
DEDICATED FIELD STAFF CONTINUE TO COMBAT RHINO POACHING IN ASSAM

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RESUME

L'état d'Assam dans le Nord - Est de l'Inde, abrite 69% des grands animaux à come unique du monde, que sont les rhinos, *Rhinoceros unicornis*. Aujourd'hui, la population totale des rhinos en Assam, est estimée à 1406 individus (voir tableau 1). Ce rapport examine les récents incidents du braconnage sur les quatre principales zones des rhinos en Assam (voir le tableau 2 et la carte) et souligne les efforts consentis pour la protection de ces rhinos. La nécessité d'étendre les aires de conservation de la faune en vue de réduire le nombre de rhinos isolés peut être aussi remarquée. Les problèmes majeurs autour de la conservation des rhinos, liés au manque de fonds pour la lutte contre le braconnage, le maintien et le développement, sont décrits avec un résumé des principales requêtes fournies par les agents de terrain, ainsi que des suggestions pour prévenir la croissance du braconnage. Ce document est basé sur un travail de terrain, conduit en Inde en Janvier 1998.

INTRODUCTION

The state of Assam in north-east India is home to 69% of the world's wild greater one-homed (or Indian) rhino, *Rhinoceros unicornis*. Today's population in Assam totals an estimated 1,406 rhinos (see Table 1). This paper will examine recent poaching incidents in Assam's four main rhino areas (see Table 2 and see map) and will highlight efforts to protect these rhinos.

The need to expand wildlife areas in order to reduce the number of straying rhinos will also be looked at. The major problems facing rhino conservation which result from lack of funds for anti-poaching, maintenance and development, will be outlined, with a summary of the main requirements as provided by field staff and suggestions to prevent an increase in poaching. This paper is based on fieldwork carried out in India in January 1998.

Table 1. Estimated number of rhinos in Assam.

	Kaziranga	Pabitora	Orang	Manas	Laokhowa	Other areas	Total
1993	1,164*	56*	100	60(?)	0	25	1,405
1995	1,200	68*	90	20	0	20	1,398
1997	1,250	76*	45	5	5	25	1,406

* Census

NB These figures exclude the rhinos in the Assam State Zoo.

RHINO POACHING AND EFFORTS TO STOP IT

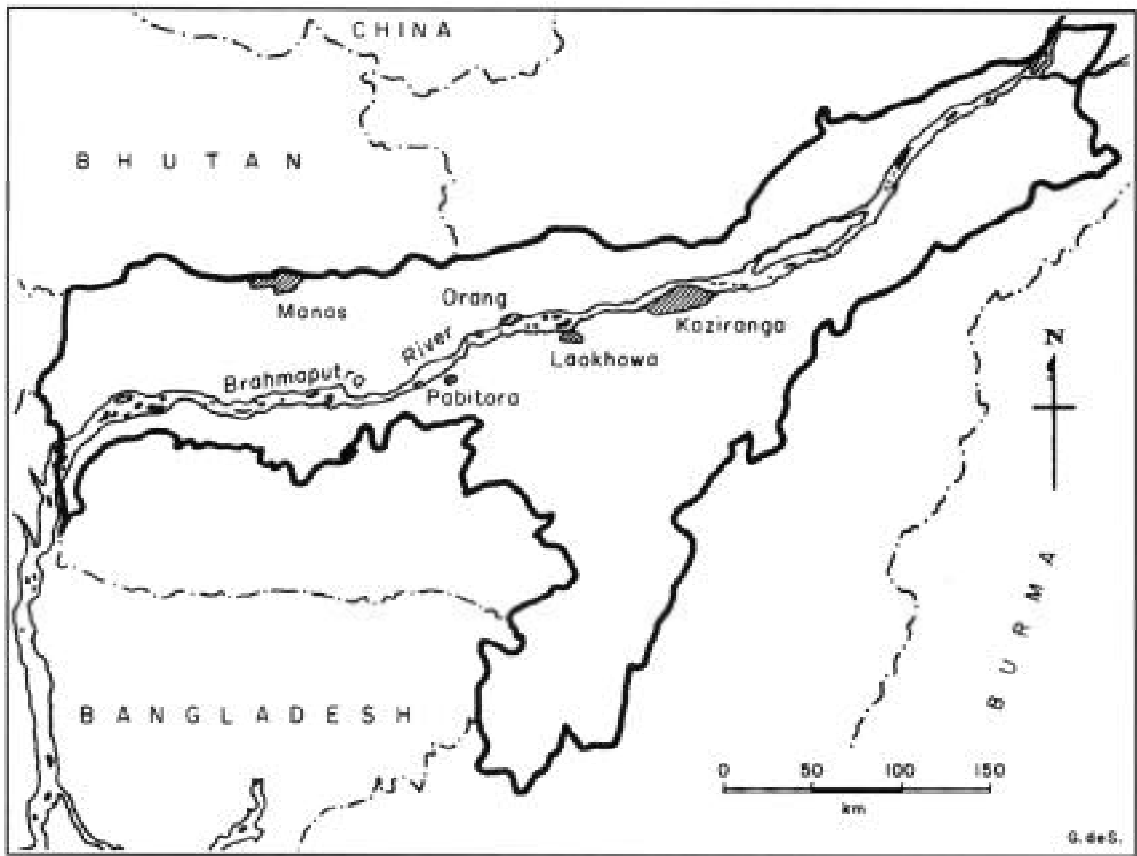
Kazingira National Park

There are approximately 1,250 rhinos in Kaziranga National Park, which is divided into west, central and eastern ranges, and each range has a range officer in charge of field staff and anti-poaching efforts. In 1997 only 12 rhinos were poached compared with 26 the year before. This was the lowest number of rhinos

poached since 1980, according to Assam Forest Department statistics (see also Table 3). The calibre of the range officer is pivotal to the Kaziranga National Park levels of poaching (see Table 4). In the past few years three of the finest range officers in the state have been posted there, which helps to explain the drop in poaching. In the western range, an excellent Range Officer, P. Sharma, in charge from 1993 to late 1997, reduced rhino poaching from 25 in 1992 and 20 in 1993 (when he arrived) to an average of five a year from 1994 to 1997. Two main strategies

Table 2. Number of rhinos poached in Assam.

	1993	1994	1995	1996	1997
Kaziranga	40	14	27	26	12
Pabitora	4	4	2	5	3
Orang	1	6	9	10	11
Manas	22	4	1	0	0
Laokhowa	0	0	0	0	0
Other areas	3	2	2	1	2
Total	70	30	41	42	28



Assam protected rhino areas in 1997

were to improve anti-poaching procedure and lift staff morale. He moved more anti-poaching patrol camps to the south boundary (30 on the fringe and 8 inside) and increased patrols to cover a maximum area, as opposed to “ambushing” (sitting and waiting), which was the previously preferred method. While his staff used elephants to patrol the whole area once a week, each morning they would check the boundary on foot. Sharma always kept the southern bank road clear for quick access, as this was vital to stop poachers. He

also kept paths clean. According to Sharma, patrol paths need to be 2m wide and straight in order to see 200m ahead. Normally six labourers are required to clear a 1km path twice a year- in May before the monsoon and in October after the monsoon. When there were no funds for labourers, Sharma, his driver, the grass cutters and mahouts would clear it themselves, and Sharma would provide a big meal afterwards. Thatch is another essential requirement to prevent the camp roofs from leaking, and Sharma

always checked that thatch was collected. He motivated his men who increasingly felt anti-poaching was vital to save rhinos. Particularly important, his staff learned that no one would be placed under suspension if rhinos were poached, as before and in turn they became a motivated workforce.

Another method of reducing poaching was an improved intelligence network in the villages south of the range. An example of this occurred in July 1997. Two gunshots were heard early in the morning to the west of the Park and one of the carcasses was quickly found with its horn removed. The following morning two informers visited the Range Officer and told him where the poachers were hiding. At midnight five field staff and police armed with seven guns set off for the small reed house in the hills, 15km south of the Park. There, they found two .303 rifles, twenty-four rounds of ammunition and two horns, and arrested seven men (four local Karbi "tribals" and three from Manipur state). A Naga living in Dimapur town bordering Assam in Nagaland state had provided the guns. The

trying to poach a rhino in April 1994, during Sharma's tenure. Another was arrested crossing the river, but has since been released — a continuing problem with

In the Kaziranga central range, credit must be given to the Range Officer, B.N. Talukdar, for some outstanding anti-poaching encounters during his short tenure in 1995 and 1996. In the two months before his transfer, no poaching occurred. A third distinguished Range Officer, D.D. Boro, was transferred from the eastern range in December 1996 to the more important central region, and replaced Talukdar. As well as excellent patrolling, he improved the informant network with the help of NGO funding. For example, in April 1997 four informers told Boro about four poachers digging a pit to trap a rhino. In the encounter, the poachers fired and the field staff retaliated; one Assamese was killed. The informers were paid 1,000r (\$28) each while 4,000r (\$110) was given to the staff, the doctor for the post mortem and for burial costs. Boro's next encounter with poachers was in August 1997 when a Forest Guard saw footprints near the southern boundary; 12 staff in groups

Table 3. Rhino mortality in Kaziranga.

	Poaching			Natural death	Total mortality
	Pit	Gunshot	Total		
1995	6	21	27	53	80
1996	1	25	26	52	78
1997	6	6	12	48	60

Table 4. Encounters with poachers in Kaziranga.

	Poachers killed	Poachers arrested	Arms recovered	Ammunition recovered	Horns recovered
1995	4	29	4	25	0
1996	9	19	7	71	0
1997	6	18	7	39	2

poachers were planning to take the horns back to him. This was one of the more successful captures in Kaziranga's history; the poachers are still in jail while the case continues. Sharma paid the two informers 10,000r (\$275) each. This capture reflects the importance of both good intelligence and close police relations, as outside the Park, police must be present on any raids. Both intelligence and police relations have improved around Kaziranga.

Sharma also helped to stop poaching from the north. An important poaching gang member living on the north side of the Park was killed in the Park while

of three silently patrolled the area. Four poachers with two .303 rifles began shooting, so the staff had to retaliate, killing one man who was carrying two tyre tubes (to cross a river), a torch, rice and a tarpaulin to sleep under. Through an informer, after one and a half months Boro found the dead poacher's wife who, with his children, initially denied recognizing his photo. Finally, the poacher's sister gave the names of two other farmers in the Karbi village who had been involved. Boro held a meeting in the village and the villagers themselves expelled the poachers. In December 1997 informers told Boro that more poachers were coming. He strategically placed his staff on the south boundary

Photo Credit: Lucy Vigne



the legal

The tourist platform in the background is a popular spot for viewing rhinos in Kaziranga, especially for people visiting by buses.

and at 1 :00am the staff saw torchlight and three poachers. One of the staff accidentally coughed and the poachers started firing. The ten forest guards were forced to retaliate until, 15 minutes later, there was no more firing from the poachers. All three were killed; they were Nagas. One had a .303 rifle while the others carried an axe, a bag of clothes, a torch, knife, and some rice. Boro paid the two informers 1,000r (\$28) each for their information and 6,000r (\$165) were spent on the poachers' burials, fuel, and for a staff party. Informers helped combat all these poaching attempts in Boro's range in 1997, demonstrating that intelligence is vital in preventing rhino poaching.

Although Boro is known to be tough in protecting his rhinos, he maintains a good rapport with the villagers. Like many villagers, he is a "tribal" himself - a member of Assam's Bodo tribe - and he relates to the villagers' problems. He threatens to kill poachers in self-defense if they enter the Park, but he also rewards them if they provide information. In this way, former poachers assist to break up poaching rings. Boro is dedicated to his work. Despite a monthly salary of 6,000r (\$158) in early 1998, he says, "My job is far more important than most as I am fighting to save a species". The rangers greatly respect Boro. He listens to his men and supports them as best he can; the staff are thus motivated under his strong leadership. In 1997 he built several temporary

camps for night patrollers and with limited funds he also put up three temporary watchtowers in the central grasslands which, he says, greatly contributed to reducing rhino poaching in his range in 1997. These temporary structures needed replacing by 1998, which Boro had been unable to do at the start of the year due to lack of money.

Another reason for the poaching decrease in Kaziranga in 1997 was because the army was posted near the northern boundary of Kaziranga in January of that year to control militant activity. It had been suggested that poachers and militants were involved together. Army and police operations, mainly in the form of roadblocks, led to 18 firearms, mostly .303 rifles, being confiscated in 1997 from suspected poachers on the north bank. This assisted in stopping poaching in northern Kaziranga that year. The presence of the army combating insurgents has thus benefited the rhinos.

According to the field staff, poaching may have declined in 1997 due to improved relations with the local people. In 1997 they were given assistance, including the development of wells for drinking water and the donation of footballs. Working from the grass roots up, regular meetings with the villagers are being held for discussions on their needs, and videos are shown to motivate people to protect their rhinos.

Photo Credit: Lucy Vigne



The best way to see rhinos close-up in Kaziranga is on elephant back, as much of the Park is too wet or the grass too high for a vehicle.

Probably the most important reason for the decline in rhino poaching in Kaziranga in 1997 was the excellent anti-poaching work. Reduced poaching since the mid-1990s lifted staff morale, despite the financial shortages and hardships. Since late 1997 there are two new range officers, however, with only Boro remaining from before. It will be a challenging time ahead.

Pabitora Wildlife Sanctuary

About 22 of the 76 Pabitora rhinos presently wander out of the Sanctuary at night to graze due to limited space, but fewer than five rhinos are usually poached annually; thus the population is still increasing steadily. The new Range Officer, M. Barua, is young and dedicated, and he has reduced poaching to three incidents in 1997 compared with five the year before (see Table 5).

The first poaching incident in 1997 was in June after two important anti-poaching patrol camps had been washed out on the eastern boundary by the monsoon; three poachers then entered from the east with a .303 rifle and shot a rhino in a forested central region of the Sanctuary. The camp guards who heard the shot had no batteries for their radio and had to come on foot to

deliver the message, by which time the poachers had escaped with the horn. Informers say the gang leader sold the horn, which probably weighed about 550g, for 190,000r (\$5,234) in Dimapur (Nagaland), and paid his assistant poachers 25,000r (\$689) each, and fishermen, who monitored the staff movements from outside, 5,000-10,000r (\$138-\$275) each.

Then in November 1997 a gang of about ten, estimated by the number of footprints, shot a rhino about 8km west of Pabitora at 8:45pm and took the horn. The poachers had learned that the staff's rifles had been removed briefly for shooting practice. The police did not co-operate in making an inquiry, and the gang-leader is thought to have paid off the officer in charge.

A week later poachers again entered from the east where, due to lack of funds, the two camps still had not been re-built by January 1998. A rhino was poached again in the forested area in the centre of Pabitora. This forest grew up since 1991 when 1km² was fenced off for deer, *Cervus eldi eldi*, to be introduced. The project was cancelled, but the trees, especially *Albizia procera*, grew fast and the Forest Department prohibits tree felling. The area now provides a good refuge for

Photo Credit: Lucy Vigne



Mr DD Boro, Range Officer for Kaziranga's central range in 1997/8, supervises all field staff and domesticated elephants in his range.

Photo Credit: Lucy Vigne



A forest guard in Pabitora Wildlife Sanctuary examines his .315 calibre rifle, but many of the petrol staff do not have guns due to a shortage.

poachers. This time it was a different *gang* leader, who also has a .303 rifle, from the same village to the east. The gang leader took the horn from his village to Jagi Road (15km south) for a week, until the horn stopped smelling, and then smuggled it again to Dimapur where a rich man in an area of the town called Nehuku usually buys horns. There is even a third gang leader in this village east of Pabitora who uses a carbine for poaching rhinos. There is no solid evidence to arrest them yet due to a shortage of money for intelligence. They are all Moslem immigrants, as are most of the people around Pabitora (M. Barua, pers. comm.).

Increased mobility of the Range Officer in 1997 (checking twice a night that the camp staff are active) has motivated the staff to patrol more. As a result no rhinos were electrocuted compared with four in 1996 (the 11 kilowatt electric power lines which cross the area are used for this form of poaching). In 1997 forest guards detected and removed three electric wires hanging down from the power lines to electrocute rhinos. Informers led to the arrest of five people in the third electrocution attempt, including one local staff member who colluded with the poachers. Many power lines are used to pump water for the paddy fields surrounding the Sanctuary. The electricity board

to 97 by 1991 and in the early 1990s the rhino population was considered the second most viable in India (Menon, 1996). The main cause of this success was due to the effort of the previously mentioned B.N. Talukdar who served for five years as Range Officer in charge of the Sanctuary, and recorded "nil" poaching in 1990. Rhinos in Orang now are the most heavily threatened. The camps have only recently been partially refurbished since Bodos heavily looted the camps' arms and radios in 1994 (Martin, 1996). Furthermore, the police were pre-occupied with other issues in 1996 and less able to assist with anti-poaching efforts. The rhino population thus declined by more than half to perhaps 45 from the beginning of 1994 to 1997. The present Range Officer, P.K. Deka, is a dedicated man, but soon after his arrival in early 1997, eight rhinos were poached. He then constructed a cap on the southern boundary from where most poachers come, and 30 home guards with 24 rifles were brought in to protect Orang. As a result, from May to December 1997 only three rhinos were poached.

With police help, Deka arrested 16 culprits linked with poaching in 1997 outside the Sanctuary, nearly all local immigrant Moslems who often hire Naga shooters. The police became more active in 1997 as the present superintendent is interested in supporting Orang. Deka

Table 5. Rhino mortality in Pabitora.

	Bullet	Poaching Electrocution	Total	Natural deaths	Total mortality
1994	0	4	4	2	6
1995	2	0	2	1	3
1996	1	4	5	2	7
1997	3	0	3	2	5

employs local people to repair these lines so they know the techniques for electrocuting rhinos! They choose the 11 kilowatt lines, not the high tension lines as sparks would be seen from these. Regular patrolling to check for hanging wires is the only way to prevent this form of poaching.

In order to improve patrols in this road-less Sanctuary, Barua and his staff (due to lack of funds for labourers) have built 2.5km of road to allow easier access by vehicle into the north of the Sanctuary near the headquarters. Although Barua requires 30km of murrum road for more mobility in the Sanctuary, this first section of road is a positive start.

Orang Wildlife Sanctuary

Orang's rhinos increased in numbers from 65 in 1985

has no informant money, but his staff manage to collect some information on poachers when visiting the market, which has helped towards certain arrests. Most poachers use guns, but pit poaching is also common. In 1995 two rhinos were poached by putting insecticide into a wallow which the rhinos drank (see Table 6).

It is important that security inside Orang does not break down again, as a rhino population in a small sanctuary can quickly be obliterated. In November 1997 a camp was looted once more, this time probably by local Moslems. Although the staff try to remain dedicated, their morale has suffered increasingly, as criminals in the villages are becoming more of a threat with the weakening of Orang's defences. This is because Orang receives the least financial support of the four main rhino areas in Assam (see Table 7). In early 1998 there were eight camps out of 23 with no firearms, making it

Photo Credit: Esmond Martin



Camps in Pabitora Wildlife Sanctuary are in disrepair with leaking roofs and collapsing walls, while inside many of the forest guards sleep on the floor without mosquito nets, making conditions hard.

Photo Credit: Esmond Martin



In January 1998, Lucy Vigne was accompanied by five armed members of the Assam Police and two mahouts for a morning's elephant ride in Manas National Park due to civil unrest in the area.

impossible for the staff to patrol against armed poachers. Morale is further lowered as staff salaries are paid very erratically. The rhino patrolling staff were not paid for five months from May to September 1997. In November 1997 all salaries were cleared, but since then, had not been paid at least to January 1998. Some salaries are very low. Casual labourers who help patrol, some of whom have been working for over 15 years, get 675r (\$18) a month (Deka, pers. comm.), making it difficult to keep men motivated.

Orang isso severely ran down that it was officially kept closed at the start of the season in November 1997 due to damaged roads and bridges. The financial position is so desperate that, according to Deka, putting scarce resources into eco-development projects for better relations with the thousands of villagers seems futile. Instead, the atmosphere is one of a continuing battle against the many locals involved in poaching. It is a hard battle to win with the field staff's present meagre resources.

Manas National Park

Money has been flowing back into Manas to rehabilitate the Park, although it is too late for the present rhino population, which has been nearly obliterated. In March 1997, during a tiger census, fresh rhino dung was found for one animal, and in another area, a second rhino was

in 1997 with 177 left vacant (see Table 9). This is due to the refusal of men to take work in this dangerous area. Patrol work is presently carried out irregularly by staff in large groups who fear being killed by Bodos. Park management is helped by the fact that funding is improving once more and salaries are paid on time. As Manas is a World Heritage Site and a tiger reserve, extra funds from central government, Project Tiger and from the Biosphere Scheme, are provided, and there is planned funding from UNESCO.

The Park was closed from February 1989 to 1 October 1995, as it was over-run by Bodo militants. Since then, it has remained open except during the monsoons and for a brief time during the election period in early 1998 when the Assam Police could not be kept there to guard visitors (R. Agarwalla, Project Director Manas, pers comm.). Relations with the military and paramilitary forces are good and this helps to reduce poaching in general.

Anew and major concern has arisen in Manas, however. The Park being on the border of Bhutan can provide a route for smugglers of wildlife products; a road was completed in 1996, running through the middle of Manas and 13km into Bhutan. Its original function was to transport oranges to Assam and staple foods back to Bhutan, but the lorries (1,016 in 1997) smuggle wildlife over the border to sell in Bhutan,

Table 6. Rhino mortality in Orang.

	Poaching			Total	Natural deaths	Total mortality
	Bullet	Pit	Poison			
1991	1	0	0	1	2	3
1992	1	1	0	2	3	5
1993	0	1	0	1	2	3
1994	4	2	0	6	4	10
1995	6	1	2	9	7	16
1996	9	1	0	10	4	14
1997	10	1	0	11	3	14

sighted. There are approximately five rhinos left in the Park. There has been no evidence of rhino poaching inside Manas in 1996 or 1997, and only one carcass was found in 1996 (see Table 8). The official estimate of 60 rhinos in 1993 was probably an over-estimate, and there are, most likely, more rhinos poached recently than thought but the carcasses were never found due to the limited patrolling by the reduced number of staff. Park management is not as effective as in the 1980s. In 1989 there were 31 camps, but today there are only 17 (one every 26km²). Of the 472 staff positions sanctioned by the Forest Department, only 295 positions were filled

pollute and erode the Park and disturb the animals (Agarwalla, pers. comm.).

In order to reduce poaching pressure in Manas in the long term, 1,400,000r (\$39,128) were spent in 1996/7 on ecodevelopment projects. There are 60 villages on the southern border with about 25,000 people, 60% of whom are Bodos, who traditionally survive off the forest and its wild animal products, and need to be offered alternative and sustainable forms of livelihoods. This would help to protect Manas, and rhinos could then possibly be relocated there in the future.

Table 7. Budgets for the main rhino areas in Assam.

	Kaziranga	Pabitora	Orang	Manas
1992/3	15,284,039 r \$ 505,759		2,766,654 r \$ 91,550	19,210,000 r \$ 635,672
1993/4	17,939,499 r \$ 574,800		2,270,828 r \$72,760	20,530,000 r \$ 657,802
1994/5	19,981,829 r \$ 628,755		3,016,187 r \$ 94,908	20,010,000 r \$ 629,641
1995/6	24,399,945 r \$ 721,252	2,968,459 r \$ 87,746	2,591,031 r \$ 76,590	16,720,000 r \$ 494,236
1996/7	29,743,018 r \$ 831,275	3,623,886 r \$101,282	3,179,626 r \$ 88,866	20,160,000 r \$ 563,443
1997/8	21,591,698 r \$ 581,203			24,763,000 r \$ 666,568

NB Earlier figures for Orang were: 1989/90=3,888,169r, 1990/1=3,458,328r, and 1991/2=2,801,581r. Manas expenditure was: 1995/6= 1 3,455,000r and 1996/7= 23,425,000r.

STRAYING RHINOS FROM THE FOUR MAIN AREAS NEED PROTECTION FROM POACHERS

Kaziranga National Park

Six additions were proposed some years ago around Kaziranga to reduce the poaching and problem of rhinos straying out of the Park. In 1997, “addition one” of 43.8km² was fully notified to the west of Kaziranga connected to the Park’s 430 km². Rhinos are already moving into this area. It is hoped that “addition six” comprising the Brahmaputra river (376.5km²) will soon be under the Park’s control. This will help to prevent poachers entering from the north, and once the cattle are removed from the islands, will extend the rhino range

further. Presently, dozens of rhinos wander out of the Park for up to two or three months.

Pabitora Wildlife Sanctuary

Pabitora’s 16km² suffer from considerable pressure from the local villagers who bring their cattle into the Sanctuary daily to graze. Of the 70% of the Sanctuary covered in grasslands approximately 30% has been degraded due to overgrazing by livestock (Barua, 1997). Cattle numbers are down from over 15,000 in 1996 to 6,000 in early 1998 because cattle are now confined in pounds if caught illegally grazing and the owners are fined. If there were no cattle degrading the area, perhaps up to 10 rhinos would still need to go out of the Sanctuary every night to graze.

Table 8. Rhino Mortality in Manas

	Poaching (bullet)	Natural death	Total mortality
1990	1	3	4
1991	3	2	5
1992	11	4	15
1993	22	1	23
1994	4	0	4
1995	1	0	1
1996	0	1	1
1997	0	0	0
Total	42	11	53

Table 9. Staff for the main rhino areas in Assam in 1997.

	Sanctioned by Forest Dept.	Forest Dept. positions filled	Forest Dept. positions unfilled	Temp. staff	Total
Kaziranga	541	441	100	85	526
Pabitora	125	79	46	17	96
Orang	60	57	3	62	119
Manas	472	295	177	54	349
Total	1,198	872	326	218	1,090

NB Most of the staff work in the field.

With no cattle in the Sanctuary it could support 30 rhinos comfortably (M. Barua, pers. comm.). Therefore, either 15 rhinos should be moved, or an area to the north-west of the Sanctuary, proposed previously as an addition, should be incorporated. This potential addition of 38km² is government-owned land, and has no permanent inhabitants, but is used for rice paddies by the neighbouring communities. To the west of this area is a hill which would provide rhinos with much needed high ground in the annual floods, and to the north is the Brahmaputra river, a natural boundary. The decision to make this extension, which the Range Officer surveyed in 1997, lies with the state government.

Orang Wildlife Sanctuary

Orang's 78.8km² would be difficult to expand, as all surrounding land, including the river islands, is occupied. Ideally, the river islands on the southern side should be included in the Sanctuary to reduce the proximity of a heavy poachers' presence on that side, and to provide more grazing space to the rhinos. Presently, Orang has space and plenty of grassland for the current rhino population, due to their reduced numbers. If rhino numbers increase substantially, as is hoped, more space will be required.

Five rhinos wandered out of the Sanctuary and apparently arrived in Laohkowa Wildlife Sanctuary in October 1997, according to Deka. Laohkowa's rhino population was decimated in 1983 during a breakdown in law and order among the local Moslem immigrants. If rhinos can survive and breed in Laohkowa, the Sanctuary (covering 70km²) could become an important protected rhino area for surplus rhinos from Orang or elsewhere. As a note of caution, however, in early 1998 forest guards detected eight poaching pits, so the area is still far from secure.

Manas National Park

Manas, with its core area of 519km² and its buffer zone of 2,837km², is sufficiently large to reintroduce

rhinos from other parts of Assam in the future. As it is an important area for other rare species, including tigers, funding will be made available if relative stability is maintained. Rhinos once crossed to neighbouring Royal Manas National Park in Bhutan, which provided a natural addition of land of at least 439km². As late as December 1996, the Bhutanese Forest Officer said that four rhinos were still crossing over to Bhutan at night to graze in Royal Manas National Park. These four rhinos which strayed across the river have not been seen since and have probably been poached in Manas.

FINANCIAL PROBLEMS FACING THE ASSAM FOREST DEPARTMENT

According to the Principal Chief Conservator of Forests of Assam, P. Lahan, 1997 has been the worst year in over 30 years for official funding to the protected rhino areas of Assam. This is especially true of Kaziranga National Park which has 84% of all the rhinos in the state. Since the early 1990s, the budget for Kaziranga had increased in rupees and dollars every year from \$505,579 in 1992/3 to \$831,275 in 1996/7. However, the budget for the financial year 1997/8 in dollars was down by over 30% from the year before (see Table 7). Furthermore, studies have shown that for rhino conservation to be successful, large sums of money need to be spent per unit of protected area (Martin, 1996). For Kaziranga the official budget per square kilometre has been reduced from 69,170r (\$1,933) in 1996/7 to only 45,572r (\$1,227) for Kaziranga plus "addition one" for 1997/1998, over a 35% decline in dollar terms. The amount of money given for maintenance of roads, bridges and camps, and money to buy supplementary food for the departmental elephants has been severely reduced (Bezbaruah and Talukdar, 1997; Vigne and Martin, 1998). Even when a specific allocation is made available, it may take months for the money to reach the Park. Thus, sometimes salaries are paid months late and inoperable equipment remains unrepaired (see



Only eight elephants are able to patrol in Orang Wildlife Sanctuary as the other four working elephants presently have young calves.

Similarly, the budget for Orang Wildlife Sanctuary reached a recent high of 3,888,169r (\$230,752) in 1989/90, but by 1996/7 the budget was only 3, 179,626r (\$88,866), just 38% of the 1989/90 budget when converted into US dollars. As a result, there has been almost no maintenance for the Sanctuary. Lack of funds has led to the worst rhino poaching in Orang for any area in Assam since 1995.

The reason for the overall decline in the budgets for Kaziranga and Orang, and the even sharper reduction in money for development projects and routine maintenance in all four main rhino areas of Assam is due to problems of maintaining law and order. With the Bodos and others fighting in the western part of the state and the continued agitation from the United Liberation Front of Assam in the east near Kaziranga, the state government has had to spend more money to protect its citizens. Thus, budgets for government departments such as Forests have been reduced to pay for improved law enforcement.

Fortunately, NGOs have recently put relatively large sums of money and equipment into rhino areas. Since 1996, WWF India, the Environmental Investigation Agency, Care for the Wild, the Rhino Foundation and other smaller NGOs based in Assam have donated items such as vehicles, speed boats, uniforms and water filters. In 1997, the major NGO donors

provided at least \$41,000 to Kaziranga and \$21,000 to Manas. TRAFFIC India supplied in 1997 25,000r (\$689) for intelligence money for Kaziranga (according to M. Misra, the director), and WWF India donated 60,000r (\$1,653) each to Kaziranga and to Manas to set up intelligence networks (according to M.K. Ranjitsinh of WWF India).

Until the mid-1990s NGOs gave relatively little assistance to the rhino protected areas in Assam as the government budgets were considered to be adequate, and the state government did not request such assistance. Now, with worsening government budgets, the NGO contributions will increase in importance, which will be especially necessary for intelligence gathering and paying for information on poachers and traders in rhino horn.

RECOMMENDATIONS

1. Range officers in Orang, Pabitora and perhaps Laokhowa need intelligence money to set up informant networks and pay rewards for information. NGOs should provide this money, as accountability required by the state and central governments is difficult because informers' names must not be recorded in the accounts, to insure confidentiality. More intelligence funding is needed for Kaziranga.

2. Patrollers require more anti-poaching equipment, especially modern rifles, wireless sets, solar panels for re-charging batteries and good torches. Vehicles need to be repaired or replaced when broken and provided with more fuel.
3. Field staff, notably those living in the camps, should have adequate supplies of uniforms including boots and jackets, as well as mosquito nets, water filters, field kits etc. They should also be provided with food rations as an incentive to entrust them with rhino anti-poaching work. Other armed personnel, such as the Armed Forest Protection Force, the police and para-military force receive food rations and the anti-poaching staff should be provided with the same benefit (P. Sharma, pers. comm.). They should also be given medical assistance to motivate them in this stressful, hardship post. Rewards for exceptional work would further increase staff morale.
4. More funds are required to repair washed-out roads and bridges. Watchtowers of reinforced concrete are needed (specifically for central Kaziranga and Pabitora). Run down camps need repairing, especially the leaking roofs, and new camps should be built where necessary.
5. Protected areas with elephants for patrol work need funds for regular food and medicinal supplies, which became increasingly erratic in 1996 and 1997.
6. The total field staff allocations need to be filled. In 1997, out of the 1,198 positions in Kaziranga, Pabitora, Orang and Manas, 326 were vacant.
7. Field staff need better training, especially in the use of firearms.
8. Salary and other staff payments must be made on time. In 1997, several months sometimes passed before wages were received.
9. The judiciary must take more seriously rhino poaching and trade in rhino horn.. Poachers and middlemen are still released or bail after only a few days, and almost none is imprisoned for any length of time.

CONCLUSION

Despite the worst shortage of maintenance and development funds in the memory of Assam Forest Department staff in the Wildlife Division, and with gloomy future prospects for adequate finances, rhino numbers have remained stable in the state over the last

Photo Credit: Lucy Vigne



As seen here in Manas, Indian tourists pay \$2.50 to ride a Park elephants the mornings while foreigners pay \$13.50; the dual price structure was introduced in October 1996. This is the same for Kaziranga (see Table 11).

Table 10. Equipment in the main rhino areas of Assam in 1997

	Kaziranga		Pabitora		Orang		Manas	
	Working	Broken	Working	Broken	Working	Broken	Working	Broken
Radio sets	100	23	5	2	6	0	?	?
Country boats	90	10	6	4	11	0	4	2
Speed boats	5	2	1	0	0	1	1	2
Trucks	1	1	0	0	0	0	}	}
Jeeps	6	4	1	0	2	0		
Tractors	0	1	0	0	0	0		
Vans	0	1	0	0	0	1		
Motorcycles	1	5	0	0	0	0	?	?
Rifles	?	?	20	0	16	0	150	0
Shotguns	?	?	1	0	5	1	?	?
Elephants		38	4	1	12	7	12	24

Table 11. Visitors and revenue raised in Kaziranga.

	Indians	Foreigners	Total visitors	Revenue	
				Rupees	Dollars
1993/4	50,794	486	51,280	652,141	20,895
1994/5	48,501	781	49,282	692,903	21,803
1995/6	16,998	2,057	19,055	761,212	23,501
1996/7	14,735	957	15,692	1,819,084	56,841

NB Park entry fees increased in October 1996:

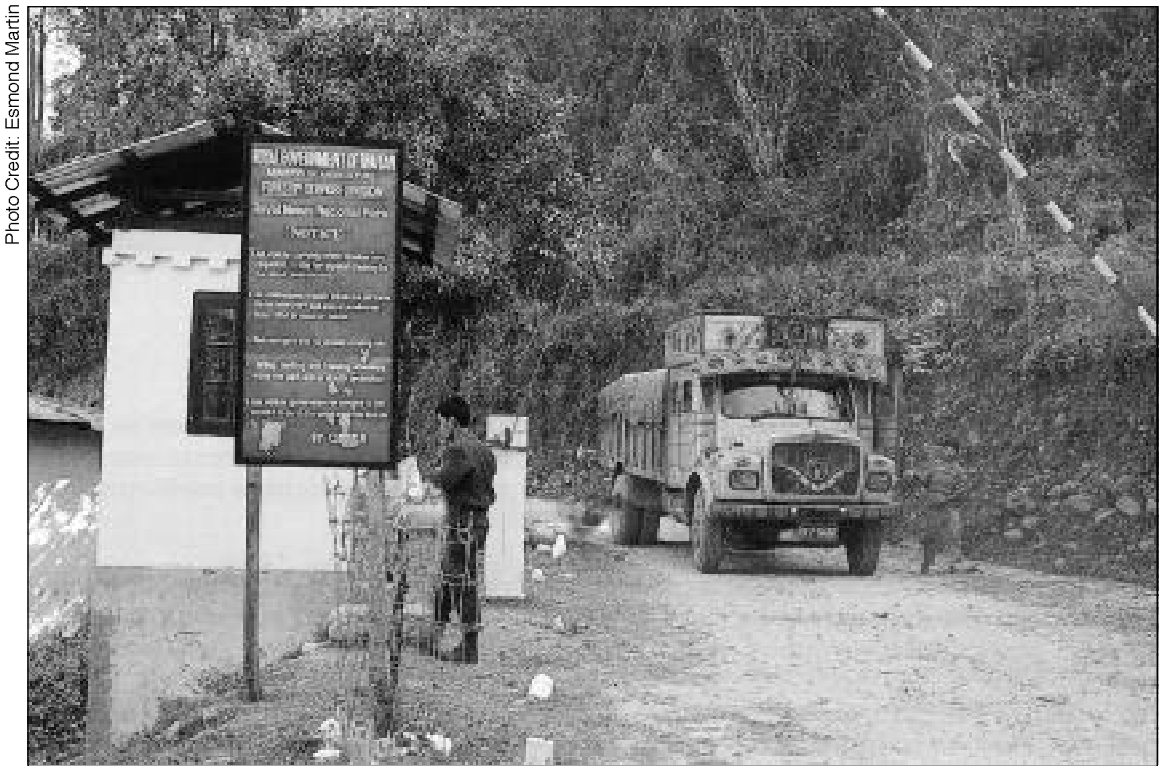
- 1) for Indians from 5-10r, plus vehicles 50-150r, and elephant rides 50-100r per seat;
- 2) for foreigners from 5-175r, plus vehicles 50-150r, and elephant rides 50-525r per seat.

few years. In 1997 there was a decrease in rhino poaching in Kaziranga, but an increase in Orang. In Kaziranga, a handful of outstanding range officers have improved patrolling and intelligence gathering, and have given good leadership in the field, helping to keep up staff morale. NGOs have provided some vital financial help to Kaziranga, and more Assam-based NGOs are beginning to support rhino conservation. There has been an increase in roadblocks throughout the state against insurgents making it harder to move arms, and this has probably helped to reduce rhino poachers in some areas. On the other hand, in Orang the rhinos have become a main target for poachers due to lack of adequate finances for patrol work and intelligence in this Sanctuary. Furthermore, twice Orang has been attacked and looted, with arms and radio sets stolen, and the army and police were unable to recover them. Orang's rhino population must be saved from poachers by giving its Range Officer the financial support he needs. It is important not to ignore the small, protected areas in Assam. If most rhinos are

killed in these areas, poaching pressure will increase in Kaziranga because it would be the only significant rhino area remaining. The state and central governments must meet the financial needs of the field staff if Assam's rhinos are to be protected properly in the future.

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Lorries drive back and forth through the middle of Manas National Park to Bhutan or a newly constructed road, increasing disturbance, pollution and poaching in the Park.

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