

Threats to the greater one-horned rhino and its habitat, Pabitora Wildlife Sanctuary, Assam, India

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Abstract

Pabitora Wildlife Sanctuary in Assam, north-eastern India, has the highest density of the Indian one-horned or greater one-horned rhinoceros, *Rhinoceros unicornis*, anywhere in its range. This area, dominated by moist savanna grasslands, was designated a wildlife sanctuary in 1987. With around 80 rhinos, Pabitora is an important habitat for this endangered species. However, the area is facing serious threats such as encroachment, road construction, overgrazing, poaching, high floods and increasingly heavy tourism. This paper discusses these threats and issues and suggests solutions.

Additional key words: *Rhinoceros unicornis*, grassland, flooding, poaching, siltation

Résumé

Le Sanctuaire de la Faune de Pabitora en Assam, au nord-est de l'Inde, comprend la plus forte densité de rhinocéros unicorns indiens (*Rhinoceros unicornis*) de toute son aire de répartition. Cette région, dominée par une savane de prairies humides, a été désignée comme sanctuaire pour la faune sauvage en 1987. Avec quelque 80 rhinos, Pabitora est un habitat important pour cette espèce en danger. Pourtant, la région fait face à de graves menaces comme l'empiètement, la construction de routes, le surpâturage, le braconnage, les inondations et un tourisme de plus en plus envahissant. Cet article discute ces menaces et problèmes et suggère des solutions.

Mots clé supplémentaires : *Rhinoceros unicornis*, prairies, inondations, braconnage, sédimentation

Introduction

Pabitora Wildlife Sanctuary (26°14'–16' N, 91°57'–92°05' E) in Assam, north-eastern India, is a known stronghold of the endangered Indian one-horned or greater one-horned rhinoceros, *Rhinoceros unicornis* (Vigne and Martin 1984, 1998; Choudhury 1985, 1991, 1997; Talukdar 2000;). It also has the highest density of *R. unicornis* anywhere in its range. Located in Morigaon District (with a small portion also in Kamrup Metropolitan District) on the south of the Brahmaputra River, it covers 38.8 km² (fig. 1). The habitat is dominated by moist savanna grassland with patches of woodland and marshy pockets, and a large hillock. Useful information on Pabitora, including the now-shelved project of introducing the critically en-

dangered subspecies of the brow-antlered deer, *Cervus eldi eldi*, is found in Choudhury (1987, 1989a,b,c,d, 2002), Rahmani et al. (1988) and Barua (1994).

Pabitora has an interesting history; in the early part of the last century it was neither a reserve forest nor an identified habitat of rhinoceros. The area was used for grazing domestic cattle and buffaloes and it was recorded in the revenue department as 'professional' and 'village' grazing reserves. In the 1960s the villagers of Raja Mayong, Lunmati and Burha Mayong demanded that the area be declared a reserve forest to prevent migrants from encroaching in it (Bengali Moslems and Hindus from the former eastern Bengal and East Pakistan, now Bangladesh) and also to protect the rhinos. In 1961/62 the Nagaon For-

est Division confirmed the presence of a few rhinos in the area. The villagers extended their full support and continued to urge the government to protect the area. In 1971 it was declared a reserve forest; in 1987 it was designated a wildlife sanctuary. The de facto area of the sanctuary was about 16 km² of grassland interspersed with wetland and a large patch of woodland. At the time of final notification in 1998, the sanctuary area was increased to 38.8 km², which included 15.85 km² of de facto sanctuary, 12 km² of Raja Mayong Reserve Forest (RF) and about 11 km² of other government land, called *khas* land by the revenue department (fig. 1). Inclusion of the additional area was finalized after all the villagers' claims and rights over the land had been settled.

Rhinos in Pabitora do not share their habitat with many other large mammal species. Those present include the wild pig (*Sus scrofa*), jackal (*Canis aureus*), and feral water buffaloes, among which is probably at least one pure wild bull of *Bubalus arnee* (= *bubalis*) that came during high floods. The sanctuary is known for its rich birdlife. In the Raja Mayong hills, leopard (*Panthera pardus*), muntjac (*Muntiacus muntjak*) and rhesus monkey (*Macaca mulatta*) are found besides various other smaller species.

This article discusses serious problems faced by this important rhino habitat and presents possible solutions.

Methods

Since the 1980s I have been visiting this wilderness, which is only about 48 km by road from Guwahati. I obtained data presented here at first hand as a researcher, as an activist of The Rhino Foundation for Nature in North-East India, and as an official of the Department of Environment and Forests of the Assam government. Census figures are departmental counts carried out by direct counting from elephant back, in which I was also involved either directly or indirectly.

The problems

The main objective of this work was to highlight the serious problems that have threatened a globally important rhino habitat and their possible solutions.

Area of the sanctuary: Raja Mayong RF is actually a rocky hillock unsuitable for rhinos although a few animals occasionally climb the slopes, sometimes ending up dead among the rocks (see photo). Khas land on the other hand is excellent for rhinos as it is in the floodplain and consists of wetland and grassy tracts. By the time formalities demarcating the sanctuary were finalized, much of the khas land was already under human occupation, both permanent and temporary, by farmers in adjacent villages, who had started wet paddy cultivation and intensive fishing. As a result this area of 11 km² cannot be used as a

sanctuary although it is designated as such. Human occupation and intensive cultivation as well as the jutting shape near Mayong of the Murkata part of the sanctuary make it difficult to reclaim this area. But the Kamarpur khas land, the area that connects the original sanctuary with Raja Mayong RF, should be cleared of human activity (fig. 1).

Growing rhino population: Table 1 shows the increase in rhino population in Pabitora. The rhino



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This rhino got caught in the rocky terrain—and, unable to extricate itself, died.

habitat remains the original 15.85 km² for around 80 rhinos. The increase in area has not helped the animals. The rhinos regularly stray out at night to nearby fields, which include both khas land that is part of the sanctuary and private land. While the growing number of rhinos is certainly not a problem, as additional rhinos may be translocated, the lack of additional habitat and the failure to get hold of the added area of the sanctuary are major issues.

Roads: An all-weather road (closed only during high floods) passes through the western boundary of the de facto sanctuary. An old, infrequently used road being

reconstructed will pass through the sanctuary at three places, posing a threat to the sanctuary and its rhinos. This road will not only disturb the animals but may also cause a few accidents with them. It will, however, be an important road, connecting Guwahati with Morigaon and Nagaon through Chandrapur and Mayong, and it will be shorter than the existing road. The bridge over Kolong River is complete and once this road is constructed visitors to Pabitora from Guwahati will use it. Busy traffic is expected on this road.

Mortality: Even the slightest negligence can result in rhinos getting killed. For instance, a mother

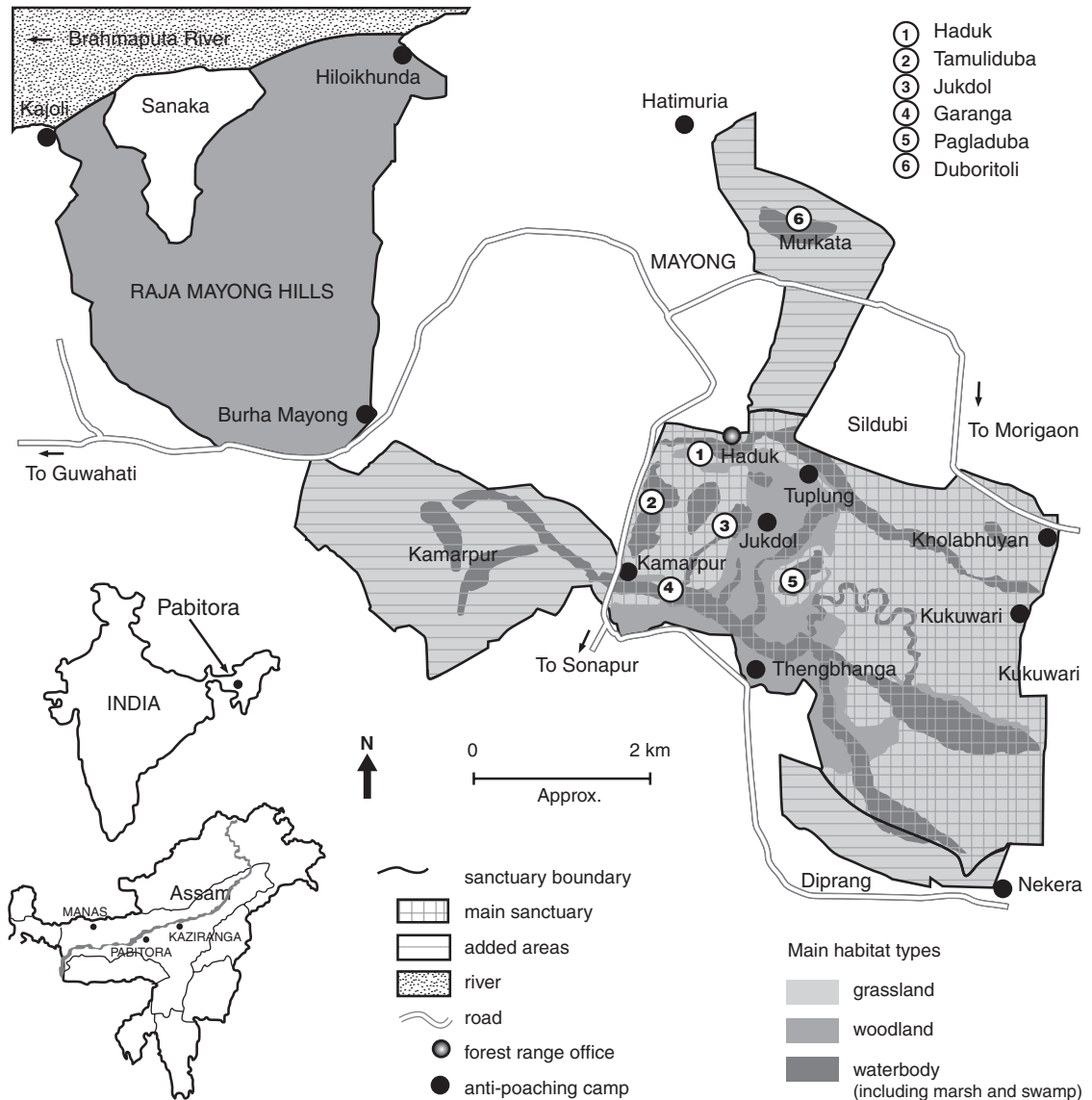


Figure 1. Pabitora Wildlife Sanctuary showing habitat types.

Table 1. Estimated number of rhinos in Pabitora Wildlife Sanctuary according to census

Year	Adult			Subadult			Calf	Total
	Male	Female	Unidentified	Male	Female	Unidentified		
1961–62	–	–	–	–	–	–	–	a few
1969–70	–	–	–	–	–	–	–	20
1993	18	21	1	1	2	2	11	56
1995	11	28	3	3	2	13	9	69
1999	17	26	0	7	5	0	19	74
2004	14	33	0	5	4	2	21	79

Source of 1961–62 and 1969–70 counts: P.C. Gogoi, Working Plan for Nagaon Division

– no detail is available

rhino with a calf were electrocuted in 2003 during a few hours of slackness by staff. The authorities immediately punished the staff and later suspended the ranger for his overall negligence. Although rhino poaching has lessened in recent years, it still remains a major problem (see photo). Poachers were also nabbed carrying a horn. Table 2 shows the number of rhinos that have died through poaching and other causes (usually recorded as ‘natural’) between 1987 and 2004.

Flooding: Annual flooding is essential for the survival of the alluvial grasslands of Pabitora, but periodic high floods are detrimental. In the 1990s, the worst flood was recorded in 1998; so far since the turn of the century, it was in July–August 2004. During such high floods, the entire de facto sanctuary reels from the effects of the floodwaters. Many rhino calves perish and the grassland is damaged. Two rhinos drowned in 1998 and four in 2004. And when animals move out of the sanctuary during this period they provide poachers with the opportunity to strike.

Table 2. Mortality of rhinoceros in and just outside Pabitora Wildlife Sanctuary

Year	Poaching	Natural death	Total
1987	2	3	5
1988	3	5	8
1989	4	3	7
1990	2	2	4
1991	1	1	2
1992	3	2	5
1993	4	1	5
1994	4	2	6
1995	2	1	3
1996	5	2	7
1997	3	2	5
1998	4	2	6
1999	6	0	6
2000	2	1	3
2001	0	0	0
2002	3	2	5
2003	2	3	5
2004 (to 25 Oct.)	0	5	5

Source: Department of Environment and Forest and The Rhino Foundation for Nature in NE India

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Rhino poaching, although declining, still takes its toll.

Siltation: Although siltation is a natural phenomenon, due to the small size of the sanctuary a major crisis could result during the drier winter months if waterbodies filled up. In the early 1990s Tamuliduba was a fine wetland, but it has now become a seasonal marsh that virtually dries up in late winter. For rhinos, the year-round presence of waterbodies is essential.

Vanishing grassland: Pabitora's savanna grassland is vanishing fast. Grazing by domestic cattle and buffalo is the main pressure on the grassland; next is villagers' illegal collection of grass and reeds for building material and for sale. Since the 1998 high floods, the grassland has not recovered as prolonged waterlogging caused much damage. Subsequent heavy grazing by domestic stock, numbers of which are also increasing yearly and now probably are 4000–5000 head, also has not allowed it to regenerate. The situation has become so precarious that during the pre-monsoon period rhinos take shelter in the woodland in the centre of the sanctuary. The decay in grassland habitat has also resulted in a sharp decline in swamp francolin (*Francolinus gularis*) population (Choudhury 2000).

Fast-growing tourism: Due to Pabitora's closeness to the city of Guwahati, the capital of Assam State with a population of almost 1 million people, a large number of domestic day tourists throng the sanctuary every winter. Most of these visitors are picnickers who like to play loud music, causing noise pollution, and who leave behind a heap of refuse including plastic materials. Up to a hundred buses were counted on Sundays during winter.

Illegal fishing: While illegal fishing is a perennial problem in Pabitora, a large wetland, Garanga, is used by a commercial contractor who got the lease from the Fisheries Department against the provisions of the Wildlife (Protection) Act 1972 as amended in 2002.

Suggested solutions

Area of the sanctuary: Due to stringent provisions of the Wildlife (Protection) Act, modifying the boundary of the sanctuary will not be an easy task. Hence, the authorities must take urgent steps to take full control of the 11 km² of khas land that was designated as part of the wildlife sanctuary. The part of khas land that is intensively cultivated and inhabited should be treated as an intensive tourism zone in the management plan and some of the villagers then made stakeholders in tourism projects so that they do not lose what they have invested but stand to profit from such projects. Privately

owned elephants may also be allowed to carry tourists in the tourism zone. The small encroachment in the Dibrang area should be sorted out by vigorously pursuing the case that is now in the court.

Growing rhino population: A detailed ecological study is needed to determine the carrying capacity of Pabitora. The 16-km² area of de facto sanctuary cannot support the growing number of animals for an indefinite period. Hence a comprehensive plan should be mapped for translocating rhinos, such as to Laokhowa and Burhachapori Wildlife Sanctuaries and Manas National Park. The successful translocations in Nepal may be taken as examples.

Roads: The all-weather road that passes through the western boundary of the original sanctuary should be realigned along the existing road through the southern and eastern boundary for vehicle traffic. The road from Guwahati that will pass through the sanctuary at three places should be redirected at the north-east corner of the sanctuary so that it does not cut off the small area on the other side of the road near Kholabhuyan. For a small sanctuary like Pabitora, even a tiny chunk is important. Little probably needs to be done about where the road cuts across at Burha Mayong and Murkata as the impact on the sanctuary will not be much. Speed-breakers and checkgates should be placed at suitable places on the road.

Law enforcement: Exemplary punishment of erring staff should be made as the need arises, as was done in 2003 after the electrocution of two rhinos so that there is no room for complacency. The anti-poaching network should be strengthened and provided with better arms; personnel should be trained like the armed forces in how to use arms. Non-governmental organizations such as The Rhino Foundation for Nature in NE India and Aaranyak should continue to maintain their network of informers to supplement government efforts on anti-poaching.

Flooding: The high floods of 1998 and 2004 showed the important role a high platform of artificially raised ground plays in saving marooned animals. However, the present mounds were not properly constructed and are not sufficiently high. There should be strict monitoring of such vital works and new highlands should be constructed at least a metre higher than the highest flood level. Responsibility should be predetermined, in case of any negligence on such issues. No measures need to be taken to control floods as the alluvial grasslands depend on them.

Siltation: Rhinos need a permanent waterbody as

well as marsh in winter when the seasonal wetlands become dry. To save the perennial wetlands from drying out in winter, selected sites should be desilted yearly. As Pabitora is a small area, such regular habitat manipulation is possible.

Vanishing grasslands: For the savanna grassland to recover to its pre-1998 condition and for its long-term survival, electric fencing may be the only option. The Rhino Foundation for Nature in NE India prepared a proposal a few years back, which also had the endorsement of the Forest Department, but it was not funded, mainly because it proposed only partial fencing. But the reality is that fencing the entire area is neither possible nor necessary. Cattle from a particular village enter from the boundary contiguous with that village or through neighbouring areas only. And the pressure is not equal from all sides. If the main entry sides are fenced off, other areas such as water areas where fencing is not feasible could be guarded. The purpose of fencing should not be to completely stop movement but to halt degradation of the grassland through overgrazing.

Fast-growing tourism: Tourism should not be discouraged even where it causes some damage; areas with negligible or no tourism become more vulnerable to poaching, encroachment, illegal felling and illegal fishing, and staff become inactive and complacent. Villagers living at the fringe of the sanctuary do not realize the importance of the area nor do they presently benefit in any way. Tourism acts as a monitoring mechanism; the idea is to regulate it. Areas such as Murkata should be developed as intensive tourism zones where village families whose farms would be affected can engage in economic activities such as providing tourists with elephant rides and decent accommodation, in homes or tented camps. Stakeholders should include the private sector, as wholly government-controlled tourism projects may not include or encourage fringe villagers. Sites for picnickers should be identified on the edges of the tourism zone.

Illegal fishing: To curb illegal fishing in the sanctuary, surprise visits by senior officials are recommended. The problem of the illegal lease for commercial fishing in Garanga should be sorted out permanently in a court of law.

Discussion

Pabitora is the second most important rhino area in India, after Kaziranga, and its problems must be

viewed seriously and addressed before it is too late. Areas such as Murkata and Kamarpur khas land were scarcely occupied in 1987 when Pabitora was made a reserve, but delays in disposing of claims and rights for a decade have resulted in encroachment and intensive human activity. Converting additional areas, especially the khas land portion, into tourism zones with villagers as stakeholders appear to be the only likely option. The time has come for a comprehensive translocation plan to move a specified number of rhinos every year. The roads should be realigned for the greater long-term interest. Anti-poaching networks should be strengthened and NGO support should continue. Since the mid-1990s, various NGOs have supplemented government efforts, which have improved anti-poaching activities. Plans to tackle high floods by constructing areas of high ground should be on management's agenda.

For the long-term survival of the grasslands, select stretches should be fenced. In 1993–94, due to stringent measures by sanctuary authorities, the number of cattle grazing in the sanctuary was brought down from 4000 to 300 a day (Barua 1994). Tourism should be encouraged in a big way, and it should involve the private sector. Illegal fishing is often a bone of contention between villagers and the authorities, as the former feel they have been forced to give up fishing rights, only to see others fish illegally. Hence there is need for stringent monitoring. Pabitora is surrounded by at least 21 villages with more than 10,000 inhabitants, so the threat of encroachment is constant.

The Department of Environment and Forests recently prepared a five-year management plan (Bora 2003); although modifications may be required from time to time, its implementation should be vigorously pursued.

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