

# A STUDY ON THE POPULATION STATUS AND CONSERVATION APPROACH FOR *Rhinoceros unicornis* IN PABITORA WILDLIFE SANCTUARY, ASSAM, INDIA

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## Introduction

North-East India is noted for its rich biodiversity, and Assam itself is famous for its population of one-horned rhinoceros (*Rhinoceros unicornis*), one of the most threatened mammalian species on earth. Unfortunately, the population of this precious animal, which is found in some protected areas of Assam and West Bengal, is decreasing at an alarming rate. In Assam, one-horned rhino is found in Kaziranga National Park, Manas National Park, Orang National Park and Pabitora Wildlife Sanctuary, with a total population of around 1,676 individuals (Kaziranga NP: 1,552; Orang NP - 46; and Pabitora WLS - 78). Out of these, the rhino population in Pabitora Wildlife Sanctuary has the highest density in Asia, at four rhino per km<sup>2</sup> (Talukder & Mahanta, 1994). Though Pabitora Wildlife Sanctuary is small in area, its grassland area provides a conducive rhino habitat for a significant population, but it receives little attention in terms of infrastructural inputs and research.

## Study area

Pabitora is a small wildlife sanctuary covering an area of 38.81 km<sup>2</sup> situated on the southern bank of the River Brahmaputra in Morigaon and Kamrup Districts of Assam. Until 1971, the area was a grazing reserve with encroachments by immigrant settlers. It was upgraded to reserved forest status in November 1971, at which time it covered an area of 15.84 km<sup>2</sup>. In 1987, the State Government of Assam declared the area a wildlife sanctuary. In 1998, after 11 years, the Pabitora Wildlife Sanctuary, was formally notified with an area of 38.81 km<sup>2</sup>.

The sanctuary is mainly an alluvial flood plain of the River Brahmaputra and most of the area

is seasonally flooded by the Brahmaputra and by Kallong, a small tributary of it. It lies at 26°12'-26°15' N latitude and 90°2'-90°5' E longitude. The altitude ranges between 15- 25 m above sea level. The average annual rainfall is 2,500-3,000 mm. Climatic conditions are those of the temperate zone with dry winters and hot summers, followed by heavy rains. The annual average minimum and maximum temperatures range from 9 °-38°C and the humidity ranges from 75% to 95%.

Grassland covers 72.25% of the total area of the sanctuary, mainly *Imperata cylindrica*, *Saccharum spontaneum*, *Erianthus ravanai*, *Phragmites karka*, *Arundo donax*, etc. Trees cover 13.09% of the total area, of which *Albizia procera*, *Barringtonia acutangula*, *Trewia nudiflora* etc. are established and regenerating species. Swampy areas cover almost 14.66% of the area, of which 10.6% is perennial and 4.05% swamp.

## Materials and methods

The methods of assessment were very simple. The entire Pabitora area was surveyed over a period of three years (2000-2002) to study the rhino poaching trends. Visits to the fringe villages were made to collect data on straying rhinos, grazing, etc. A questionnaire was used to collect the data from the villagers. Census figures, data on poaching and rhino mortality were collected from the forest department. The problems of Pabitora were discussed with the authority/manager.

## Results and discussion

In 1971, there were only 8 rhinos in the Pabitora Wildlife Sanctuary. From that year onward, an increasing trend prevailed in the sanctuary and the 1995 census recorded a rhino population of

68. The rhinos now number 78 (1999 census). Between the 1995 census and the 1999 census 12 rhinos died of natural and other causes. But

in spite of such losses the rhino population of Pabitora Wildlife Sanctuary is noticeably on the increase.

**Table 1: Population status of Rhino in Pabitora WLS**

Census year	Adult			Sub-Adult			Calf	Total
	Male	Female	Unsexed	Male	Female	Unsexed		
1993	18	21	1	1	2	2	11	56
1995	11	28	3	3	1	13	9	68
1999	-	-	-	-	-	-	-	78

### Mortality of rhinos

The forest department carried out an extensive census from 1989 to 1997 which revealed the mortality trend of rhinos in Pabitora Wildlife

Sanctuary. From 1989 to 1992, mortality as a result of poaching was less, but from 1993 onwards the mortality has been gradually increasing, which reveals an upward trend of poaching.

**Table 2: Mortality of Rhinos in Pabitora Wildlife Sanctuary**

Year	Poaching			Natural causes				Grand Total
	Bullet	Electric trap	Total	Illness	Infighting	Drowning	Total	
1989	1	2	3	1	-		1	4
1990	2	-	2	2	-		2	4
1991	1	-	1	-	1		1	2
1992	1	2	3	-	1	1	2	5
1993	4	-	4	-	-	1	1	5
1994	-	4	4	-	2		2	6
1995	2	-	2	1	-		1	3
1996	-	4	4	1	1		2	6
1997	2	-	2	1	-		1	3

It is therefore clear that rhino mortality has been more greatly affected by poaching than by natural calamities. In recent times the Government has developed extensive protection measures to stop/reduce poaching, but they have not succeeded in reducing the mortality of rhinos. The general behavior of the rhino also makes it easier for the poachers. Rhinos usually follow a particular trail or route for their daily activities and the poachers track these routes and take the animals with the help of electric

traps, pitfalls, poison and guns. In addition, the rhino's tendency to stray out of the sanctuary to forage, especially at night, also helps the poachers. About 30% of the rhinos in the sanctuary used to stray outside the core area to forage in the fringe area. The poachers take the opportunity to kill the rhinos. Pabitora is surrounded by villages on all sides, which facilitates easy access for the poachers to enter the sanctuary. The Forest Department has set up many camps outside the sanctuary to try to

control the situation, but despite all these efforts around 75% of the total rhino poaching occurs outside the sanctuary area.

But in spite of all this, the population of rhinos in Pabitora has still continually increased because of the habitat suitability and good breeding potential.

Since up until 1971 the sanctuary was a "grazing reserve" for the surrounding villages, grazing by domesticated animals is a major problem in Pabitora Wildlife Sanctuary. More than 2,500-3,000 cattle presently graze inside the sanctuary. Due to grazing pressure, one third of the rhinos stray outside the sanctuary every day, and weeds have also invaded one-third of the area. Illegal collection of thatch and wood from the sanctuary is also a common practice, which has remained unchecked over the years and places additional pressure on the sanctuary resources.

Moreover, the annual floods in Pabitora Wildlife Sanctuary are the most severe of all the natural calamities that affect the area. The flood waters submerge up to 90% of the area during the rainy season, which compels the animals to take shelter in nearby villages and on small hillocks like Buraburi Pahar. Young calves can be swept away by the strong current and killed. This situation also makes the rhino population more vulnerable to poaching.

### **Rhino conservation approach**

In 1954, the Assam Rhinoceros Prevention Act gave protection to *Rhinoceros unicornis* in all important areas of the state and the Act was strengthened with the enactment of the Indian Wildlife Protection Act, 1972.

The Indian Action Plan for Rhino Conservation has the following components (Talukder, 1999):

1. Habitat protection and restoration
2. Creation of corridors for migration
3. Proper communication network
4. Anti-poaching squads and strike force
5. Training of wildlife personnel
6. Arms training for protection staff
7. Research and monitoring
8. Eco-development works
9. Education and public awareness program
10. Relocation of enclaved villages through

persuasion

11. Veterinary care
12. Translocation of animals for rehabilitation
13. Development of intelligence networks
14. Rewards for good work and case detection.

However, most of the components of the action plan are not functional and cannot be executed due to financial and other administrative constraints in the state of Assam. This is particularly true for Pabitora Wildlife Sanctuary, which has always been given low priority in comparison to the other rhino-occupied areas of the state. The present state of habitat management in Pabitora consists only of yearly uncontrolled and unplanned burning of grassland. From the infrastructure point of view, the sanctuary stands at a very low level, especially regarding the communication network, patrol vehicles, anti-poaching squads, etc. Proper law enforcement always depends upon the manpower and infrastructure. Unlike the other rhino areas in the state, one of the main deficiencies in Pabitora is the lack of research and monitoring. Insufficient accurate information about the status of the rhino population weakens the conservation strategies for Pabitora Wildlife Sanctuary.

Rhinos are poached for their horn, which has great value in the international market. It is used in traditional medicines in China, Taiwan, Japan and South Korea (Nowell *et al.*, 1992; Loh & Loh, 1994).

The primary goal in most of the protected areas of Assam, including Pabitora, is to protect rhinos from hunting and killing, which can be properly done by enforcing the laws, deploying personnel and building up the infrastructure.

But the ecological factors in wildlife management has not been properly reviewed in Pabitora Wildlife Sanctuary. Habitat conditions in Pabitora have deteriorated significantly in the last decade (Talukder, 1994). Although anti-poaching activities are important, so is the improvement and maintenance of the habitat, as they are also vital for protection. It has been observed that the ideal rhino habitat should comprise 50% plain grassland for feeding and grazing, 25% should be suitable for wallowing during the hotter part of the day and to protect the animal from the bites of flies and insects, and 25% should contain forest highlands where

the animals can seek shelter and shade during the hot summers and times of flooding (Sharma & Bhattacharyya, 2000).

The grazing by domestic cattle inside the sanctuary is a major problem which must be stopped immediately in order to preserve the sanctuary. Prohibition of grazing is important for protecting the animals from contagious diseases like anthrax, rinderpest, etc., which can wipe out entire rhino populations. Moreover, grazing also encourages the invasion of dangerous weeds which can spoil the rhinos food base. Therefore, drastic measures should be taken immediately to stop the entry of cattle into the sanctuary.

Floods are natural calamities which are very difficult or impossible to check. To save the rhinos and other animals in the sanctuary from the floods, the construction of artificial highlands in the low-lying areas is a good strategy to provide shelter for the wildlife, as practiced in Kaziranga National Park.

The Government of Assam has already taken various measures to save this precious animal by enacting laws and developing appropriate infrastructure in the rhino-occupied areas of the state. But the approach is not uniform, as seen in the case of Pabitora Wildlife Sanctuary, even though it harbors a population of rhinos with the highest density in Asia. The lack of proper initiative to implement legislation of acts and other programs has led the rhino population in Pabitora to a vulnerable state. NGOs, both national and international, can play an important role in managing the sanctuary by helping to develop the infrastructure, create awareness among the local communities, and promoting research. It is now time for the State Forest

Department to come forward and cooperate with all concerned to save the rhino population of Pabitora by tapping every possible resource to give maximum inputs to the sanctuary.

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