A REVIEW OF THE PRESENT CONSERVATION SCENARIO OF HOG DEER (*AXIS PORCINUS*) IN ITS NATIVE RANGE

TANUSHREE BISWAS AND V.B. MATHUR

Wildlife Institute of India, Dehra Dun (U.P.)

Introduction

Hog deer is a species belonging to the genus *Axis*, endemic to the tall moist grasslands of South and South-East Asia. Its thickset appearance and habit of crashing away through the undergrowth in head down posture has undoubtedly contributed to its popular name (Schaller, 1967; Prater, 1980). There are only seven species of deer included under the genus *Axis* found all over the world. Among them Chital (*Axis axis*) is the only congeneric species occurring in sympatry with Hog deer in India, Nepal and Pakistan. The deer belonging to the genus *Axis*, are considered to be among the most primitive of the true cervids, having been present during the Pliocene and Pleistocene in Europe and Asia (Flerov, 1952; Matthes, 1962). Morphologically the high rump and sloping back in Hog deer are similar to that of a Barking deer (*Muntjac* spp.). Though Hog deer shares its common ancestry with Barking deer it is considered relatively advanced over *Muntjac* (Grubh and Groves, 1983; Groves and Grubh, 1987).

Classification

Lydekkar[1] (1898) was the first to compile the bibliography on the taxonomic classification of Hog deer :

Cervus porcinus : Brooke (1878), Lydekkar (1885), Sclater (1891), Blanford (1891), Ward (1896), Zimmerman (1977)

Cervus (Axis) porcinus : Smith (1827)

Cervus (Axis) pumilio : Smith (1827)

Axis porcinus : Jardine (1835), Jerdon (1884), Sterndale (1884)

Axis minor : Hodgson (1841)

Cervus (Heylaphus) porcinus : Sundevall (1846), Ward (1910, 1914).

He (1913-16) regarded *Axis* as a subgenus of *Cervus* until Simpson (1945) and Ellerman and Morrison Scott (1951) designated *Axis* to be the factual generic name for Hog deer due to the presence of pedal glands in their hind feet. Ellerman and Morrison Scott (1951) recognized later two subspecies of Hog deer, both occurring in the Asian continent.

Axis porcinus porcinus (typical race) Pakistan, Northern India, Nepal, Myanmar and Sri Lanka.

Axis porcinus annamiticus (Eastern race) Thailand and Indo-China - Heude (1888), Whitehead (1972), Putman (1988), Dhungel and Gara (1991), Hill and Corbett (1992).

[1] Source : Moore and Mayze (1990)

The species is also found in Australia, introduced from the coastal region of South-Western Sri Lanka where its origin remains the subject of discussion. The Dutch most probably introduced Hog deer in Sri Lanka either during 16th century (Whitehead, 1972) or by the Portuguese in 16th century (Lever, 1985 In: Moore and Mayze, 1990). Kelaart (1852) and Phillips (1984) classified the Sri Lankan population as separate sub-species (*Axis porcinus oryzus*) until currently re-classified as *A. porcinus* by Honacki *et al.* (1982).

Native range and status

The native range of Hog deer stretches from Pakistan, across Northern India, Nepal and Bhutan, through Bangladesh and Burma, as far as Southern Thailand and Vietnam (Dhungel and Gara, 1991). Thus the Indian subspecies *Axis porcinus porcinus* is restricted to South-Western coast of Kalutara District in Sri Lanka and in the alluvial grasslands of the Indus, Ganges and Brahmaputra valley in India. The species was never found in Central and Southern India (Dollman and Burlace, 1935; Schaller, 1967; Prater, 1980) thus confining its habitat only to the foothills of Himalayas and the flood plains of Northern India and Nepal. Currently, there is no ecological explanation as to why this species has such a skewed distribution unlike its congeneric species Chital, which is so widely distributed. Its presence in Sri Lanka still remains an unsolved mystery. Some observers consider the species to be a relic of a past invasion during a period of low sea levels when the land bridge between India and Sri Lanka was in existence (Padmalal and Saparamadu, McCarthy and Dissanayake, 1994) while others consider the species to be introduced either by Sinhalese ruler in the pre-colonial, or Britishers during the colonial period. The latter being more factual due to the historical absence of the species from peninsular India. The later sub species, *A. p. annamiticus*, a slightly larger race is found in Burma and extending further into South Thailand. Apart from the above mentioned places Hog deer are reported from Laos, Cambodia and China. Unfortunately though Hog deer has such specialized habitat requirements and narrow range of distribution yet there has been no effort to study and monitor the species in the past. The entire native range of Hog deer and other species of the genus *Axis* is shown in Fig. 1. Table 1 shows the status of Hog deer throughout its native range (Roberts, 1977; Sunquist, 1981; Ohtaishi and Gao, 1990; Moore and Mayze, 1990).

Literature Review

Taylor (1971) carried out the first pioneering study on the biology of Hog deer in Australia where it was introduced into New South Wales in 1864. He mostly studied the osteology and reproductive biology of a small wild population of Hog deer in Victoria. Dhungel and Gara (1991) did the first ecological study on Hog deer in its native range at Royal Chitawan National Park, Nepal. They studied the habitat requirement, activity pattern, home range and breeding behaviour of Hog deer for 3 years (1987-89). Results of their study showed that Hog deer is a grassland dwelling species with a preference for *Imperata cylindrica, Cynodon dactylon* and other species of 'Graminae'. They were found to be solitary in nature and highly active only during early morning and evening hours. Prior to this, Moore and Mayze (1990) published a book on Hog deer compiling the natural history of the captive

Table 1

Status of Hog deer throughout its native range (1975-1983)

Pakistan	Believed endangered.	Roberts, 1987
India	Abundant in particular reserves.	
Nepal	Abundant in some reserves. May be increasing in Chitawan (Dhungel) but also reported as endangered.	Sunquist, 1981
Bangladesh	Believed extinct.	Seidensticker and Hai, 1983
Burma	Unknown and known to be enormously reduced in numbers.	
Thailand	Endangered. Possibly extinct in the wild.	Miller, 1975
Vietnam, Laos, & Cambodia	Endangered.	Seidensticker and Hai, 1983
China	1st ranked protected species in China.	Ohtaishi and Gao, 1990; Moore and Mayze, 1990 Attapattu
Sri Lanka	Endangered or Possibly extinct in the wild.	*Pers. comm.*

and wild Hog deer introduced in Australia. Ghosh (1997) stressed on the need to manage grasslands in a matrix of burnt and unburnt patches for providing better conservation and protection for the species at Corbett National Park, India. Bhowmick (1997) gave an insight to the occurrence of 174 diseases in wild and captive Hog deer in West Bengal. His study however does not mention the number of wild and captive individuals studied to reach the above conclusion. Although he recorded the life span of Hog deer to vary from 15.6 to 18.1 years (avg. 16.7 years) from 6 captive animals, his study did not provide detailed information about the ecology of the species in wild. More recently a short term but intensive study was undertaken on Hog deer by Biswas (1999) at Jaldapara Wildlife Sanctuary, West Bengal on 'Habitat utilization of Hog deer in relation to other sympatric species.' The results of this study indicated the extreme dependence of Hog deer on natural grasslands as opposed to plantation areas within the sanctuary. Jaldapara Wildlife Sanctuary is specifically managed for Rhino and plantations of forage species are raised, which have a negative influence on the habitat selection pattern of Hog deer (Biswas *et al.*, 2000). Biswas and Mathur (in press) showed the implication of such a single species management strategy on the habitat and ecology of other sympatric species at Jaldapara. The plantation areas of Jaldapara were observed to be highly degraded due to woodland invasion and high weed encroachment. Natural grasslands had high incidence of weed encroachment, fire, grass cutting and cattle grazing. This study. also showed the preference of *Imperata cylindrica* as forage species by Hog deer. Preference for a mosaic of burnt and unburnt patches of tall and short grassland by Hog deer further supported the recommendation by Ghosh

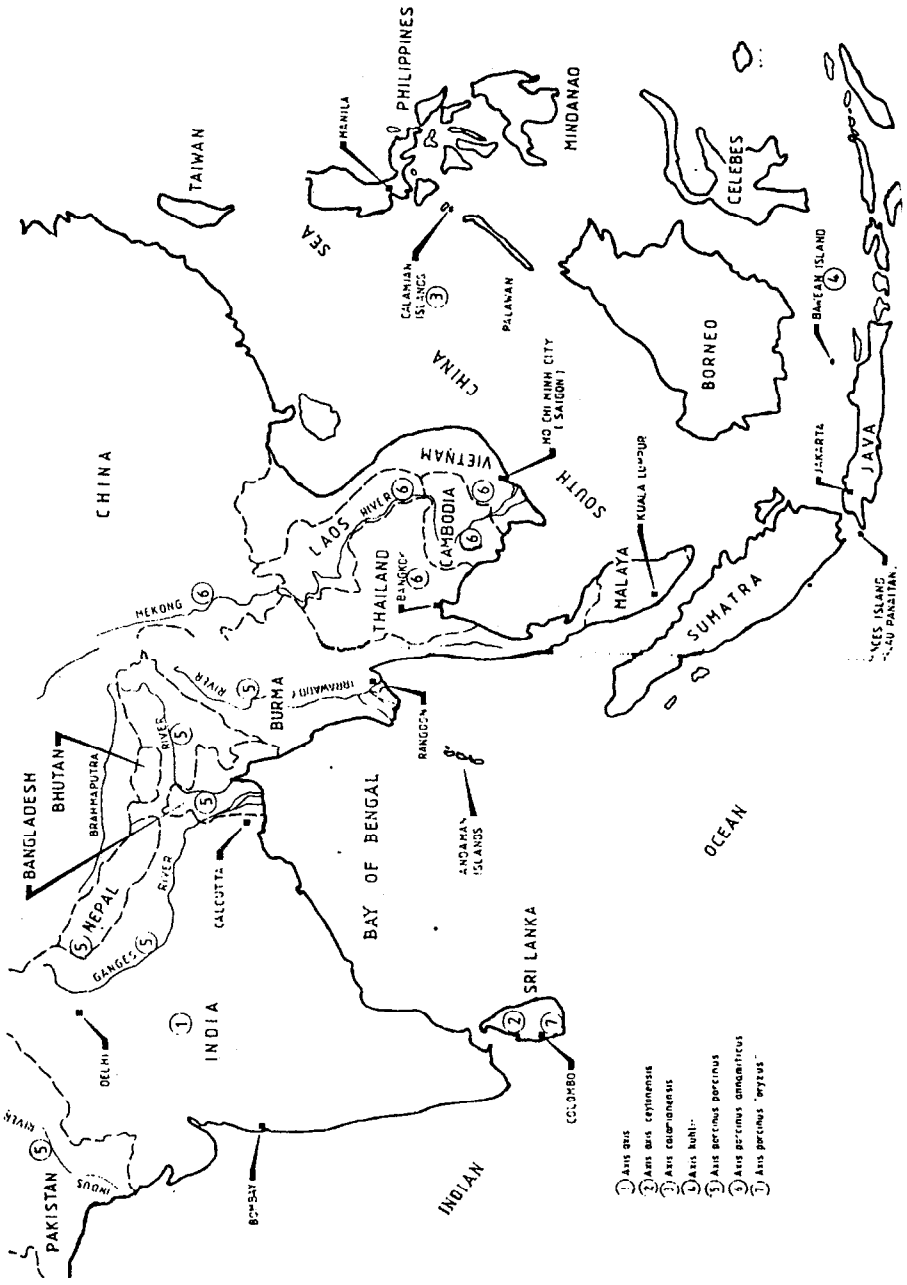


Fig. 1

Native range of Hog deer (*Axis porcinus*) and other species of *Axis* in the world
(Source : Moore and Mayze, 1990)

(1997) at Corbett. Hog deer were found to avoid areas with homogeneous strands of either short or tall grasses. Compared to all these studies, Dhungel and Gara (1991) gave a complete insight to the ecology of this species in its natural range, Royal Chitawan National Park, Nepal.

Dhungel and Gara (1991) during their study radio collared 21 Hog deer and captured 95 Hog deer. The adult sex ratio of Hog deer favored hinds both at Chitawan and Jaldapara respectively (52 males : 100 females and 28 males : 49 females) unlike equal sex ratio reported by Schaller (1967) in India (Biswas *et al.*, in press). Home range of Hog deer is small and overlaps in comparison to other larger deer species because of a seasonal distribution of food, hiding cover, and water in Chitawan (Moore and Mayze, 1990, Dhungel and Gara, 1991). Home range of stags in Chitawan varied from 16 ha to 233 ha (mean = 80 ha), and those of hinds varied from 11 to 205 ha (mean = 60 ha). Movement of Hog deer were found to be less compared to all other species, except for rutting season and disturbance by human being or large compared animals (Dhungel and Gara, 1991). Hog deer are mainly solitary species and active only during night, early morning and evening hours (Schaller, 1967; Dhungel and Gera, 1991; Biswas, 1999, Biswas *et al.* in Press; Biswas and Mathur, in Press). All the studies till date account for the fact that Hog deer are an obligate species of grassland and they prefer natural grasslands as compared to any other area (Dhungel and Gara, 1991; Biswas, 1999). These studies (Dhungel and Gara, 1991; Biswas, 1999, 2000; Biswas and Mathur, in Press) have also defined the importance of a matrix of forage and cover for Hog deer. All these studies have demonstrated the importance of grasslands for Hog deer, which are susceptible to agricultural conversion and human settlements, often leading to the extinction of resident wildlife.

During the current literature review, it was observed that Hog deer are confined to the grasslands in their seral stage of succession found along the flood plains of different river systems. Hog deer in Pakistan are found along the Indus basin while in South-East Asia they are found along the Irrawadi and Mekong River. In India the grasslands in the upper and lower Gangetic plain are known as 'Tarai' in the West and 'Duars' towards the East (Singh and Singh, 1987). The Tarai region falls under the 7A and 7B biogeographic zone of India (Rodgers *et al.*, 2000). The grasslands within these regions are currently under intense threat due to habitat degradation and fragmentation. Several studies have speculated the threat of serious decline of grasslands due to intrusion by woodland succession, weed encroachment, agricultural conversion, changed community composition, increase of unpalatable species, loss of nutrients, change in productivity, sporadic fire and annual flooding (Rodgers and Sawarkar, 1988; Lehmkhul, 1989; McNaughton, 1992; Biswas, 1999). Though annual flooding in Tarai maintains the grasslands in their climax stage however under the current landscape and landuse pattern flooding causes severe damage due to erosion (Pandit, 1995; Biswas, 1999). Hence under the prevailing situation, distribution of Hog deer restricted to this narrow belt of Tarai makes the species highly vulnerable to extinction.

Current range and status of Hog deer and its habitat in India

In India there is not much information

available on the current status and distribution of Hog deer. The original range of the Hog deer typically extended over the Indo-Gangetic plain (Lydekkar, 1898), across Northern India through the states of Uttar Pradesh, Bihar and West Bengal to the Brahmaputra valley in Assam (Whitehead, 1972). Throughout its range the species is associated with swampy plains and river systems such as the Ganges and the Brahmaputra. In the North, Schaller (1967), Tak and Lamba (1981) and Ghosh (1997) have occasionally observed them in the Ramganga River valley of Corbett National Park, but did not notice them in the surrounding hills. Schaller (1967) considered Hog deer to be common on the low-lying marshy meadows bordering the Sal forests in West Kheri, and abundant in the vast grass thickets of Kaziranga Wildlife Sanctuary in Assam. Seshadri (1969) visited 48 sanctuaries throughout India of which 11 were stated to contain Hog deer (Table 2). According to him the survival of Hog deer in future depends on the availability of habitat and decrement of man's persistent pursuit for their meat. According to Whitehead (1972) the population of Hog deer has reduced drastically in West Bengal due to excessive shooting and conversion of grasslands to crop fields. Information provided by the Bombay Natural History Society suggested a substantial decline in the range of the species. Where once the species "extended in an arc South of the Himalayan foothills from Pakistan, Sind and Punjab to Bangladesh and Assam... today it occurs sporadically in the Tarai or Duar grasslands from Uttar Pradesh to Arunachal Pradesh and in suitable grasslands on either bank of the river Brahmaputra and Ganges...". The exact population of this species has not been studied by any agency in India so far (Lamba, 1984).

The range of Hog deer seems to be affected worst in Punjab since the partition due to rapid agricultural developments and success of 'Green Revolution' (Singh, 1991). The adoption of high yielding seeds extended the areas under cultivation, increased the crop cover of paddy and wheat, replacing the sustainable and diversified cropping pattern (Shiva, 1991). Paddy and wheat in a multiple cropping scheme changed the entire landscape. The Central belt of Punjab covering the districts of Amritsar, Jalandhar, Kapurthala, Ludhiana, Sangrur and Patiala, which lay in the zone of intensive 'green revolution', emerged as the area with the highest impact on the grasslands. The green revolution stimulated a process whereby land became precious and was used more intensively on commercial lines. There was a simultaneous increase in area under both crop and trees. Generally agricultural land encroached forest land especially in the upland areas but in plains of Punjab agricultural land was extended by clearing marshes in the flood plains or by introducing canal irrigation (Rahaman, 1976; Kang, 1982; Brar, 1999). More remarkably, due to the introduction of multiple cropping, there was an increase of area under paddy and wheat, with a simultaneous increase in the density of this cover with the loss in heterogeneity and genetic diversity of natural systems (Brar, 1999). With the changed land use practices and extensive farming Punjab currently has only 5% of its area under forests (Atwal *et al.*, 1984). Hence with the advent of green revolution the efforts in wildlife conservation in Punjab gradually decreased as only 5 wildlife sanctuaries and 1 zoological park could be notified till 1984 (Prashad, 1984; Atwal *et al.*, 1984). Hog deer is among the few medium and large sized mammals still found in Punjab (Lamba, 1984). As reported

Table 2

Distribution range of Hog deer in India (1967-1997) based on literature survey

State	Protected Area	Comment	Source
1	2	3	4
Arunachal Pradesh	Itanagar WLS	Lower Subansiri, 140.8 km^2	Daniel, 1986**; Tikader, 1983
Arunachal Pradesh	Lali WLS	East Siang, 190 km^2	Daniel, 1986**; Tikader, 1983
Arunachal Pradesh	Namdafa WLS	Tirap, 1907.82 km^2	Daniel, 1986**; Tikader, 1983
Arunachal Pradesh	Mahao Reserve Forest	Dibang Valley 281.50 km^2	Tikader, 1983
Arunachal Pradesh	Pakkui WLS	East Kameng, 86 km^2	Daniels, 1986**; Tikader, 1983
Assam	Kaziranga NP	42,500 ha, Brahmaputra river, Population estimate 6000 approx.	Lahan-Sonowal, 1972; Tikader, 1983
Assam	Manas Tiger Reserve	26,900 ha, Manas river.Population estimate 10,000 Hog deer.	Tandon, 1988** Tikader, 1983
Assam	Laokhowa WLS	6,650 ha, Brahmaputra river system. Reserve affected by grazing and forest exploitation. Hog deer are seen in Nowgong District.	Seshadri, 1969; Tikader, 1983
Assam	Orang WLS	Prominent in this protected reserve	Rosalind and Narayan, 1988**
Assam	Sunai Rupa WLS	21,760 ha. Important supplement to Kaziranga	Seshadri, 1969
Assam	Barnodi WLS	26.21 km^2	NWLD, WII
Assam	Pobitora WLS	38.83 km^2	NWLD, WII

Contd...

1	2	3	4
Assam	Ripu Chirang WLS	300 km²	NWLD, WII
Bihar	Valmiki NP	335.65 km²	NWLD, WII
Haryana	Sultanpur NP	1.43 km²	NWLD, WII
Manipur	Keibul Lamjao NP	2,560 ha, Logtak lake, Population estimate 25 Hog deer. Single Hog deer sighted in 1987 (Rosalind and Narayan, 1988**)	Gee, 1969
Manipur	Dzuko NP	200 km²	NWLD, WII
Manipur	Siroi WLS	200 km²	NWLD, WII
Meghalaya	Ri Bhoi District, Balpakram NP	West Garo hills, East Garo Hills, South Garo Hills, Jaintia	Alfred and Chattopadhyay, ZSI
Punjab	Bir Motibagh WLS	6.4 km²	NWLD, WII
Punjab	Bir Motibagh WLS	8 km from Patiala	DFWL, Punjab, 1997
Punjab	Bir Gurdialpur WLS	45 km from Patiala	DFWL, Punjab, 1997
Punjab	Bir Bhadson WLS	32 km from Patiala	DFWL, Punjab, 1997
Punjab	Bir Dosanjh WLS	8 km from Patiala	DFWL, Punjab, 1997
Punjab	Bir Aishwan	4 km from Sangrur	DFWL, Punjab, 1997
Punjab	Harike Sanctuary	In Ferozepur, 55 km from Amritsar	DFWL, Punjab, 1997
Rajasthan	Keoladeo Ghana NP	2,800 ha. Population estimate fewer than 20.	Spillett, 1966
Tripura	Trishna WLS	194.70 km²	NWLD, WII
Uttar Pradesh	Corbett NP	32,000 ha. Valuable habitat inundated by damming of the river	Ashok Singh, 1973**

Contd...

1	2	3	4
Uttar Pradesh	Dudhwa NP	21,000 ha. Population estimation 4,000, threat of poaching	Rosalind and Narayan, 1988**
Uttar Pradesh	Kishanpur WLS	No details available	Daniel, 1986**
Uttar Pradesh	Rajaji NP	Population considered significant	Tandon, 1988**, ZSI, 1995
Uttar Pradesh	Katerniaghat	Some population exists in this area but detailed information not available	Pers. Comm. Sawarkar, 1999
Uttar Pradesh	Hastinapur WLS	Population of Hog deer is known to exists in this area but detailed information is not available.	Pers. Comm. Sawarkar, Dr. Salim Javed, 1999
Uttar Pradesh	West Kheri Forest	Schaller counted 105 Hog deer in nine days in 1967.	Schaller, 1967
West Bengal	Chapramari WLS	870 ha unlikely to have any long term significance	Seshadri, 1969.
West Bengal	Gorumara WLS	845 ha unlikely to have any long term significance	Seshadri, 1969, Tikader, 1983
West Bengal	Jaldapara WLS	9,700 ha, Torsa river. Population estimate more than 200	Waller, 1972**, Biswas, 1999
West Bengal	Mahanada WLS	12,500 ha, Mahanadi river. Terrain difficult and animals hard to see.	Seshadri, 1969, Tikader, 1983
West Bengal	Bethuadahari WLS	0.67 km^2	NWLD, WII

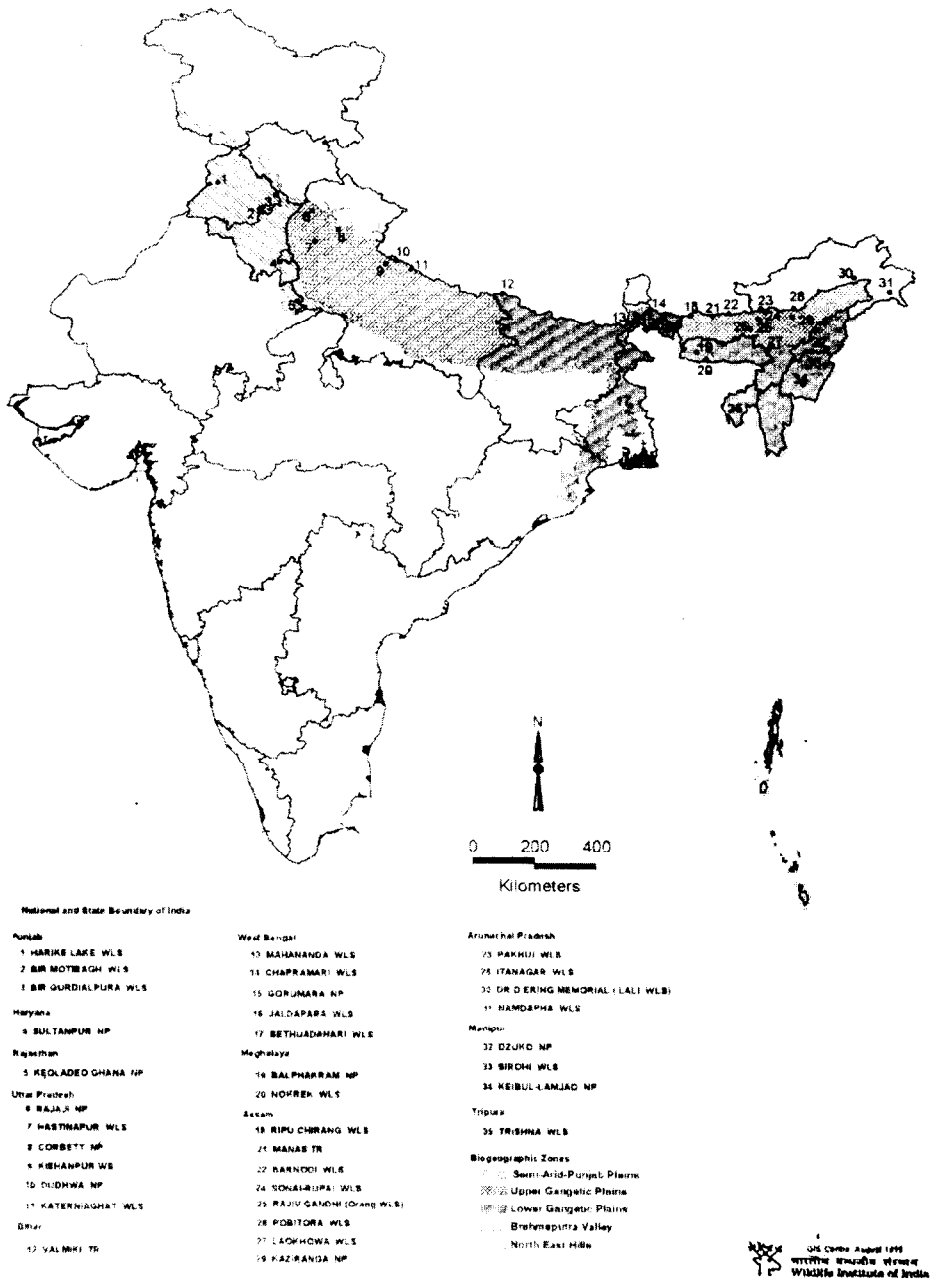
**Indicates direct communication with the author of the book 'Hog deer' by Geoff Moore and Mayze (1990);
NWLD (National Wildlife data Base, Wildlife Institute of India, Dehra Dun);
DFWL (Department of Forestry and Wildlife, Punjab 1997).

by Lamba (1984) Hog deer is restricted to Gurdaspur District (Sri Hargobindpur) and Ludhiana ('bet' area). No definite published record giving the distribution and population of mammals of Punjab is available (Parshad, 1984). The occurrence of as many as 87 species of mammals has been indicated in a number of books (Finn, 1929; Stracey, 1963; Gee, 1964; Spillett and De, 1966; Prater, 1980). But at present (after partition) only 38 species of wild mammals are believed to occur in Punjab (Prashad, 1984). Most of the wild animals according to Prashad (1984) have taken refuge in river beds, plantations near large canals and small forest like Siswan (Ropar), Mattewar (Ludhiana), and 'rakhs' and 'birs' like Bir Motibagh (Patiala), Bir Bhunnerheri (Patiala), Bir Talab (Bhatinda) and Abohar Wildlife Sanctuary. He has reported the presence of Hog deer in the riverine areas of Gurdaspur, Amritsar and Kapurthala districts. Along the Sutlej its occurrence has been noticed in Ludhiana District. It persists in considerable numbers in the riverine tracts along the Indus in Pakistan. Recently the Department of Forests and Wildlife Punjab (1997) has published a list of wild fauna of Punjab with information on the presence of Hog deer in different areas. Fig. 2 shows the current range of distribution of Hog deer in India as obtained from the present literature survey.

The major portion of Indo-Gangetic plain lies in Uttar Pradesh (U.P.) and West Bengal (W.B.) which have a very high population density. As a consequence, arable land is in demand for crops such as rice and wheat and in UP particularly sugarcane. Sharma (1991) states the East - West narrow elongated strip of the Tarai region of Eastern U.P. to be under intense agricultural pressure due to high water table and fertile soils with excessive water logging, flooding and innumerable streams and nalas criss-crossing the entire region. According to him the forest cover has declined during 1955-57 to 1985-87, by 3.8% due to the destruction of forests as a result of agricultural colonization and felling of trees in order to meet the increasing demand for timber and firewood. Fig. 3 shows the extent of change in forest cover across the entire Tarai tract in India. It shows a rapid loss of forest cover in Assam, Bihar, Manipur, Mehgalaya since 1989. According to FSI reports the sudden increase in forest cover in 1989 and 1993 in Manipur and UP were due to the better interpretation of forest imageries from these areas. Since 1993 though there has been no loss of forest cover in U.P. and W.B. the overall percentage of increase in forest cover has gradually decreased, thus indicating a possible loss of forest cover in future. Due to unavailability of similar information on grasslands in the Tarai region we have used productivity of rice, wheat and sugarcane as an index of possible loss of grassland in India since last 7 years (1998-95) (Fig. 4). Fig. 5 shows the increment in annual production of rice and wheat in U.P., W.B., Assam and Bihar, the potential habitats of Hog deer. Hence with the prevalent agricultural pressure Hog deer appears to have rarely any future in this vast area except in the sanctuaries and national parks. Several of the sanctuaries presently hold only small Hog deer populations. In Corbett the number has been substantially reduced following construction of a large reservoir on the Ramganga River (Tak 1998, *per. comm.*; Ashok Singh, 1987).

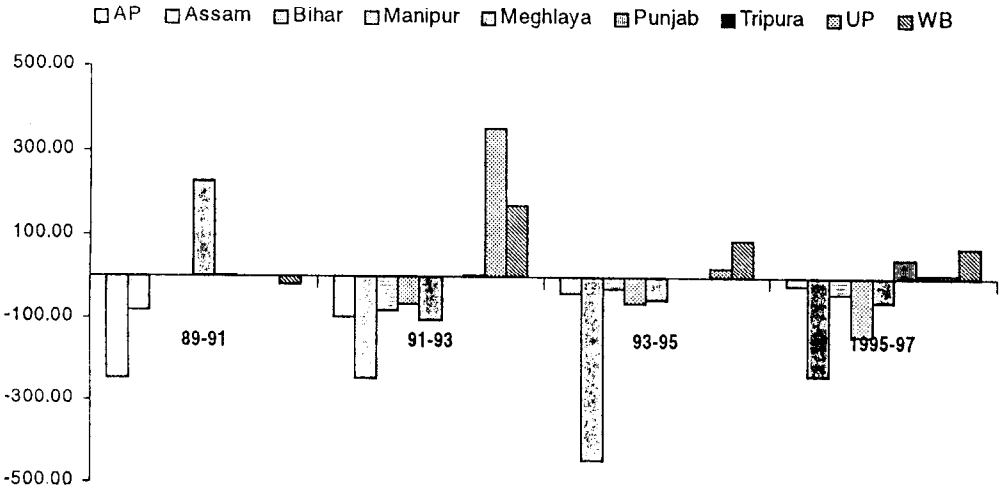
On March 24th, 1988 the Deputy Director, Ministry of Environment and Forests, New Delhi (letter CF & L files)

Fig. 2



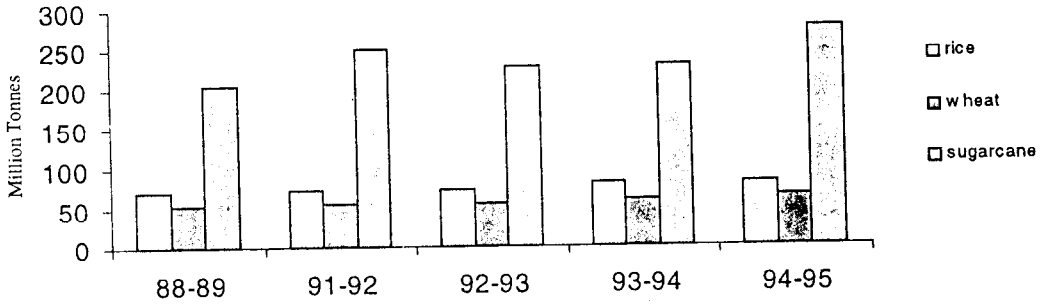
Present range of distribution of Hog deer (*Axis porcinus*) in India, from secondary sources

Fig. 3



Variation of forest cover (km²) along the entire Tarai tract (AP : Arunachal Pradesh, UP : Uttar Pradesh, WB : West Bengal) of India 1989 to 1997.
(Compiled from *Annual Report of Forest Survey of India,* 1989-1997)

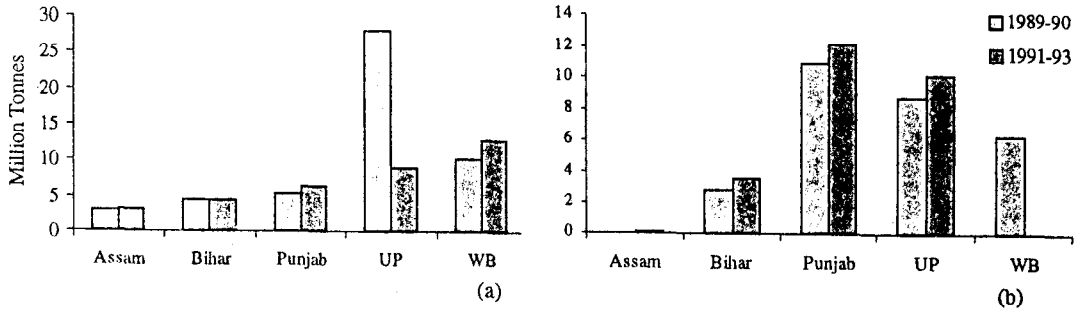
Fig. 4



Annual production of major crops grown in the Tarai region between 1988-1995
(Compiled from *Information India* 1994-95 and 1995-96 pp. 20;
Statesman Year Book 1989-1993)

reported that the population of Hog deer totals to 22,000 to 23,000 in Kaziranga National Park, Manas Tiger Reserve and Dudhwa National Park. Although population estimates were not carried out significant populations are believed to occur in Rajaji, Keibul Lamjao and Gorumara National Park, Orang and Jaldapara Wildlife Sanctuary" (Source Moore and Mayze, 1990). However, over the past 7-8 years there has been no recent sighting of Hog deer from Rajaji National Park (A.J.T.Johnsingh, pers. comm.). Though Rosalind and Narayan (1988) believed that Hog deer was out of danger in well-protected areas they were found to be under stress

Fig. 5



Comparison of the annual production of (a) Rice and (b) Wheat grown in the Tarai States (Assam, Bihar, Punjab, UP and WB) between 1989-90 and 1991-93 (compiled from *Statesman Year Book* 1989-1993)

because of severe poaching specially in Dudhwa. The stress also continues at present in many places like Jaldapara and Hastinapur Wildlife Sanctuary (personal sighting and interview) where hunting is a mode of celebration and amusement for the locals and outsiders. Apart from agricultural and hunting pressures the habitat of Hog deer has also been damaged by domestic, livestock thus affecting the ungulate population that area (Schaller, 1967). Though Assam offers the best chance for long term survival of the Hog deer in India (Schaller, 1967 CF&L files in Moore and Mayze) but if the present situation of insurgency and militancy persists for long in Assam then the populations of Hog deer may perish along with other wild animals. Although in the past Hog deer populations were found to be secure in National Parks and Wildlife Sanctuaries of our country (Narayan and Rosalind) but at present the situation is entirely different. Inspite of the above remarks and knowledge about the pressure on its natural habitat grasslands, there are no definite thoughts to improve the conservation status of Hog deer in India. If given proper protection from poaching and habitat loss, Kaziranga, Dudhwa, Corbett National Parks and Kishanpur WLS, seem to be the only areas to offer long-term future for Hog deer in India. Though Jaldapara harbours a good population of Hog deer, the area is highly vulnerable because of the shape and size of the sanctuary, its geographic location, and single species conservation strategy (Biswas, 1999).

Hog deer though listed as endangered in most of its present range i.e., Thailand (Miller, 1975), Vietnam and Bangladesh (Seidensticker and Hai, 1983), Pakistan (Roberts, 1977) and Nepal (Sunquist, 1981) is yet to be given an endangered status in India inspite of the prevailing pressures on their habitat. Although Hog deer is not endangered on a world scenario (IUCN, 1996), the current position of the species in most of its ranges is quite alarming (Moore and Mayze, 1990; Biswas, 1999; pers. comm. Salim Javed, Hussain, Qamar Qureshi; Sawarkar, 1999). Unfortunately, this species has been highly neglected all through out its range in India as a result we

hardly have any information about its ecology and present range of distribution.

This could be further supported from the IUCN Red Data Book (1972-1990) where the species has not even been included within the Vulnerable (V) or Indeterminate (I) list of species. Under the current IUCN code species which can be threatened or endangered or at risk in future under the prevalent operating factors are included among 'vulnerable' and the taxa that are suspected to be belonging to the one of the first three categories (E, R, or V) identified by IUCN, but for which insufficient information is currently available are known as 'indeterminate' species. However, in 1973 the first Convention of International Trade in Endangered Species (CITES) listed Hog deer as one of the endangered species of the genus *Axis* in Appendix 1. But the list has created some confusion by specifying the Hog deer as 'Ganges Hog' or 'Thai Hog deer' i.e., *A. p. porcinus* and not *A. p. annamiticus*. It has also been included under Schedule III of Wildlife (Protection Act 1972. According to the Wildlife (Protection) Act, Schedule III comprises of special and small games and Appendix I of CITES includes species threatened with extinction. However, presently one of the sub-species of Hog deer (*Axis porcinus porcinus*) has been placed under Low Risk 'near threatened' (LR nt) category under the new IUCN convention in 1996 whereas *Axis porcinus annamaniticus* has been marked as Data Deficient (DD) under the same convention (1996 IUCN Red List of Threatened Animals, pp. 226).

Conclusions

Hence under the prevailing situation there is an urgent need to study the ecology of Hog deer in the changing landuse scenario and re-evaluate its current status and range in India. With this background the Wildlife Institute of India has initiated a research project to assess the conservation status of Hog deer and identify potential habitats to sustain the species in future. As a part of this project we first plan to survey the potential grassland lying within Tarai region for the presence or absence of Hog deer. Secondly we plan to study in detail the ecology of the species in one of its potential habitat. The first phase of the project has been initiated in May 2000 to assess its current conservation status in India.

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SUMMARY

Hog deer (*Axis porcinus*) is a special endemic to the tall moist grasslands of South and South-East Asia. There are two subspecies of Hog deer, the Indian subspecies (*Axis porcinus porcinus*) occurring in Pakistan, Nepal, India, Bangladesh and Burma and South-East Asian subspecies (*Axis porcinus annamiticus*) occurring in China, Thailand, Laos, Cambodia and

Vietnam. Populations of Hog deer are confined only to the flood plain of different river systems within these countries. Hog deer has a narrow range of distribution, specific habitat requirements and has not been well studied throughout its native range. In this paper, the authors have made an attempt to compile the available information on the species with a review of its current status and distribution in India. The review indicates large-scale transformations in the native range of this species mainly due to agricultural developments in the Indo-Gangetic belt. There is also a need to re-assess its present categorisation under the Indian Wildlife (Protection) Act and IUCN Red Data Book.

प्रियक (*एक्सिस पोर्किनुस*) की अपनी ही परिसीमा के अन्दर उसके वर्तमान संरक्षण परिदृश्य की समीक्षा

तनुश्री बिश्वास व वी०बी० माथुर

सारांश

प्रियक (*एक्सिस पोर्किनुस*) ऐसी स्थान सीमित जाति है जो दक्षिण और दक्षिण पूर्वी एशिया की लम्बी, आर्द्र घासभूमियों में ही पाई जाती है । प्रियक (मृग) की दो उपजातियां मिलती हैं, भारतीय उपजाति (*एक्सिस पोर्किनुस पोर्किनुस*) जो पाकिस्तान, नेपाल, भारत, बांगला देश और बर्मा में पाई जाती हैं तथा दक्षिण पूर्व एशियाई उपजाति (*एक्सिस पोर्किनुस अन्नमिटिकुस*) जो चीन, थाई देश, लाओस, कम्बोडिया और वियतनाम में पाई जाती हैं । इन देशों में प्रियक समूह केवल विभिन्न नदी प्रणालियों के बाढ़ नियन्त्रित हो जाने वाले मैदानों में ही फलते हैं । प्रियकों का वितरण बहुत संकीर्ण क्षेत्रों में मिलता है और इसके प्राकृतावास की विशिष्ट आवश्यकताएं हैं । अपने संपूर्ण क्षेत्र में इसका भली-भांति अध्ययन कहीं नहीं किया गया है । प्रस्तुत अभिप्रत्र में हमने इस जाति के सम्बन्ध में मिलने वाली जानकारी को भारत में इसे जाति की वर्तमान स्थिति का वितरण की समीक्षा करने के लिए संकलित करने का प्रयास किया है । समीक्षा से यह संकेत मिलता है कि अपनी देशज परिसीमा में प्रधानत: सिन्धु-गंगा की मैदानी पट्टी में हुए कृषि विकास के कारण इसके विस्तार में बहुत रूपान्तरण हो गया है । भारतीय वन्य प्राणि (संरक्षण) अधिनियम और आईयूसीएन की लाल किताब में किए गए इसके वर्तमान श्रेणीकरण को भी पुनराकलित करने की आवश्यकता है ।

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