NATIONAL STUDBOOK

Blue Sheep (*Pseudois nayaur*)

Published as a part of the Central Zoo Authority sponsored project titled

"Development and maintenance of studbooks for selected endangered species in Indian zoos"

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केन्द्रीय चिड़ियाघर प्राधिकरण
Central Zoo Authority

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FOREWORD

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

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

As part of the project outcomes the WII has developed the 'National Studbook of Blue sheep (*Pseudois nayaur*)' in Indian zoos. It is hoped that the zoos will adopt the recommendations and keep the WII informed of changes in their populations on a regular basis to enable the timely update of the studbook.

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

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We acknowledge the support from zoo directors, biologists, curators and veterinarians from the following contributing zoos for providing pedigree information that led to the successful establishment of the studbook.

Padmaja Naidu Himalayan Zoological Park, Darjeeling

Himalayan Zoological Park, Gangtok

Pandit Goving Ballabh Pant Himalayan Zoological Park, Nainital

Authors

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Blue Sheep (*Pseudois nayaur*): Biology and Status

Blue sheep are a medium sized caprid inhabiting steep slopes in the trans-Himalayas. The species is characterized by a short stocky body (Wang and Hoffman 1987) specifically adapted for survival in the rugged trans-Himalayan terrain. The pelage consists of short hair ranging in colour from brown to slate blue (Schaller 1998). Their body colour enables them to camouflage themselves against the back ground of blue-grayish rock typical to their habitat (Wang and Hoffman 1987).

Taxonomy

Kingdom	Animalia
Phylum	Chordata
Class	Mammalia
Order	Cetartiodactyla
Family	Bovidae
Sub-family	Caprinae
Genus	*Pseudois*
Species	*nayaur*
Species Authority	Hodgson, 1833
Common Name	Blue Sheep, Bharal, Naur

Initially believed to be a monotypic species (Allen 1940; Ellerman and Morrison-Scott 1951); recent studies on morphological traits and molecular genetics, suggests the presence of two subspecies: Tibetan blue sheep (*P. n. nayaur*), and Sichuan blue sheep (*P. n. szechuanensis/ schaeferi*) or two distinct species *P. nayaur* and *P. szechuanensis* (Feng et al. 1986; Groves 1978; Wang and Hoffmann 1987; Wu et al. 1990; Feng et al. 2001). The two differ in size and range occupied by them with *P. nayaur* being larger in size and occupying ranges at altitudes between 2,500 and 5,500 m asl (Schaller 1977) in Tibet, Karakoram and Pamir (Schaller et al. 1987) while *P. schaeferi* are restricted to ranges below 1000 m asl in central-Sichuan province of China.

Biology

General Characteristics

Females and males are similar in appearance; with differences only in the dorsal stripe, that is black in males and gray in females and shorter horns of females (Schaller 1998). The species has unique adaptations including a stocky body, well developed pectoral region, stout legs and feeding habits that allow it to exploit the rugged terrain of the trans-Himalayan region. Local altitudinal movements enable it utilize the seasonal changes in vegetation structure and density.

The males have grayish-buff with a tinge of slaty-blue on the back and lateral parts; while the belly, rump, inside and back of limbs, knees and base of the tail, are white (Sowerby, 1923). Similar white bands are also present on the sides of the face. The face between the white bands, the throat, and the whole front of the legs are black. A black band along the lower part of the flanks borders the white of the under-parts and about two-thirds of the tail is black. Ewes are light brown coloured. Adult rams lack beard or long hair on the neck. In summer, the underwool is shed in ragged patches and the faded reddish-gray pelage feels harsh and springy, but in winter, the bharal grows thick underwool (Roberts, 1977). Horns are present in both sexes, and have small ridges on the upper surface. In males, they grow upwards, then turn sideways and curve backwards, ewes however have small horns, usually diverging at the top (Wang and Hoffmann 1987).

Table 1: Key physical and reproductive parameter of Blue sheep*

Parameters	**Males**	**Females**
Weight	60 – 75 kg	35 – 55 kg
Shoulder height	80 – 91 cm	75 – 90 cm
Range age at sexual or reproductive maturity (male)	2 years – 7 years	2 years – 7 years
Breeding season	Late November – February	
Range gestation period	4 to 5.33 months	
Average number of offspring	1.5	
Range number of offspring	1 to 2	
Parental care	female based	

***** Based on various sources

Reproduction and growth

Estrus has been reported to take place between late November to January (Schaller 1973, 1977; Wilson 1984) depending on location specific habitat and climatic conditions. Ewes give birth to a single lamb after a gestation period of 150 – 160 days (Crandall 1964; Roberts 1977; Wilson 1984) between May to early July. This coincides with the new growth of grasses during the summers. Yearling males (almost 2 years old) are approximately two-thirds the size of adult females, have horns measuring upto 15 cm and lack stripes on the flanks. Sub-adult males (almost 3 years old) are about the size of adult females, have horns about 25 cm long and still lack a flank stripe. As 4-year-olds, males begin to show the flank stripe; their horns are about 35 cm long. In the fifth to seventh years, males approach full growth, but are slightly less heavy in build than a full-grown ram; their horns are about 45 to 55 cm long. Similar information on growth patterns of females is lacking in literature.

Habitat

Blue Sheep inhabit open grass covered slopes in mountains from 2,500 – 5,500 m asl near cliffs and areas that provide easy escape from predators (Schaller 1977). The species successfully utilize resource poor habitats that are inhospitable for other wild species. The habitat of the species is characterized by low temperature and rainfall and poor vegetation growth. The species prefers open grasslands interspersed with shrubs and avoid patches with dense vegetation (Schaller 1998). During winters the species descends into valleys or use the southern aspects of their habitats along ridgelines with lesser snow (Schaller 1998).

Feeding ecology and behaviour

Roberts (1977) reported the food preferences from Karakoram Mountains and suggested that during summers alpine grasses (*Poa alpina* and *Poa pratensis*) probably constitute an important part of their diet. While during winter they browse on the thorny clumps of *Astragalus* sp. and may supplement their diet with Alpine willow, lichens and mosses. Zhensheng (2007) commented on the differences in the diet of the species at Helan Mountains and ascribed them to adaptations for geographical range, vegetation, and other factors. Blue sheep consumed 41 plant species that contributed >0.01% to the diets. During autumn, winter, and spring, primary species consumed were Stipa spp., Ulmus pumila, and Poa spp. Blue sheep also showed the different preference for these plant species. Graminoids were the largest proportion of the diet (36.7–58.8%) throughout the year, followed by the tree and shrub categories. Sedges were the smallest proportion of the diet (0.7– 7.1%). Among the four habitat types, blue sheep showed pronounced preference for montane woodland steppe. Blue Sheep are active throughout the day, feeding on lichens, herbaceous plants, and mosses. The species can be termed as an intermediate forager, with diet consisting primarily of grasses, hardy herbaceous plants, also some shrubs.

Bharal feed during the day; in the Kang Chu valley, eastern Nepal, and they had no diurnal schedule with a large proportion moving or feeding between 6:30 am and 5:30 pm," with activity concentrated before 0930,

between 1130 and 1300, and after 1430 (Schaller 1973). However, according to local hunters in Chaidamu Pendi (Basin), Qinghai Province, China, the species descend twice a day, once early in the morning, and again after midday, to feed in grasslands, and spend the rest of the day resting at higher elevations, on rocky mountain slopes (Wang et al., 1963).

Social organization and behaviour

The species is gregarious with groups consisting of about 10 to 40 individuals (Qian et al., 1974; Roberts, 1977; Schaller, 1973); however, occasionally larger groups of up to 400 individuals (Schaller, 1980; Stockley, 1928); and solitary individuals (Schafer, 1937) are encountered. Schaller (1973) commented that herd composition changes constantly as single individuals and groups join and part. Groups consist either of adult and subadult males; or adult females, young, and yearlings (Schaller, 1973). Wilson (1984) suggested that resource availability and habitat quality may affect social organization. Wilson (1981) reported a yearling sex ratio of 1:1.05 adult sex ratio of 1:1.45 in favor of females caused by selective hunting by trophy hunters and village poachers. In remote areas where populations are not significantly affected by human activities, a higher ratio of adult males to adult females was observed.

Adult males and adult females form separate groups except during the rutting season with mature rams living in small groups of five to six individuals close to the snowline (Roberts, 1977; Stockley, 1936) this segregation being more pronounced during summers. Schaller (1977) commented that there may be seasonal and geographic variation in social behavior and herd composition also varies with population density and range condition. Male and female groups associate during the rutting season (Schaller 1977).

Rams exhibit typical ungulate behaviours such as lip-curl, low-stretch twist, kick, penis mouthing, flehmen and mount. Other aggressive caprine behaviors such as broadside display, horning vegetation, jerk and lunge, head-shake, jump, butt, and clash are also shown (Wang and Hoffman 1987). Female aggression is also observed, being the only species of caprine in which females bit one another (Schaller 1977). Wilson (1984) also reported horn-pull and neck-fight.

Distribution

The species has a large distribution range across the central Asian mountains - from Kunjereb in Pakistan in the west, to the Sichuan and Gansu provinces of China in the east, through bulk of the Tibetan plateau. Southern limit of

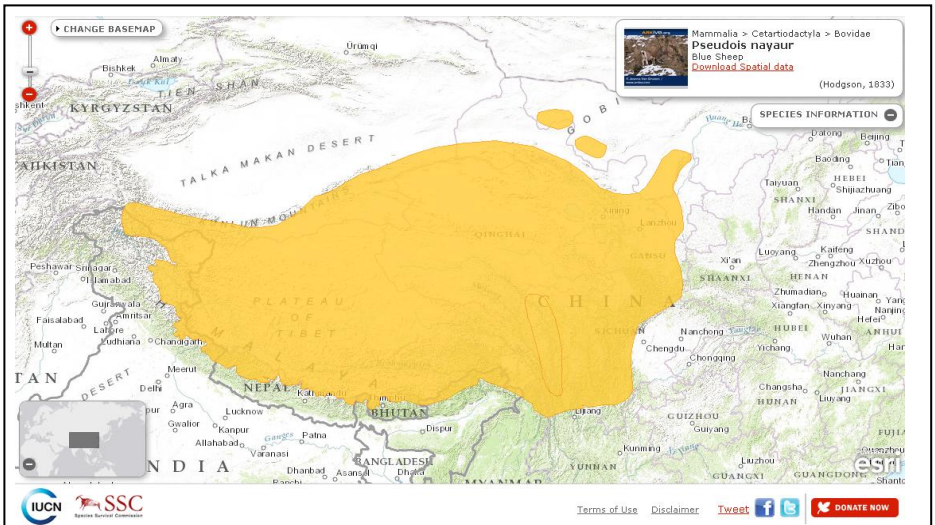

Fig. 1: Global distribution of Blue sheep

distribution is along the Greater Himalayan chain in India, Nepal and Bhutan. Northern flank covers the Altai Shan, and parts of the Tien Shan. In India, the species is found in Ladakh, high alpine meadows of Himachal Pradesh, Uttarakhand, Sikkim, and the western Tawang region of Arunachal Pradesh covering ca. 30,000km^2 (Harris 2014).

Threats and status

The species does not currently face any serious threats to its long term survival in its natural habitat; however, it is vulnerable to competition from livestock, disease threats trophy hunting and poaching (Harris 2014). In India the major threats are localized over-hunting and excessive competition from livestock grazing that can lead to habitat degradation across its natural range (Harris 2014). Accurate population estimates are currently not available; however it is believed to be abundant across most of its range (Harris 2014). Accordingly the species is listed as a species of least concern in the IUCN Redlist 2014, while local concerns have caused it to be listed as a Schedule I species in the Wildlife Protection Act (1972) of India.

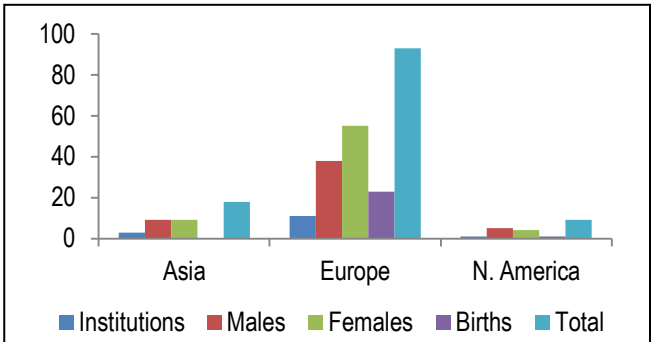

Fig. 2: Global status in captivity (Source: ISIS: ZIMS database)

Global Status in captivity

The species is presently housed in three institutions in Asia, 11 in Europe and one Institution in North America with nine, 93 and nine specimens respectively in the regions mentioned. The species is included in a conservation breeding programme only ion India due to local threat perceptions.

Methodology

Data on individual history was collected by means of mailed questionnaires, and from the websites of CZA and ZIMS (Zoological Information Management System). Questionnaires were sent to the institutions housing Blue sheep 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). Further analysis was not performed due to the small size of the population [12.7.0 (19)].

Scope of the studbook and data quality

The current edition of the Clouded leopard national studbook represents the history of the species (*Pseudois nayur*) in Indian zoos and is current through October 2014. A total of 19 individuals at two institutions are registered in the Studbook as per records provided by holding zoos.

Analysis

The captive population of Blue sheep in Indian zoos was initiated at Padmaja Naidu Himalayan Zoological Park, Darjeeling with receipt of a male from Bhutan, subsequently another male was added in 1999 from the same source. The details of individual specimens are provided in Annexure I. Absence of mates and the death of both animals during the period 2001 – 2002 resulted in the exterpitation of the captive population. In 2009 the population was re-established with the acquisition of a pair of animals from Okinawa Zoo, Japan. Since then captive births have led to the population increasing to its current size of 15 specimens in captivity. The number of institutions housing the species in Indian has increased to three with a pair of animals being transferred to Himalayan Zoological Park, Gangtok and Pandit Gobind Ballabh Pant Himalayan Zoological Park, Nainital. The details of the living population are listed in Annexure II.

Demographic Analysis

Census trends

Census trends of the population show that the population has remained small since its inception in 1998. Analysis of sex based census trends depicted in Fig. 3 suggests of a lower female recruitment rate though it was re-established with an equitable sex ratio. The population since 2009 has been showing a growth leading to its increase from four (2.2) to 15 (9.6) specimens. The population received two wild origin males in 1998; however in the absence of mates and their death in 2001 – 2002 the captive population includes individuals born in captivity only.

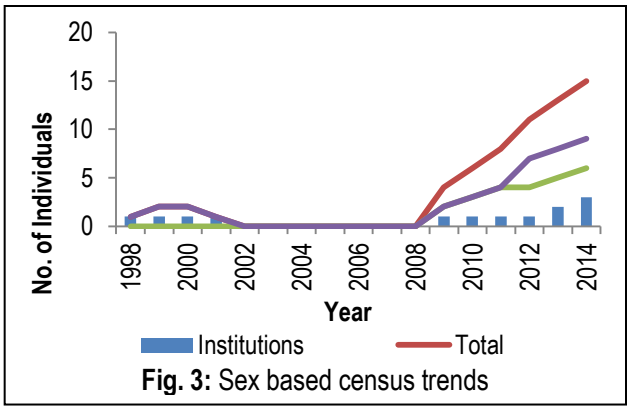

Fig. 3: Sex based census trends

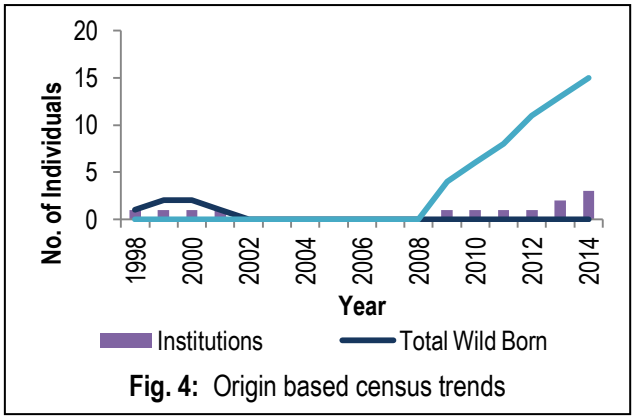

Fig. 4: Origin based census trends

The small sample size of the population limits further demographic and genetic analysis and makes pairing choices and population planning redundant. An understanding of the relationships between individuals can be obtained from the Pedigree charts in Annexure III.

Conclusions

The current population of Blue sheep in Indian zoos includes 15 (9.6.0) specimens at three institutions. The population currently does not include any wild origin animals and is founded from captive origin individuals. Detailed demographic and genetic analysis of the population was limited by the small size of the captive population. The population currently is derived from two pairs acquired from Okinawa Zoo, Japan. The species is currently listed as a species of least concern by the IUCN Redlist (2014) however local considerations have led to its inclusion in Schedule I of the Wildlife Protection Act (1972).

The population has increased from two pairs in 2009 at one location to 15 specimens at three locations. Census trends suggest that it is increasing at a steady rate with a male sex bias. The long term ex-situ management of the species would however require the inclusion of additional animals and a much larger population size with the current population being used to standardize husbandry techniques before the acquisition of fresh founder animals.

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Appendix I

Historical Population of Blue sheep (*Pseudois nayur*) in Indian Zoos

National Stud#	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Tag/Band	House Name
00001	M	????	WILD	WILD	BHUTAN DARJEELIN	???? 5-Dec-98 6-Jun-02	ZASKAR ZASKAR	Capture Transfer Death		ZASKAR
00002	M	????	WILD	WILD	BHUTAN DARJEELIN	???? 14-May-99 16-Jun-01	TASHI TASHI	Capture Transfer Death		TASHI
00003	M	????	UNK	UNK	OKINAWA C DARJEELIN	???? 23-Nov-09 21-Oct-13	BUNTY BUNTY	Birth Transfer Death		BUNTY
00004	M	????	UNK	UNK	OKINAWA C DARJEELIN	???? 23-Nov-09	NEEL NEEL	Birth Transfer	PNHZPDARJ AO16	NEEL
00005	F	????	UNK	UNK	OKINAWA C DARJEELIN	???? 23-Nov-09	BUBBLY BUBBLY	Birth Transfer	PNHZPDARJ AO14	BUBBLY
00006	F	????	UNK	UNK	OKINAWA C DARJEELIN	???? 23-Nov-09 18-Oct-13	NIKKI NIKKI	Birth Transfer Death	PNHZPDARJ A017	NIKKI
00007	M	21-May-10	00003	00005	DARJEELIN	21-May-10	MOON	Birth	PNHZPDARJ AO26	MOON
00008	F	3-Jun-10	00004	00006	DARJEELIN	3-Jun-10	VENUS	Birth	PNHZPDARJ AO28	VENUS
00009	M	29-May-11	00004	00006	DARJEELIN GANGTOK	29-May-11 29-Oct-13	BONEY BONEY	Birth Transfer	PNHZPDARJ AO20	BONEY

National Stud#	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Tag/Band	House Name
00010	F	25-May-11	00003	00005	DARJEELIN GANGTOK	25-May-11 29-Oct-13	NILU NILU	Birth Transfer	PNHZPDARJ AO19	NILU
00011	M	30-May-12	00003	00005	DARJEELIN	30-May-12	KUSHRO	Birth	PNHZPDARJ AO15	KUSHRO
00012	M	23-May-12	00004	00006	DARJEELIN NAINITAL	23-May-12 6-Mar-14	MIKKI MIKKI	Birth Transfer	PNHZPDARJ AO18	MIKKI
00013	M	8-Jun-12	00007	00008	DARJEELIN	8-Jun-12	MARS	Birth	PNHZPDARJ AO27	MARS
00014	M	23-May-13	00004	00006	DARJEELIN	23-May-13	BRAD	Birth	PNHZPDARJ AO33	BRAD
00015	F	27-May-13	00003	00005	DARJEELIN NAINITAL	27-May-13 6-Mar-14	NUTAN NUTAN	Birth Transfer	PNHZPDARJ AO43	NUTAN
00016	F	27-May-13	00007	00008	DARJEELIN	27-May-13	ANGELI	Birth	PNHZP DARJ AO47	ANGELINA
00017	M	7-Jul-13	00009	00010	DARJEELIN	7-Jul-13	SUNNY	Birth	PNHZPDARJ AO48	SUNNY
00018	F	24-May-14	00004	00005	DARJEELIN	24-May-14	_____	Birth		
00019	M	26-May-14	00007	00008	DARJEELIN	26-May-14	_____	Birth		
TOTALS: 12.7.0 (19)										

Appendix II

Living Population of Blue sheep (*Pseudois nayur*) in Indian Zoos

National Stud#	Sex	Birth Date	Sire	Dam	Location	Date	Local ID	Event	Tag/Band	House Name
Padmaja Naidu Himalayan Zoological Park, Darjeeling										
00004	M	????	UNK	UNK	OKINAWA C DARJEELIN	???? 23-Nov-09	NEEL NEEL	Birth Transfer	PNHZPDARJ AO16	NEEL
00005	F	????	UNK	UNK	OKINAWA C DARJEELIN	???? 23-Nov-09	BUBBLY BUBBLY	Birth Transfer	PNHZPDARJ AO14	BUBBLY
00007	M	21-May-10	00003	00005	DARJEELIN	21-May-10	MOON	Birth	PNHZPDARJ AO26	MOON
00008	F	3-Jun-10	00004	00006	DARJEELIN	3-Jun-10	VENUS	Birth	PNHZPDARJ AO28	VENUS
00011	M	30-May-12	00003	00005	DARJEELIN	30-May-12	KUSHRO	Birth	PNHZPDARJ AO15	KUSHRO
00013	M	8-Jun-12	00007	00008	DARJEELIN	8-Jun-12	MARS	Birth	PNHZPDARJ AO27	MARS
00014	M	23-May-13	00004	00006	DARJEELIN	23-May-13	BRAD	Birth	PNHZPDARJ AO33	BRAD
00016	F	27-May-13	00007	00008	DARJEELIN	27-May-13	ANGELI	Birth	PNHZP DARJ AO47	ANGELINA
00017	M	7-Jul-13	00009	00010	DARJEELIN	7-Jul-13	SUNNY	Birth	PNHZPDARJ AO48	SUNNY
00018	F	24-May-14	00004	00005	DARJEELIN	24-May-14	_____	Birth		
00019	M	26-May-14	00007	00008	DARJEELIN	26-May-14	_____	Birth		
Himalayan Zoological Park, Gangtok										
00009	M	29-May-11	00004	00006	DARJEELIN GANGTOK	29-May-11 29-Oct-13	BONEY BONEY	Birth Transfer	PNHZPDARJ AO20	BONEY
00010	F	25-May-11	00003	00005	DARJEELIN GANGTOK	25-May-11 29-Oct-13	NILU NILU	Birth Transfer	PNHZPDARJ AO19	NILU
Pandit Goving Ballabh Pant Himalayan Zoological Park, Nainital										
00012	M	23-May-12	00004	00006	DARJEELIN NAINITAL	23-May-12 6-Mar-14	MIKKI MIKKI	Birth Transfer	PNHZPDARJ AO18	MIKKI
00015	F	27-May-13	00003	00005	DARJEELIN NAINITAL	27-May-13 6-Mar-14	NUTAN NUTAN	Birth Transfer	PNHZPDARJ AO43	NUTAN
TOTALS: 9.6.0 (15)										

Appendix III

Pedigree Chart Report Blue sheep (*Pseudoois nayur*)

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==========================================================================
Taxon Name: PSEUDOIS NAYAUR                          Studbook Number:  00001
==========================================================================
                  WILD                                    WILD
                               \          /               Sex: Male
                                \        /       Birth Date:    ????
                                 \      /  Last Location: DARJEELIN (dead)
                               dam\    /sire    House Name: ZASKAR
                                   \  /              Tattoo:
                                    \/             Tag/Band:
                                  00001

==========================================================================
Taxon Name: PSEUDOIS NAYAUR                          Studbook Number:  00002
==========================================================================
                  WILD                                    WILD
                               \          /               Sex: Male
                                \        /       Birth Date:    ????
                                 \      /  Last Location: DARJEELIN (dead)
                               dam\    /sire    House Name: TASHI
                                   \  /              Tattoo:
                                    \/             Tag/Band:
                                  00002

==========================================================================
Taxon Name: PSEUDOIS NAYAUR                          Studbook Number:  00003
==========================================================================
                  UNK                                     UNK
                               \          /               Sex: Male
                                \        /       Birth Date:    ????
                                 \      / Last Location: DARJEELIN (dead)
                               dam\    /sire    House Name: BUNTY
                                   \  /              Tattoo:
                                    \/             Tag/Band: PNHZP (UNK)
                                  00003

==========================================================================
Taxon Name: PSEUDOIS NAYAUR                          Studbook Number:  00004
==========================================================================
                  UNK                                     UNK
                               \          /               Sex: Male
                                \        /       Birth Date:    ????
                                 \      /    Last Location: DARJEELIN
                               dam\    /sire    House Name: NEEL
                                   \  /              Tattoo:
                                    \/             Tag/Band: PNHZPDARJ AO16
                                  00004
```

```
==============================================================================
Taxon Name: PSEUDOIS NAYAUR                          Studbook Number:  00005
==============================================================================
                  UNK                                     UNK
                                  \          /            Sex: Female
                                   \        /      Birth Date:    ????
                                    \      /    Last Location: DARJEELIN
                                  dam\    /sire    House Name: BUBBLY
                                      \  /             Tattoo:
                                       \/            Tag/Band: PNHZPDARJ AO14
                                     00005

==============================================================================
Taxon Name: PSEUDOIS NAYAUR                          Studbook Number:  00006
==============================================================================
                  UNK                                     UNK
                                  \          /            Sex: Female
                                   \        /      Birth Date:    ????
                                    \      /  Last Location: DARJEELIN (dead)
                                  dam\    /sire    House Name: NIKKI
                                      \  /             Tattoo:
                                       \/            Tag/Band: PNHZPDARJ AO17
                                     00006

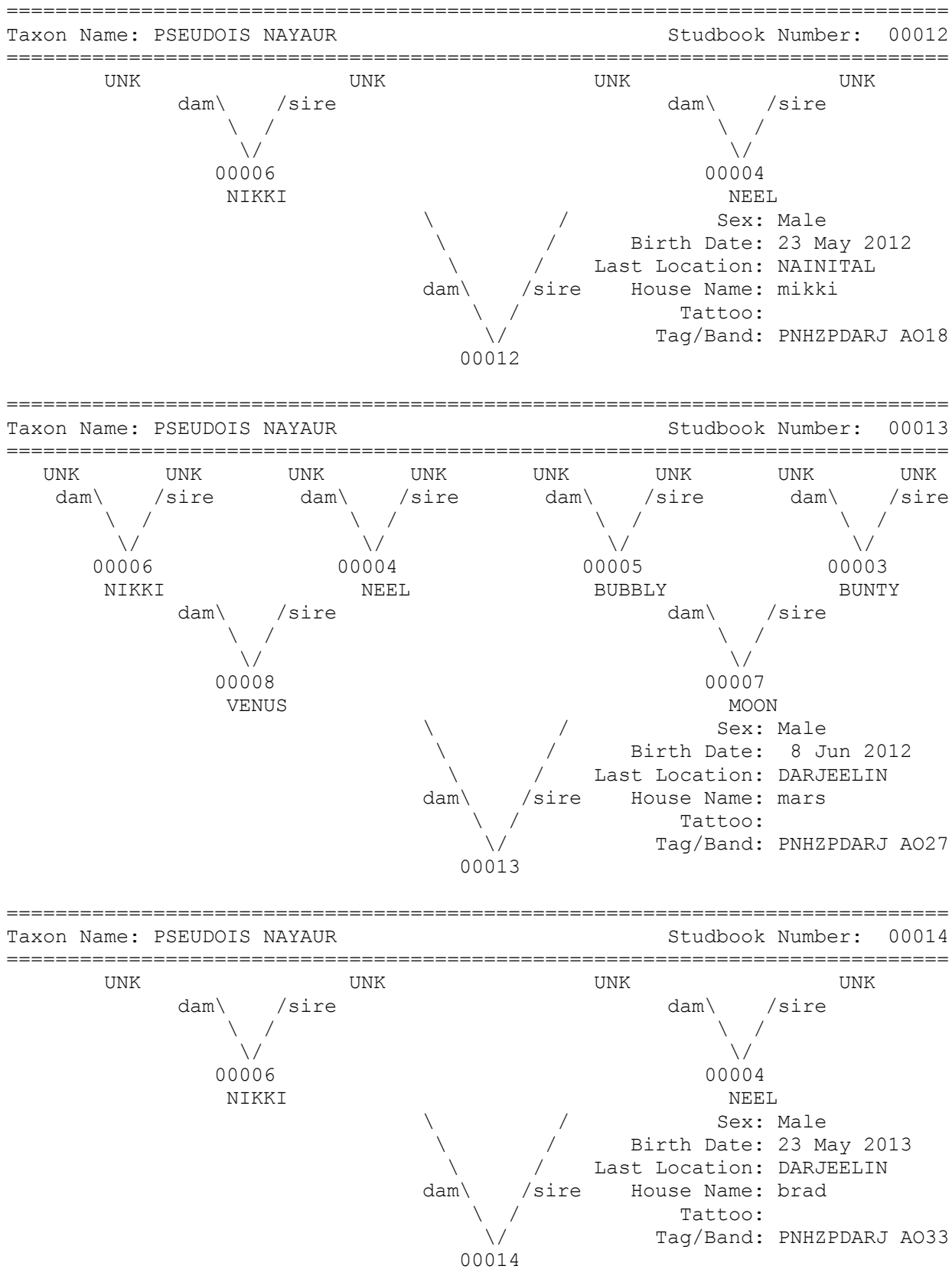
==============================================================================
Taxon Name: PSEUDOIS NAYAUR                          Studbook Number:  00007
==============================================================================
        UNK                 UNK                 UNK                 UNK
              dam\    /sire                           dam\    /sire
                  \  /                                    \  /
                   \/                                      \/
                 00005                                   00003
                  BUBBLY                                  BUNTY
                                  \          /            Sex: Male
                                   \        /      Birth Date: 21 May 2010
                                    \      /    Last Location: DARJEELIN
                                  dam\    /sire    House Name: MOON
                                      \  /             Tattoo:
                                       \/            Tag/Band: PNHZPDARJ AO26
                                     00007

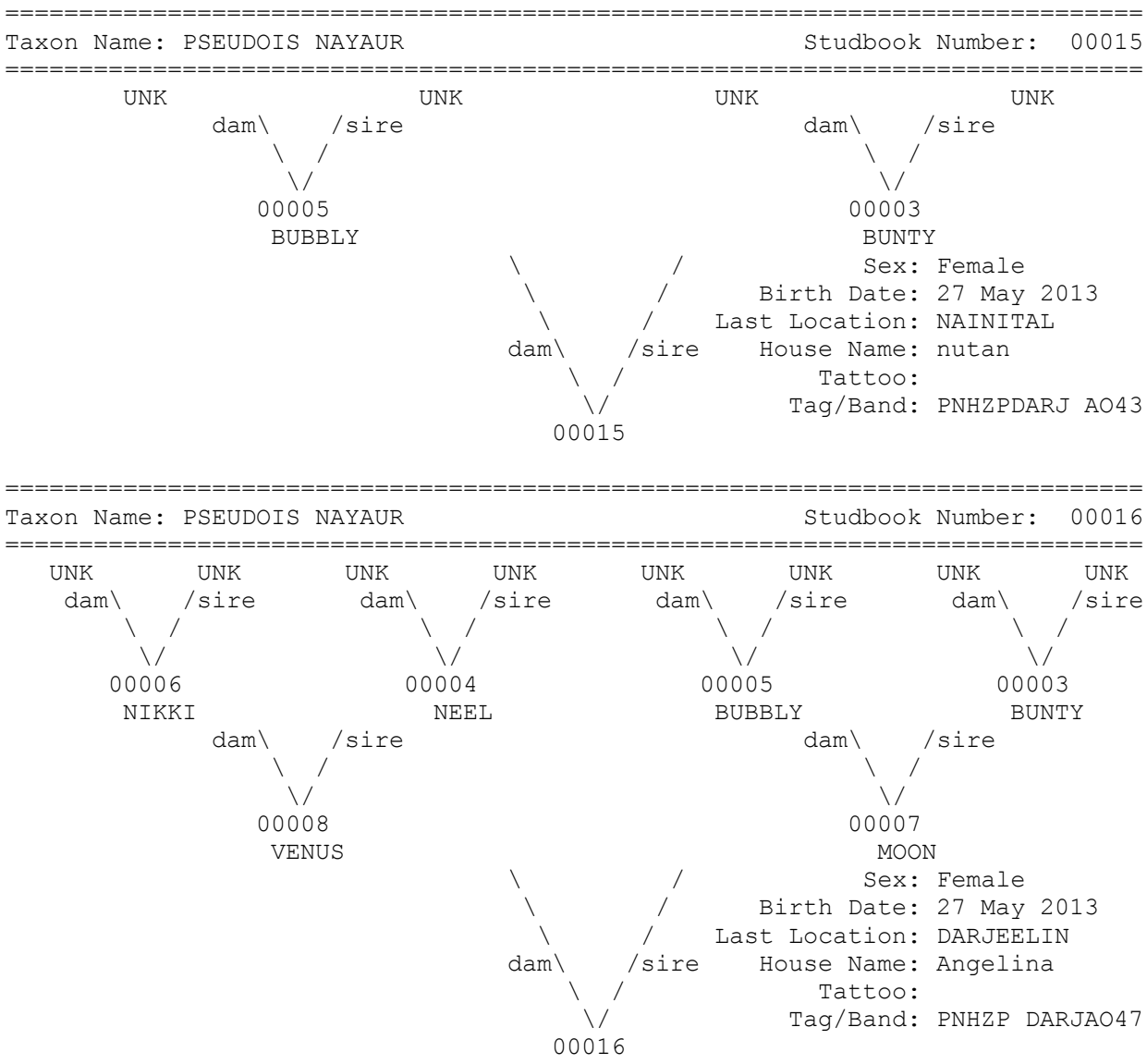
==============================================================================
Taxon Name: PSEUDOIS NAYAUR                          Studbook Number:  00008
==============================================================================
        UNK                 UNK                 UNK                 UNK
              dam\    /sire                           dam\    /sire
                  \  /                                    \  /
                   \/                                      \/
                 00006                                   00004
                  NIKKI                                    NEEL
                                  \          /            Sex: Female
                                   \        /      Birth Date:  3 Jun 2010
                                    \      /    Last Location: DARJEELIN
                                  dam\    /sire    House Name: venus
                                      \  /             Tattoo:
                                       \/            Tag/Band: PNHZPDARJ AO28
                                     00008
```

```
================================================================================
Taxon Name: PSEUDOIS NAYAUR                          Studbook Number:  00009
================================================================================
        UNK                  UNK                  UNK                  UNK
              dam\    /sire                                dam\    /sire
                  \  /                                         \  /
                   \/                                           \/
                00006                                        00004
                 NIKKI                                        NEEL
                                \          /                  Sex: Male
                                 \        /       Birth Date: 29 May 2011
                                  \      /     Last Location: GANGTOK
                                dam\    /sire    House Name: boney
                                    \  /             Tattoo:
                                     \/            Tag/Band: PNHZPDARJ AO20
                                  00009

================================================================================
Taxon Name: PSEUDOIS NAYAUR                          Studbook Number:  00010
================================================================================
        UNK                  UNK                  UNK                  UNK
              dam\    /sire                                dam\    /sire
                  \  /                                         \  /
                   \/                                           \/
                00005                                        00003
                 BUBBLY                                       BUNTY
                                \          /                  Sex: Female
                                 \        /       Birth Date: 25 May 2011
                                  \      /     Last Location: GANGTOK
                                dam\    /sire    House Name: nilu
                                    \  /             Tattoo:
                                     \/            Tag/Band: PNHZPDARJ AO19
                                  00010

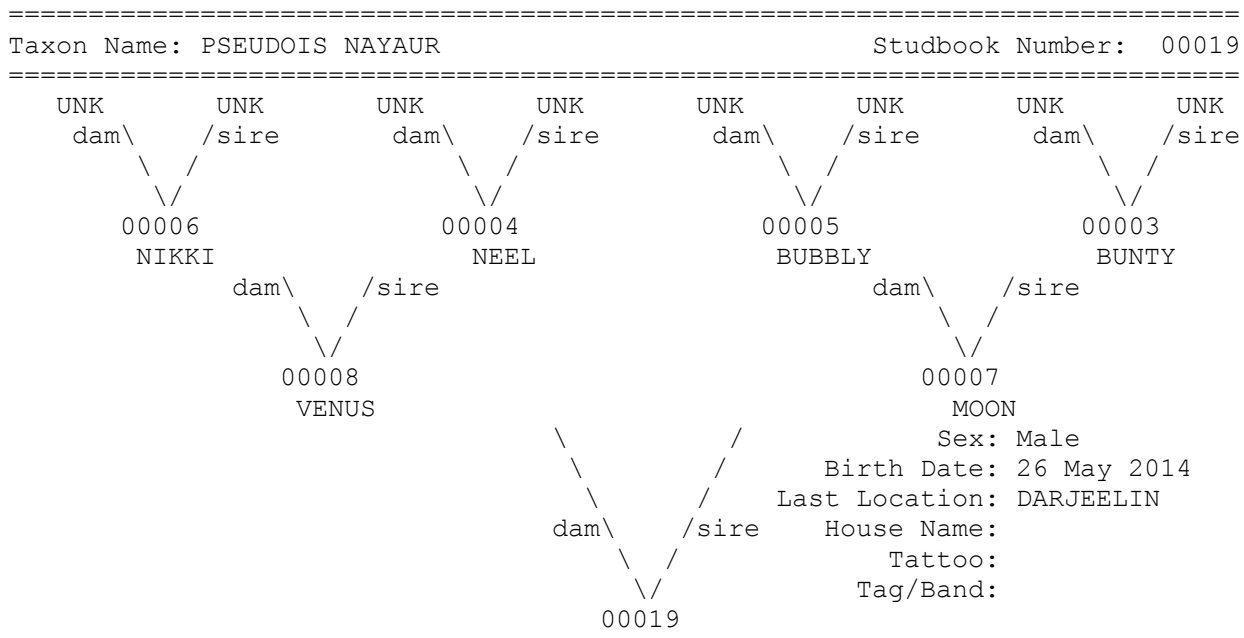
================================================================================
Taxon Name: PSEUDOIS NAYAUR                          Studbook Number:  00011
================================================================================
        UNK                  UNK                  UNK                  UNK
              dam\    /sire                                dam\    /sire
                  \  /                                         \  /
                   \/                                           \/
                00005                                        00003
                 BUBBLY                                       BUNTY
                                \          /                  Sex: Male
                                 \        /       Birth Date: 30 May 2012
                                  \      /     Last Location: DARJEELIN
                                dam\    /sire    House Name: Kushro
                                    \  /             Tattoo:
                                     \/            Tag/Band: PNHZPDARJ AO15
                                  00011
```


Taxon Name: PSEUDOIS NAYAUR
Studbook Number: 00012
UNK
UNK
UNK
UNK
dam\ /sire
dam\ /sire
00006
NIKKI
00004
NEEL
Sex: Male
Birth Date: 23 May 2012
Last Location: NAINITAL
dam\ /sire
House Name: mikki
Tattoo:
Tag/Band: PNHZPDARJ AO18
00012
Taxon Name: PSEUDOIS NAYAUR
Studbook Number: 00013
UNK
UNK
UNK
UNK
UNK
UNK
UNK
UNK
dam\ /sire
dam\ /sire
dam\ /sire
dam\ /sire
00006
NIKKI
00004
NEEL
00005
BUBBLY
00003
BUNTY
dam\ /sire
dam\ /sire
00008
VENUS
00007
MOON
Sex: Male
Birth Date: 8 Jun 2012
Last Location: DARJEELIN
dam\ /sire
House Name: mars
Tattoo:
Tag/Band: PNHZPDARJ AO27
00013
Taxon Name: PSEUDOIS NAYAUR
Studbook Number: 00014
UNK
UNK
UNK
UNK
dam\ /sire
dam\ /sire
00006
NIKKI
00004
NEEL
Sex: Male
Birth Date: 23 May 2013
Last Location: DARJEELIN
dam\ /sire
House Name: brad
Tattoo:
Tag/Band: PNHZPDARJ AO33
00014


Taxon Name: PSEUDOIS NAYAUR
Studbook Number: 00015
UNK
UNK
UNK
UNK
dam\
/sire
dam\
/sire
00005
BUBBLY
00003
BUNTY
Sex: Female
Birth Date: 27 May 2013
Last Location: NAINITAL
dam\
/sire
House Name: nutan
Tattoo:
Tag/Band: PNHZPDARJ AO43
00015
Taxon Name: PSEUDOIS NAYAUR
Studbook Number: 00016
UNK
UNK
UNK
UNK
UNK
UNK
UNK
UNK
dam\
/sire
dam\
/sire
dam\
/sire
dam\
/sire
00006
NIKKI
00004
NEEL
00005
BUBBLY
00003
BUNTY
dam\
/sire
dam\
/sire
00008
VENUS
00007
MOON
Sex: Female
Birth Date: 27 May 2013
Last Location: DARJEELIN
dam\
/sire
House Name: Angelina
Tattoo:
Tag/Band: PNHZP DARJAO47
00016

```
================================================================================
Taxon Name: PSEUDOIS NAYAUR                          Studbook Number:  00017
================================================================================
   UNK       UNK       UNK       UNK       UNK       UNK       UNK       UNK
    dam\    /sire       dam\    /sire       dam\    /sire       dam\    /sire
        \  /                \  /                \  /                \  /
         \/                  \/                  \/                  \/
      00005               00003               00006               00004
       BUBBLY              BUNTY               NIKKI                NEEL
             dam\    /sire                               dam\    /sire
                 \  /                                       \  /
                  \/                                         \/
               00010                                      00009
                 NILU                                       BONEY
                                \          /                Sex: Male
                                 \        /      Birth Date:  7 Jul 2013
                                  \      /    Last Location: DARJEELIN
                                dam\    /sire    House Name: SUNNY
                                    \  /             Tattoo:
                                     \/            Tag/Band: PNHZPDARJ AO48
                                  00017

================================================================================
Taxon Name: PSEUDOIS NAYAUR                          Studbook Number:  00018
================================================================================
        UNK                 UNK                 UNK                 UNK
             dam\    /sire                               dam\    /sire
                 \  /                                       \  /
                  \/                                         \/
               00005                                      00004
                BUBBLY                                     NEEL
                                \          /                Sex: Female
                                 \        /      Birth Date: 24 May 2014
                                  \      /    Last Location: DARJEELIN
                                dam\    /sire    House Name:
                                    \  /             Tattoo:
                                     \/            Tag/Band:
                                  00018
```



Compiled by: Nilofer Begum thru Wildlife Institute of India
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