



Rediscovery of Swamp Deer *Rucervus duvaucelii* (G. Cuvier, 1823) in Kumaon Region of Uttarakhand State of India

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Abstract: Swamp deer *R. d. duvaucelii* with its lighter coat, un-palmate antlers and larger hoof known to occur in the soft swampy ground of Himalayan foothills encompassing the forests of Terai Arc Landscape. Mostly, isolated population of Swamp deer reported from the state of Uttar Pradesh state of India and in the recent past scattered population reported from the Garhwal region of Uttarakhand state. Available literature shows distribution of swamp deer from various pockets of Kumaon region of Uttarakhand but in the present time its existence was doubtful due to lack of evidence or a direct sighting. Advances in scientific based techniques and tools for the monitoring of elusive and cryptic wild species provides an opportunity to document rarely seen and occurring in low abundance species. The reappearance of swamp deer based on a by-catch of camera traps from the Kumaon region of Uttarakhand is reported here.

Keywords: *Rucervus eldi*, *Rucervus schomburgki*, Swamp deer, Kumaon, Uttarakhand

Swamp deer is endemic to the Indian sub-continent and shares its species group with the brow-antlered deer *Rucervus eldi* and the now-extinct Schomburgk's deer *Rucervus schomburgki*. These species are believed to have evolved in the Indo-Chinese and Malayan sub-regions, where they have adapted to thrive in swampy grassland conditions (Mani 1974). Blanford (1888-91) documented the distribution of the Swamp deer. Subsequently, three subspecies of swamp deer were identified (Brander 1923, Ellerman and Scott 1951, Groves 1982). These subspecies include *R. d. duvaucelii*, which inhabits the swampy grasslands of Northern India and Nepal; *R. d. branderi*, which occupies the hard ground of Central India; and *R. d. ranjitsinhi*, which prefers marshes and grasslands in the Brahmaputra flood plains. It is important to note that swamp deer is already extinct in Pakistan and Bangladesh (Qureshi et al 2004). Historically, swamp deer were found across a vast range, from the foothills of the Himalayas in the North to the Godavari River in the South. In the East, their habitat extended from the Brahmaputra alluvial floodplains to the marshy areas of the Sundarbans, and in the West, their presence reached the Indus River. In 1967, Schaller narrowed down the occurrence of swamp deer to 28 specific sites in India and Nepal. Out of these 28 sites, 11 were represented by the *R. d. duvaucelii* sub-species and were primarily located in Northern India. However, the range of the swamp deer continued to diminish over time. Holloway (1973), reported only four surviving population of the swamp

deer in Northern India, located in Pilibhit, Bahraich, North and South Kheri, all within the Uttar Pradesh state of India. In addition to these four localities, swamp deer populations in Uttar Pradesh were also recorded in the Hastinapur Wildlife Sanctuary and its surrounding areas along the River Ganges, as well as near Afzalgarh (Bijnor district) in the marshy area of the Ramganga River (Paul et al 2018). In the state of Uttarakhand, swamp deer were rediscovered on 1st February, 2005, in the Jhilmil Jheel area, close to Haridwar town, which falls under Haridwar Forest Division under Garhwal region of the state. Later on, this area was declared as a conservation reserve for swamp deer on 14th August, 2005 (Sinha and Chandola 2006). Here we are reporting rediscovery of swamp deer from the Kumaon region of the Uttarakhand state based on photographic evidence (Fig. 1).

MATERIAL AND METHODS

Study was carried out in an important wildlife corridor which connects forests of Nandhaur Wildlife Sanctuary with the Pilibhit Tiger Reserve in Uttar Pradesh state. This corridor is known as Kilpura-Khatima-Surai and also provide connectivity with the Shuklaphanta National Park through Sharda River and agroforestry mosaic in Nepal (Anwar and Borah 2019). Corridor area was divided into 2.04 sq km grid framework for the deployment of camera traps. A total of 66 pairs of camera traps were deployed between September 14, 2014 and October 3, 2014, in three forest ranges, namely Kilpura, Khatima and Surai within the Terai East Forest

Division (Fig. 2). Camera traps were operational 24x7 for 20 days session and were regularly monitored. Data downloaded and collated folder wise with unique identity designating corresponding camera stations. All the photographs of the animals manually segregated to the species level with the help of available check list of the area and doubtful species were later identified with the help of field guide (Menon 2014).

RESULTS AND DISCUSSION

This study primarily aimed at estimating the tiger population. During the camera trap survey, we captured three photographs of the swamp deer at two different camera locations in Kilpura range (Fig. 3). The first photograph, taken at camera point number 7, was recorded on 30th September 2014 at 23:44 hrs. The second photograph was captured at camera point number 11 on 1st October 2014, at 01:04 hrs. Lastly, the third photograph of the swamp deer was captured on 2nd October 2014, at 04:16 hrs at the same camera point. These camera pairs were deployed along the fire line in a sal *Shorea robusta* dominated forest. Other trees species present included *Mallotus philippensis*, *Acacia catechu*, *Terminalia chebula*, and *T. tomentosa*. The ground cover was predominately composed of *Cassia tora*, *Lantana camara*, *Flemingia* sp. etc. The area represented a typical bhabhar zone, with seasonal water bodies and stream located approximately 4 to 5 kilometers to the south of the camera sites.

Historically, the swamp deer population in the Jaulasal, Lalkuan, and Maldhan Sanctuaries witnessed a significant decline as reported by Holloway in 1973. Factors contributing to this decline included poaching and habitat loss due to the planting of exotic species like *Eucalyptus* and the conversion of forest land into crop fields (Holloway 1973). Since then, this is the first photographic evidence of

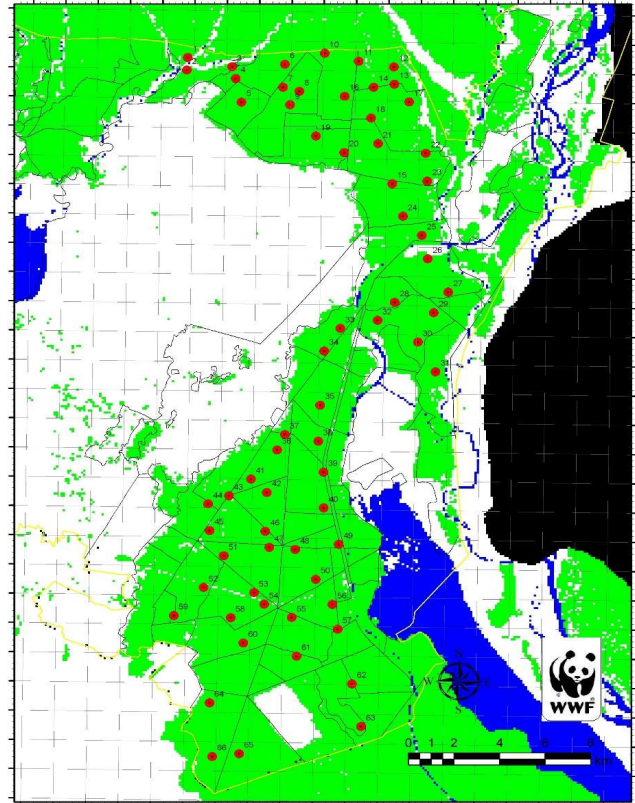


Fig. 2. Grid design for the placement of the camera traps and sites of capture of swamp deer (camera point 7 & 11)

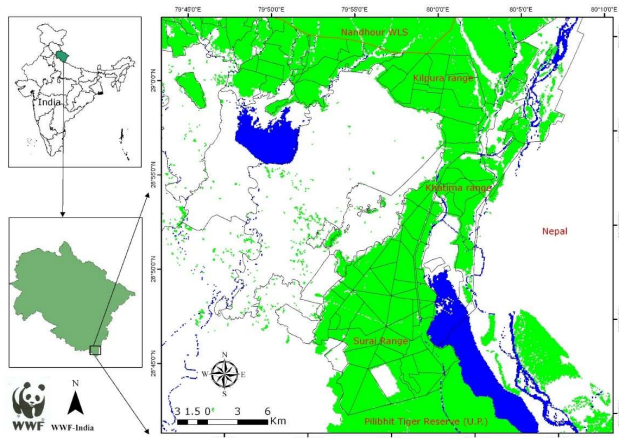


Fig. 1. Location map of the study area



Fig. 3. Swamp deer photo-captured in Kumaon region

the swamp deer's presence in the Kilpura range, which adjoins the recently declared (2012) Nandhaur Wildlife Sanctuary. This significant record might have gone unnoticed if all the photographs of wild animals accumulated during the study were not sorted at the species level. Recent advancements in camera trap data management software have the potential to lead to more discoveries like this one within the scientific community. Present report provides a strong base for carrying out thorough occupancy survey of swamp deer in the Himalayan foothills of the Kumaon region in the Uttarakhand state. Additionally, it emphasizes the need to implement conservation management practices for swamp deer within the Nandhaur Wildlife Sanctuary and adjoining reserved forest areas. Reclaiming and restoring the marshy areas under Nandhaur Wildlife Sanctuary and enhanced protection level is recommended for rebounding of swamp deer population in the Kumaon region of Uttarakhand. The swamp deer is listed as 'Vulnerable' in IUCN Red list of threatened species (Duckworth et al 2015) and Schedule I species under Wildlife Protection Act, (1972) of India.

CONCLUSION

Swamp deer is habitat specialist species, prefers marshes and grassland (Sankaran 1990). Terai Ecosystem is characterized by low water table, enabling creation of typical habitat for swamp deer. Rampant destruction of this ecosystem for agricultural practices, industrialization, development of linear infrastructure, and human settlement has led to large scale fragmentation, shrinkage, and isolation of such habitat resulting in decline of population of habitat specialist species such as swamp deer, Bengal florican and hispid hare. Additionally, forestry policies considered grassland as suitable places for carrying out target-based plantations and introduced exotic species of trees such as

Eucalyptus (Rahmani et al 1988), which completely changed the habitat at its micro climate level. Present report of swamp deer from the Kumaon provide us another opportunity to reclaim, and restore habitat of swamp deer in the Himalayan foothills, actively manage and conserve this endemic species by establishing a breeding center in Uttarakhand.

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