least time spent during monsoons (36%) and winter (57%); while maximum time is spent during spring (65%) (Laurie, 1978).

Feeding ecology

They are reported to feed on parts of 183 species of plants belonging to 57 families in Chitwan. Of these grasses (mainly *Saccharum*, *Narenga* and *Cynodon*) of 53 species made upto 70 – 89% of their diet that varies seasonally (Laurie, 1978). Fruits, leaves and branches of shrubs and trees, submerged and floating aquatic plants, sedges, ferns and agricultural crops are also reported to form a part of their diet (Laurie et al. 1983). Changes in seasonal availability of food plants resulted in movement between vegetation types (Laurie et al. 1983).

Social organization and behaviour

The species is solitary with the only exceptions being cow and calf pairs and sub-adult dispersing males. These have been termed as groups by Laurie (1982). Temporary associations of both genders and various age classes may form at wallowing pools; however, the animals continue to move independent of each other (Laurie, 1978).

Interactions between sub-adults and cows and calves involve playful interactions, that include nuzzling, running around a companion, head bobbing and waving, and horn to horn sparring contests (Laurie,

1978). Interactions between members of different groups are agonistic and may result in flight of one or more animals after initial displays (Laurie, 1982).

Dominant males maintain a limited level of range exclusiveness; however, range may overlap with that of subordinate males and other neighbouring dominant males. The size of ranges has been reported to vary from two to eight square kilometers in Chitwan National Park, Nepal (Laurie *et al.* 1983).

On being disturbed the animals exhibit a flight response; however, cows with calves may charge the intruder, with the charge being carried through occasionally resulting in casualties. Besides human beings the calves at an early age are vulnerable to attacks by tigers (Laurie, 1982).

Communication and vocalization

Auditory and olfactory cues are used for communication. The vocalizations include snort: an initial contact call; honk bleat and roar for agonistic interactions; squeak pant by males after extended chases of females or other males; moo-grunt used as a contact call by calves (Laurie, 1978). Olfactory cues in the urine, dung and secretions from pedal glands are used by males to indicate their dominant status and identify females in estrus (Laurie, 1982).

Reproduction

The cow on heat utters typical rutting calls and squirts urine at short intervals to attract the bulls (Tripathi 2013). An adult male locates an estrus female by her olfactory cues, sniffing the ground and performing flehmen. The male accompanies the female for several days, who repels his attempts by turning and snorting. Horn to horn confrontations develop and result in severe fights or prolonged chases with loud vocalizations by the female. After a successful courtship copulation occurs, lasting upto 75 minutes with the animals dispersing afterwards (Tripathi 2013).

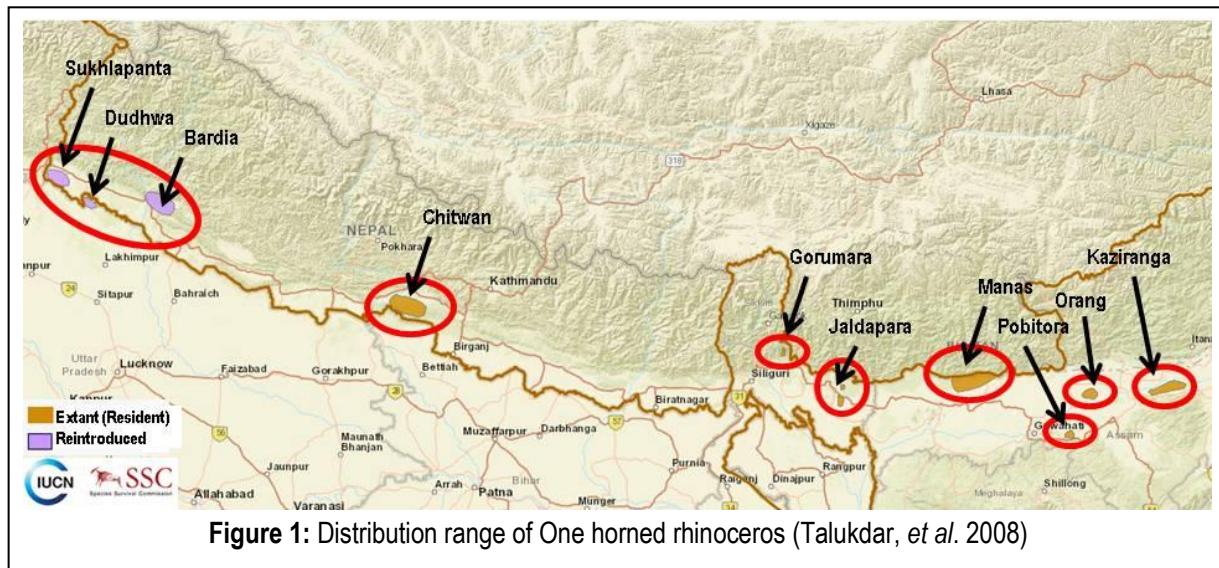
Pregnancy is not manifest externally initially and is discernible only during the last two – three months by the development of the teats. Females grow aggressive shortly after parturition and choose secluded areas to give birth. The calves are active within an hour after parturition and seek the teats for suckling (Tripathi 2013). Parental care is provided by the mothers with the father's taking no part in the rearing. Up to the age of 6 months' calves are left alone for periods as long as 90 min while their mothers feed up to 800 m away (Laurie, *et al.* 1983). Table 2 summarizes the key reproductive attributes of the species.

Table 2: Reproductive characters of Greater one horned rhinoceros

Characters	Males	Females	Source
Median age at first reproduction	10years 5months	9years 2months	Zschokke <i>et al.</i> (1998)
Estrus cycle length		48 days (39 – 64 days)	Miller (2003)
Gestation	462 – 491 days (mean 479 days)		
Age at weaning	18 months	18 months	Laurie <i>et al.</i> (1983)
Age at dispersal	39 months	36 months	
Litter size	Single calf		
Inter-birth interval	45.6 ±1.8 months (range = 34-51 months)		Dinerstein and Price (1991)

Distribution

The historical range of the species extended across the floodplains of Indus, Ganga and Brahmaputra rivers from Peshawar in northern Pakistan eastward along the base of the Himalayas, through the north-western provinces of India, northern Uttar Pradesh and Bihar, the Nepal terai and north Bengal into the Brahmaputra valley of Assam (Laurie 1978). The species declined sharply in the rest of its range from 1600-1900, until the species was on the brink of extinction at the beginning of the twentieth century.



The species presently persists in a few small subpopulations in Nepal and India (West Bengal, Uttar Pradesh, Assam) (Foose and van Strien 1997; Grubb, 2005), with translocated populations in Sukhlapanta Wildlife Reserve and Bardia National Park in Nepal and Dudhwa National Park in India. Reintroduction efforts of a pair of animals in Pakistan were unsuccessful (Talukdar, et al. 2008).

Threats and status

The species declined to near extinction in the 1900s due to habitat loss caused by conversion alluvial plain grasslands to farmland, sport hunting during the late 1800s and early 1900s. Recent threats include poaching for use of horns in traditional Chinese medicine and habitat degradation caused by invasion by exotic plants into grasslands reducing available habitats (Talukdar, et al. 2008).

The total population in May 2007 was estimated at 2,575 individuals, including a total of 378 in Nepal and 2,200 in India (Asian Rhino Specialist Group 2007). The population status of the free ranging population in India and Nepal is presented in table 3.

Table 3: Population status of Greater One Horned Rhinoceros in protected areas *

Sl. No.	Protected Area	1999	2006
India			
1.	Kaziranga National Park	1,551	1,855
2.	Pabitora	74	81
3.	Jaldapara	84 (2002)!	108
4.	Orang	46	81
5.	Dudhwa National Park (re-introduced)		21

Sl. No.	Protected Area	1999	2006
6.	Manas National Park		3
7.	Gorumara	22 (2002)!	27
8.	Karteniaghata		2
Nepal			
9.	Royal Chitwan National Park	544 (2000)!	372 (2005)!
10.	Royal Bardia National Park (re-introduced)	40 (1997)!	35 (2007)!
11.	Royal Suklaphanta Wildlife Reserve (re-introduced)		6 (2004)!

* Various sources

! numbers in () indicate census year

The population has shown signs of recovery in the recent past. Accordingly the species threat perception of the species has declined. It is currently listed as vulnerable in the IUCN Red List of threatened species (Talukdar, et al. 2008) and in Schedule I of the Wildlife Protection Act (1972) of India.

Status in Captivity

The Species360 database includes 182 (95.87.0) living specimens held at 62 institutions globally spread across four regions, of these 46 (27.19.0) specimens are held at 10 Indian zoos; while, the inventory of animals for 2015 – 2016 maintained by Central Zoo Authority indicates the presence of 27 (16.11.0) animals held at 11 Indian zoos. A total of 30 (18.12.0) specimens are present at 10 institutions are however included in the updated studbook, based on data made available by zoos. Table 4 summarizes the status of the species in captivity.

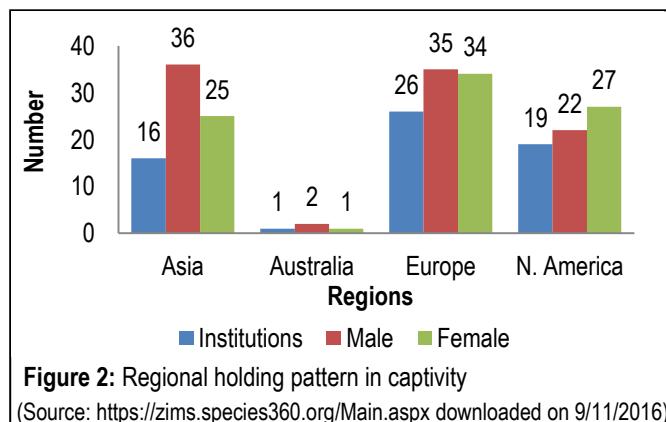


Figure 2: Regional holding pattern in captivity

(Source: <https://zims.species360.org/Main.aspx> downloaded on 9/11/2016)

Table 4: Status of One horned rhinoceros in Indian Zoos

Zoo Name	CZA inventory *			Based on data made available by holding zoos		
	Male	Female	Total	Male	Female	Total
Nawab Wazid Ali Shah Zoological Garden, Lucknow	1	0	1	1	0	1
Indira Gandhi Zoological Park, Vishakhapatnam	1	0	1	1	0	1
Alipore Zoological Garden, Kolkata	1	0	1	1	0	1
Nandankanan Biological Park, Bhubaneswar	1	0	1	1	0	1
Assam State Zoo Cum Botanical Garden, Guwahati	2	2	4	3	2	5
Sanjay Gandhi Biological Park, Patna	5	5	10	5	5	10
National Zoological Park, Delhi	0	2	2	0	2	2
Sri Chamarajendra Zoological Gardens, Mysore	1	1	2	0	1	1
Thiruvananthapuram Zoo, Thiruvananthapuram	1	0	1	1	0	1
Kanpur Zoological Park, Kanpur	3	1	4	3	1	4
Nehru Zoological Park, Hyderabad	0	0	0	2	1	3
Total	16	11	27	18	12	30

* Source: <http://cza.nic.in/inventory.html> downloaded on 9/11/2016)

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 institutions housing One horned rhinoceros in India, requesting information for each captive specimen. Data was entered in the Single Population Analysis and Records Keeping System (SPARKS v 1.66) (ISIS 2004) and subsequently exported to population management programme PMx v 1.2 (Ballou *et al.*, 2011) for further analysis. The International Studbook (von Houwald, 2015) was used for assigning international studbook numbers of the specimens.

Scope of the Studbook and Conventions

- The studbook includes all specimens present in India for whom records were available from holding institutions, species taxon report from Species360 website and the International Studbook (von Houwald, 2015).
- The specimens whose fates were not known due to non availability of data from holding institutions or their movement to institutions outside India were listed as lost to follow up and the same is recorded as 'Ltf' in the events column of the studbook report.
- The mnemonics present in the SPARKS software were used for individual institutions and the same are listed in the location glossary (Appendix IV). The mnemonic India was used for all specimens acquired from the wild.
- The CZA inventory was used as a benchmark for population estimates and deviations from the same are based on movement records made available by both the donor as well as the recipient institution.
- Specimens for whom records were not available from holding institutions but present in the International studbook were assigned Studbook Numbers beginning with 'IN'.

Analysis

Historical population

The species has been housed at 22 zoos in the country with a historical population of 152 (86.66) specimens. The captive population includes approximately 54% of wild origin specimens (Table 4). A total of 43 (16.27) specimens of both wild and captive origin have reproduced in captivity. A summary of the historical population is provided below in table 5 while details of events of each specimen are provided in Appendix I.

Table 5: Summary of the historical population

	Males	Females	Total
Total Studbook size	86	66	152
Total number of acquisitions from wild	46	35	81
Total number of captive births	37	28	65
Total number of wild-conceived individuals	2	2	4
Total number of unknown origin individuals	1	1	2
Total number of deaths	67	54	121
Total number of LTFs (lost to follow up)	10	4	14
Total number of breeding individuals	16	27	43

Census trends

The history of the population in captivity is presented in figure 3 that summarizes the census trends of the captive population. A perusal of the figure reveals that the first individual for whom records are available entered captivity prior to 1956 and was transferred from Assam State Zoo and Botanical Garden to Thiruvananthapuram zoo in 1956, subsequently another male was acquired from the wild in 1957. The first recorded entry of a female into captivity was in 1958. The increase in population was largely driven by acquisitions from the wild till 2001 subsequently the proportion of captive born specimens in the population increased. The figure also reveals that while a larger proportion of males were acquired from the wild the male bias is also present in the captive born specimens.

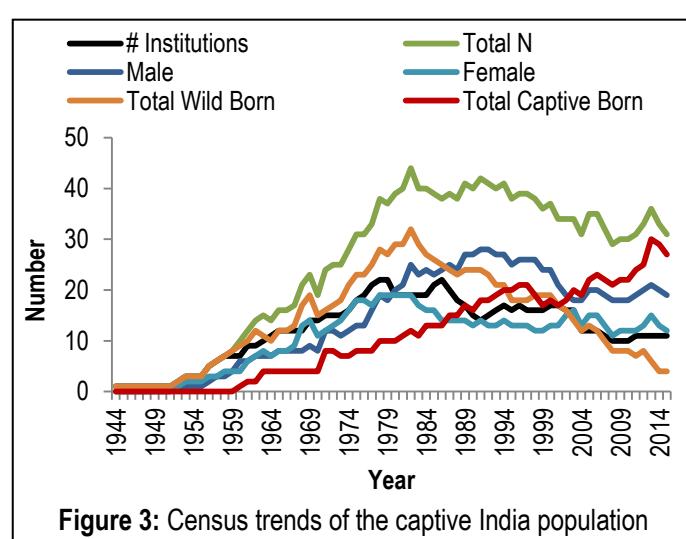


Figure 3: Census trends of the captive India population

Living population

The living population includes 30(18.12) specimens housed at 11 locations. The status of the living population is summarized in table 6. It includes a total of five (4.1) wild origin specimens while the remaining 26 (15.11) specimens are of captive origin. Approximately 35% of the population or 11 (3.8) specimens are reproductively active. The limited reproductive activity may be attributed to the presence of single sex specimens at six institutions.

Table 6: Summary of the living population

	Males	Females	Total
Total no. of living individuals	18	12	30
Total number of wild-born individuals	4	1	5
Total number of captive-born individuals	15	11	26
Total number of breeding individuals	3	8	11

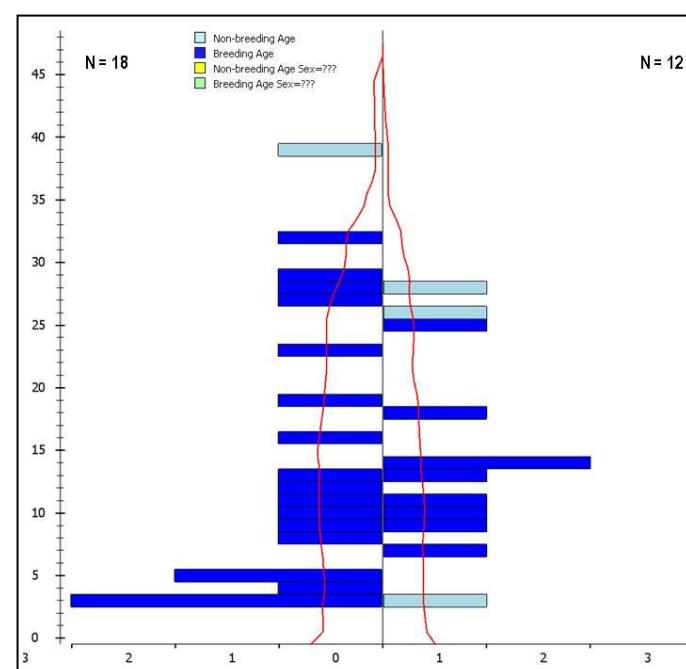


Figure 4: Age distribution of One horned rhinoceros

specimens in the population resulting in a declining population. An additional cause of concern is the male bias of the population. Addressing inequities in the age distribution by acquisition of females from wild/ zoos outside India can ensure effective population growth and fulfillment of conservation breeding goals of the population.

Life table analysis

Population growth rate of the population obtained from analysis carried out reveals a declining population with a generation time of 16.6 years. Based on the vital rates of the population, it is projected to decline over the next 20 years with a total projected population of 20 specimens after 20 years. Table 7 summarizes the vital rates of the captive population.

Genetic Status

The living population of 30 (18.12) specimens includes five (4.1) wild origin specimens. The current population retains the genetic representation from 10 founder animals, while the historical population includes contributions from 25 wild origin specimens. The current population retains 90% genetic diversity brought in by the founders; however unequal representation founder genome in the population has resulted in its retaining genome equivalents of only five founder animals. Regulated mating choices have resulted in specimens in the population maintaining low level of relatedness with each other as is evinced by values of mean inbreeding and population mean kinship. The current genetic status of the population is summarized in table 8.

Pairing Recommendations

The pairing recommendations (table 9) for the species in captivity have been arrived at based on 'Mate Suitability Index' (Box 1 for details) that assesses changes in genetic diversity, differences in mean kinship and inbreeding coefficient as result of each pairing choice being exercised. The pairing between other animals produces MSI scores of four and above, they have accordingly not been recommended for pairing.

Table 7: Vital rates of the captive population

	Male	Female	Total
Population growth rate (λ)	0.972	0.979	0.976
Generation time (T)	19.0 years	14.2 years	16.6 years
Projected population after 20 years (N 20)	11.5	8.6	20.1

Table 8: Genetic summary

Summary statistics	Current
Founders	10
Living Animals	30
Percent Ancestry Known	92%
Gene Diversity	0.9011
Founder Genome Equivalents	5.05
Mean Inbreeding	0.0365
Population mean kinship	0.0989
Ne/N	0.3265

Table 9: Pairing recommendations

Studbook No.	Location	Males		MSI Score
		Studbook No.	Location	
89	Assam	77	Assam	1
112	Assam	141	Assam	1
100	Delhi	123	Hyderabad	2
124	Delhi	85	Kanpur	3
92	Patna	72	Lucknow	3

Box 1: Mate Suitability Index (MSI)

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

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

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

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

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

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

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

Using Pairwise Info

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

Targets for Population Management

The current captive population of One horned rhinoceros in Indian zoos includes 30(18.12) specimens housed at 10 institutions. A large proportion of these specimens are in the reproductively active age classes; however. Limited recruitment; however, has resulted in a declining population (Maximum potential lambda; 0.9756) and it is unlikely to achieve *ex-situ* conservation goals. The population retains 90% genetic diversity introduced by 10 founders and has effective population size of 10.4. The population also has an unequal representation of founder genome as is indicated by the founder genome equivalent value of 5.05.

Multiple simulations were run using PMx to determine the fate of the current population to assess the effect of management interventions that result in increased population growth rate for achieving demographic stability and supplementation with effective founders for ensuring genetic viability; over the next 100 years. The outcomes of the scenarios that were run without change and with changes (supplementation with effective founders and increasing the population growth rate) that ensure a genetically viable and demographically stable population over the next 100 years are presented below.

Scenario I:

The simulation was run using the current population variables and increasing the maximum population size to 100 individuals, without supplementation with additional animals. The outcomes indicate that the population was unlikely to survive over the next 100 years and would be unable to achieve the goal of maintaining a demographically and genetically viable population in captivity. The population variables used and the outcomes of the simulation are presented in Figure 5.

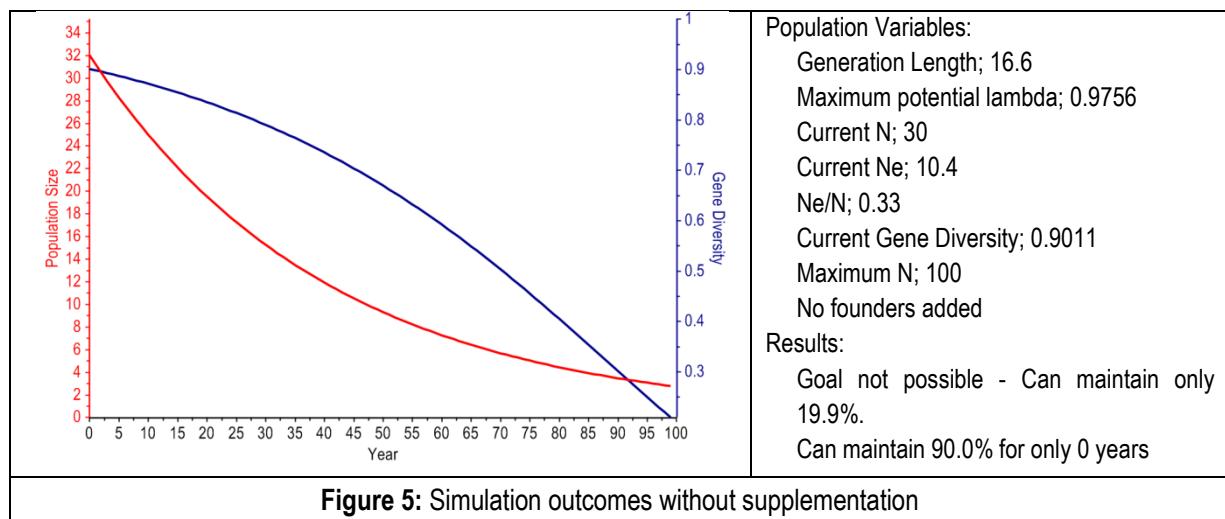


Figure 5: Simulation outcomes without supplementation

Scenario II:

The outcomes of the simulation that was run using a maximum potential lambda of 1.0586, increasing the maximum size of the population to 100 specimens and supplementation with one effective founder every eighth year provided a population that was able to achieve the goals of maintaining 90% of the genetic diversity and a demographically stable population. The population and founder related variables, and the simulation outcome are presented as Figures 6.

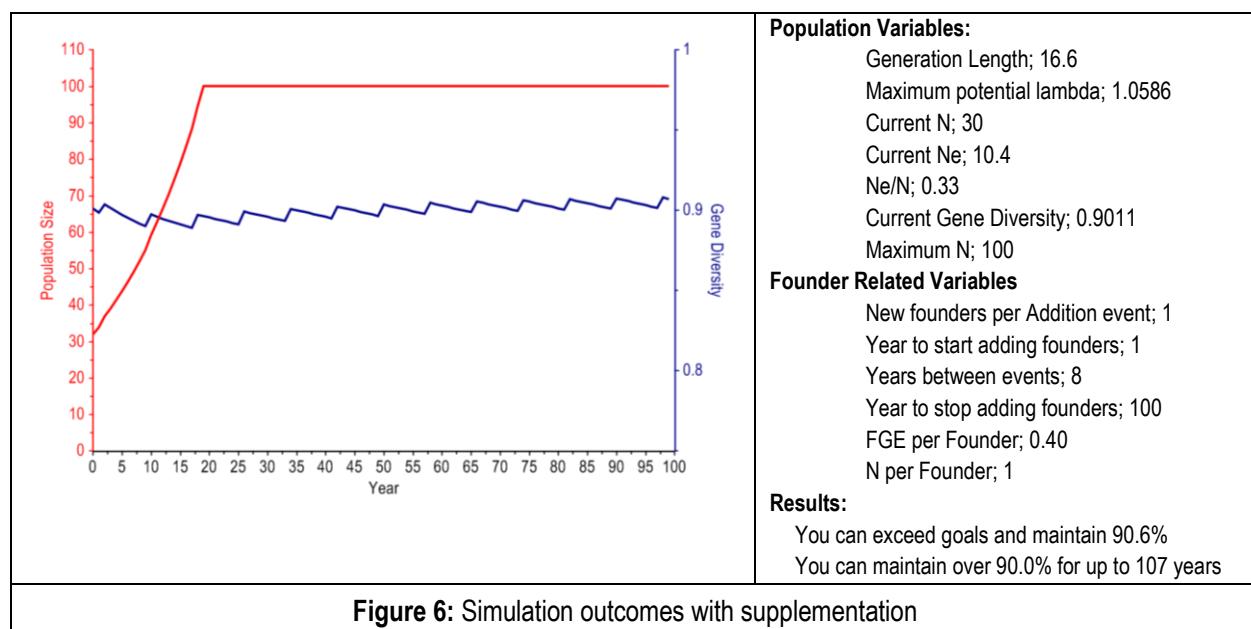


Figure 6: Simulation outcomes with supplementation

Conclusions and Recommendations

Recent recovery of free-ranging one horned rhinoceros population owing to intensive protection measures has resulted in a decrease in its threat perception from ‘Endangered’ to ‘Vulnerable’ in the IUCN Red List of Threatened Species; it remains to be placed in the Schedule I of the Wildlife Protection Act of India. The factors that led to the population decline; however, remain active and it is imperative to maintain demographically stable and genetically viable captive populations towards ensuring the long-term persistence of the species.

The current population is characterized by its small size that shows a declining trend ($\lambda = 0.976$; $N_{20} = 20.1$). The population has a male bias with a large proportion of the individuals in reproductively active age classes. The extended generation time ($T = 16.6$ years) owing to the natural history characteristics of the species that limits rapid population growth and less than 1/3 of the population being reproductively active. It retains approximately 90% genetic diversity brought in by 10 founders. The founder genome is however, unequally represented ($FGE = 5.05$) in the population leading to limited mating choices available for pairing of individuals. The presence of a large proportion of wild origin animals and regulated mating choices has resulted in minimizing relatedness of individuals in the population.

Population simulations run using PMx software indicate that supplementation with one effective founder every eighth year and increasing the population growth rate to 1.052 and size to 100 specimens in Indian institutions can ensure that the population remains viable over the next 100 years.

The captive population of One horned rhinoceros in Indian zoos therefore requires intensive management efforts towards ensuring achievement of *ex-situ* conservation goals to address the following concerns:

Additional housing needs to be created to ensure adequate space for holding the additional number of specimens needed for maintaining a genetically viable and demographically stable population.

The specimens that are acquired as founders should be assessed for their genetic and reproductive fitness before inclusion in the conservation breeding programme. The relatedness of these specimens with individuals in the captive population and with each other should be assessed using appropriate molecular genetics tools.

Issues that limit optimum reproductive performance of the captive population viz. housing and husbandry practices and keeping of unpaired animals need to be addressed for ensuring effective population growth.

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Appendix I

Historical Population of One Horned Rhinoceros (*Rhinoceros unicornis*) in Indian Zoos

National Stud#	Name LocalID Tag/Band Transponder	Sex	Birth Date	Sire	Dam	Location	Date	Event	Intl SB#
1	MOHAN SENIOR NONE _____	M	~ 1940	WILD	WILD	INDIA ASSAM P DELHI	~ 1957 13-Dec-57 5-Apr-59 13-Apr-70	Capture Transfer Transfer Death	290
2	RAJESH NONE _____	M	~ 1940	WILD	WILD	INDIA ASSAM P	~ 1978 3-Mar-78 18-Jan-87	Capture Transfer Death	302
3	PADMINI SR NONE _____	F	~ 1948	WILD	WILD	INDIA ASSAM	~ 1958 5-Oct-58 28-Oct-64	Capture Transfer Death	82
4	MONY NONE _____	M	~ 1950	WILD	WILD	INDIA ASSAM TRIVANDRU	???? ???? 29-May-56 16-Feb-87	Capture Transfer Transfer Death	12
5	GEETA NONE _____	F	~ 1951	WILD	WILD	INDIA ASSAM PARIS	~ 1960 19-Mar-60 ????	Capture Transfer Ltf	291
6	DEEPALI SR NONE _____	F	~ 1952	WILD	WILD	INDIA ASSAM NZP-WASH	~ 1962 29-Oct-62 5-Nov-63 28-Dec-63	Capture Transfer Transfer Death	30
7	SHIVAJI NONE _____	M	~ 1955	WILD	WILD	INDIA ASSAM	~ 1960 24-Sep-60 23-Sep-84	Capture Transfer Death	24
8	PADMINI JR NONE _____	F	~ 1956	WILD	WILD	INDIA ASSAM	~ 1965 29-Sep-65 19-Oct-82	Capture Transfer Death	25
9	MOHAN JUNIOR _____	M	7-Apr-60	WILD	5	ASSAM DELHI	7-Apr-60 1-Dec-65 5-Jul-88	Birth Transfer Death	33
10	SNEHA _____	F	12-Jun-61	WILD	105	CALCUTTA	12-Jun-61 14-Aug-82	Birth Death	23
11	RANGI NONE _____	F	~ 1962	WILD	WILD	INDIA ASSAM DELHI	???? ???? 28-Mar-68 10-Nov-84	Capture Transfer Transfer Death	43
12	RAJKUMAR NONE _____	M	~ 1962	WILD	WILD	INDIA ASSAM HYDERABAD	~ 1962 28-Jun-62 16-Jun-64 19-Aug-83	Capture Transfer Transfer Death	76
13	PADMA NONE _____	F	~ 1963	WILD	WILD	INDIA ASSAM HYDERABAD	???? ???? 26-Jun-68 19-Aug-83	Capture Transfer Transfer Death	77
14	RAJKUMARI 29607 _____	F	10-Apr-63	WILD	6	ASSAM NZP-WASH	10-Apr-63 16-Dec-63 9-Sep-80	Birth Transfer Death	28
15	JAPARI 100288 100288 S1857 _____	F	10-Jul-63	7	3	ASSAM SANDIEGOZ SD-WAP GULF BREZ	10-Jul-63 28-Feb-65 26-Apr-72 7-Nov-95 9-Jan-04	Birth Transfer Transfer Transfer Death	29

National Stud#	Name LocalID Tag/Band Transponder	Sex	Birth Date	Sire	Dam	Location	Date	Event	Intl SB#
16	KOSHA NONE	M	~ Jun 1964	WILD	WILD	INDIA ASSAM	~ 1964 28-Oct-64 13-Nov-64	Capture Transfer Death	292
17	RUKIMINI NONE 92900	F	~ Apr 1967	WILD	WILD	INDIA ASSAM LOSANGELE	~ 1967 23-Dec-67 25-Nov-69 10-Nov-88	Capture Transfer Transfer Death	46
18	LAKHIMI NONE	F	~ 1968	WILD	WILD	INDIA ASSAM	~ 1968 28-Feb-68 23-Mar-70	Capture Transfer Death	293
19	KALONGMUKHI NONE 10	F	~ 1968	WILD	WILD	INDIA ASSAM BARODA MYSORE	~ 1968 1-Aug-68 13-Apr-69 19-Jan-90 3-Aug-02	Capture Transfer Transfer Transfer Death	294
20	KUMAR NONE	M	~ Jul 1968	WILD	WILD	INDIA ASSAM	~ 1969 23-Jul-69 23-Mar-70	Capture Transfer Death	295
21	SASADEV NONE M4769 184002	M	~ 1969	WILD	WILD	INDIA ASSAM ANTWERP PLANCKNDL	~ 1970 30-Jul-70 23-Mar-71 24-Nov-78 16-Oct-88	Capture Transfer Transfer Transfer Death	73
22	SANTU NONE 184002	M	~ 1969	WILD	WILD	INDIA ASSAM BROWNSVIL	~ 1971 28-Jun-71 29-Aug-73 3-Dec-73	Capture Transfer Transfer Death	81
23	MEGNAD/BIHU NONE 2	M	~ 1969	WILD	WILD	INDIA ASSAM CALCUTTA	~ 1974 12-Feb-74 11-Mar-74 13-Jan-03	Capture Transfer Transfer Death	94
24	BHISMA NONE	M	~ May 1969	WILD	WILD	INDIA ASSAM	~ 1969 26-Jul-69 27-Dec-69	Capture Transfer Death	24
25	KUMARI NONE	F	10-Jul-69	WILD	WILD	INDIA ASSAM	~ 1969 20-Jul-69 24-Jul-70	Capture Transfer Death	297
26	DABB/AGNI NONE _____	M	~ 1970	WILD	WILD	INDIA ASSAM DELHI	~ 1982 5-May-82 23-Mar-83 24-Apr-01	Capture Transfer Transfer Death	151
27	SHAKUNTALA/S NONE _____	F	~ 1971	WILD	WILD	INDIA ASSAM CHATBIR Z	~ 1978 15-Jun-78 29-Jul-78 25-May-86	Capture Transfer Transfer Death	216
28	ROOPA L259	F	28-Jan-71	9	11	DELHI WHIPSNADE	28-Jan-71 6-Feb-73	Birth Transfer Ltf	51
29	KRISHNA/SAMB _____	M	12-Sep-71	7	8	ASSAM NAGOYA	12-Sep-71 29-Sep-74	Birth Transfer Ltf	57
30	RAJESH _____	M	25-Nov-71	12	13	HYDERABAD	25-Nov-71 11-Aug-83	Birth Death	58
31	GANESH JUNIO NONE _____	M	~ 1972	WILD	WILD	INDIA ASSAM	~ 1982 15-Jul-82 19-Nov-06	Capture Transfer Death	172

National Stud#	Name LocalID Tag/Band Transponder	Sex	Birth Date	Sire	Dam	Location	Date	Event	Intl SB#
32	MAYURI/KADAM NONE _____	F	~ 1973	WILD	WILD	INDIA ASSAM CALCUTTA	~ 1974 22-Jan-74 11-Mar-74 ~ 2004	Capture Transfer Transfer Death	219
33	MAYONG KUMARI	F	~ May 1973	WILD	WILD	INDIA ASSAM NY BRONX	~ 1973 11-Aug-73 30-Jan-75 6-Jul-2004	Capture Transfer Transfer Death	66
34	MAYA	F	~Aug 1973	WILD	WILD	INDIA ASSAM KANPUR LUCKNOW HYDERABAD	~10 Aug 1973 11 Aug 1973 4 Mar 1977 30 Apr 1977 23 Sep 1999 13 Jan 2007	Capture Transfer Transfer Transfer Transfer Death	128
35	RADHA NONE 751512	F	16-Jun-73	WILD	WILD	INDIA ASSAM NY BRONX	~ 1973 21-Jun-73 30-Jan-75 12-Jul-76	Capture Transfer Transfer Death	67
36	CHITRALEKHA/ NONE _____ _____	F	~ 1974	WILD	WILD	INDIA ASSAM PATNA RANCHI	~ 1974 21-Jul-74 25-May-79 4-Dec-96 ~ Sep 2008	Capture Transfer Transfer Transfer Death	0155
37	LACHIT _____ 301	M	23-May-74	7	8	ASSAM KANPUR	23-May-74 4-Mar-77 8-Aug-92	Birth Transfer Death	37
38	NUMULI NONE 4001	F	~ 1972	WILD	WILD	INDIA ASSAM NANDANKAN	~ 1972 16-Sep-72 8-Jun-74 28-May-07	Capture Transfer Transfer Death	153
39	ANJALI NONE	F	~ 1975	WILD	WILD	INDIA ASSAM	9-Aug-75 10-Aug-75 20-Aug-77	Capture Transfer Death	298
40	RAM/MUNNI NONE _____	M	~ 1975	WILD	WILD	INDIA ASSAM MYSORE	~ 1980 24-Jan-80 23-Jan-85 2-Aug-02	Capture Transfer Transfer Death	61
41	NONE _____	M	~ 1975	WILD	WILD	INDIA ASSAM	~ 1976 2-Feb-76 7-Mar-76	Capture Transfer Death	299
42	SHAYAM NONE _____	M	~ May 1975	WILD	WILD	INDIA ASSAM NANDANKAN ONTHE WAY	~ 1975 2-Jun-75 4-Apr-76 22-Apr-76	Capture Transfer Transfer Death	300
43	BALARAMGANES NONE _____	M	17-Oct-75	WILD	WILD	INDIA ASSAM CHATBIR Z	~ 1977 17-Oct-77 14-Dec-77 3-Jul-93	Capture Transfer Transfer Death	215
44	LAXMAN NONE _____	M	~ 1976	WILD	WILD	INDIA ASSAM	~ 1980 27-Jan-80 16-Jun-13	Capture Transfer Death	169
45	NONE _____ _____	F	~ Mar 1976	WILD	WILD	INDIA ASSAM LUCKNOW	~ 1976 6-Apr-76 17-Oct-79 19-Dec-83	Capture Transfer Transfer Death	92

National Stud#	Name LocalID Tag/Band Transponder	Sex	Birth Date	Sire	Dam	Location	Date	Event	Intl SB#
46	SANJAI NONE _____	M	1-Nov-76	WILD	WILD	INDIA ASSAM LUCKNOW	~ 1976 13-Nov-76 17-Oct-79 18-Jan-80	Capture Transfer Transfer Death	91
47	NANDAN NONE _____	M	~ 1977	WILD	WILD	INDIA ASSAM NANDANKAN	~ 1977 22-Aug-77 29-Nov-79	Capture Transfer Transfer	154
48	KAMAL NONE _____	M	~ 1977	WILD	WILD	INDIA ASSAM	~ 1982 6-Feb-82 7-Feb-82	Capture Transfer Death	308
49	KANCHABIJÖY NONE _____ PAT-2	M	~ Apr 1977	WILD	WILD	INDIA ASSAM PATNA	~ 1977 19-Aug-77 25-May-79 15-Dec-11	Capture Transfer Transfer Death	0156
50	GEETA/LAXMI _____	F	9-Jan-78	7	8	ASSAM	9-Jan-78 11-Jan-98	Birth Death	168
51	KRISHNA JUNI NONE _____ _____	M	~ 1978	WILD	WILD	INDIA ASSAM KANPUR LUCKNOW	~ 1978 24-Mar-78 17-Oct-79 23-May-82 1-Jan-85	Capture Transfer Transfer Transfer Death	440
52	PRABHAT NONE _____	M	~ Aug 1978	WILD	WILD	INDIA ASSAM	~ 1978 9-Nov-78 24-Nov-78	Capture Transfer Death	303
53	LADDU/VEERU _____	M	12-Nov-78	12	13	HYDERABAD	12-Nov-78 6-Aug-01	Birth Death	96
54	GOMOTI 462 G4844	F	9-Jan-79	23	10	CALCUTTA KOLN SINGAPORE	9-Jan-79 10-Mar-86 2-May-97	Birth Transfer Transfer Ltf	97
55	SHIVA M1 _____	M	~ Mar 1978	WILD	WILD	INDIA ASSAM VEERMATA DELHI	~20-Apr-79 24-Apr-79 25-Feb-85 21-Aug-13 ~Jun 2014	Capture Transfer Transfer Transfer Death	217
56	_____	F	9-Mar-79	43	27	CHATBIR Z	9-Mar-79 9-Mar-79	Birth Death	304
57	PARBATI NONE _____	F	~ Jul 1979	WILD	WILD	INDIA ASSAM	~ 1980 20-Jan-80 18-Jun-83	Capture Transfer Death	305
58	JOHN/PALITRA NONE _____	M	~ Apr 1980	WILD	WILD	INDIA ASSAM	~ 1980 23-Aug-80 22-Jan-08	Capture Transfer Death	170
59	RAMU SENIOR NONE _____	M	~ May 1980	WILD	WILD	INDIA ASSAM MADRAS	~ 1980 3-Sep-80 17-Apr-85 7-Jul-89	Capture Transfer Transfer Death	218
60	GINITARALI NONE _____	F	~ 1980	WILD	WILD	INDIA ASSAM	~ 1980 23-Aug-80 24-Jun-99	Capture Transfer Death	171
61	_____ _____	F	13-Nov-80	43	27	CHATBIR Z DELHI	13-Nov-80 5-May-82 2-Jun-86	Birth Transfer Death	306

National Stud#	Name LocalID Tag/Band Transponder	Sex	Birth Date	Sire	Dam	Location	Date	Event	Intl SB#
62	RAJU NONE	M	~ 1981	WILD	WILD	INDIA PATNA	~ 1982 28-Mar-82 2-Apr-95	Capture Transfer Death	0157
63	SRINIVAS RABHA	M	15-May-81	12	13	HYDERABAD SD-WAP	15-May-81 10-Sep-83	Birth Transfer Ltf	106
64	RUPA NONE	F	~ Jun 1981	WILD	WILD	INDIA ASSAM	~ 1981 3-Jul-81 11-Oct-81	Capture Transfer Death	307
65	MOHINI/RUBY NONE	F	~ 1982	WILD	WILD	INDIA ASSAM DELHI	~ 1982 4-Jun-82 12-Dec-90 25-Mar-01	Capture Transfer Transfer Death	194
66	DALIMI NONE	F	~ Apr 1982	WILD	WILD	INDIA ASSAM	~ 1982 2-May-82 27-Oct-82	Capture Transfer Death	309
67	SHYAM JUNIOR	M	9-Jun-82	7	8	ASSAM	9-Jun-82 23-Sep-98	Birth Death	268
68	RASHMI/SAWAK	F	1-Oct-82	37	34	KANPUR YOKOHAMA	1-Oct-82 31-Mar-85 4-Jan-95	Birth Transfer Death	122
69	_____	M	15-Feb-83	43	27	CHATBIR Z	15-Feb-83 2-Mar-83	Birth Death	310
70	SABITRI NONE	F	~ Mar 1983	WILD	WILD	INDIA ASSAM	~ 1983 9-Apr-83 30-Apr-83	Capture Transfer Death	311
71	DEBRAJ 5	M	4-Jun-84	23	32	CALCUTTA	4-Jun-84 13-Nov-00	Birth Death	150
72	LOHIT 305	M	6-Aug-84	37	34	KANPUR DUDHWA LUCKNOW	6-Aug-84 27-Apr-92 6-Apr-95	Birth Transfer Transfer	129
73	_____	M	11-Dec-84	43	27	CHATBIR Z	11-Dec-84 21-Dec-84	Birth Death	312
74	SUCHILA NONE	F	~ Dec 1985	WILD	WILD	INDIA ASSAM	~ 1986 27-Feb-86 28-Feb-86	Capture Transfer Death	313
75	RAJA/PRINCE	M	9-May-86	43	27	CHATBIR Z	9-May-86 14-Apr-2004	Birth Death	250
76	RATUL NONE	M	~ Jan 1987	WILD	WILD	INDIA ASSAM GORUMARA	~ 1987 25-Aug-87 17-Oct-95	Capture Transfer Release	174
77	BISHNU	M	11-May-87	44	50	ASSAM	11-May-87	Birth	173
78	MOHIT 306	M	17-Jun-87	37	34	KANPUR HYDERABAD	17-Jun-87 1-Mar-03	Birth Transfer Ltf	140
79	RAMU NONE	M	~ Mar 1988	WILD	WILD	INDIA ASSAM TRIVANDRU	~ 1988 2-Sep-88 19-May-93	Capture Transfer Transfer	175
80	HARTALI PAT-4	F	8-Jul-88	62	36	PATNA	8-Jul-88	Birth	159
81	JADU NONE	M	26-Jul-88	WILD	WILD	INDIA ASSAM TRIVANDRU	~ 1989 26-Jul-89 19-May-93	Capture Transfer Transfer Ltf	177

National Stud#	Name LocalID Tag/Band Transponder	Sex	Birth Date	Sire	Dam	Location	Date	Event	Intl SB#
82	MAHESH	M	30-Mar-89	44	50	ASSAM	30-Mar-89 19-Apr-15	Birth Death	176
83	MADU	M	~ Jun 1989	WILD	WILD	INDIA ASSAM JALDAPARA	25-Jul-89 26-Jul-89 17-Oct-95	Capture Transfer Release	178
84	DHAN	M	~ 1989	WILD	WILD	INDIA ASSAM	~ 1989 26-Jul-89 4-Sep-89	Capture Transfer Death	315
85	ROHIT 307	M	20-Jun-89	37	34	KANPUR	20-Jun-89	Birth	160
86	KANAK	M	~ 1989	WILD	WILD	INDIA ASSAM	~ 1989 25-Jun-89 26-Jun-89	Capture Transfer Death	316
87	PRAKASH	M	~ Mar 1990	WILD	WILD	INDIA	~ 1990 22-Apr-90	Capture Death	317
88	PRADEEP/SUND RH-1	M	~ 1990	WILD	WILD	ASSAM TRIPURA TRIPURA	20-Aug-90 14-Oct-94 ~ Sep 2014	Transfer Transfer Death	179
89	BAGHEKHAITI	F	~ 1990	WILD	WILD	INDIA ASSAM	~ 1991 10-Aug-91	Capture Transfer	192
90	MONOMALI	F	30-Apr-91	WILD	WILD	INDIA ASSAM	~ 1991 6-Aug-91 17-Aug-91	Capture Transfer Death	318
91	MUDIT	M	5-Jul-91	37	34	KANPUR	5-Jul-91 31-Dec-02	Birth Death	186
92	CHOTKI/RANI PAT-5	F	6-Jul-91	62	36	PATNA	6-Jul-91	Birth	203
93	AYODHYA/AMAR PAT13	M	27-Dec-92	26	65	DELHI PATNA	27-Dec-92 21-Oct-05	Birth Transfer	202
94		F	25-Nov-94	58	60	ASSAM	25-Nov-94 25-Nov-94	Birth Death	319
95	HANUMAN	M	~ 1995	WILD	WILD	INDIA ASSAM	~ 1995 21-Mar-95 27-Nov-95	Capture Transfer Death	320
96	RITA	F	22-Jan-95	44	50	ASSAM TRIVANDRU	22-Jan-95 6-Nov-03 13-Dec-04	Birth Transfer Death	235
97	RANGA	M	~ 1995	WILD	WILD	INDIA ASSAM	~ 1995 11-Jun-95 5-Nov-95	Capture Transfer Death	321
98	MEGHDOOT	M	28-Aug-95	26	65	DELHI	28-Aug-95 6-Mar-99	Birth Death	251
99	TARUN	M	29-Apr-96	78	34	KANPUR LUCKNOW	29-Apr-96 30-Apr-97 19-May-97	Birth Transfer Death	322
100	MAHESWARI	F	27-Nov-97	26	65	DELHI	27-Nov-97	Birth	252
101		F	15-Jun-99	58	60	ASSAM	15-Jun-99 15-Jun-99	Birth Death	260
102	MADAN	M	????	UNK	UNK	UNKNOWN ASSAM LOSANGELE	???? ???? 7-Feb-66	Birth Transfer Ltf	35
103	BABUL	M	????	WILD	WILD	INDIA ASSAM	~ 1988 16-Sep-88 24-Sep-88	Capture Transfer Death	314

National Stud#	Name LocalID Tag/Band Transponder	Sex	Birth Date	Sire	Dam	Location	Date	Event	Intl SB#
104	LOHAMANI	M	~ Jul 1998	WILD	WILD	INDIA ASSAM	~ 1998 26-Oct-98 15-Mar-03	Capture Transfer Death	323
105	LAUIE/RANI	F	~ 1955	WILD	WILD	INDIA ASSAM CALCUTTA HAMURA	????? ????? 6-Jun-61 16-Jul-61 13-Dec-91	Capture Transfer Transfer Transfer Death	21
106	GOTANGI	F	?????	WILD	WILD	INDIA ASSAM OMAHA	~ 1968 29-Jul-68 23-Jan-70 31-Jan-70	Capture Transfer Transfer Death	48
107	RAJA	M	19-Dec-93	49	36	PATNA DELHI	19-Dec-93 22-Mar-05 22-Sep-07	Birth Transfer Death	347
108	RANI	F	26-Jun-94	62	80	PATNA KANPUR	26-Jun-94 6-Oct-97 21-Mar-08	Birth Transfer Death	348
109	BAJRANGI	M	23-Oct-97	49	80	PATNA	23-Oct-97 17-Jul-99	Birth Death	349
110		M	2-Jul-00	26	65	DELHI	2-Jul-00 2-Jul-00	Birth Death	350
111	BHOPO 00-000B-D432 607123	M	29-Sep-00	49	80	PATNA SANDIEGOZ	29-Sep-00 12-May-07	Birth Transfer Ltf	351
112	PORI	F	4-Jun-02	77	89	ASSAM	4-Jun-02	Birth	352
114	AKANCHANA/GAUR PAT-10	F	8-Aug-02	49	80	PATNA	8-Aug-02	Birth	353
115		F	15-Feb-00	UNK	UNK	SANDIEGOZ DELHI	15-Feb-00 29-Apr-07 29-Sep-07	Birth Transfer Death	272
116	GAIRI PAT-16	F	23-Jul-01	ISB106	ISB209	SANDIEGOZ PATNA	23-Jul-01 9-May-07 9-Dec-14	Birth Transfer Death	278
117	RUSTAM	M	31-May-03	107	92	PATNA SANDIEGOZ	31-May-03 9-May-07	Birth Transfer Ltf	364
118	MANU	F	22-Jun-03	85	108	KANPUR	22-Jun-03	Birth	328
119	BRAHMAPUTRA	M	10-Nov-03	93	100	DELHI SANDIEGOZ	10-Nov-03 7-May-07	Birth Transfer Ltf	330
120	GANESH PAT12	M	19-Sep-04	107	80	PATNA	19-Sep-04	Birth	365
121	NAKUL	M	~ 1997	WILD	WILD	INDIA KANPUR VISAKAPAT	10-Jan-05 12-Jan-05 6-Apr-13	Capture Transfer Transfer	420
123	SURAJ PAT14	M	6-Nov-05	49	92	PATNA HYDERABAD	6-Nov-05 24-Aug-11	Birth Transfer	365
124	ANJUHA	F	10-Nov-05	93	100	DELHI	10-Nov-05	Birth	421
125	LALI PAT17	F	3-Dec-05	ISB190	116	SANDIEGOZ PATNA	3-Dec-05 9-May-07	Birth Transfer	362
126	HARSH	M	28-Mar-06	85	108	KANPUR	28-Mar-06	Birth	422
127	SARASWATI PAT-15	F	24-Jan-07	49	80	PATNA HYDERABAD	24-Jan-07 24-Aug-11	Birth Transfer	287

National Stud#	Name LocalID Tag/Band Transponder	Sex	Birth Date	Sire	Dam	Location	Date	Event	Intl SB#
128	_____	M	17-Sep-07	UNK	115	DELHI	17-Sep-07 17-Sep-07	Birth Death	423
129	SHAKTIRAJ PAT-18	M	30-Oct-07	ISB190	116	PATNA	30-Oct-07	Birth	390
130	ELECTION PAT-19	F	6-Apr-09	49	80	PATNA	6-Apr-09	Birth	441
131	VIRAT PAT20	M	25-May-11	49	80	PATNA MYSORE	25-May-11 20-Jul-14	Birth Transfer	449
132	PAT21	F	10-Jun-11	93	114	PATNA	10-Jun-11 10-Jun-11	Birth Death	495
133	Jambo PAT22	M	11-Nov-11	93	92	PATNA	11-Nov-11	Birth	456
134	DOLLY RPAT23 BOBBLI	F	11-May-13	93	114	PATNA MYSORE	11-May-13 20-Jul-14	Birth Transfer	479
135	VIDHUT PAT-24	M	6-Sep-13	93	116	PATNA	6-Sep-13	Birth	483
136	BABLI PAT-25	F	16-Sep-13	93	80	PATNA	16-Sep-13 9-Aug-15	Birth Death	493
137	PAT-26	M	16-Feb-14	93	125	PATNA	16-Feb-14 19-Feb-14	Birth Death	--
138	_____	M	27-May-13	85	118	KANPUR	27-May-13	Birth	480
139	RANI NONE	F	~ 1972	WILD	WILD	INDIA ASSAM	~26 Sep 2012 7-Oct-12 18-Sep-14	Capture Transfer Death	--
140	SANATAN	M	1-Sep-13	77	89	ASSAM	1-Sep-13	Birth	--
141	NAG-SANKAR 0006CDB50C	M	~ 2008	WILD	WILD	ASSAM P ASSAM	~ 1 Jul 2016 3-Jul-16	Capture Transfer	
142	USHA USHA USHA USHA _____	F	~ Mar 1973	WILD	WILD	INDIA ASSAM KANPUR LUCKNOW HYDERABAD	~ 1 Aug 1973 11-Aug-73 1-Mar-77 30-Apr-97 23-Sep-99 13-Jan-07	Capture Transfer Transfer Transfer Transfer Death	128
143	JOYMATI NONE	F	10-Apr-91	WILD	WILD	INDIA ASSAM	~25 Jul 1991 10-Aug-91 19-Sep-91	Capture Transfer Death	402
144	_____	F	15-Jun-99	58	60	ASSAM	15-Jun-99 15-Jun-99	Birth Death	260
145	SAI VIJAY	M	5-Jul-2012	93	127	HYDERABAD	5-Jul-2012	Birth	--
IN1	KASI NONE	M	????	WILD	WILD	INDIA ASSAM MYSORE	???? ???? 24-Apr-65 30-Apr-79	Capture Transfer Transfer Death	1
IN2	RANI 560003	F	????	WILD	WILD	INDIA ASSAM MYSORE	???? ???? 4-Aug-56 7-May-92	Capture Transfer Transfer Death	11
IN3	VINU 7720 901264	M	16-Apr-71	IN1	IN2	mysore GELSNKRKN TORONTO NY BRONX	16-Apr-71 28-Aug-75 28-Jul-76 30-May-90	Birth Transfer Transfer Ltf	53

National Stud#	Name LocalID Tag/Band Transponder	Sex	Birth Date	Sire	Dam	Location	Date	Event	Intl SB#
IN4	LACIT NONE _____	M	????	WILD	WILD	INDIA ASSAM VEERMATA	???? ???? 14-Apr-52 14-Sep-80	Capture Transfer Transfer Death	62
IN5	JAYA NONE _____	M	????	WILD	WILD	INDIA ASSAM NAGOYA	~ 1974 3-Jan-74 2-Oct-74	Capture Transfer Ltf	64
IN6	KUSHAL NONE _____	F	~ 1953	WILD	WILD	INDIA MADRAS	~ 1953 9-Jun-53 15-Jun-80	Capture Transfer Death	75
IN7	INDIRA _____ _____	F	19-Jul-75	IN1	IN2	mysore GELSNKRKN TORONTO	19-Jul-75 25-Jun-76 27-Apr-79	Birth Transfer Ltf	79
IN8	JAISINGH NONE _____	M	????	WILD	WILD	INDIA LUCKNOW	~ 1959 30-Mar-59 6-May-79	Capture Transfer Death	90
IN9	ROSY NONE _____	F	????	WILD	WILD	INDIA LUCKNOW	~ 1944 2-Apr-44 2-Apr-73	Capture Transfer Death	105
Total: 152 (86.66)									

Appendix II

Living Population of One Horned Rhinoceros (*Rhinoceros unicornis*) in Indian Zoos

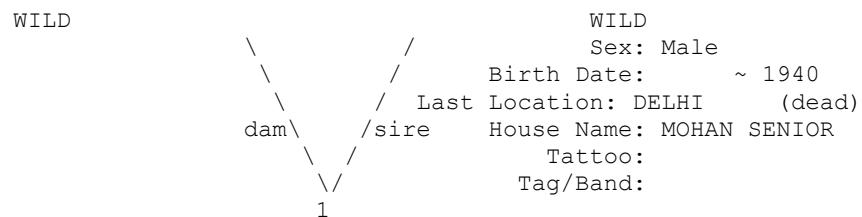
National Stud#	Name LocalID Tag/Band Transponder	Sex	Birth Date	Sire	Dam	Location	Date	Event	Intl SB#
Assam State Zoo cum Botanical Garden, Guwahati									
77	BISHNU	M	11-May-87	44	50	ASSAM	11-May-87	Birth	173
89	BAGHEKHAITI	F	~ 1990	WILD	WILD	INDIA ASSAM	~ 1991 10-Aug-91	Capture Transfer	192
112	PORI	F	4-Jun-02	77	89	ASSAM	4-Jun-02	Birth	352
140	SANATAN	M	1-Sep-13	77	89	ASSAM	1-Sep-13	Birth	--
141	NAG-SANKAR 0006CDB50C	M	~ 2008	WILD	WILD	ASSAM P ASSAM	~ 1 Jul 2016 3-Jul-16	Capture Transfer	--
Total: 5(3.2)									
National Zoological Park, Delhi									
100	MAHESWARI	F	27-Nov-97	26	65	DELHI	27-Nov-97	Birth	252
124	ANJUHA	F	10-Nov-05	93	100	DELHI	10-Nov-05	Birth	421
Total: 2(0.2)									
Nehru Zoological Park, Hyderabad									
123	SURAJ PAT14	M	6-Nov-05	49	92	PATNA HYDERABAD	6-Nov-05 24-Aug-11	Birth Transfer	365
127	SARASWATI PAT-15	F	24-Jan-07	49	80	PATNA HYDERABAD	24-Jan-07 24-Aug-11	Birth Transfer	287
145	SAI VIJAY	M	5-Jul-2012	93	127	HYDERABAD	5-Jul-2012	Birth	--
Total: 3(2.1)									
Kanpur Zoo, Kanpur									
85	ROHIT 307	M	20-Jun-89	37	34	KANPUR	20-Jun-89	Birth	160
118	MANU	F	22-Jun-03	85	108	KANPUR	22-Jun-03	Birth	328
126	HARSH	M	28-Mar-06	85	108	KANPUR	28-Mar-06	Birth	422
138	_____	M	27-May-13	85	118	KANPUR	27-May-13	Birth	480
Total: 4(3.1)									
Nawab Wazid Ali Shah Zoological Garden, Lucknow									
72	LOHIT 305	M	6-Aug-84	37	34	KANPUR DUDHWA LUCKNOW	6-Aug-84 27-Apr-92 6-Apr-95	Birth Transfer Transfer	129
Total: 1(1.0)									
Sri Chamarajendra Zoological Gardens, Mysore									
131	VIRAT PAT20	M	25-May-11	49	80	PATNA MYSORE	25-May-11 20-Jul-14	Birth Transfer	449
134	DOLLY RPAT23 BOBBLI	F	11-May-13	93	114	PATNA MYSORE	11-May-13 20-Jul-14	Birth Transfer	479
Total: 2(1.1)									
Nandankanan Biological Park, Bhubaneswar									
47	NANDAN NONE	M	~ 1977	WILD	WILD	INDIA ASSAM NANDANKAN	~ 1977 22-Aug-77 29-Nov-79	Capture Transfer Transfer	154
Total: 1(1.0)									
Sanjay Gandhi Biological Park, Patna									
80	HARTALI PAT-4	F	8-Jul-88	62	36	PATNA	8-Jul-88	Birth	159
92	CHOTKI/RANI PAT-5	F	6-Jul-91	62	36	PATNA	6-Jul-91	Birth	203

National Stud#	Name LocalID Tag/Band Transponder	Sex	Birth Date	Sire	Dam	Location	Date	Event	Intl SB#
93	AYODHYA/AMAR PAT13	M	27-Dec-92	26	65	DELHI PATNA	27-Dec-92 21-Oct-05	Birth Transfer	202
114	AKANCHA/GAUR PAT-10	F	8-Aug-02	49	80	PATNA	8-Aug-02	Birth	353
120	GANESH PAT12	M	19-Sep-04	107	80	PATNA	19-Sep-04	Birth	365
125	LALI PAT17	F	3-Dec-05	ISB19 0	116	SANDIEGOZ PATNA	3-Dec-05 9-May-07	Birth Transfer	362
129	SHAKTIRAJ PAT-18	M	30-Oct-07	ISB19 0	116	PATNA	30-Oct-07	Birth	390
130	ELECTION PAT-19	F	6-Apr-09	49	80	PATNA	6-Apr-09	Birth	441
133	Jambo PAT22	M	11-Nov-11	93	92	PATNA	11-Nov-11	Birth	456
135	VIDHUT PAT-24	M	6-Sep-13	93	116	PATNA	6-Sep-13	Birth	483
Total: 10(5.5)									
Thiruvananthapuram Zoo, Thiruvananthapuram									
79	RAMU NONE	M	~ Mar 1988	WILD	WILD	INDIA ASSAM TRIVANDRU	~ 1988 2-Sep-88 19-May-93	Capture Transfer Transfer	175
Total: 1(1.0)									
Indira Gandhi Zoological Park, Vishakhapatnam									
121	NAKUL	M	~ 1997	WILD	WILD	INDIA KANPUR VISAKAPAT	10-Jan-05 12-Jan-05 6-Apr-13	Capture Transfer Transfer	420
Total: 1(1.0)									
Total living at 10 institutions: 30(18.12)									

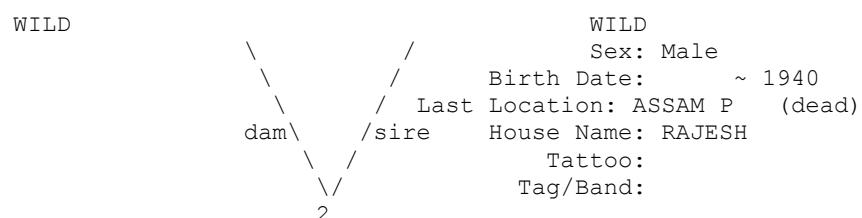
Appendix - 3

Pedigree Chart Report One-Horned Rhinoceros (*Rhinoceros unicornis*)

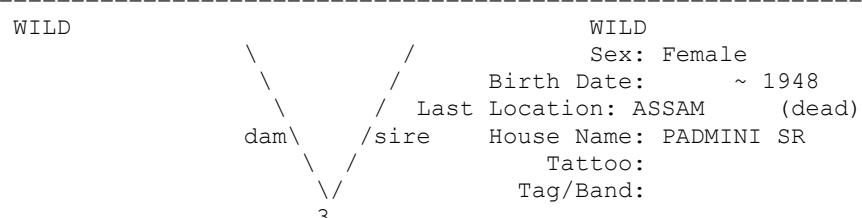
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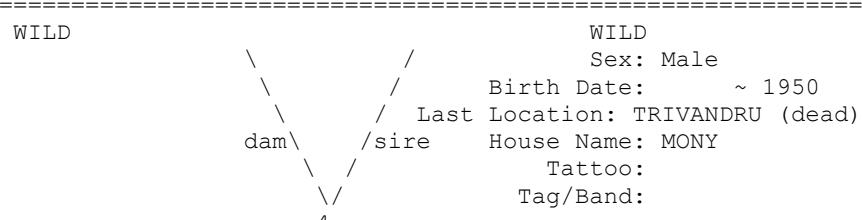
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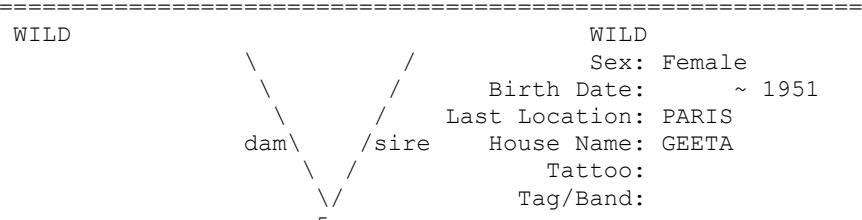
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Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 4



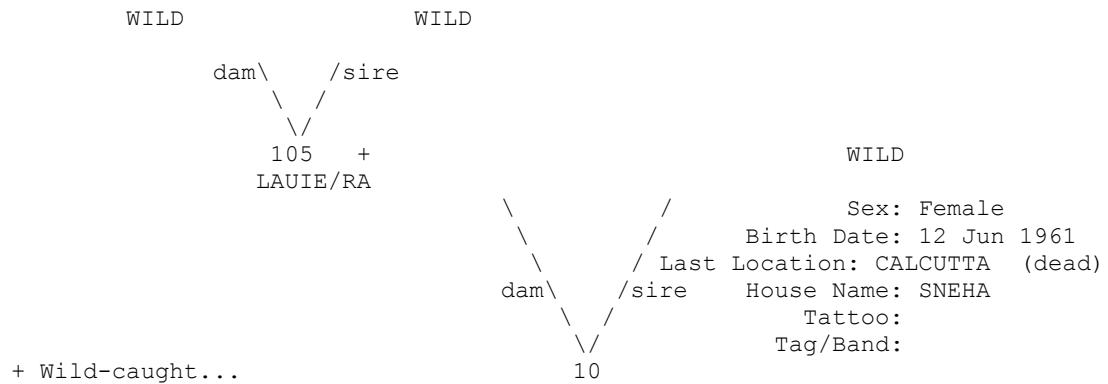
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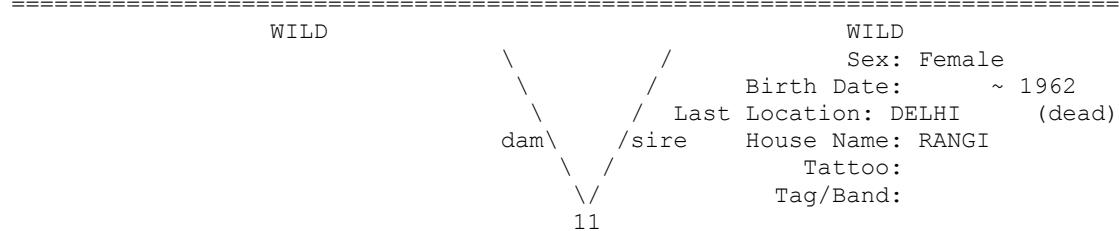
Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 6
=====

WILD WILD
\\ / Sex: Female
\\ / Birth Date: ~ 1952
\\ / Last Location: NZP-WASH (dead)
dam \\ /sire House Name: DEEPALI SR
\\ /
6 Tag/Band:

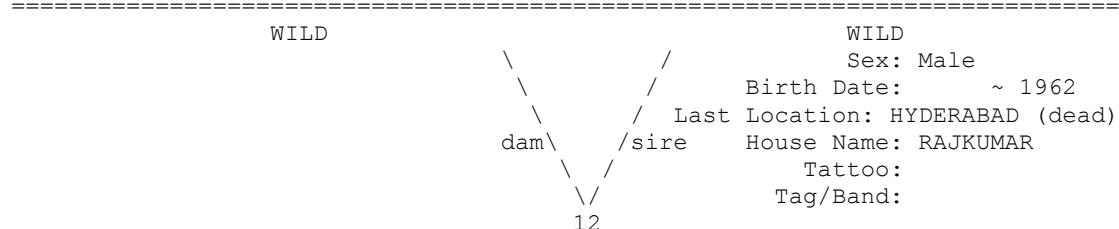
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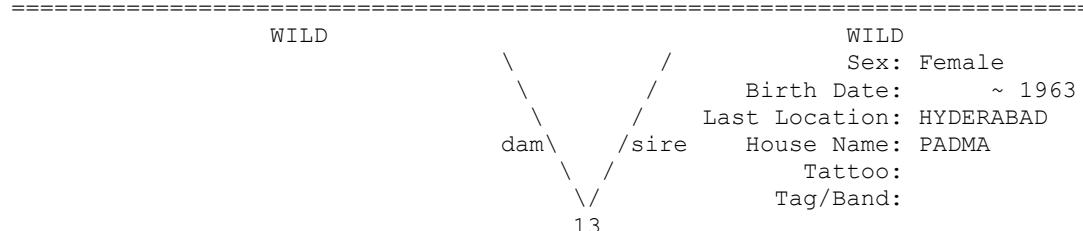
Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 11



Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 12



Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 13



=====
Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 14
=====

WILD WILD
dam\ /sire
\ /\
\/
6 +
DEEPALI
\\ / /
\\ / /
dam\ /sire Birth Date: 10 Apr 1963
\\ / / Last Location: NZP-WASH (dead)
\\ / / House Name: RAJKUMARI
\\ / / Tattoo:
\\ / / Tag/Band:
14
+ Wild-caught...
=====

Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 15
=====

WILD WILD WILD WILD
dam\ /sire dam\ /sire
\ /\ /\ /\
\ /\ /\ /\
3 + 7 +
PADMINI SHIVAJI
\\ / / /
\\ / / /
dam\ /sire Birth Date: 10 Jul 1963
\\ / / Last Location: GULF BREZ (dead)
\\ / / House Name: JAPARI
\\ / / Tattoo:
\\ / / Tag/Band:
15
+ Wild-caught...
=====

Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 16
=====

WILD WILD
\\ / /
\\ / /
dam\ /sire Birth Date: ~ Jun 1964
\\ / / Last Location: ASSAM (dead)
\\ / / House Name: KOSHA
\\ / / Tattoo:
\\ / / Tag/Band:
16
=====

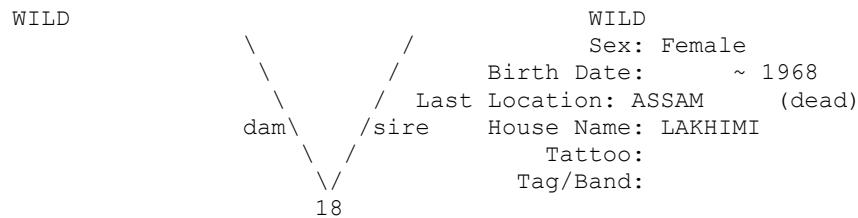
Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 17
=====

WILD WILD
\\ / /
\\ / /
dam\ /sire Birth Date: ~ Apr 1967
\\ / / Last Location: LOSANGELE (dead)
\\ / / House Name: RUKIMINI
\\ / / Tattoo:
\\ / / Tag/Band:
17
=====

=====

Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 18

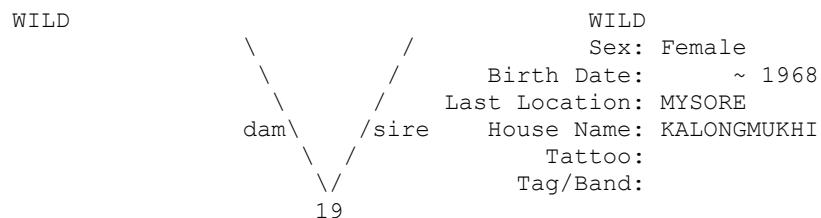
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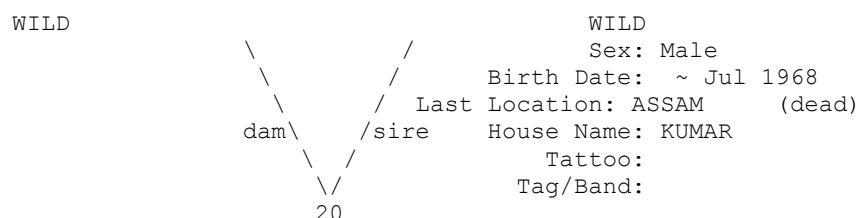
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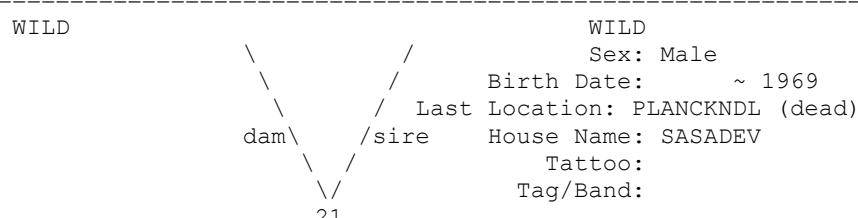
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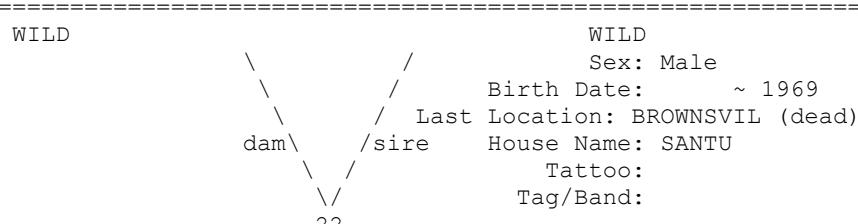
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=====

Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 22

=====



=====

Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 23

=====

WILD

```
      \       /           WILD
      \       /           Sex: Male
      \       /           Birth Date: ~ 1969
      \       /           Last Location: CALCUTTA (dead)
      dam\   /sire        House Name: MEGHNAD/BIHUA
      \   /
      \   /
      23
```

Tattoo:

Tag/Band:

=====

Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 24

=====

WILD

```
      \       /           WILD
      \       /           Sex: Male
      \       /           Birth Date: ~ May 1969
      \       /           Last Location: ASSAM (dead)
      dam\   /sire        House Name: BHISMA
      \   /
      \   /
      24
```

Tattoo:

Tag/Band:

=====

Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 25

=====

WILD

```
      \       /           WILD
      \       /           Sex: Female
      \       /           Birth Date: 10 Jul 1969
      \       /           Last Location: ASSAM (dead)
      dam\   /sire        House Name: KUMARI
      \   /
      \   /
      25
```

Tattoo:

Tag/Band:

=====

Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 26

=====

WILD

```
      \       /           WILD
      \       /           Sex: Male
      \       /           Birth Date: ~ 1970
      \       /           Last Location: DELHI (dead)
      dam\   /sire        House Name: DABBU/AGNI
      \   /
      \   /
      26
```

Tattoo:

Tag/Band:

=====

Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 27

=====

WILD

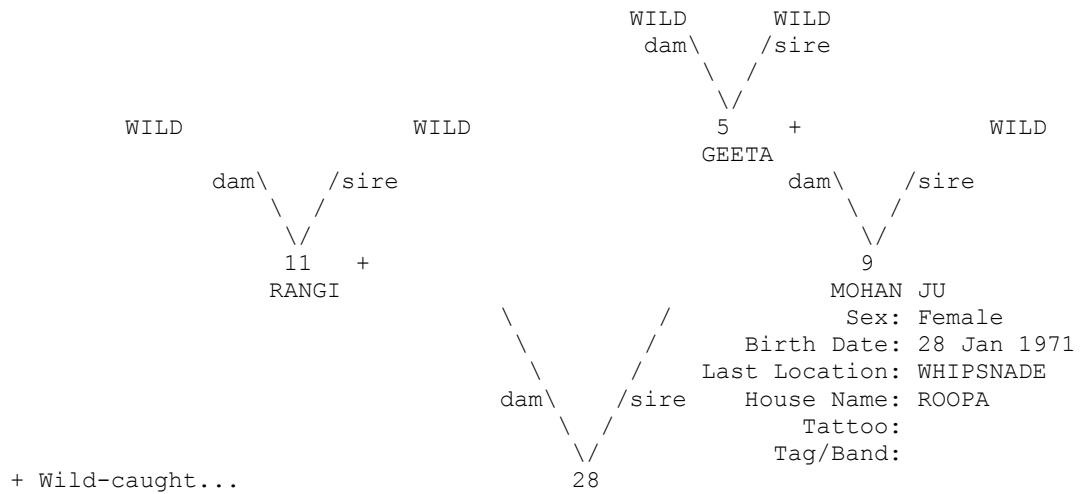
```
      \       /           WILD
      \       /           Sex: Female
      \       /           Birth Date: ~ 1971
      \       /           Last Location: CHATBIR Z (dead)
      dam\   /sire        House Name: SHAKUNTALA/SUND
      \   /
      \   /
      27
```

Tattoo:

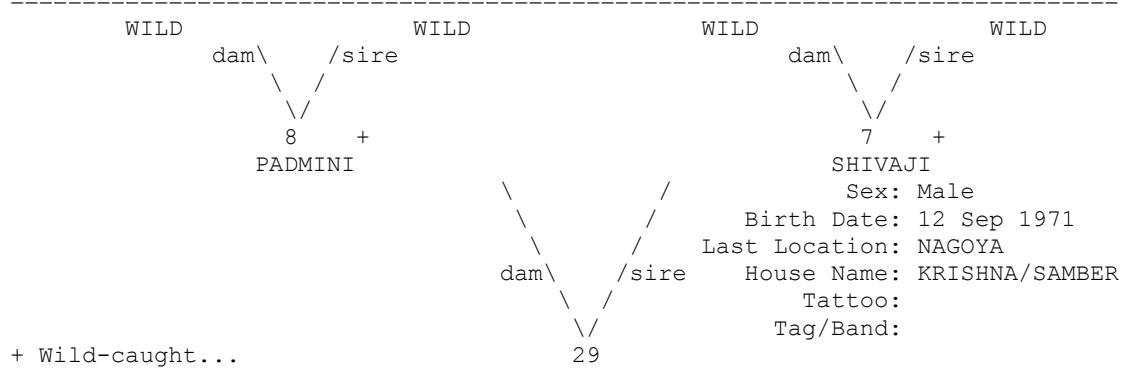
Tag/Band:

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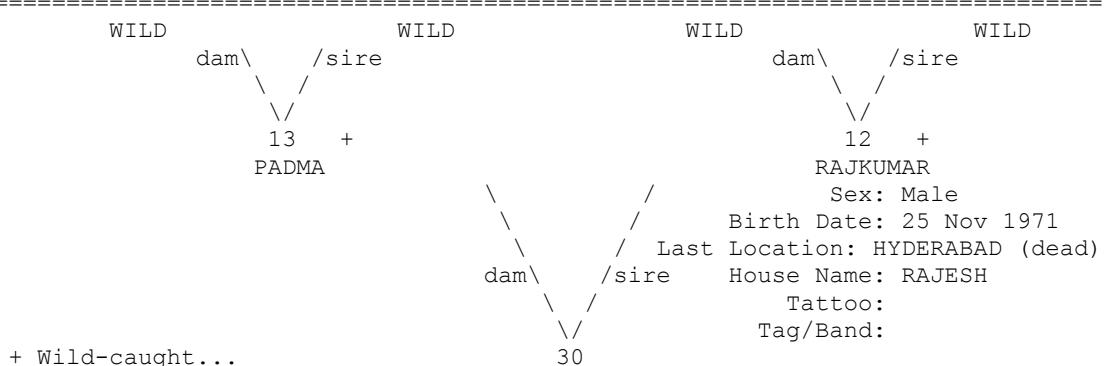
Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 28



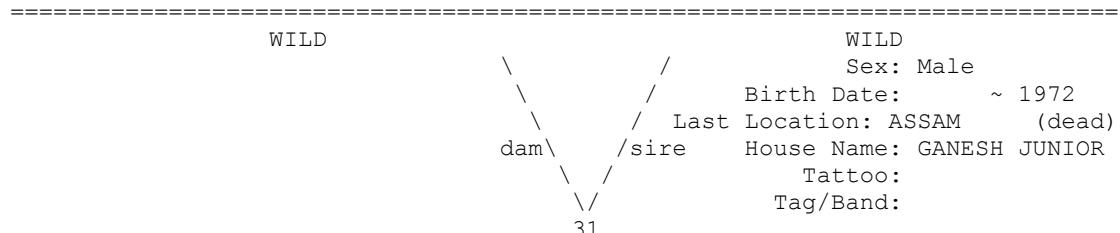
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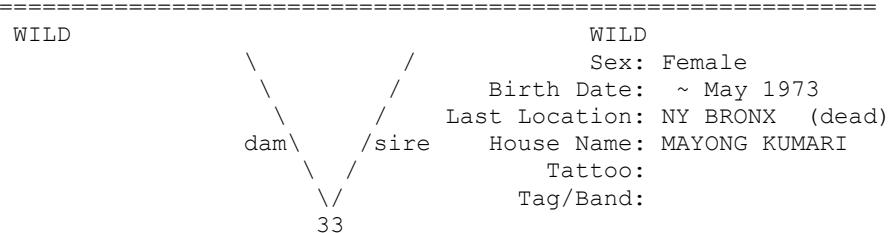
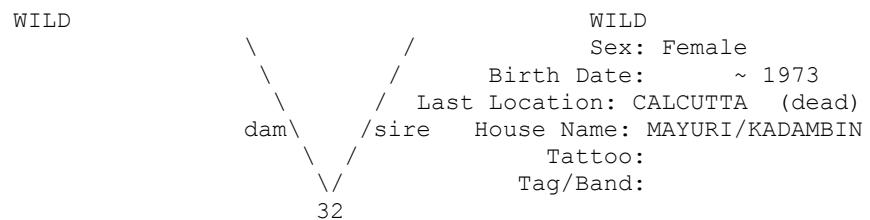
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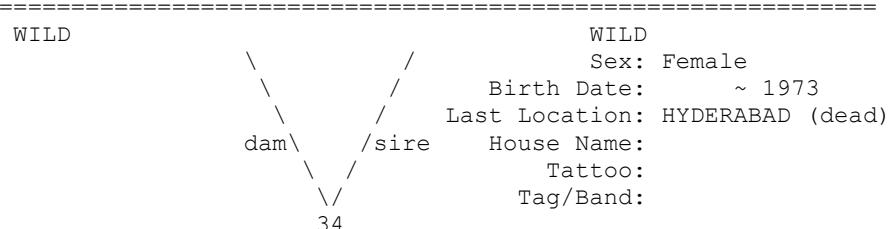
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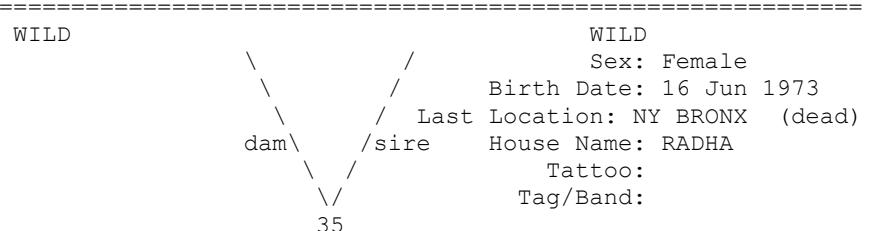
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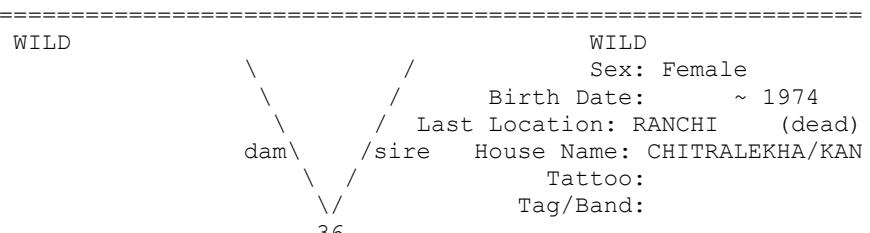
Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 34



Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 35



TOWER Name: BINGOEEROS_UNICORNIS Study Code Number: 36



=====
Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 37
=====

WILD WILD WILD WILD
dam\ /sire dam\ /sire
\\ \\ \\ \\
8 + 7 +
PADMINI SHIVAJI
\\ \\ / Birth Date: 23 May 1974
\\ \\ / Location: KANPUR (dead)
dam\ /sire House Name: LACHIT
\\ \\ \\ \\
37 Tattoo:
Tag/Band:
+ Wild-caught...
=====

=====
Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 38
=====

WILD WILD
\\ \\ / Sex: Female
\\ \\ / Birth Date: ~ 1972
\\ \\ / Location: NANDANKAN (dead)
dam\ /sire House Name: NUMULI
\\ \\ \\ \\
38 Tattoo:
Tag/Band:
=====

=====
Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 39
=====

WILD WILD
\\ \\ / Sex: Female
\\ \\ / Birth Date: ~ 1975
\\ \\ / Location: ASSAM (dead)
dam\ /sire House Name: ANJALI
\\ \\ \\ \\
39 Tattoo:
Tag/Band:
=====

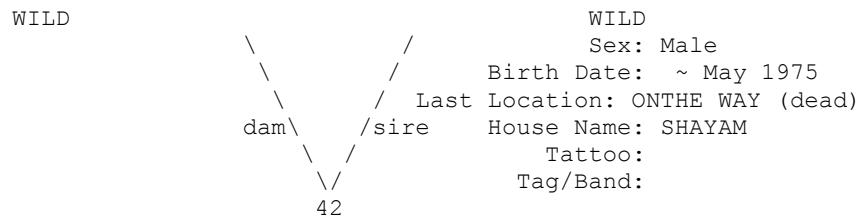
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Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 40
=====

WILD WILD
\\ \\ / Sex: Male
\\ \\ / Birth Date: ~ 1975
\\ \\ / Location: MYSORE (dead)
dam\ /sire House Name: RAM/MUNNI
\\ \\ \\ \\
40 Tattoo:
Tag/Band:
=====

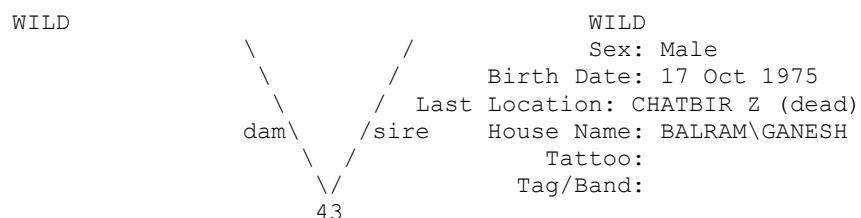
=====
Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 41
=====

WILD WILD
\\ \\ / Sex: Male
\\ \\ / Birth Date: ~ 1975
\\ \\ / Location: ASSAM (dead)
dam\ /sire House Name:
\\ \\ \\ \\
41 Tattoo:
Tag/Band:
=====

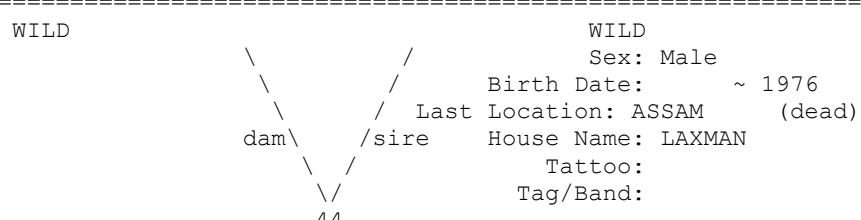
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Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 42
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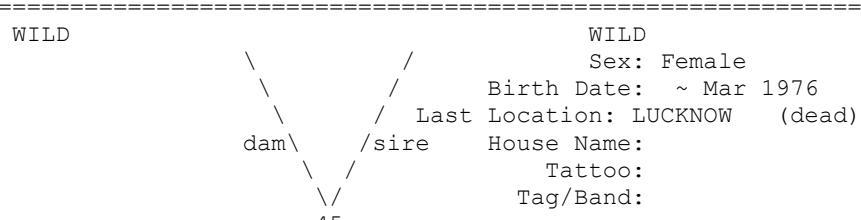
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Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 43
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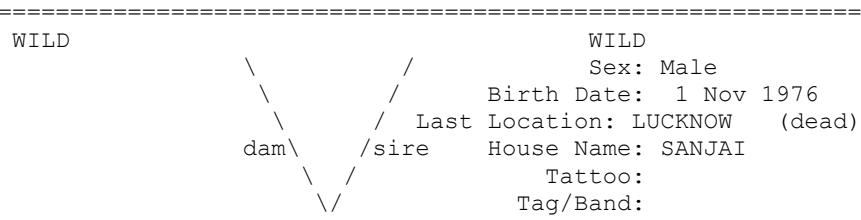
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Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 44
=====



=====
Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 45
=====



=====
Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 46
=====



Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 47
=====

WILD WILD
\\ /
\\ /
dam \\ / sire Birth Date: ~ 1977
Last Location: NANDANKAN
House Name: NANDAN
Tattoo:
Tag/Band:
47

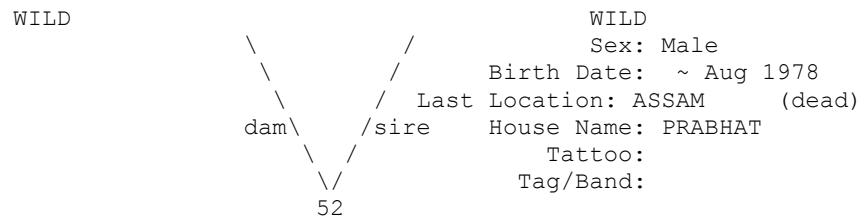
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=====
Taxon Name: RHINOCEROS UNICORNIS           Studbook Number: 50
=====
WILD          WILD          WILD          WILD
  dam \      /sire        dam \      /sire
    \   /      \   /
      8   +      7   +
PADMINI      SHIVAJI
              Sex: Female
              Birth Date: 9 Jan 1978
              Location: ASSAM (dead)
              House Name: GEETA/LAXMI
              Tattoo:
              Tag/Band:
+ Wild-caught...
      \   /      \   /
      50
=====
```

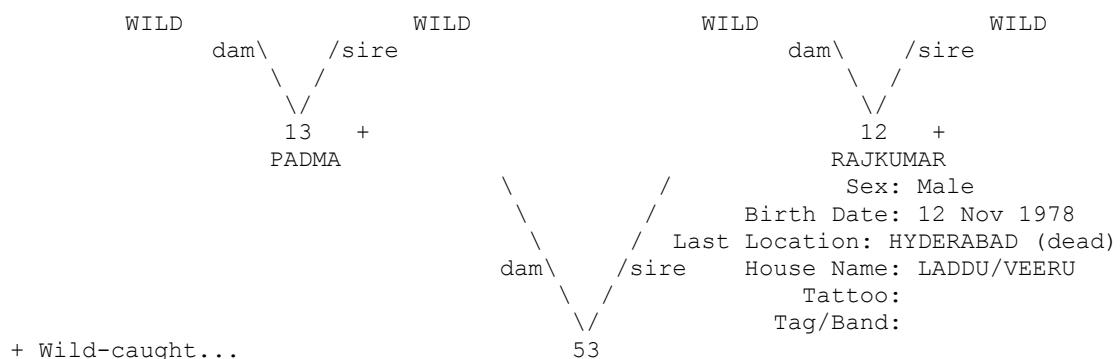
Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 51
=====

WILD WILD
\\ / Sex: Male
\\ / Birth Date: ~ 1978
\\ / Last Location: LUCKNOW (dead)
dam\\ /sire House Name: KRISHNA JUNIOR
\\ / Tattoo:
\\ / Tag/Band:
51

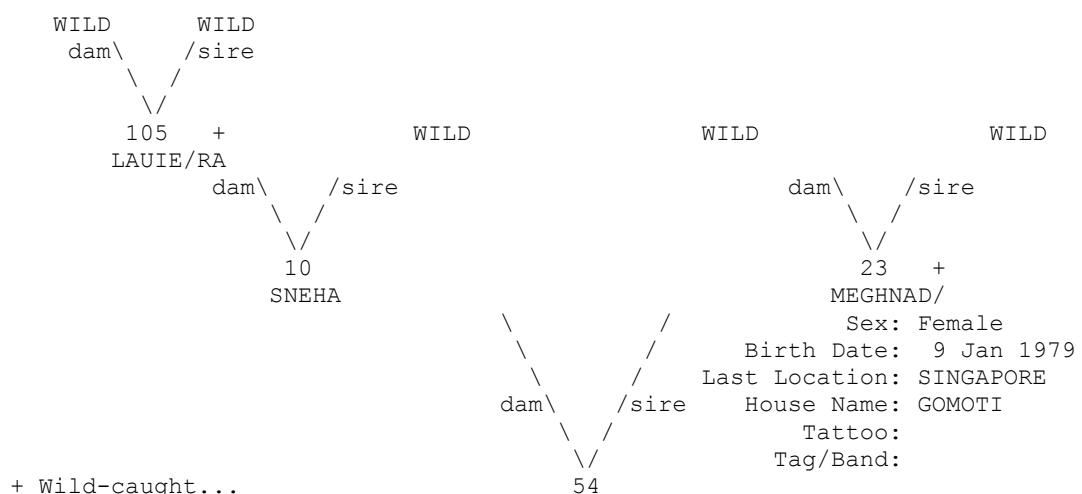
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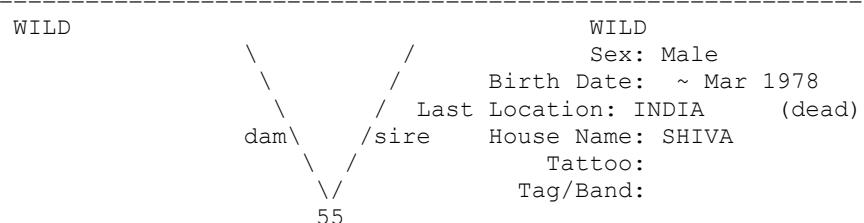
Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 53



Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 54



Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 55



=====
Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 56
=====

WILD WILD WILD WILD
dam\ /sire dam\ /sire
\\ \\ \\ \\
27 + 43 +
SHAKUNTA BALRAM\G
\\ \\ / Birth Date: 9 Mar 1979
\\ \\ / Last Location: CHATBIR Z (dead)
dam\ /sire House Name:
\\ \\ / Tattoo:
\\ \\ / Tag/Band:
56
+ Wild-caught...
=====

Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 57
=====

WILD WILD
\\ / Sex: Female
\\ \\ / Birth Date: ~ Jul 1979
\\ \\ / Last Location: ASSAM (dead)
dam\ /sire House Name: PARBATI
\\ \\ / Tattoo:
\\ \\ / Tag/Band:
57
=====

Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 58
=====

WILD WILD
\\ / Sex: Male
\\ \\ / Birth Date: ~ Apr 1980
\\ \\ / Last Location: ASSAM (dead)
dam\ /sire House Name: JOHN\PALITRA
\\ \\ / Tattoo:
\\ \\ / Tag/Band:
58
=====

Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 59
=====

WILD WILD
\\ / Sex: Male
\\ \\ / Birth Date: ~ May 1980
\\ \\ / Last Location: MADRAS (dead)
dam\ /sire House Name: RAMU SENIOR
\\ \\ / Tattoo:
\\ \\ / Tag/Band:
59
=====

Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 60
=====

WILD WILD
\\ / Sex: Female
\\ \\ / Birth Date: ~ 1980
\\ \\ / Last Location: ASSAM (dead)
dam\ /sire House Name: GINI\TARALI
\\ \\ / Tattoo:
\\ \\ / Tag/Band:
60
=====

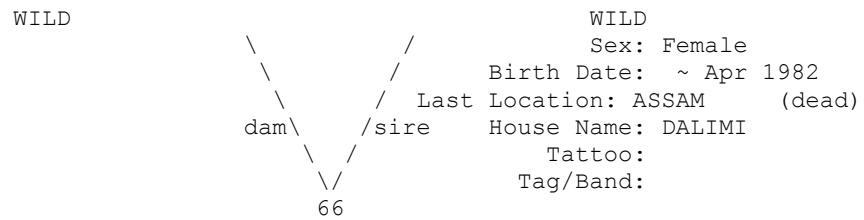
Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 61
=====

WILD	WILD	WILD	WILD
dam\	/sire	dam\	/sire
\ \ / \ /		\ \ / \ /	
27 + 43 +			
SHAKUNTA	BALRAM\G		
\ \ / \ /		Sex: Female	
\ \ / \ /	Last	Birth Date: 13 Nov 1980	
dam\	/sire	Location: DELHI	(dead)
\ \ / \ /		House Name:	
\ \ / \ /		Tattoo:	
		Tag/Band:	
+ Wild-caught...	61		

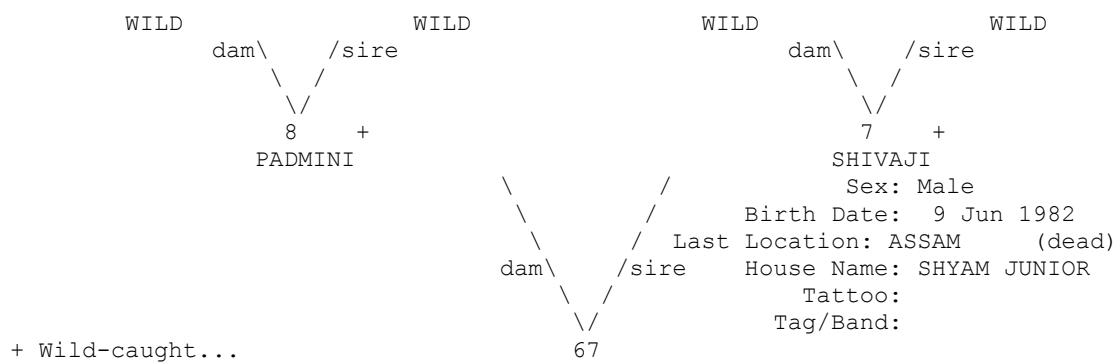
Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 62
=====

WILD WILD
\\ / Sex: Male
\\ / Birth Date: ~ 1981
\\ / Last Location: PATNA (dead)
dam\\ /sire House Name: RAJU
\\ / Tattoo:
\\ / Tag/Band:
62

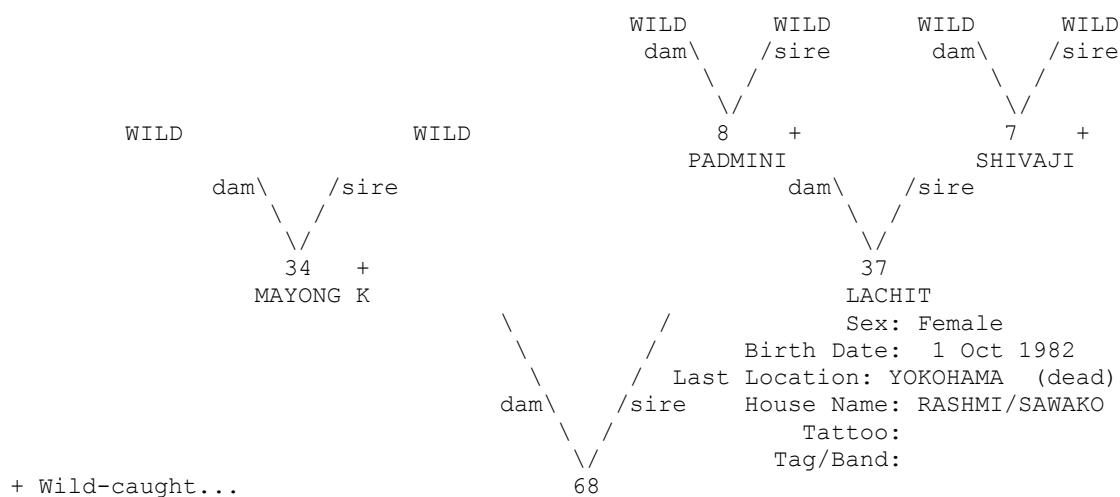
Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 63
 ======
 WILD WILD WILD WILD
 dam\ /sire dam\ /sire
 \ / \ / \ / \ /
 13 + 12 +
 PADMA RAJKUMAR
 Sex: Male
 Birth Date: 15 May 1981
 Last Location: HYDERABAD (dead)
 House Name: SRINIVAS
 Tattoo:
 Tag/Band:
 63
 + Wild-caught...



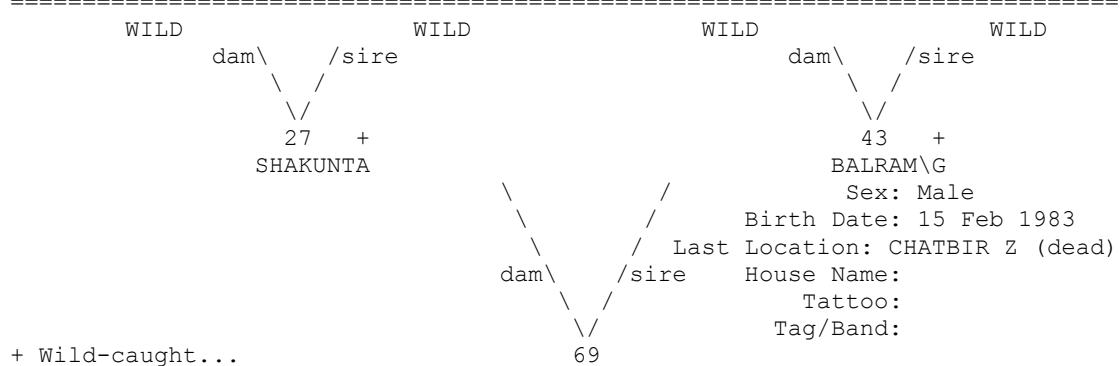
Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 67



Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 68



Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 69



Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 70
=====

WILD WILD
\\ / Sex: Female
 \\ / Birth Date: ~ Mar 1983
 \\ / Last Location: ASSAM (dead)
 dam \\ /sire House Name: SABITRI
 \\ / Tattoo:
 \\ / Tag/Band:
 70

```

=====
Taxon Name: RHINOCEROS UNICORNIS           Studbook Number: 71
=====

          WILD          WILD          WILD          WILD
      dam \   /sire      dam \   /sire      dam \   /sire      dam \
          \| /          \| /          \| /          \| /
          32 +          23 +          MEGHNAD/
          MAYURI/K      Sex: Male
                           Birth Date: 4 Jun 1984
                           Location: CALCUTTA (dead)
                           House Name: DEBRAJ
                           Tattoo:
                           Tag/Band:
                           71

+ Wild-caught...

```

```

=====
Taxon Name: RHINOCEROS UNICORNIS           Studbook Number: 72
=====

          WILD      WILD      WILD      WILD
          dam\   /sire   dam\   /sire   dam\   /sire
          \  /     \  /     \  /
          8   +     7   +     SHIVAJI
          PADMINI
          dam\   /sire
          \  /
          37
          LACHIT
          Sex: Male
          Birth Date: 6 Aug 1984
          Last Location: LUCKNOW
          House Name: LOHIT
          Tattoo:
          Tag/Band:
          72

          + Wild-caught...

```

```

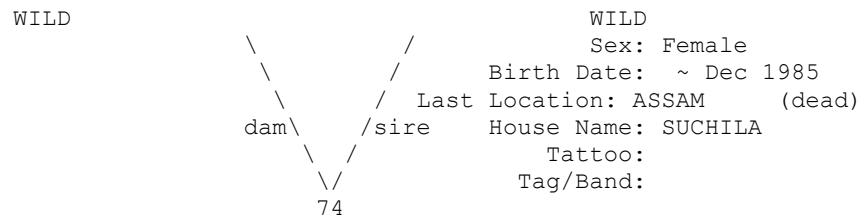
=====
Taxon Name: RHINOCEROS UNICORNIS           Studbook Number: 73
=====

          WILD          WILD          WILD          WILD
      dam \   /sire      dam \   /sire      dam \   /sire      dam \
          \| /          \| /          \| /          \| /
          27 +          43 +          BALRAM\G
          SHAKUNTA      Sex: Male
                           Birth Date: 11 Dec 1984
                           Location: CHATBIR Z (dead)
                           House Name:
                           Tattoo:
                           Tag/Band:

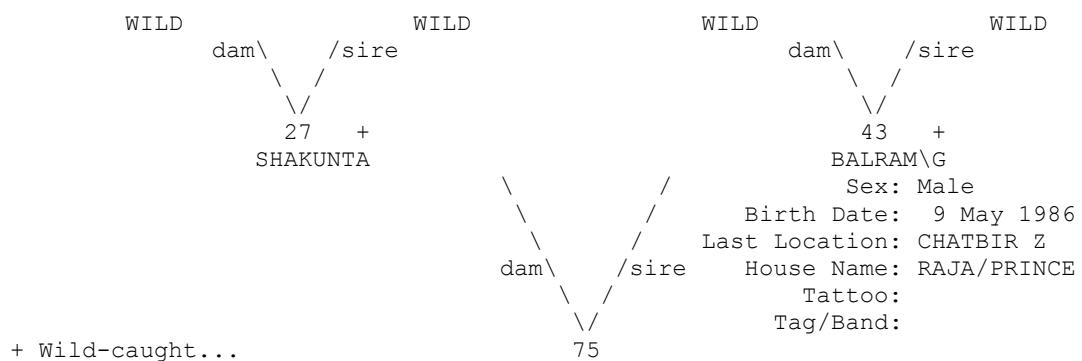
          \| /          \| /          \| /
          dam \   /sire    Last
          \| /          \| /
          73
          + Wild-caught...

```

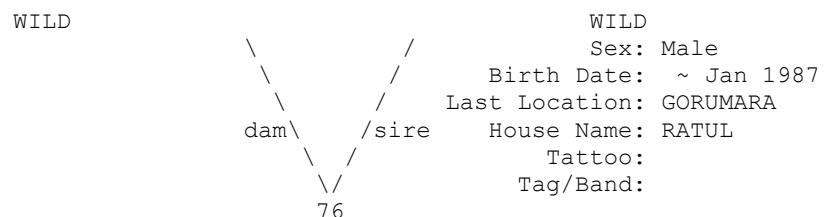
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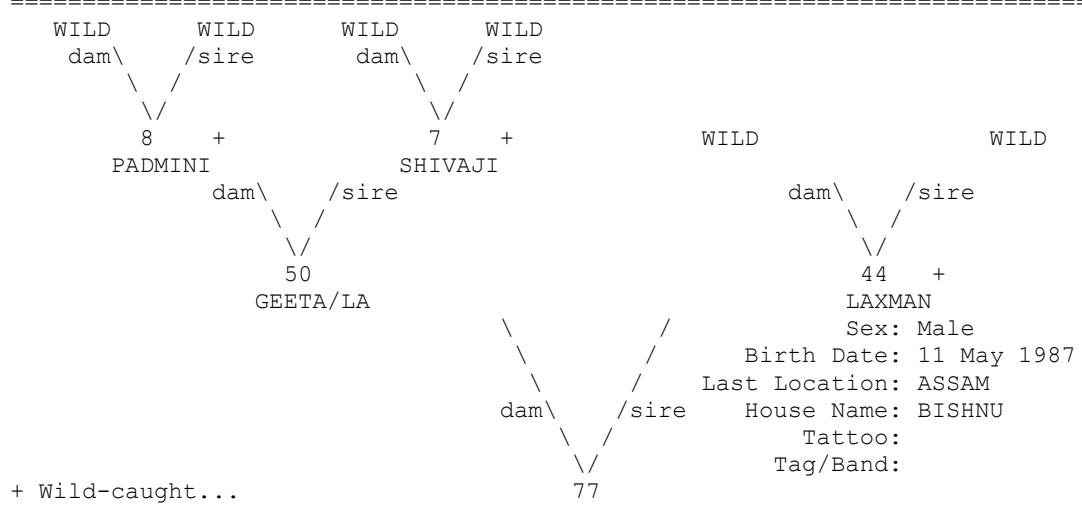
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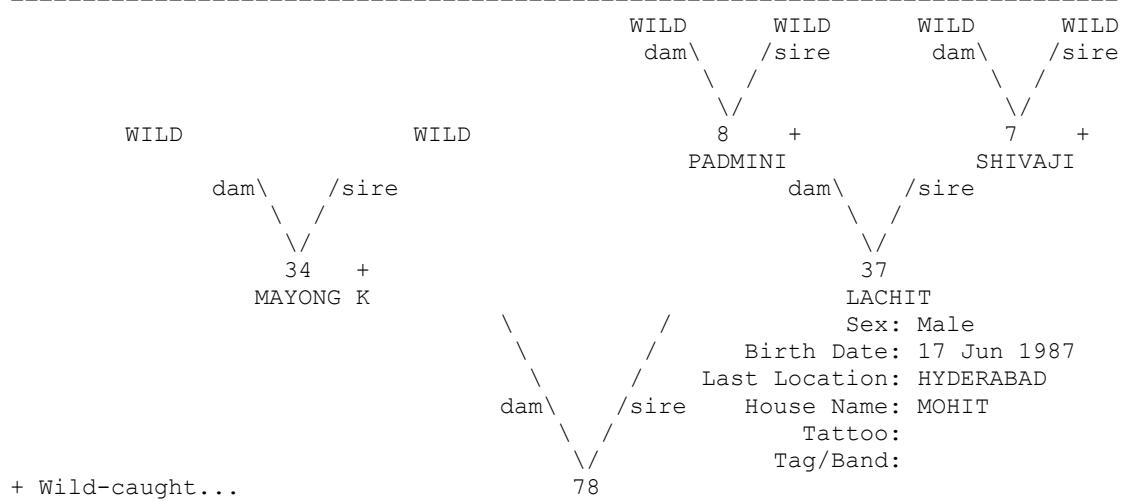
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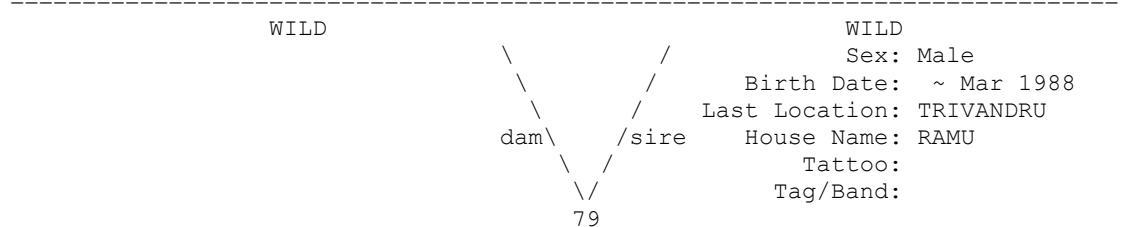
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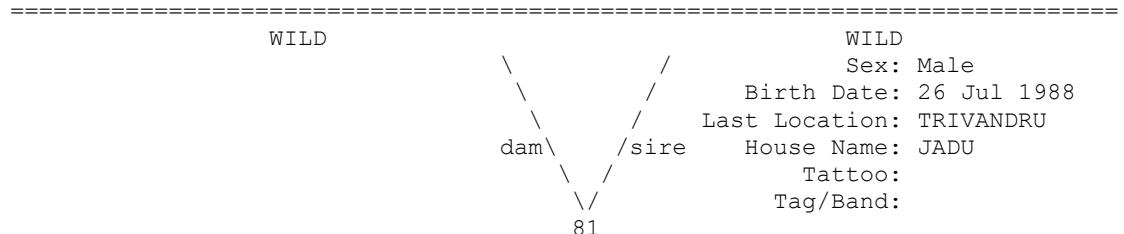
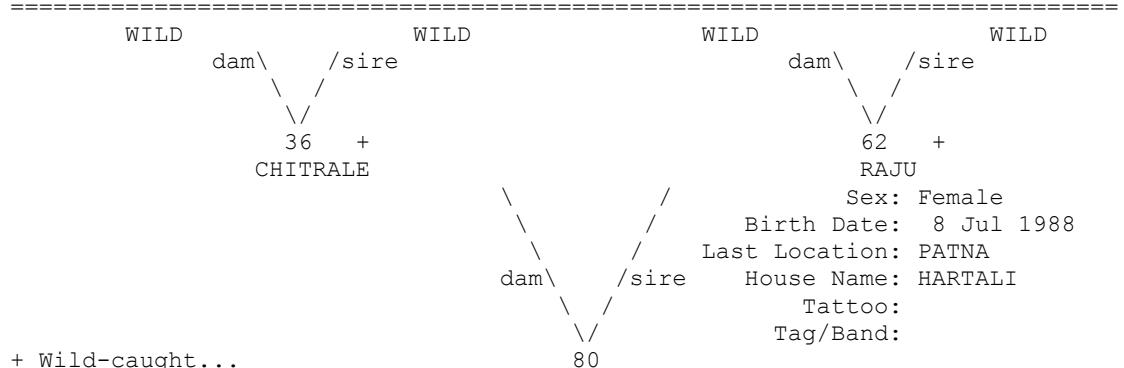
Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 78



Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 79



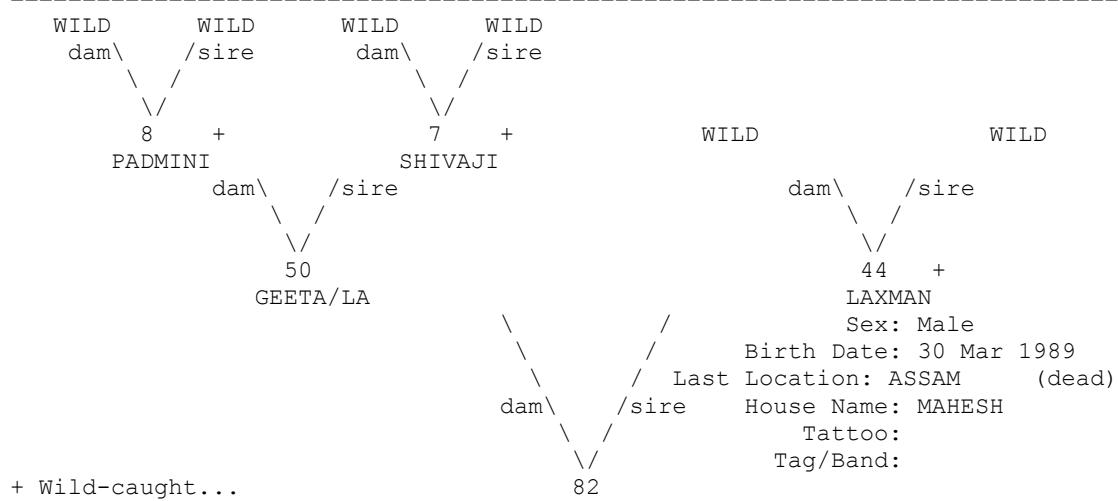
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Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 82

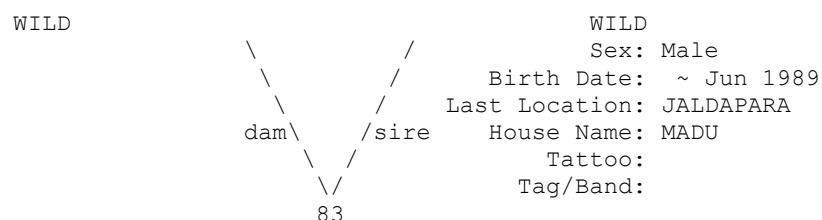
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Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 83

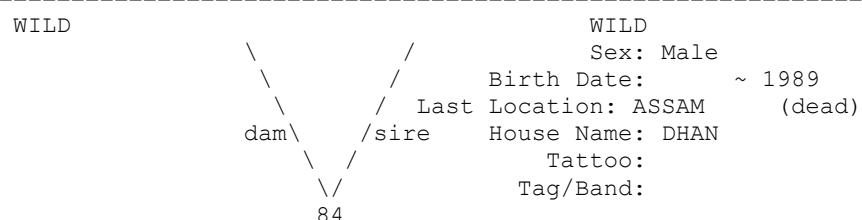
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Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 84

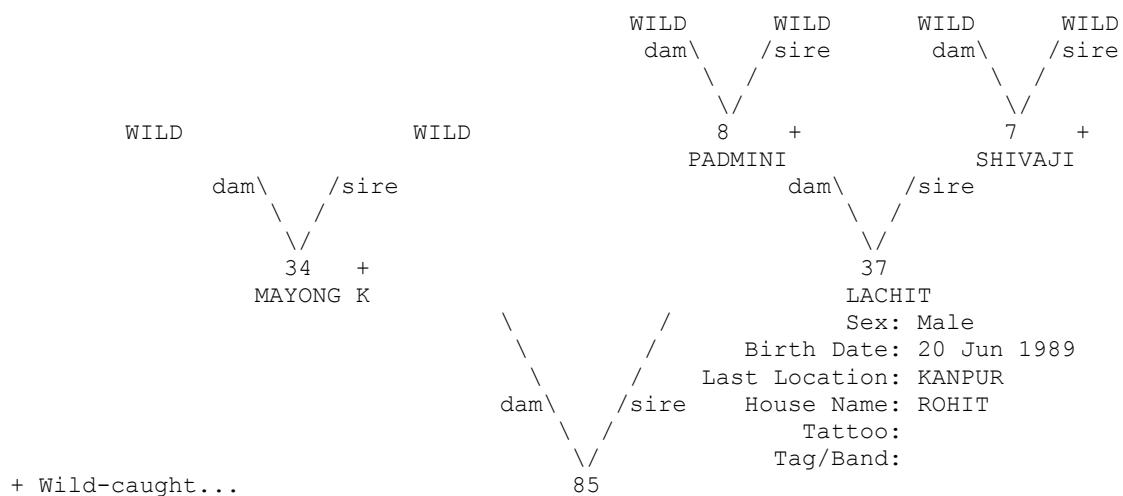
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=====

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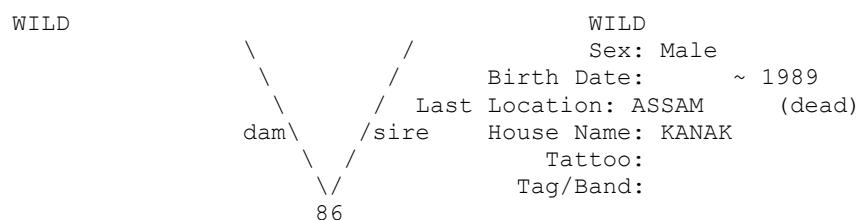
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Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 86

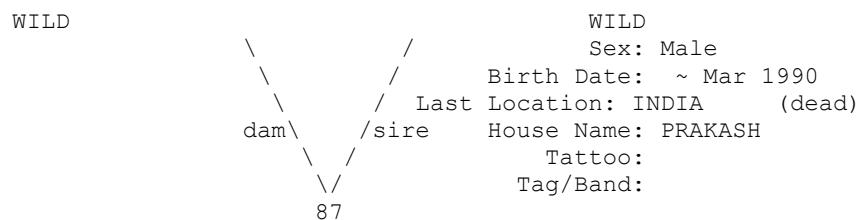
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Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 87

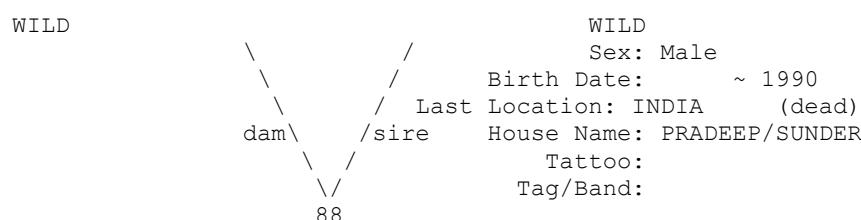
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=====

Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 88

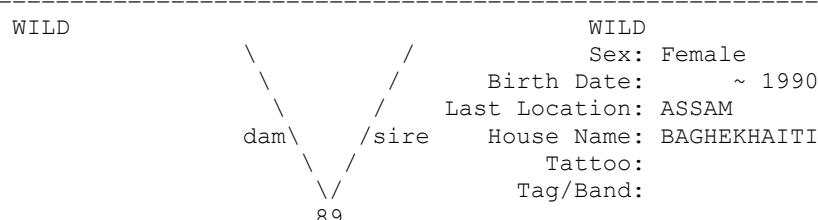
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=====

Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 89

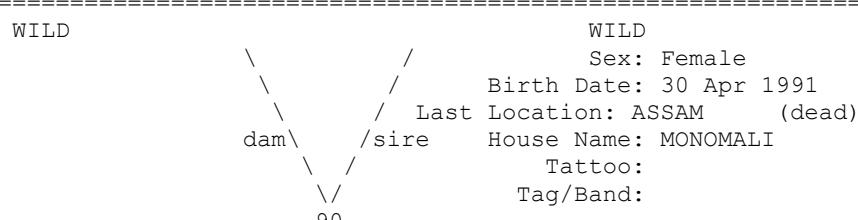
=====



=====

Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 90

=====



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=====
Taxon Name: RHINOCEROS UNICORNIS           Studbook Number: 92
=====
WILD          WILD          WILD          WILD
    dam \   /sire      dam \   /sire
        \ /           \ /
        36 +           62 +
CHITRALE      RAJU
               Sex: Female
               Birth Date: 6 Jul 1991
               Last Location: PATNA
               House Name: CHOTKI/RANI
               Tattoo:
               Tag/Band:
=====
+ Wild-caught...
92

```

```

=====
Taxon Name: RHINOCEROS UNICORNIS           Studbook Number: 93
=====

          WILD          WILD          WILD          WILD
      dam \   /sire      dam \   /sire      dam \   /sire      dam \
          \ /           \ /           \ /           \ /
          65 +           26 +           DABB/AG
          MOHINI/R       Sex: Male
                           Birth Date: 27 Dec 1992
                           Last Location: PATNA
                           House Name: AYODHYA/AMAR
                           Tattoo:
                           Tag/Band:
                           93

+ Wild-caught...

```

=====

Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 94

=====

WILD WILD WILD WILD
dam\ /sire dam\ /sire dam\ /sire dam\ /sire
\ / \ / \ / \ / \ /
60 + 58 +
GINI\TAR JOHN\PAL
\ / / /
Last Birth Date: 25 Nov 1994
dam\ /sire Location: ASSAM (dead)
\ / / /
94 House Name:
\ / / /
Tag/Band:
+ Wild-caught...
Tattoo:

=====

Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 95

=====

WILD WILD
dam\ /sire dam\ /sire
\ / \ / \ /
Sex: Male Birth Date: ~ 1995
Last Location: ASSAM (dead)
House Name: HANUMAN
Tattoo:
Tag/Band:
95

=====

Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 96

=====

WILD WILD WILD WILD WILD WILD
dam\ /sire dam\ /sire dam\ /sire dam\ /sire
\ / \ / \ / \ / \ /
8 + 7 +
PADMINI SHIVAJI WILD WILD
dam\ /sire dam\ /sire
\ / \ / \ /
GEETA/LA 50 44 +
LAXMAN
Sex: Female Birth Date: 22 Jan 1995
Last Location: TRIVANDRU (dead)
House Name: RITA
Tattoo:
Tag/Band:
96 + Wild-caught...
=====

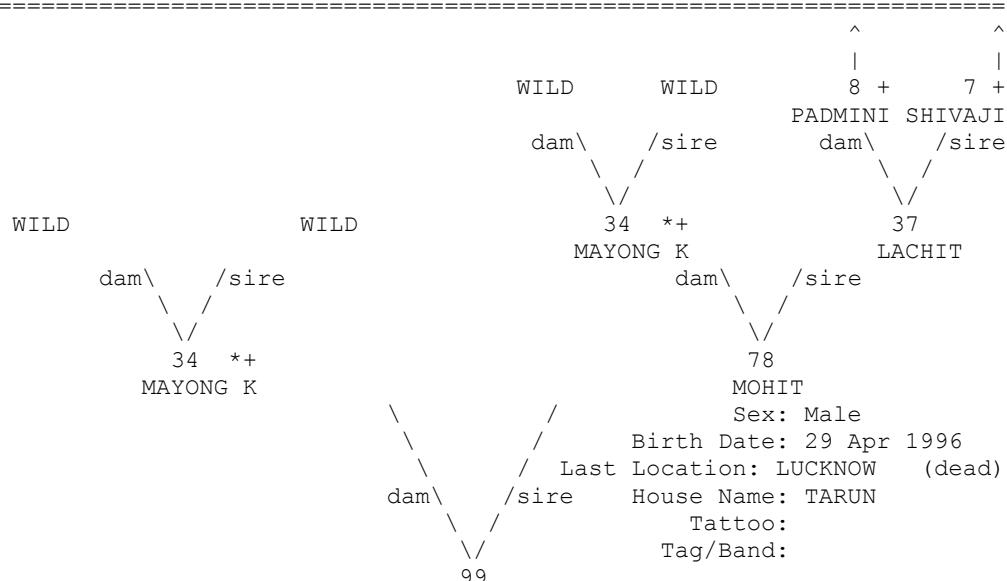
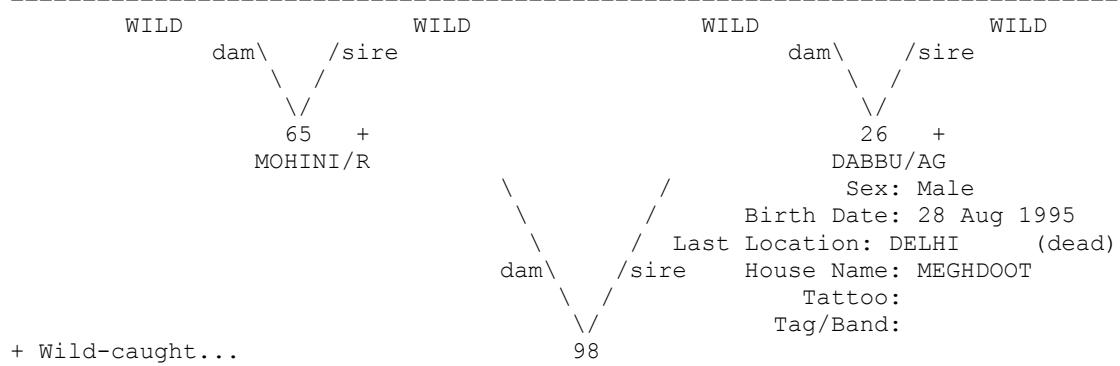
Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 97

=====

WILD WILD
dam\ /sire dam\ /sire
\ / \ / \ /
Sex: Male Birth Date: ~ 1995
Last Location: ASSAM (dead)
House Name: RANGA
Tattoo:
Tag/Band:
97

=====

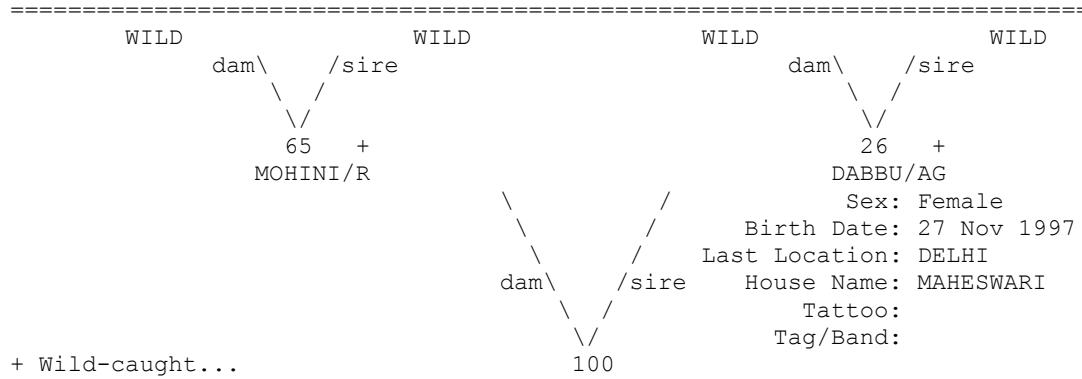
Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 98



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

[^] Pedigree continues beyond top of page...

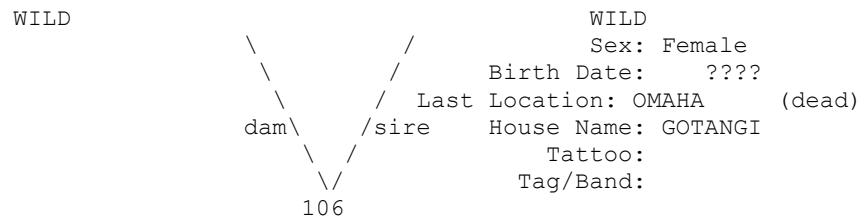
Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 100



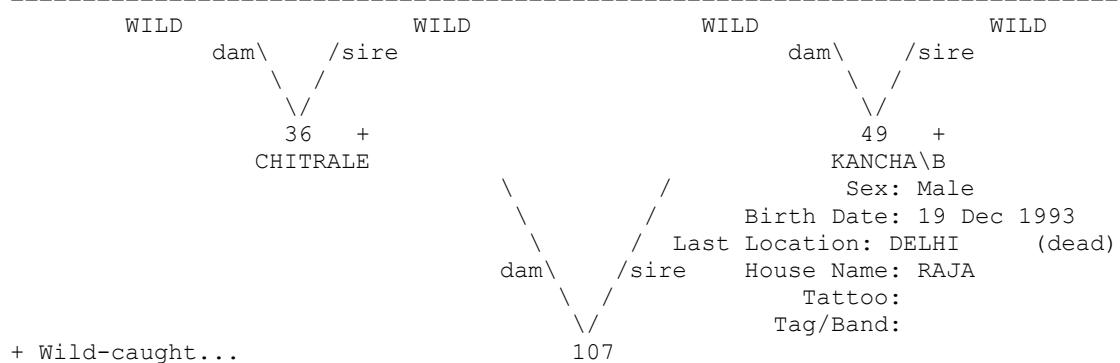
Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 104
=====

WILD WILD
\\ / Sex: Male
\\ / Birth Date: ~ Jul 1998
\\ / Last Location: ASSAM (dead)
dam \\ /sire House Name: LOHAMANI
\\ / Tattoo:
\\ / Tag/Band:
104

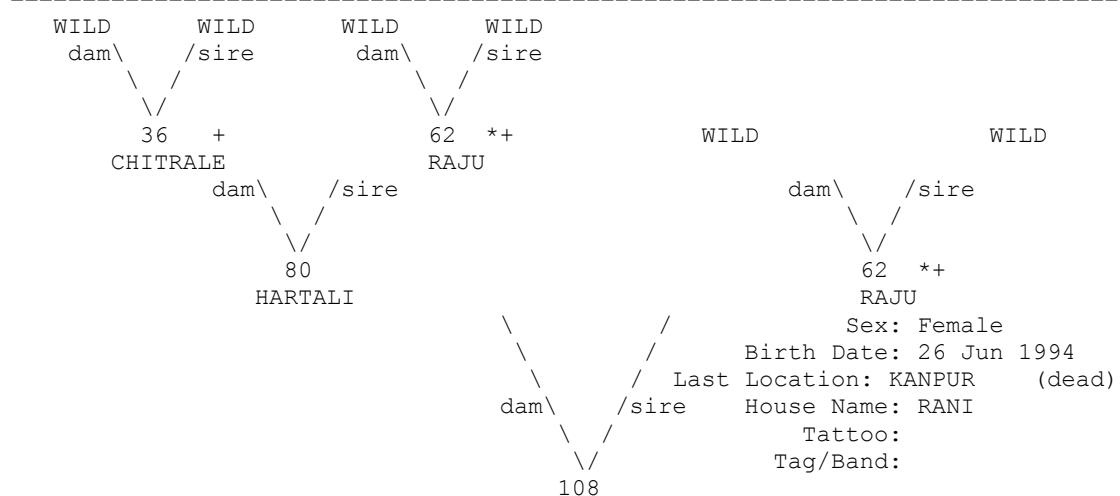
Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 106



Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 107



Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 108



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

Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 109
 ======
 WILD WILD WILD WILD
 dam\ /sire dam\ /sire
 \ / \ / \ / \ /
 36 + 62 +
 CHITRALE RAJU WILD WILD
 dam\ /sire
 \ / \ /
 80 HARTALI
 dam\ /sire
 \ / \ /
 49 +
 KANCHAB Sex: Male
 Birth Date: 23 Oct 1997
 Last Location: PATNA (dead)
 House Name: BAJRANGI
 Tattoo:
 Tag/Band:
 + Wild-caught...

```

=====
Taxon Name: RHINOCEROS UNICORNIS           Studbook Number: 110
=====

          WILD          WILD          WILD          WILD
      dam\ /sire      dam\ /sire      dam\ /sire      dam\ /sire
        \ /           \ /           \ /           \ /
        \|/           \|/           \|/           \|/
       65 +         26 +         DABBHU/AG
      MOHINI/R
          \         /           \
          \         /           Sex: Male
          \         /           Birth Date: 2 Jul 2000
      dam\ /sire     Last Location: DELHI (dead)
        \ /           House Name:
        \ /           Tattoo:
        \ /           Tag/Band:
          \|/
          110
+ Wild-caught...

```

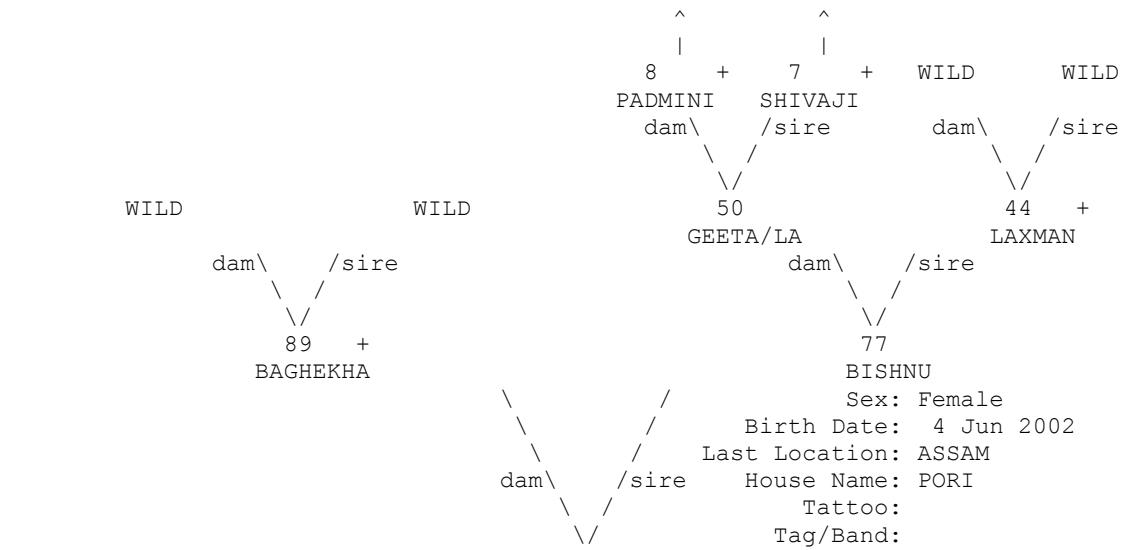
```

=====
Taxon Name: RHINOCEROS UNICORNIS           Studbook Number: 111
=====

WILD      WILD      WILD      WILD
dam\    /sire   dam\    /sire
  \  /      \  /
  36 +     62 + 
CHITRALE          RAJU          WILD          WILD
                    dam\    /sire
                      \  /
                      80
HARTALI          KANCHAB
                    Sex: Male
                    Birth Date: 29 Sep 2000
                    Last Location: SANDIEGOZ
                    House Name: BHOPO
                    Tattoo:
                    Tag/Band:
+ Wild-caught...
                    111

```

Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 112



+ Wild-caught...

112

[^] Pedigree continues beyond top of page...

Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 114

=====

```

WILD      WILD      WILD      WILD
  dam\    /sire    dam\    /sire
    \ /      \ /
   36 +     62 +           WILD           WILD
  CHITRALE          RAJU

  dam\    /sire
    \ /
   80
  HARTALI

  dam\    /sire
    \ /
   49 +           KANCHAB\B
                  Sex: Female
                  Birth Date: 8 Aug 2002
                  Last Location: PATNA
                  House Name: AKANCHANA/GAURI
                  Tattoo:
                  Tag/Band:

+ Wild-caught...

```

----- Taxon Name: RHINOCEPHALUS UNICORNIS ----- Studbook Number: 115

Taxon Name: RHINOCEPHALUS UNICORNIS Studbook Number: 116

TAXON NAME: RHINOCEROS UNICORNIS Studbook Number: 116
===== ISB209 ISB106
\\ / Sex: Female
\\ / Birth Date: 23 Jul 2001
\\ / Last Location: PATNA (dead)
dam\\ /sire House Name: GAIRI
\\ /
116 Tag/Band:

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

Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 118

```

      ^   ^
      |   |
  36 + 62 *+ WILD   WILD   WILD   WILD   8 + 7 +
CHITRALE RAJU      dam\ /sire    dam\ /sire    dam\ /sire    PADMINI SHIVAJI
          \/\           \/\           \/\           dam\ /sire
          80           62 *+         34 +         37
HARTALI      RAJU      MAYONG K      LACHIT
              dam\ /sire      dam\ /sire
              \  /           \  /
              108           RANI
              RANI
              \  /
              dam\ /sire
              \  /
              118
              /sire
              Birth Date: 22 Jun 2003
              Last Location: KANPUR
              House Name: MANU
              Tattoo:
              Tag/Band:
Sex: Female
Tag/Band:
+ Wild-caught...
^ Pedigree continues beyond top of page...

```

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

```

=====
Taxon Name: RHINOCEROS UNICORNIS           Studbook Number: 120
=====

WILD      WILD      WILD      WILD      WILD      WILD      WILD      WILD
dam\    /sire   dam\    /sire   dam\    /sire   dam\    /sire   dam\    /sire
 \  /      \  /      \  /      \  /      \  /      \  /      \  /
 36 *+    62 +    36 *+    49 +
CHITRALE RAJU     CHITRALE KANCHAB
dam\    /sire
 \  /
 80
HARTALI

Sex: Male
Birth Date: 19 Sep 2004
Last Location: PATNA
House Name: GANESH
Tattoo:
Tag/Band:
120 * Appear more than once...
+ Wild-caught...

```

Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 121
=====

WILD WILD
\\ /
\\ /
dam \\ / sire Birth Date: ~ 1997
\\ /
\\ /
121 Last Location: VISAKAPAT
House Name: NAKUL
Tattoo:
Tag/Band:

```

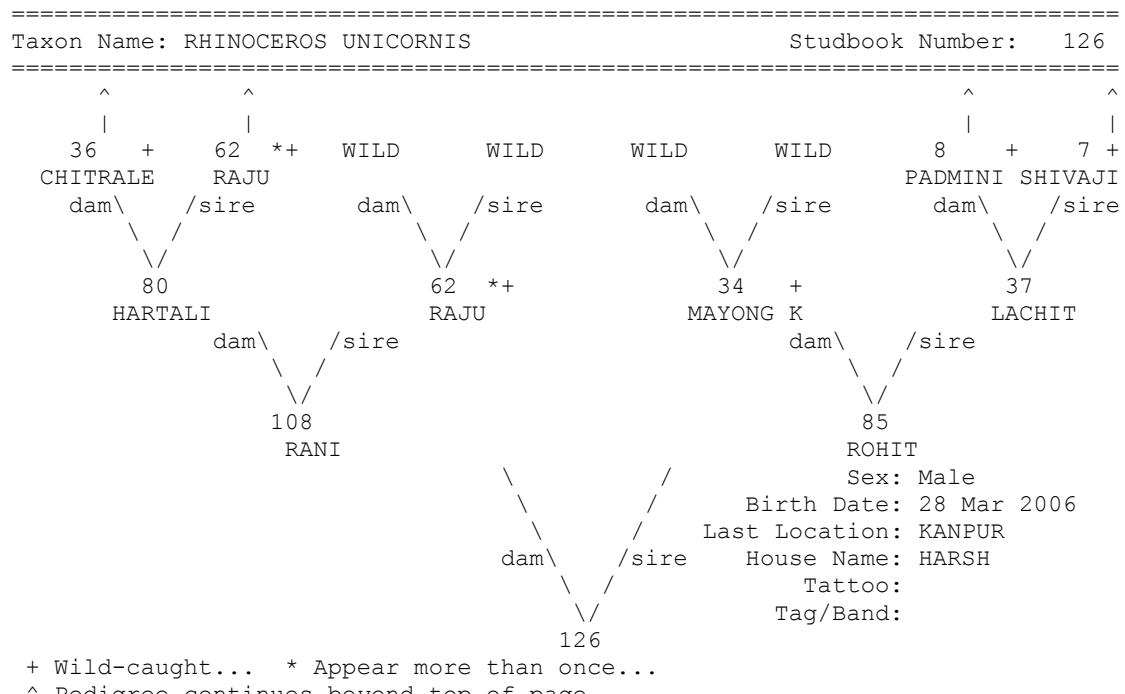
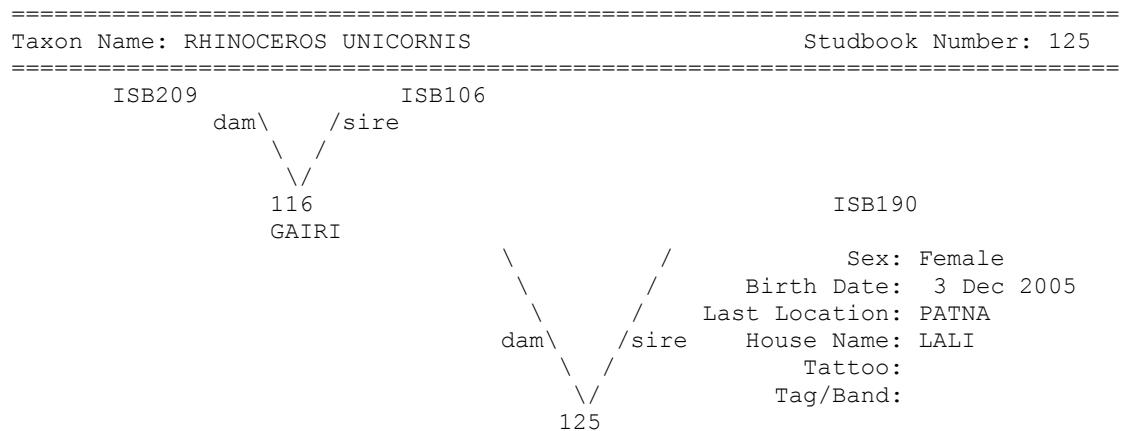
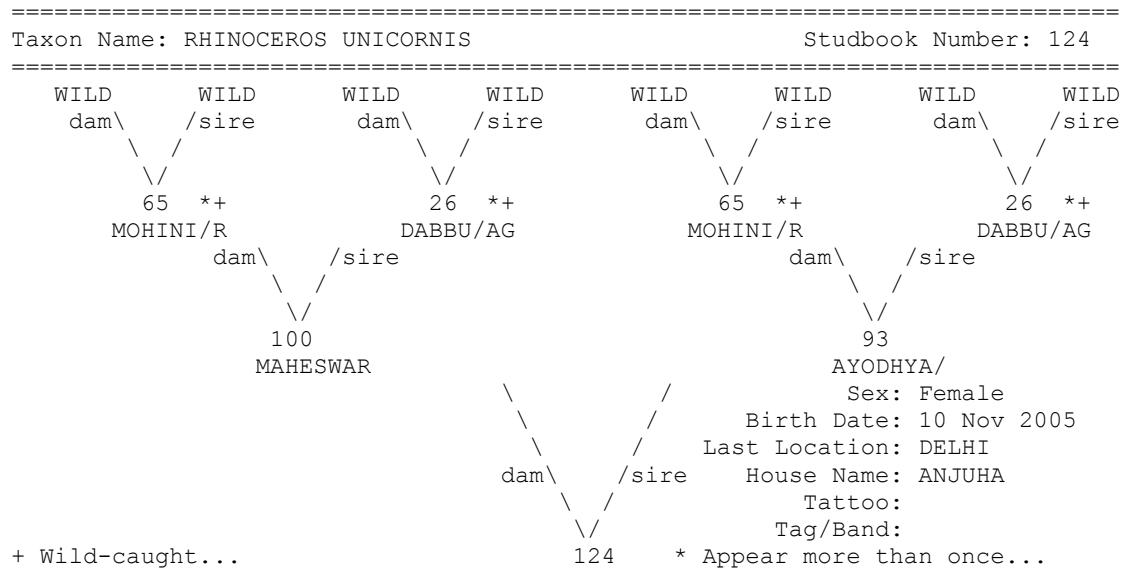
=====
Taxon Name: RHINOCEROS UNICORNIS           Studbook Number: 123
=====

          WILD      WILD      WILD      WILD
          dam\    /sire   dam\    /sire
          \  /      \  /
          36 +     62 +       RAJU
          CHITRALE
          dam\    /sire
          \  /
          92
          CHOTKI/R

          WILD
          dam\    /sire
          \  /
          49 +
          KANCHAB
          Sex: Male
          Birth Date: 6 Nov 2005
          Last Location: HYDERABAD
          House Name: SURAJ
          Tattoo:
          Tag/Band:
          123

+ Wild-caught...

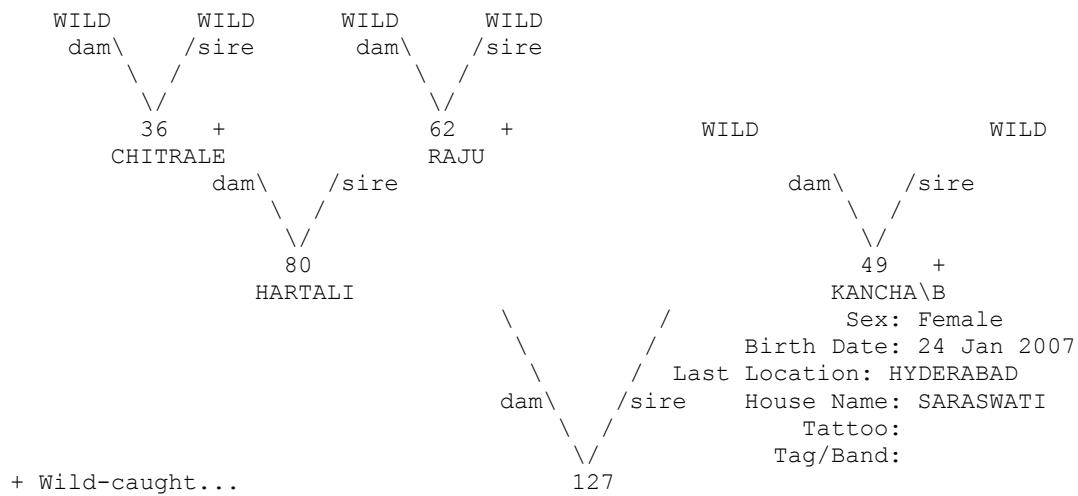
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Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 127

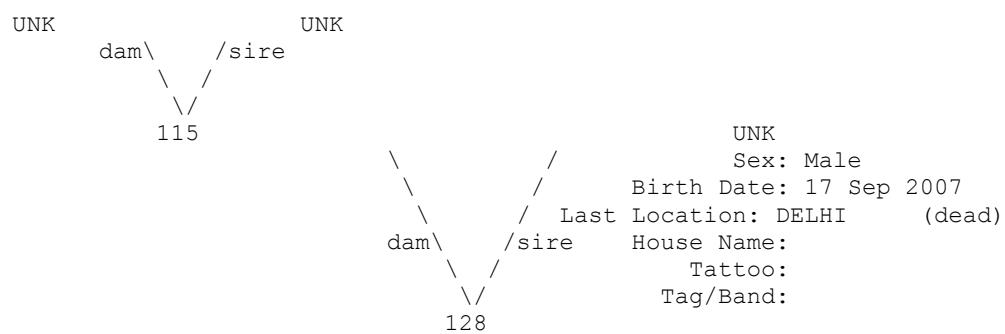
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Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 128

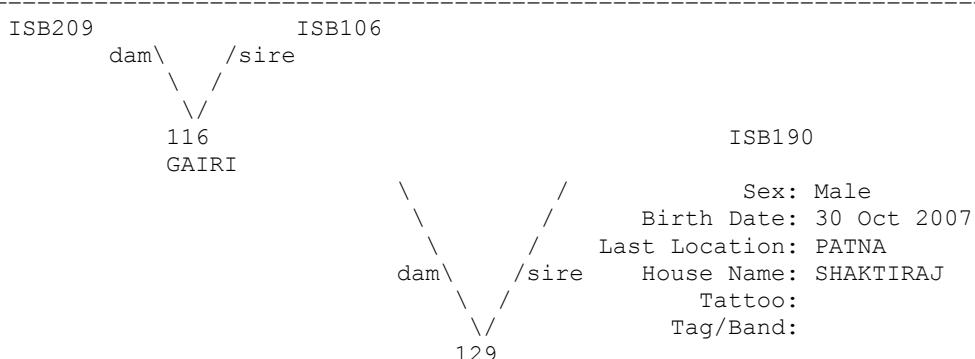
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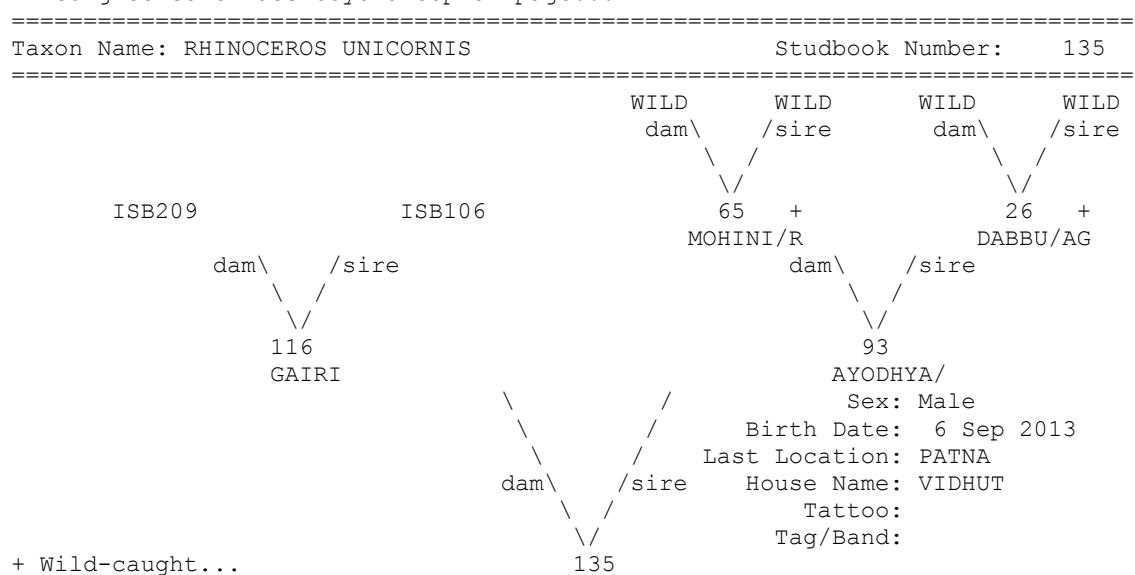
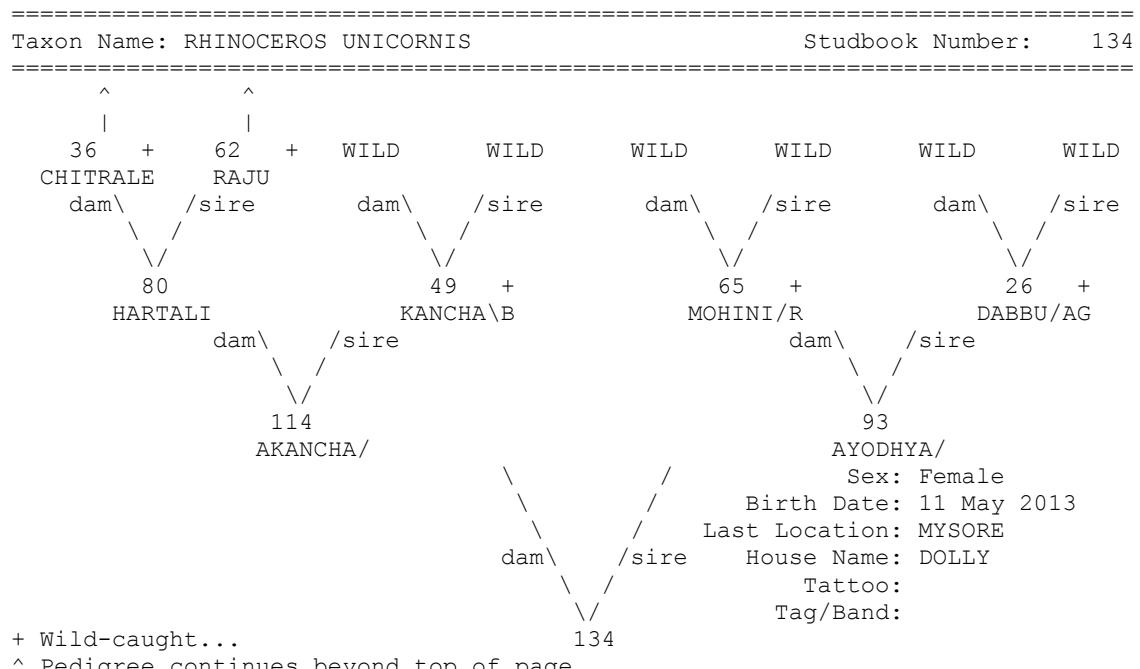
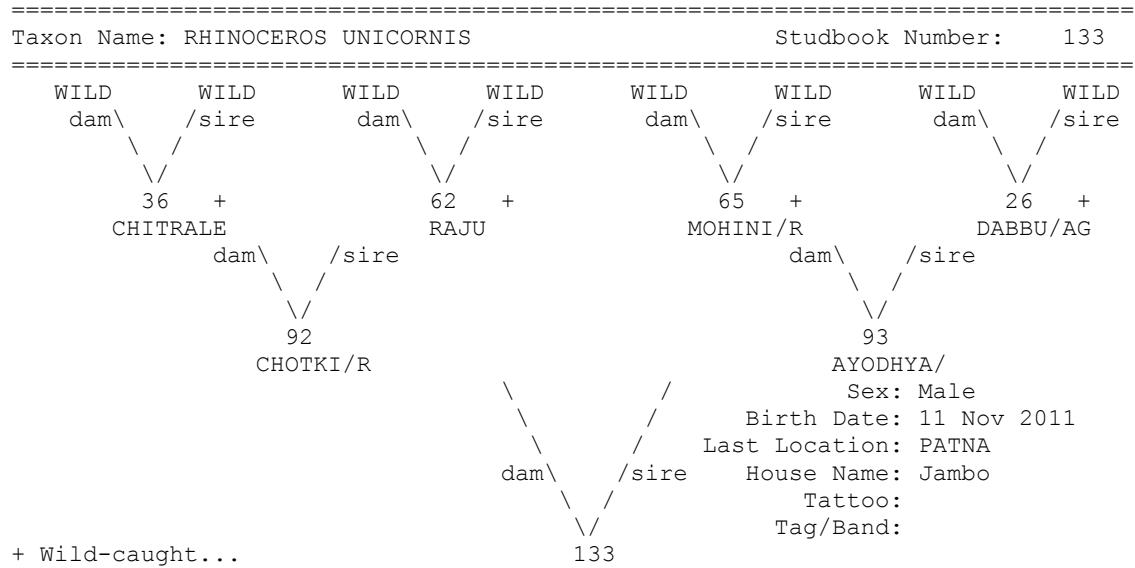


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Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 129

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Taxon Name: RHINOCEROS UNICORNIS           Studbook Number: 136
=====

WILD          WILD          WILD          WILD          WILD          WILD          WILD          WILD
dam\        /sire      dam\        /sire      dam\        /sire      dam\        /sire
   \ /          \ /          \ /          \ /          \ /          \ /
   36 +        62 +        65 +        26 +        CHITRALE RAJU MOHINI/R DABBHU/AG
   CHITRALE      RAJU      MOHINI/R DABBHU/AG
   dam\        /sire      dam\        /sire      dam\        /sire
   \ /          \ /          \ /
   80          HARTALI          93          AYODHYA/
   HARTALI      93          AYODHYA/
   Sex: Female
   Birth Date: 16 Sep 2013
   Last Location: PATNA (dead)
   House Name: BABLII
   Tattoo:
   Tag/Band:

+ Wild-caught...

```

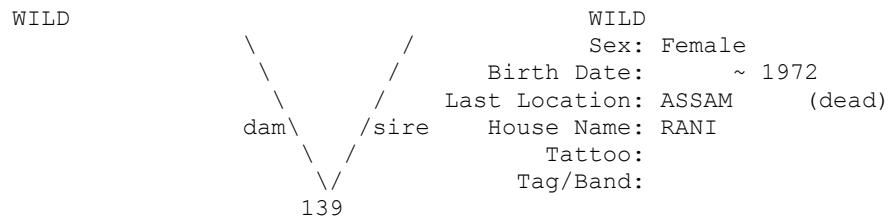
```

=====
Taxon Name: RHINOCEROS UNICORNIS           Studbook Number: 137
=====
ISB209      ISB106          WILD        WILD        WILD        WILD
dam\ /sire   dam\ /sire   dam\ /sire   dam\ /sire
  \ /       \ /       \ /       \ /
  \ \       \ \       \ \       \ \
116          ISB190          65         +          26         +
GAIRI          MOHINI/R      DABBHU/AG
dam\ /sire   dam\ /sire
  \ /       \ /
  \ \       \ \
125          LALI           93          AYODHYA/
LALI           MOHINI/R      Sex: Male
                           Birth Date: 16 Feb 2014
                           Last Location: PATNA (dead)
                           House Name:
                           Tattoo:
                           Tag/Band:
+ Wild-caught...
                           137
=====
```

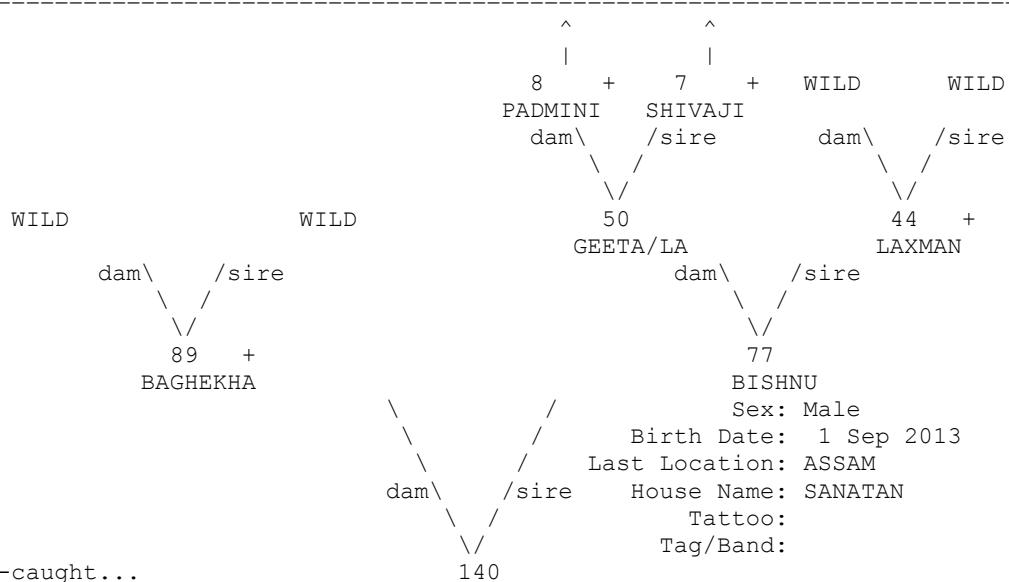
Pedigree continues beyond t

[^] Pedigree continues beyond top of page...

Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 139



Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 140

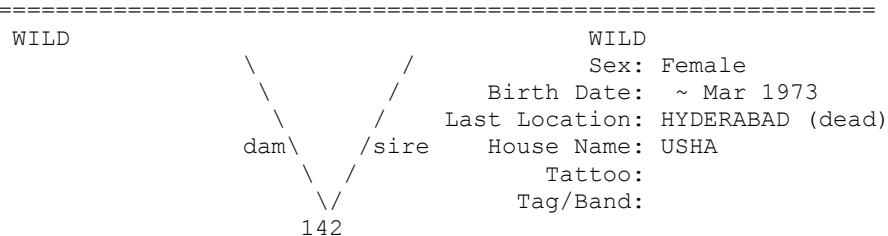


Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 141

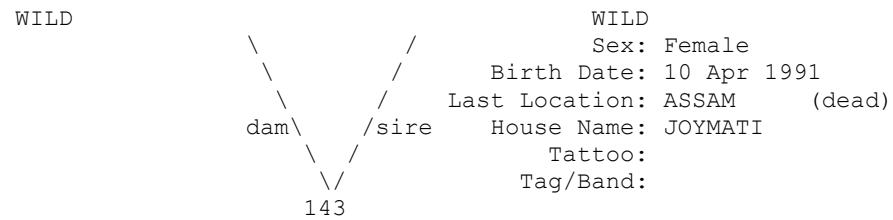
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Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 141
=====
WILD WILD
\\ / Sex: Male
\\ / Birth Date: ~ 2008
\\ / Last Location: ASSAM
dam \\ /sire House Name: NAG-SANKAR
\\ / Tattoo:
\\ / Tag/Band: 0006CDB50C
141

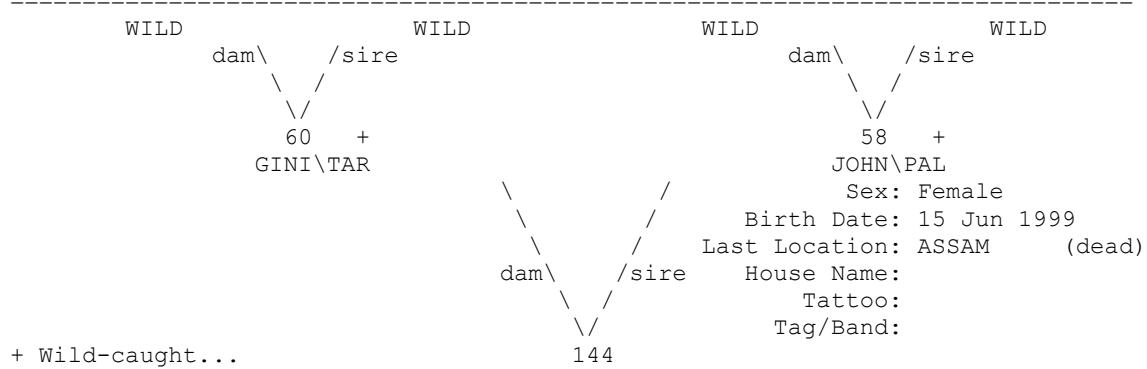
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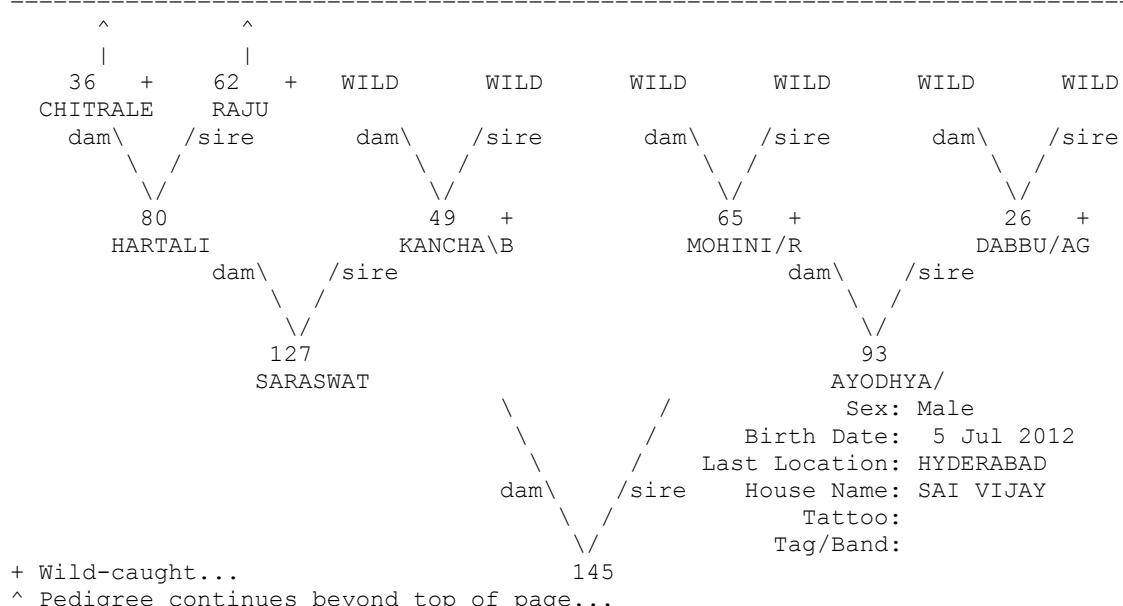
Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 143



Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 144



Taxon Name: RHINOCEROS UNICORNIS Studbook Number: 145



Taxon Name: RHINOCEROS UNICORNIS Studbook Number: IN1
=====

WILD WILD
\\ /
\\ /
dam \\ / sire Birth Date: ????
\\ /
\\ /
IN1 Tag/Band:
House Name: KASI
Last Location: MYSORE (dead)
Sex: Male
Tattoo:

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=====
Taxon Name: RHINOCEROS UNICORNIS           Studbook Number:    IN3
=====
WILD          WILD          WILD          WILD
dam\ /sire   dam\ /sire   dam\ /sire   dam\ /sire
  \ /        \ /        \ /        \ /
  \ /        \ /        \ /        \ /
IN2 +       IN1 +       Sex: Male
RANI          KASI
             Birth Date: 16 Apr 1971
                         Last Location: NY BRONX
                         House Name: VINU
                         Tattoo:
                         Tag/Band:
                         IN3
=====
+ Wild-caught...

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Taxon Name: RHINOCEROS UNICORNIS Studbook Number: IN6
=====

WILD WILD
\\ /
\\ /
dam \\ /sire Birth Date: ~ 1953
Last Location: MADRAS (dead)
House Name: KUSHAL
Tattoo:
Tag/Band:
IN6

Location Glossary - One-Horned Rhinoceros (*Rhinoceros unicornis*)

ANTWERP	Zoo of Antwerp Royal Zool.Society of Antwerp, Antwerp, Belgium, B2018
ASSAM	Assam State Zoo, Guwahati M/S Cinderella Restaurant Annex, Guwahati, Assam, India, 781006
BARODA	Shri Sayaji Baug Zoo Municipal Corp, Baroda, Gujarat, India
BROWNSVIL	Gladys Porter Zoo 500 Ringgold St., Brownsville, Texas, USA, 78520
CALCUTTA	Kolkata / Alipore Zool. Garden Kolkata, West Bengal, India, 700 027
CHATBIR Z	M.C. Zoological Park, Chat-bir SCO No 839-40, Sector-22-A, Chandigarh, Punjab, India, 160 022
DELHI	National Zoological Park, New Delhi Mathura Rd., Near Purana Quilla, New Delhi, India, 110 003
DUDHWA	Dudhwa National Park
GELSNKRKN	Ruhr Zoo Gelsenkirchen Bleckstrasse 64, Gelsenkirchen, N Rhine-westph, Germany, 45889
GORUMARA	Gorumara National Park Divisional Forest Officer, Jalpaiguri, West Bengal, India
GULF BREZ	The ZOO, Northwest Florida 5701 Gulf Breeze Pkwy., Gulf Breeze, Florida, USA, 32563
HAMURA	Hamura Zoological Park 4122, Hane, Hamura City, Tokyo, Japan, 205-0012
HYDERABAD	Nehru Zoological Park Bahadurpura, Hyderabad 500 064 A., Andhra Pradesh, India
INDIA	INDIA South Central Asia, Asian Region
JALDAPARA	Jaldapara Wildlife Sanctuary Divisional Forest Officer, Jalpaiguri, West Bengal, India
KANPUR	Kanpur Zoological Park Allen Forest Azadnagar, Kanpur, Uttar Pradesh, India, 208002
KOLN	Cologne Zoo Riehler Strasse 173, Koeln, N Rhine-westph, Germany, D-50735

LOSANGELE	Los Angeles Zoo & Botanical Gardens 5333 Zoo Dr., Los Angeles, California, USA, 90027
LUCKNOW	Nawab Wazid Ali Shah Zoological Garden, Lucknow 226001, Uttar Pradesh, India
MADRAS	Arignar Anna Zoological Park Arignar Anna Zool. Park, Chennai, Madras, Tamil Nadu, India, 600 048
mysore	Sri Chamarajendra Zool. Garden Gar. Rd., Mysore 570 010, Karnataka, South India
NAGOYA	Nagoya Higashiyama Zoo 3-70 Higashiyamamotomachi, Nagoya, Aichi, Japan, 464-0804
NANDANKAN	Nandankanan Biological Park Janpath, Saheed Nagar, Bhubaneswar 751 007, India
NY BRONX	Bronx Zoo/Wildlife Conservation Society 2300 Southern Blvd., Bronx, New York, USA, 10460-1099
NZP-WASH	Smithsonian National Zoological Park 3001 Connecticut Avenue NW, Washington, District Of Columbia, USA, 20008-2537
OMAHA	Omaha's Henry Doorly Zoo 3701 South 10th St., Omaha, Nebraska, USA, 68107-2200
ONTHE WAY	In transit
PARIS	Paris (inc. Ile-de-France) France, Cont Europe, European Region
PATNA	Sanjay Gandhi Biol.Park- Patna.
PLANCKNDL	Wild Animal Park Mechelen Planckendael Royal Zool. Society of Antwerp, Mechelen (muizen), Belgium, B2812
RANCHI	Ranchi Biological Park
SANDIEGOZ	Zoological Society of San Diego PO Box 120551, San Diego, California, USA, 92112-0551
SD-WAP	San Diego Wild Animal Park 15500 San Pasqual Valley Rd, Escondido, California, USA, 92027
SINGAPORE	Singapore Zoological Gardens 80 Mandai Lake Road, Singapore, Singapore, 729826
TORONTO	Toronto Zoo 361A Old Finch Ave., Scarborough, Ontario, Canada, M1B 5K7
TRIPURA	Sepahijala Zoological Park India, South Central A, Asian Region

TRIVANDRU	Thiruvananthapuram Zoo Kerala, India, 91 62275
UNKNOWN	Unknown Location
VEERMATA	Veermata Jijabai Bhosle Udyan Ambedkar Road, Mumbai (Bombay), Maharashtra, India, 400027
VISAKAPAT	Indira Gandhi Zoological Park Visakapatnam, A P, India, 530 001
WHIPSNADE	Whipsnade Wild Animal Park Zoological Society of London, Dunstable, Beds, England, United Kingdom, LU6 2LF
YOKOHAMA	Nogeyama Zoological Gardens of Yokoham 63-10 Oimatsu-cho, Yokohama, Kanagawa, Japan, 220-0032