

## Historical Range and Present Status of Hangul Deer *CERVUS ELAPHUS HANGLU* In Kashmir, India

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### ABSTRACT

Hangul deer *Cervus elaphus hanglu* is the only survivor of red deer group in Indian subcontinent. Prior to 1950, the deer was quite abundant and distributed widely in mountains of Kashmir. Historically its range was spread to an arc of 65km in width, north and east of Jhelum and lower Chenab river from Shalurah in the north to Ramnagar in the south.

However, due to deterioration of its habitat and anthropogenic pressure, it is now battling for survival within 141 sq km of Dachigam National Park in Jammu & Kashmir state of India, where last viable population is known to occur. The Park which had about 2000 hangul in 1947, currently has only around 200. Grazing by domestic livestock in upper altitudes of park, natural resource extraction by locals, poaching, predation and loss of habitat have all been considered as possible causes of decline. The current trends even indicate imbalance of sex and fawn-female ratios which is alarming. The timely management interventions are needed to save relict population of deer from danger of extinction.

**KEYWORDS :** Hangul, Historical range, Present status, threats, Kashmir

### INTRODUCTION

Kashmir red deer (*Cervus elaphus hanglu* Wagner), the state animal of Jammu and Kashmir is the only survivor of red deer group in Indian sub-continent. It is locally known as 'Hangul' because of food it takes 'Indian horse-chestnut' locally known as 'Han Doon' or because of antlers it bears. The antlers are known as 'Heng' vernacularly. It is a large, dingy brown cervid with a small orange-white rump patch that is bordered by a broad black band and a black tail. The colour fades during summer but tones up with denser winter coat, which in a big stag is very dark or rufous brown (Prater 1971). Hangul is considered as least concern (LC) under IUCN red data list of threatened species but it is placed under Schedule-I of both the Indian Wildlife (Protection) Act, 1972 and the Jammu & Kashmir Wildlife (Protection) Act, 1978. It has also been listed among the top 15 conservation priority species by Government of India (MoEF 2011). The estimated individuals in the beginning of 1900s were about 3000-5000 which had shrunk down to about 1000-2000 by 1947 and subsequently reported as low as 180-250 in 1965 (Gee 1965) and 140-170 in 1970 (Holloway 1970). The estimated individuals left over in the area till 2011 were  $218 \pm 13.96$  (Charoo et al 2011). Grazing by domestic livestock in upper altitudes of the park, poaching, natural resource extraction by locals, predation and loss of habitat have all been considered as possible causes of decline (Ward, 1925; Stockley, 1936; Gee 1965; Schaller 1969b, Holloway 1971 Kurt 1978; Inayatullah, 1985). The hangul population is significantly inbred and exhibited a low genetic diversity in comparison to other deer populations of world (Mukesh et al., 2013).

### Distribution and Status of hangul deer in Kashmir

Hangul was once distributed in mountains of Kashmir (Schaller 1969b). The known past distribution of hangul was restricted to an arc 65 miles in width, north and east of Jhelum and lower Chenab rivers extending from Shalurah in the north to Ramnagar in the south (Lydekker 1924, Holloway 1970, Fig.1). A small population existed outside Jammu & Kashmir in the Chamba district of Himachal Pradesh (Lydekker 1924) which is now extinct. The distribution of hangul was limited to moist temperate forests on northern side of valley of Kashmir and some other adjacent valleys (Kurt 1978). The deer was also known to be present in upper Bringhi valley (Holloway 1971); Kishen Ganga Valley, Bandipora, Gurez, Sindh Valley, Drass valley, Lidder Valley and Desu (Kurt 1978); Overa Rakh, Shikargah (Kurt 1979) and Kishtwar (Kapenberger et al 1978). The deer was found throughout eastern folds of Pir Panjal range in the west (Bates 1980) upto Chamba in the south (Lawrence 1895). The deer did not occur beyond himalayan range in the east (Blanford 1891) except perhaps in Drass valley where it seems to be extinct now (Kurt 1979).

At present, the only viable population of red deer of Kashmir is confined to Dachigam National Park (DNP), with a few isolated hangul herds in its adjoining protected areas (Ahmad et al 2009). The park is situated 21km northeast of Srinagar approximately between  $34^{\circ}5'$

and  $34^{\circ}12'N$  and  $74^{\circ}54'$  and  $75^{\circ}9'$  E. Roughly rectangular (Fig.2), the Park is 141 sq.km in area. It is approximately 24km in length and 6km in breadth ranging in altitude from 1700 to over 4000m. A more or less continuous range of mountains except in the west where it has been artificially fenced, borders the Park. The Park is divided into two ranges, lower (26 sq.km) and upper Dachigam (115 sq.km) on the basis of altitudinal and vegetation differences. It exhibits a variety of vegetation types (Singh and Kachroo 1976, Fig.3) and experiences sub-Mediterranean type of

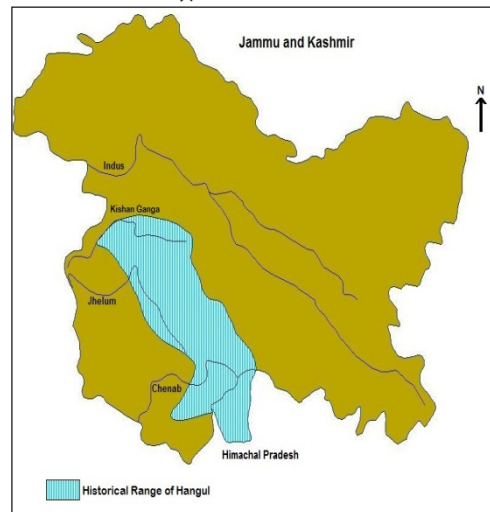


Fig. 1

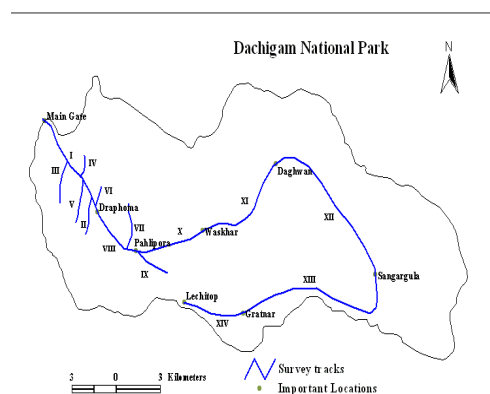
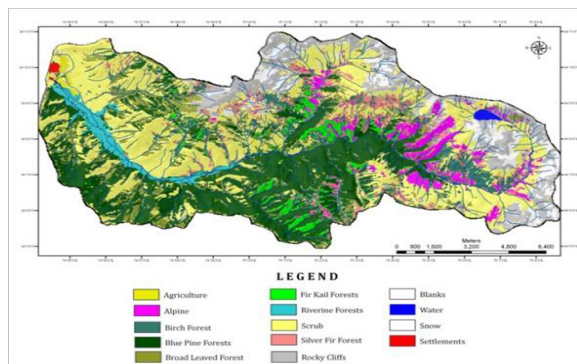


Fig. 2

climate. Hangul are reported to possess two distinct winter and summer ranges in DNP (Gee 1965, Schaller 1969b). These two ranges are separated by a distance of about 15km (Schaller 1969b). However, the deer no longer migrates to upper altitudes of Dachigam due to large scale disturbance in the form of livestock grazing in those areas but remain confined to lower Dachigam throughout the year which is less than than 2/3<sup>rd</sup> of the park ( Kurt 1979, Bhat 2008).



**Fig.3. Vegetation map of Dachigam National Park (Fa-rooq et al.,2012)**

### Sex and fawn female ratios

The young to female ratio in hangul was reported to range between 21 to 51 young /100 females during February and March (Department of Wildlife Protection Jammu & Kashmir 1996, 1997, 2000, 2001, 2002, 2003). Schaller (1969b) reported 45 juveniles to 100 females. The census reports of Department of Wildlife Protection, Jammu & Kashmir indicate that in 2004 it was 23fawns/100 females and in 2006 9fawns/100females. The latest trend in 2010 indicates 29males/100females and 25fawns/100females  $\pm 0.36$  which is alarming for last surviving population of hangul in Kashmir. Stockley (1936) mentions that in his time, ratio was 3 stags to 10 hinds(1:3.3). The optimum ratio is 1 stag to 2 hinds (Darling 1937). The hangul population diminishing by such means is in serious danger of extinction.

### Anthropogenic pressure on hangul and its habitat

Dachigam and other parts of hangul distribution range were historically exposed to heavy anthropogenic pressure. Ward (1925), Stockley (1936), Gee (1965), Schaller (1969b), Holloway (1971), Kurt (1978) and Inayatullah (1985) described in detail, the detrimental effects of grazing in upper Dachigam, poaching, effect of Sheep breeding farm, disease, dogs of shepherds, and natural resource extraction by locals. The majority of these problems are still prevalent in the present range of deer i.e., Dachigam national park and its adjoining ranges (Shah et al., 2011) and therefore, need to be addressed at the earliest

Poaching has been, in the past, identified as principal cause of decline of hangul (Gee 1966, Schaller 1969b, Holloway 1970, Kurt 1978). Poaching by nomads who take their livestock to upper Dachigam during summer is still a major cause for hangul decline (Stockley 1936, Gee 1965). This is compounded by large scale biotic interference due to grazing by state animal husbandry department owned sheep which use Dagwan meadow in upper Dachigam as a grazing ground. In other vast areas of alpine meadows like Nageberan and Marsar, thousands of sheep, goat, horses and cattle are grazed by local grazers, gujjars from Kashmir as well as Bakarwals and Banyaris from Jammu. This has created potential competitors and persistent sources of disturbance for hangul during summers preventing it from full exploitation of its habitat (Bhat 2008). The alpine meadows formed ideal foraging habitats during summer (Kurt 1977, Oza 1977). The deer migration to such meadows is hampered due to grazing by domestic livestock in upper reaches and are forced to stay in lower areas of the park (Bhat 2008).

There is a great danger that parasites and diseases of sheep may spread to deer (Longhurst et al. 1954). Hangul population had been affected by diseases like Johne's disease (Kurt 1978) and Foot and Mouth disease (Stockley 1936). Food and Mouth disease had taken toll of livestock and hangul in the past (Stockley 1936). Other threats to habitat include fuel-wood, timber, grass extraction etc. The mainte-

nance of several govt. departments in the park also poses a threat to deer particularly during rutting when stags get disturbed by vehicles and staff of these departments (Bhat et al., 2009). Kurt (1978, 1979) recognized grazing, poaching and disturbance due to human beings as major causes of decline of hangul deer population.

### Predation on hangul deer

Leopard, the top predator in the park had 18% of hangul occurrence in its scats (Shah et al., 2009). Iqbal et al (2005) reported 25% hangul occurrence in leopard scats which contributed 61% of prey biomass consumed by leopard. This indicates substantial dependence of leopard on last surviving population of hangul on national park. Stockley (1936) has reported leopard as main predator of hangul and black bear as destroyer of fawns. Hangul becomes more prone to predation by leopard during winter when former come down to lower reaches due to heavy snowfall on upper altitudes and remain concentrated in a small belt of lower Dachigam (Bhat 2008, Shah et al 2009). Some prey species tend to congregate in small areas in deeper snow as forage becomes unavailable elsewhere (Fuller 1991) and encounter rate may increase (Huggard 1993).

According to Schaller (1969a) black bear is one of main predators killing young ones of hangul deer. The fawns are vulnerable to bear predation during summer due to excessive movements of bears in lower Dachigam owing to availability of fruit and other food items and also on the onset of winter bear and hangul deer share same habitats in lower belts of Dachigam which are devoid of food for black bear making hangul more vulnerable to bear predation (Bhat2008).

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### RECOMMENDATIONS

The current trends indicate that hangul deer could go extinct if necessary interventions are not made immediately. Due consideration should be given to following points for protection and management of wildlife in general and hangul deer in particular in DNP.

- 1) There is an urgency to develop a comprehensive management plan for Dachigam National Park. Despite the fact that some conservation steps had been taken in the past, the park is still being degraded for its resources. So a fresh comprehensive management plan be worked out to protect hangul habitats in park.
- 2) Scientific community should conduct research on priority management issues. It is often argued that ecologists/researchers fail in communicating their knowledge to decision makers and, therefore, have limited influence. It is, therefore, necessary to link science to management in order to have effective management. The advice provided by researchers need to be fed into development exercise.
- 3) The Department of Wildlife Protection, Government of Jammu & Kashmir in collaboration with Wildlife Institute of India, Dehradun has been monitoring hangul populations by adopting scientifically robust methods since 2004. The census of predators like black bear and leopard should also be conducted on regular basis to know their exact status.
- 4) The fawn- female ratio is alarming and therefore fawning grounds need to be monitored and safe guarded.
- 5) The government of Jammu and Kashmir should develop and implement strategies for controlling grazing in upper Dachigam so as to prevent summer habitats of deer from destruction.
- 6) Appropriate legal measures should be enforced in order to protect park areas against illegal exploitation.
- 7) The presence of several government departments is recognized as the main and long outstanding problem, which can be solved only by their removal. The restriction of access to lower Dachigam during rutting season should be enforced and fully implemented.
- 8) The Wildlife Department of Jammu and Kashmir should practice captive breeding of hangul deer. In this context Hangul Conservation Breeding Center at Shikargah Tral was established in August 2011 with an aim to increase declining number of Hangul in state. The breeding centre is presently not functional due to the lack of required infrastructure at Shikargah like Labs, veterinary facilities, accommodation for staff etc. and therefore, needs to be

- equipped with requisite infrastructure.
- 9) The regular monitoring of all entry routes should be undertaken to prevent local people from entering park premises. For this purpose, strength of field staff should be increased.
  - 10) The exchange of information between public, forest managers and wildlife biologists should be given due emphasis for ensuring long term success of wildlife management.
  - 11) Tourism should be controlled and its negative consequences reduced. A centre should be established in National Park to educate visitors about environmental protection and management.
  - 12) A thorough study of predator-prey interactions be undertaken to know impact of predation on hangul deer.
  - 13) A socio-economic survey in adjoining villages of park be undertaken to know dependence of people on park resources and development of viable alternatives should be given emphasis. Eco-development should be launched as necessary measures for rural development.
  - 14) A detailed survey of cement factories in Khrew area which is in the vicinity of park be conducted to examine their effects on ecology of area including habitat of hangul and to suggest safety measures required for controlling pollution.
  - 15) Awareness programs should be launched to educate local people about values and importance of wildlife.

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