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Cover: Parts of *Vachellia nilotica*, medium - watercolours. © P Kritika



Hastinapur Wildlife Sanctuary) in the south and eastwards to Pilibhit Tiger Reserve, Dudhwa National Park, Kishanpur Wildlife Sanctuary, and Katernaighat Wildlife Sanctuary of India, and Bardiya National Park and Shuklaphanta National Park in Nepal (Qureshi et al. 2004). The subspecies once considered extinct from the Terai grassland was rediscovered in the Jhilmil Jheel Conservation Reserve in 2005 (Sinha & Chandola 2006). Subsequently, a population of *R. d. duvaucelii* was also reported from the Ban Ganga Wetland area of Uttarakhand (Tewari & Rawat 2013). The southernmost limit of the *R. d. duvaucelii* distribution is along the Ganga River up to the State Wildlife Barasingha Sanctuary, approximately 100 km (aerial distance) from Jhilmil Jheel Conservation Reserve (Duckworth et al. 2015).

Surprisingly, in the Gangetic plains, the majority of studies on the status, distribution, habitat use, and threats of the swamp deer are restricted to the landscape between Jhilmil Jheel Conservation Reserve and State Wildlife Barasingha Sanctuary (Sinha & Chandola 2006; Tewari & Rawat 2013; Duckworth et al. 2015; Paul et al.

2018). The status and distribution of swamp deer in the grasslands along the Ganga River downstream of the State Wildlife Barasingha Sanctuary remains unknown. This geographical limitation in research highlights the need for extensive surveys outside the species' reported range in the Gangetic floodplain landscape to achieve a comprehensive understanding of its distribution and population status. Hence, the study was conducted to assess the distribution and status of the swamp deer population in the Upper Ganga River Ramsar Site, India.

MATERIALS AND METHODS

The survey was conducted along the banks of the Ganga River between Brijghat and Narora (Image 1). The grassland patches and riparian areas were surveyed to assess the presence of *R. d. duvaucelii*. The stretch of the Ganga River between Brijghat and Narora is designated as the Upper Ganga River Ramsar Site (Ramsar site no. 1574). The river stretch has fragmented grassland patches along the banks and on islands (WII-GACMC 2018). The major vegetation of these grassland patches

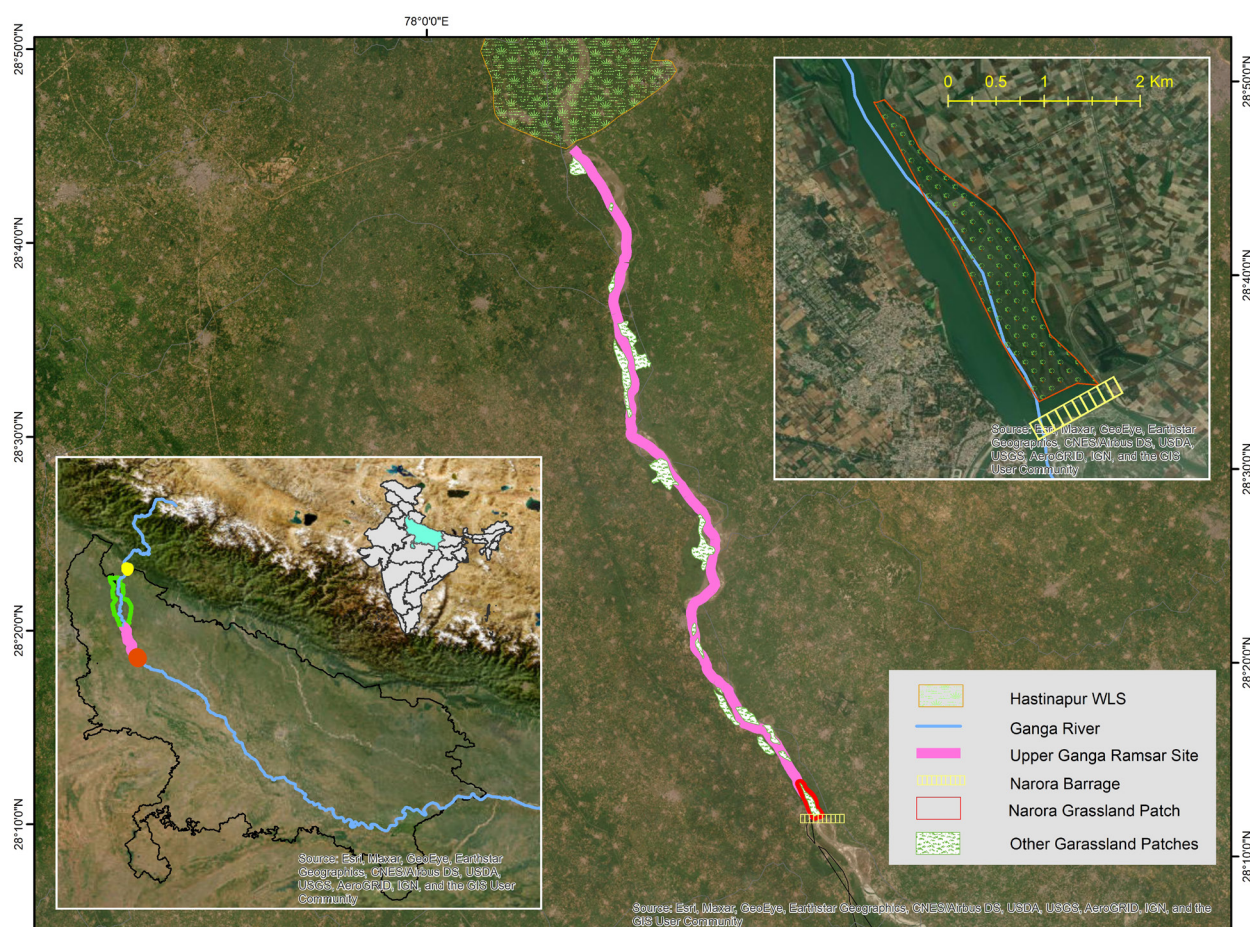


Image 1. The survey area of swamp deer between the Brijghat and Lower Ganga Barrage.

includes *Typha* sp., *Phragmites* sp., *Saccharum* sp., *Eichhornia* sp., etc. This stretch of the river is inhabited by the Gangetic Dolphin *Platanista gangetica*, 76 species of waterbirds, Gharial *Gavialis gangeticus*, Mugger *Crocodylus palustris*, and six species of freshwater turtles (WII-GACMC 2018; Usmani et al. 2025). The major terrestrial species found in this landscape include Sambar *Rusa unicolor*, Hog Deer *Axis porcinus*, Chital *Axis axis*, and Leopard *Panthera pardus* (Usmani 2010).

The study was part of a large-scale Ganga Biodiversity assessment survey conducted in 2021. During the survey, we also gathered information on the presence of the species from locals, especially farmers, cattle herders and fishermen. Photographs of species and their antlers were shown to identify the species. Based on the information collected from local people and identified grassland patches along the Ganga River (Paul et al. 2018), a survey was conducted in selected stretches along the river between May and July 2021. The grassland patches were extensively surveyed on foot, and the riverbank was surveyed by boat for the presence of swamp deer in the identified stretch.

RESULTS

Evidence of swamp deer presence was found only in the Narora grassland patch (Image 2). We located a group of eight individuals, including two males, three females and three sub-adults, during the survey (Images

3 & 4). The individuals were seen in a densely covered grassland patch within Lower Ganga Barrage Reservoir, around one km from Lower Ganga Barrage or Narora Barrage (Image 28.2030° N, 78.3930° E). Local farmers, cattle herders and fishermen have also confirmed the year-round presence of the swamp deer in this area. These people have confirmed the presence of groups of up to 20 individuals in the area. The sighting was outside the protected area, around 70 km (aerial distance) from the State Wildlife Barasingha Sanctuary.

The grassland patch is located within the Lower Ganga Barrage Reservoir, with a deep and fast-flowing channel towards the right bank and a low-depth narrow channel on the left bank. This seasonally flooded grassland habitat is dominated by *Typha* sp., *Phragmites*



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Image 2. Grassland patch near Lower Ganga Barrage, Narora.



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Image 3. Herd of swamp deer in the grassland patch near Lower Ganga Barrage, Narora.



Image 4. Subadult swamp deer in the grassland patch near Lower Ganga Barrage, Narora.

karka, and *Saccharum spontaneum* and provides an ideal home for the swamp deer. The area also faces a wide range of disturbances, including occasional poaching, intensive grazing, agricultural encroachment, unsustainable extraction of aquatic vegetation, and uncontrolled burning.

DISCUSSION

The survey confirmed the presence of a small number of *R. d. duvaucelii* outside the protected area, around 70 km (aerial distance) south of the State Wildlife Barasingha Sanctuary in Narora. This is the southernmost extended distribution of the swamp deer population along the Ganga River in Uttar Pradesh. Combined with the previously known range extending 100 km (aerial distance) from Jhilmil Jheel Conservation Reserve to State Wildlife Barasingha Sanctuary, the present record extends the total known distribution of *R. d. duvaucelii* to approximately 170 km (aerial distance) along the Ganga River (Qureshi et al. 2004; Sinha & Chandola 2006; Tewari & Rawat 2013; Duckworth et al. 2015; Paul et al. 2018). The swamp deer population in the Narora grassland observed during this study may also be connected to the Northern populations of the State Wildlife Barasingha Sanctuary and, further, to the Jhilmil Jheel Conservation Reserve population through seasonal and flood-driven movement (Martin & Gopal 2015). However, this connectivity may be influenced by anthropogenic barriers including irrigation infrastructure, settlements and transportation infrastructure.

The Narora grassland is threatened by encroachment for agricultural purposes, and illegal burning of grasslands and the swamp deer population is threatened by poaching. The swamp deer population in this area is highly vulnerable and needs dedicated conservation measures supported by strong legislation. Conservation efforts through major government programmes, such as the National Mission for Clean Ganga (NMCG), are also required to extend protection for wetland-dependent species.

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