

## Status of Indian One-horned Rhino, *Rhinoceros unicornis* Linn. 1758 in Dudhwa National Park, Uttar Pradesh, India

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### Abstract

Dudhwa National Park, located in the foothills of Himalayas in Uttar Pradesh (India), has become an ideal home to the Indian one-horned rhino, *Rhinoceros unicornis* Linn. 1758. The population in Dudhwa National Park was re-established in 1984-85, under Central Government Project, with rhinos being sourced from Assam (India) and Nepal. The population of rhino has grown in size manifolds over the last three decades. The rhino rehabilitation programme of Dudhwa can be deemed as one of the most successful initiatives of its kind in India. Present study, conducted in 2017 (January to December), provides vital information to strengthen the available data and to supplement the gaps in conservation and management plans for the Indian rhinos in Dudhwa National Park.

**Key Words:** Rhino; *Rhinoceros unicornis*; Rehabilitation; Dudhwa National Park.

The Indian one-horned rhinoceros once distributed throughout the northern floodplains of Indus, Ganges and Brahmaputra Rivers, from Hindu Kush in the west to Indo-Myanmar border in the east (Dinerstein, 2003); but due to disappearance of most of the alluvial plain grasslands of the northern Indian subcontinent, hunting for flesh and poaching for horns and sports over the last three centuries there has been a great reduction in their number. At present, they are confined to a few protected areas in India and Nepal. The global population of Indian rhinos estimated at 3300 with two major strongholds of the species, the Kaziranga National Park, Assam (India) and Royal Chitwan National Park, Nepal. The largest population of about 2330 free roaming rhinos found in Kaziranga National Park (Talukdar, 2013) and the second largest population of 605 rhinos inhabit Royal Chitwan National Park (DNPWC, 2015).

In 1979, for long term survival of the species, the Asian Rhino Specialist Group of IUCN and the Rhino Sub-Committee of Indian Board of Wildlife (IBWL) identified Dudhwa National Park, Uttar Pradesh as a most suitable alternate habitat for the rehabilitation of Indian rhinos. The rhino rehabilitation programme in Dudhwa National Park was undertaken in 1984 by translocation of 5 rhinos (a sub-adult and two elderly females, a young adult and one older male) from Pabitora Wildlife Sanctuary, Assam (Sale and Singh, 1987). Both the elderly females died shortly after arrival, but the remaining three settled well. In order to establish a viable breeding population, this introduction was added in 1985 by translocation of 4 female rhinos from Royal Chitwan National Park, all of which were able to adapt to their new home (Sale and Singh, 1987). However, only 7 rhinos remained alive in 1985; the seed population started breeding after a lapse of 4 years which resulted in a steady rise of rhino population in Dudhwa National Park. Released population of rhinos in DNP is listed below in Table 1.

**Table 1:** Released Population of Rhinos in RRA, Dudhwa National Park.

S. No.	Origin	Name	Sex	Age on arrival	Date of arrival	Death
1	Assam	Raju	M	25 yr	31.03.1984	11.12.1988
2	Assam	Bankey	M	7 yr	31.03.1984	29.11.2017
3	Assam	Saheli	F	30 yr	31.03.1984	12.04.1984
4	Assam	Asha	F	17 yr	31.03.1984	31.07.1984
5	Assam	Pabitri	F	4 yr	31.03.1984	2013
6	Nepal	Swayambara*	F	5 yr	29.03.1985	--
7	Nepal	Narayani*	F	5 yr	29.03.1985	--
8	Nepal	Hemrani	F	4 yr	01.04.1985	2014
9	Nepal	Rapti	F	6 yr	01.04.1985	25.09.1991
10	Kanpur Zoo	Lohit	M	8 yr	28.04.1992	Returned to Zoo in 2004

\* Surviving

(Source: Field Director, Dudhwa Tiger Reserve)

Being a part of Dudhwa Tiger Reserve (established in 1987), Dudhwa National Park is located in Lakhimpur-Kheri district of Uttar Pradesh in northern India. It lies between 28° 18' - 28° 42' N latitudes and 80° 28' - 80° 57' E longitudes (Fig. 1). The park covers an area of 680.335 km. sq., out of which 490.2979 km. sq. area forms the core zone and 190.0371 km. sq. area serves as the buffer zone (Mathur and Midha, 2008). The area of park is a vast alluvial plain, which shows succession of beds of sands, loam and clay. The Park has a subtropical climate with three distinct season viz. winter, summer and rainy season. January is the coolest month with minimum temperature of 8.32° C and May and June are the hottest months with maximum temperature of 40.37° C. The average annual rainfall is about 150 cm, 90% of which is occupied from mid-June to September. The intensive study area i.e. Rhino Rehabilitated Area (RRA) extends over 28.11 sq. km. in the south Sonaripur range of Dudhwa National Park (Fig. 2). The RRA comprises- Sal Forests (04%), Grasslands (69%) and water bodies including swamps (27%). According to the kinds of vegetation the RRA is classified into 6 major habitat types viz., tall grasslands, short grasslands, marshy grassland, woodland, water bodies and fringes and riparian.

The observations were restricted only in the sunlight and carried out by means of elephant riding, motorcycle and watchtowers. Ground-based methods were used to evaluate the habitat types and their utilization by rhinos. The data regarding natality and mortality of rhinos from the date of rehabilitation up to December 2017 were obtained from the office of Field Director, Dudhwa National Park to know the vital index.

The wide range of materials eaten by Rhinos suggests that the animal is not very specific in its food choices. Their food chiefly comprise of 25 species of grasses, 15 species of herbs and shrubs, 12 species of aquatic plants, 7 species of woody climbers and trees and 1 species of fern. The most highly preferred food types are the grasses such as *Saccharum spontaneum*, *Imperata cylindrica* and *Vetiveria zizanioides* and the aquatic plants such as *Hydrilla verticillata* and *Hygrorhiza aristata*, which made up only a small proportion of the diet.

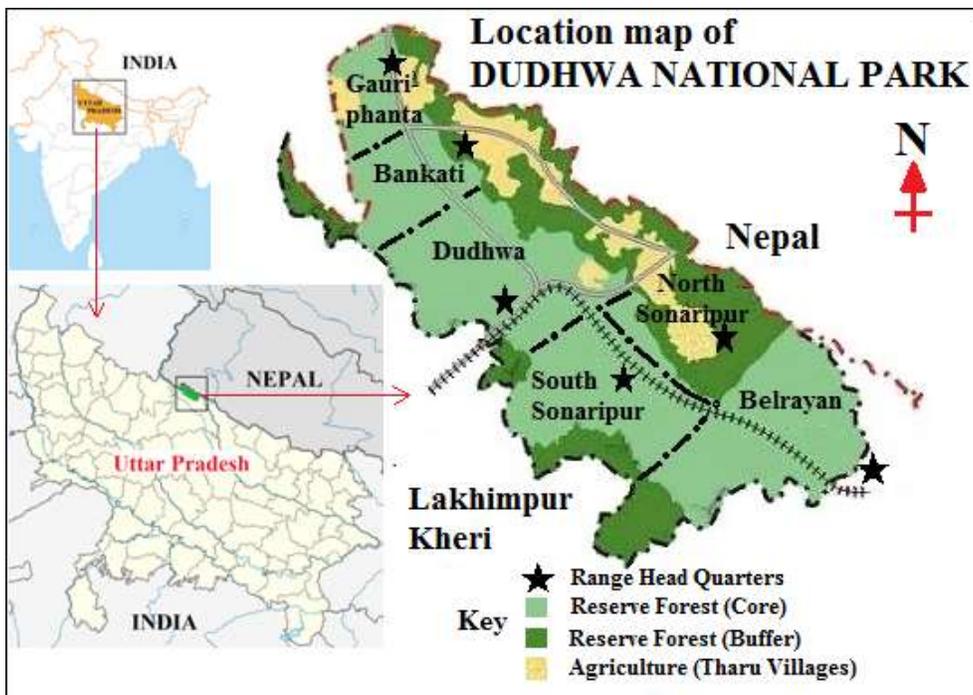


Fig. 1. Location map of Dudhwa National Park.

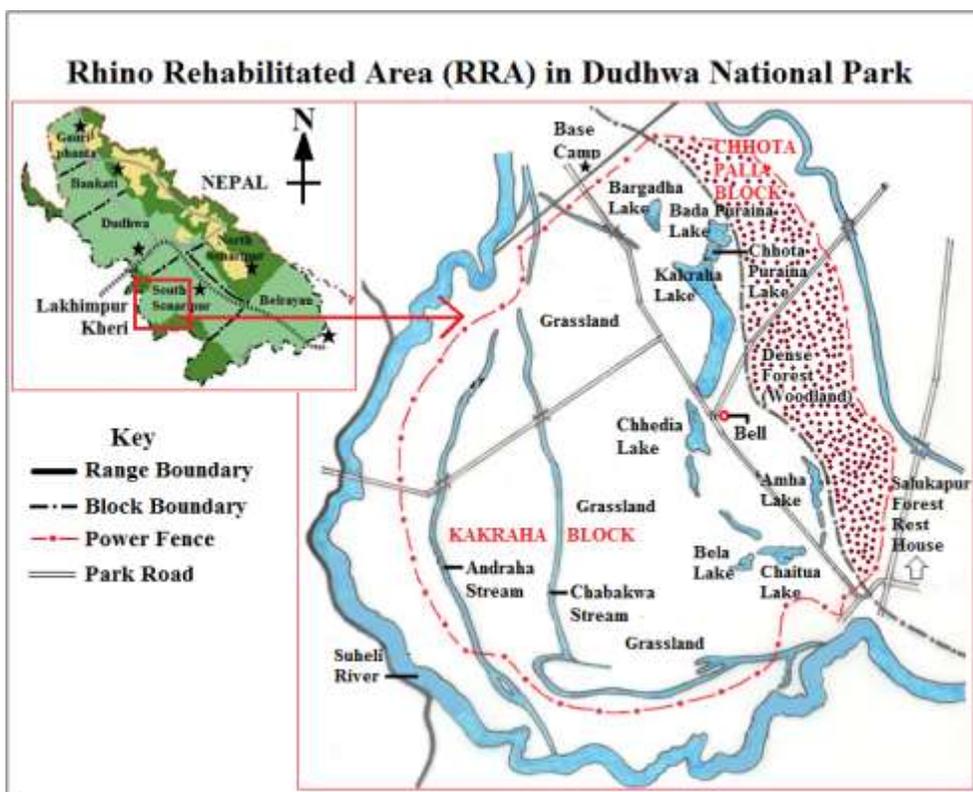


Fig. 2. Rhino Rehabilitated Area (RRA) in Dudhwa National Park.

There is no record of calving among the re-introduced population since the time of rehabilitation till July 1987. The first evidence of breeding was detected under unfortunate circumstances when remains of a newly born calf discovered in a patch of tall grass in August 1987. As a consequence of death of an adult male Raju in 1988, Bankey remained the only breeding male of the founder or seed population in RRA and started breeding with five females *viz.* Swayambara, Narayani, Hemrani, Rapti and Pabitri. The first successful calving was recorded on 19.05.1989 followed by three calving in the same year. The third and fourth generations were observed in 1994 and 2009 respectively. Overall 47 calves have been born from the year 1989 to the end of the study i.e. 2017, out of which 17 died (Table 2).

**Table 2:** Year-wise calving and death of rhinos in RRA, Dudhwa National Park

Calving Year	No. of Calving	Male	Female	Unknown Sex	Died			Surviving
					Male	Female	Unknown Sex	
1989	4	-	2	2	-	1	2	1
1991	2	1	-	1	-	-	1	1
1992	2	1	1	-	-	-	-	2
1994	2	-	1	1	-	-	1	1
1995	1	-	-	1	-	-	1	-
1997	3	1	2	-	1	-	-	2
1998	1	1	-	-	1	-	-	-
1999	3	-	-	3	-	-	2	1
2001	1	-	1	-	-	-	-	1
2002	3	1	1	1	-	-	1	2
2004	2	-	-	2	-	-	-	2
2005	2	-	2	-	-	-	-	2
2006	2	2	-	-	-	-	-	2
2007	4	3	-	1	-	-	-	4
2008	1	-	-	1	-	-	-	1
2009	2	1	1	-	-	-	-	2
2011	3	2	-	1	1	-	-	2
2012	3	-	2	1	-	2	1	-
2013	2	1	-	1	1	-	-	1
2014	4	1	1	2	-	-	1	3
<b>Total</b>	<b>47</b>	<b>15</b>	<b>14</b>	<b>18</b>	<b>4</b>	<b>3</b>	<b>10</b>	<b>30</b>

(Source: Office of the Deputy Director, Dudhwa National Park)

In 2017, after the death a dominant old male Bankey (Fig. 3) and a calf, the population size comprised 32 individuals (11 males, 13 females and 8 of unknown sex). Hence, present sex ratio between male and female is about 1:2 excluding individuals whose sexes have not been confirmed. Presently, 32 rhinos living in 28.11 sq km area give a density of approximately 0.878 rhino/km<sup>2</sup>. About 33 years (1984-2017) duration of breeding, a total 47 calves were born out of which 30 are surviving. Hence, the vital index (birth-death ratio) will be as under:

$$\text{Vital Index} = \text{Birth/Death} \times 100 = 47/17 \times 100 = 276.470$$



**Fig. 3.** A dominant male rhino, Bankey (died on 29.11.2017)

The current vital index (276.470) indicates that the population will increase in future because during 29 years under existing conditions the realized natality is greater than the realized mortality. However, the rhino rehabilitation programme very clearly indicates the success in case of sub-adult individuals and failure in case of old aged individuals. There has been no causality in translocation of sub-adult females whereas the adult females died. Further, these sub-adult females only have contributed to breeding.

A new area for creating the satellite rhino population has been established in Bhadi-Churella sector of Belrayan Range in Dudhwa National Park. The new RRA fulfills the basic need like adequate forage availability, wallows, shade of woodland for resting and calving and free movement. The area comprises Sal and Mixed forests (2,416.36 ha), Grassland (1,203.68 ha) and Wetland/Swamp (129.00 ha). The experiences from first phase of rhino rehabilitation programme were utilized in translocation of rhinos to newly developed RRA-2 at Bhadi-Churella sector of DNP. The translocation of 4 rhinos (1 male and 3 females) from RRA-1 to RRA-2 was started on April 10, 2018 and successfully completed on April 13, 2018.

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