

# NEPAL'S RHINOS — ONE OF THE GREATEST CONSERVATION SUCCESS STORIES

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Photographs by Esmond B. Martin

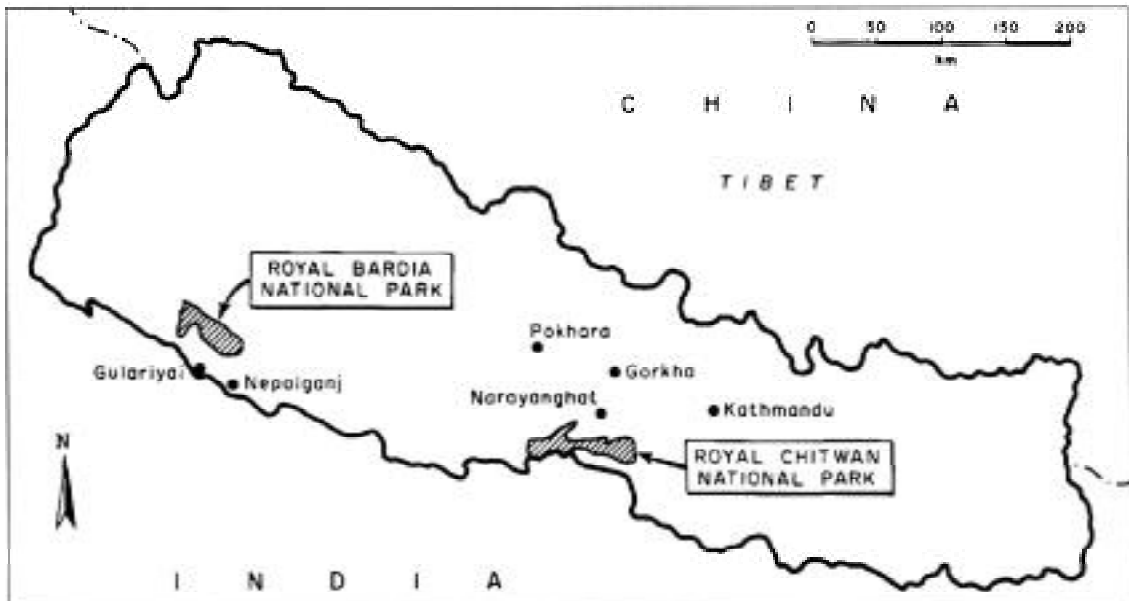


Figure 1: Map of Nepal showing the location of Royal Bardia and Royal Chitwan National Parks.

## INTRODUCTION

Nepal has two national parks inhabited by the greater one-horned rhino, *Rhinoceros unicornis* (see maps in Figures 1-3). Within the Chitwan valley, the Royal Chitwan National Park was gazetted in 1973 and made a World Heritage Site in 1984. Now covering an area of 932km<sup>2</sup>, its rhino population has grown in number from around 100 in the mid-1960s to 450 in 1994. This achievement has been due primarily to His Majesty the King of Nepal's commitment in protecting the rhinos, and since 1990, to His Majesty's new government's efforts. This is one of the greatest conservation success stories in the world for the rhinoceros. From 1986 to 1991 38 rhinos were translocated from the Chitwan area to Royal Bardia National Park to form another population. Bardia had been gazetted as a wildlife reserve in 1976, and was expanded to cover 968km<sup>2</sup> in 1984, and then made into a national park in 1988 due its large numbers of ungulates and tigers (Upreti, 1994).

Despite Nepal's gradual increase in rhino numbers since

the late 1960s, in 1992 18 Chitwan rhinos were illegally killed, the highest number since the 1960s, and poaching increased in Royal Bardia National Park also. Reasons for Nepal's success in curtailing rhino poaching and opinions as to why rhino poaching in Nepal increased in 1992 will be discussed in this paper, as well as recommendations for further improvements to Nepal's excellent rhino conservation efforts.

## ROYAL CHITWAN NATIONAL PARK

### A general history of rhino poaching and protection in the Chitwan area

In 1950 Chitwan's rhino population numbered about 800 animals (see Table 1). In 1951, the Rana ruling family, Nepal's hereditary prime ministers, was overthrown and many of the rhinos were shot dead illegally in that decade by Nepalese and Indians. The horns were sold in India. There was also massive human settlement at that time due to a malaria

Table 1. Number of rhinos in the Chitwan valley, and from 1973 in Royal Chitwan National Park

Year	Number	Comment	Source
1950	800	Estimate	Willan (1965), in Laurie (1978)
1957	400	Estimate	Stracey (1957)
1959	300	Estimate	Gee (1959)
1961	165	Estimate	Spillett (1966)
1966	100+	Estimate	Spillett & Tamang (1966)
1968	81-108	Helicopter census	Caughley (1969)
1972	120-147	“ “	“Pelinck & Upreti (1972)
1978	270-310	Estimate	Laurie (1978)
1988	358-376	Census by photos	Dinerstein & Price (1991)
1994	440-460	Ground census	Yonzon (1994)

eradication scheme and over half the area became agricultural land. Then, realising that the numbers of rhinos had declined to about 300 in the late 1950s and that there had been a 70% reduction in forest and grassland areas, His Majesty's Government of Nepal created a deer park in part of the Chitwan valley. Due to lack of law and order, however, poaching and habitat loss continued. By 1968, there were estimated to be only around 100 rhinos remaining.

Traditionally, each head of State has had to perform a sacred ceremony offering rhino blood from a newly killed animal to the Hindu gods; this is called the Blood Tarpan ceremony (Martin, 1985). This has meant that the rhinos have had to be strictly protected for future generations. So, when His Majesty's Government finally gained control of the country, it gazetted Chitwan as a National Park, and a special "Rhino Patrol" or Gainda Gasti was established under the

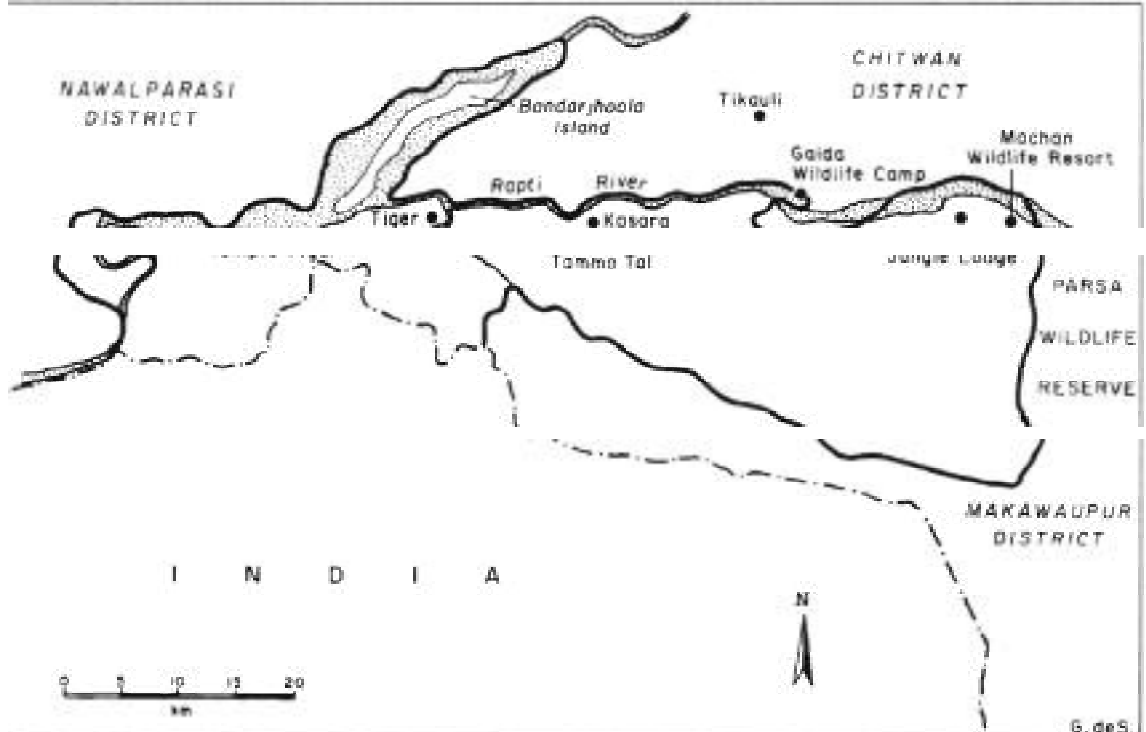


Figure2: Map of Royal Chitwan National Park

Table 2. Number of known rhinos poached in the Chitwan valley before 1973, and from 1973 in Royal Chitwan National Park.

Year	No.	Comment	Source
1954	72	min. no. poached	Talbot (1960)
1958	60	“ “	Gee(1959)
1973	5		D.N.R.W.C*
1974	2		“
1975	0		“
1976	2		“
1977	0		“
1978	0		“
1979	0		“
1980	0		“
1981	0		“
1982	0		“
1983	0		“
1984	2		“
1985	0		“
1986	3		“
1987	0		“
1988	3		“
1989	1		“
1990	3		“
1991	1		“
1992	17		“
1993**	4		“

\*Dept. of National Parks and wildlife conservation

\*\* January to November

Forest Department in the same year (1973) to protect rhinos that wandered outside the Park. Three years later His Majesty the King stationed units of the Nepali Royal Army inside the Park, enabling the National Parks staff to concentrate their efforts on Park management. There was originally one company, and poachers initially feared the army; no rhino poaching is known to have occurred from 1977 to the end of 1983. Poachers then learned that the army did not patrol very effectively. At least 19 rhinos were illegally killed from 1984 to 1990 in the Chitwan area, although in 1987, three companies had been sent to guard Royal Chitwan National Park, and by 1988 there was a whole battalion; poaching pressure

Table 3. Number of known rhinos poached from 1973 outside Royal Chitwan National Park

Year	No.	Source	Year	No.	Source
1973	2	D.N.P.W.C.	1984	4	D.N.P.W.C.
1974	2	”	1985	2	“
1975	1	”	1986	0	“
1976	0	“	1987	0	“
1977	0	”	1988	0	“
1978	0	“	1989	0	“
1979	0	“	1990	1	“
1980	0	“	1991	1	“
1981	0	“	1992	1	“
1982	0	“	1993*	4	“
1983	0	“	* January to November		

continues into the 1990s, despite this large security force within the Park.

Until 1990, the horns and nails from dead rhinos were taken to His Majesty the King’s Palace in Kathmandu. These included horns from the occasional rhino shot by His Majesty the King’s party from 1951 to 1990 on Royal hunting expeditions to the Chitwan area (Martin, 1985). Since then, with the election of the new democratic government, all rhino horns and nails and some skin, collected from rhino carcasses or taken from poachers, are kept locked up in Kasara in the centre of the Park, or in Tikauli if they are found outside the Park. On 1 January 1994 the storeroom at Kasara held 30 horns, while the one in Tikauli had 18 weighing 15kg in total.

## Recent rhino poaching in the Chitwan area

Unlike most other countries with rhino populations, Nepal’s rhino numbers have been steadily increasing in recent years from around 100 in 1966 to 270-310 in 1978, reaching 358-376 in 1988, and according to the latest census carried out on elephant back from 2 March to 19 April 1994, a total of 440-460 rhinos were counted. The population has increased by an estimated 5.6% a year on average from 1966 to early 1994 (Leader-Williams, pers. comm.). These figures show that rhino poaching has been under control since the 1970s and continues to be negligible. Poachers



*These Forest Department officials are responsible for protecting rhinos that wander out of Royal Chitwan National Park into the Tikauli area.*

have killed an average of only 4.7 rhinos per year from 1984 to November 1993 in and around the Park (see Tables 2 and 3). Most poachers are from the Tharu and Tamang tribes. Sometimes they are organised by a local leader who will provide them with guns and ammunition. The size of a gang varies from two or three for shooting or snaring a rhino, to five or six for pit-digging, but gangs of more than ten are known. Most poaching pressure is in the grassland areas where rhinos occur in highest density, especially along the floodplain of the Rapti River, the Tamma Tal and on Bandarjhoala island. An estimated 23% of Royal Chitwan National Park is grassland as opposed to 70% sal (*Shorea robusta*) forest and 7% riverine forest (Yonzon, 1994).

Several methods are used to kill rhinos. Pit-diggers make large rectangular pits at night on a rhino's path into which the animal may fall, but this can be a slow way of catching a rhino. In 1992 over 50 pits were known to be dug, but only 14 rhinos were caught in this manner in the Park. The poisoning of rhinos has been attempted several times through placing poison in maize and pumpkins near the Park in an area commonly visited by a rhino (Martin, 1992). After eating the poisoned food, the rhino takes up to five hours to die, and often the animal cannot be found by the poachers. Wire nooses and heavy spears

suspended in trees are other techniques used to kill rhinos. These methods usually are not very effective as it may take three days or more to catch a rhino and in the meantime the army are likely to have found the traps. Rifles are by far the most effective weapons, and automatic ones have been commonly used since 1992. Occasionally, however, rhinos are wounded by a bullet and take several days to die. For example, in December 1993 one such rhino was found injured; for four days 20,000 visitors came to see the animal, many of whom anointed its skin with vermilion powder, burnt incense sticks and offered fruit for the animal's well-being. Some spectators cursed the poacher, while many prayed for the rhino's recovery. There were eight guards and 70 to 80 local volunteers who protected the wounded animal. When the rhino eventually died, the Forest Department staff cut off the horn, skin and hooves, while the villagers took the rest of the carcass except the bones (Santosh Nepal, DFO Nawalparasi, pers. comm.).

When a poaching operation is successful, the poachers take the animal's single horn and sometimes its hooves. In 1993 a gang was paid about 50,000 to 100,000 rupees (\$1,087 to \$2,174) for an average 700gm horn (about \$1,553 to \$3,106 per kg), and 4,000 rupees (\$87) for the animal's 12 nails. In 1992 the first middleman in the chain (who bought from

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the poachers) sold the horn for 300,000 to 400,000 rupees (\$7,042 to \$9,390) per kg, but by late 1993 these middlemen were able to sell a horn for around 550,000 rupees (\$11,224) per kg (Tika Ram Adhikari, Assistant Warden, Royal Chitwan National Park, pers. comm.). The buyers are usually from Narayanhata, Pokhara and Kathmandu, and they export the horn from Nepal usually by aeroplane to eastern Asia.

Fake rhino horns are occasionally put on the market. In 1993 five such horns made of buffalo and cow horn were intercepted in Chitwan and Nawalparasi districts, along with their maker who lived in Gorkha district. He had sold them to five people for 1,000 rupees (\$22) each; all the people involved were arrested as it is illegal to buy and sell fake rhino horns because of fraud (Adhikari, pers. comm.).

## **Rhino anti-poaching units in the Chitwan area**

In recent years, the Department of National Parks and Wildlife Conservation, the Forest Department (including the Gaijda Gasti) and the army have all continued to be involved in anti-poaching work in and around Royal Chitwan National Park, sometimes with financial assistance from NGOs.

In 1993 the National Parks Department consisted of 256 staff in the Park (including 150 workers for 50 domestic elephants), with a warden and three assistant wardens, 10 rangers, 12 senior game scouts and 60 game scouts. Morale is good: as well as a salary, the staff receive a uniform each year, free rations, housing and medical assistance. Park staff carry no guns, however, as anti-poaching patrols inside the Park are supposedly the job of the army only. In mid-1993, following the sudden 1992 poaching increase, however, two anti-poaching units were created by the National Parks Department: one in the east of the Park and one in the west, including Bandarjhoala island. Each unit has six men: a senior game scout, two other Department staff and three local villagers. The units are proving a success in collecting information on poachers, but they do not yet have any guns so the units cannot combat poachers actively.

The Forest Department has three District Forest Officers (DFOs) around the Park whose main job is tree protection outside the Park. Rhino anti-poaching work is considered only a minor duty. Nevertheless, the DFO in Chitwan district at Tikauli to the north of Royal Chitwan National Park has forest guards who are conscientious and patrol their area at night. There

is also a DFO in Nawalparasi district, to the west of the Park, with 98 forest guards. These men carry 50 to 60.303 rifles, and 15 of the guards patrol for rhinos. There are 25 resident rhinos within 60 km<sup>2</sup> of this district plus 10 to 15 migrants in the season. None was poached in 1991 or 1992, but two were killed in 1993. There is a third DFO in Makawaupur district, near Parsa Wildlife Reserve to the east of the Park, but there are seldom rhinos in the district so poaching pressure is not a problem there.

The Gaijda Gasti has worked under the DFOs around the Park for 20 years, continuing to patrol just outside the Park's borders in order to protect any straying rhinos. They are knowledgeable about rhinos, with much experience. There were about 150 guards until December 1993 when the special unit was amalgamated with the Forest Guards. They are now called Armed Forest Guards and their primary work is to protect the trees outside the Park; rhinos have thus had to become a lesser concern. The 150 guards patrol on foot and have 70 to 80 .303 rifles and 10 pistols.

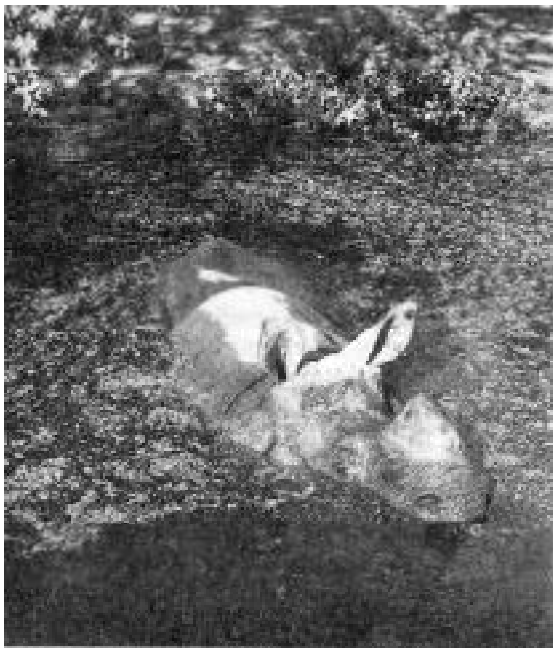
In charge of the army is a Lieutenant Colonel who has 800 men in one battalion. Due to leave and training time, there are about 550 men working on any one day; they are divided into five companies stationed at 30 posts inside the Park. Soldiers have a one-month training period and spend two years working in the Park before being transferred elsewhere in the country. Most of Nepal's parks and reserves are still guarded by the army, a heritage of His Majesty the King's former government. The soldiers are supposed to patrol day and night inside the Park to stop all forms of poaching. They carry .762 self-loading rifles. They are not involved in information-gathering in the villages as they operate only inside the Park, unlike the National Parks and Forest Departments who have informers in the villages and in the small towns along the highway.

## **The intelligence system in the Chitwan area**

As well as good patrol work, one of the best deterrents to poaching is a good intelligence system. Until rhino poaching was stopped in the late 1970s, His Majesty the King gave rewards of up to \$400 for information leading to the arrest of poachers (Martin, 1985). When poaching restarted in 1984, an intelligence system was set up until 1988 when it was terminated because of government budget cut-backs, and due to the difficulty of accountability for cash funds spent on rewards for information (Adhikari, pers. comm.). The UK-based



*In January 1994 the Forest Department at Tikauli recorded 18 rhino horns weighing about 15kg; these horns had been collected from animals that died outside Royal Chitwan National Park or had been confiscated from, illicit traders.*



*The greater one-horned rhino, along with the Javan or lesser, one -horned rhino, has a single horn. I-loin from the greater one -horned rhino is ten times more valuable than horn from Africa's rhinos.*

International Trust for Nature Conservation took over as the providers for informant money, as unlike the Department, the Trust could provide ready cash. Since January 1991, ITNC has given 2,000 rupees (about \$45) a month for informers. This small amount has been extremely effective in catching poachers. As a direct result of ITNC support, eight rhino poachers and eight tiger poachers were caught in 1991, three tiger poachers in 1992, and in 1993, with additional funds of at least 138,000 rupees (\$3,000), 37 rhino poachers and three tiger poachers were apprehended (Adhikari, pers. comm.) (see Table 4). Most of these were local villagers; they were all caught with evidence. In early 1994 these poachers were still in jail awaiting trial.

*Table 4. Number of poachers arrested in and around Royal Chitwan National Park*

Year	Rhino poachers	Tiger poachers	Total
1991	8	8	16
1992	0	3	3
1993	37	3	40

*Source: Royal Chitwan National Park*

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When a poacher is caught, pressure is sometimes used to extract evidence. At other times, a member of the Department of National Parks and Wildlife Conservation may pose as a buyer to catch poachers and confiscate the horns, and often he works in conjunction with the two DFOs. Tika Ram Adhikari believes that giving rewards for information is the most cost-effective anti-poaching system, and that if he were given 200,000 rupees (worth \$4,348 in 1993) each year, he could catch almost all the poachers.

In April 1993, punishment for rhino poachers was increased from five years in jail and/or a 15,000 rupee (\$326) fine to a maximum 15 years in jail and a 100,000 rupee (\$2,174) fine, a further deterrent to poachers.

### **Attitudes of the villagers around Royal Chitwan National Park towards rhinos**

With an increasing human population around the Park, and increasing rhino numbers, negative feelings towards rhinos have risen; perhaps 75% of the local villagers now dislike the animals (Ganga Thapa, the King Mahendra Trust for Nature Conservation, pers. comm.). This is because about 7% of the rhino population live outside the Park, disturbing the people and their livelihood. Old rhinos, especially, tend to wander out of the Park to eat rice as they cannot compete for grass inside; these old rhinos either die of natural causes or get speared. Generally, villagers chase the rhinos away rather than kill them, despite damage to crops being very severe in certain areas. For example, over 60% of the paddy lost to wild animals is caused by rhinos which often trample the paddy at night. Recent research has shown that wild animals, especially rhinos, boars and spotted deer, destroy 13.2% of the crops around Royal Chitwan National Park each year (Nepal & Weber, 1993). No compensation is paid. It is probable, however, that villagers equalise their losses by illegally entering the Park to obtain firewood, grasses, fodder, fish and medicinal or edible plants.

Rhinos are also dangerous to people. In 1993 one person was killed outside the Park, while five illegal grass cutters were injured inside the Park as well as one member of Parks staff (Adhikari, pers. comm. and Ram Prit Yadav, Warden, pers. comm.). No fixed compensation is paid for death.

Villagers have other reasons for complaint. The soldiers sometimes treat them badly, beating those they catch for stealing thatch or wood instead of reporting them to

the National Parks headquarters. Technically, villagers are fined 60 rupees for trespassing in the Park, and 20 rupees for each of their domestic animals found in the Park. Despite fines having been doubled since 1988/9, there has been no decrease in trespassing (Sharma, 1993). The army arrested about 11,000 people inside the Park (mainly women) from March to December 1993, and about 25,000 cattle were impounded (Lt. Col S.R. Pradhan, Commanding Officer of the army battalion in Chitwan, pers. comm.); these figures are probably the highest in Asia for any protected area with rhinos. The villagers dislike the sometimes arrogant soldiers and they feel deprived by them of their former rights to Royal Chitwan National Park. Lack of firewood and fodder are the villagers' main grievances over the Park.

It is very important to have the full co-operation and support of the villagers. Park officials realise the importance of benefits to the locals, and some valuable measures exist. Since 1976, grass and reed cutting has been permitted for a certain period each year. In recent years, for 15 days every January, villagers pay five rupees each for a permit to enter the Park as often as they wish, in order to collect thatch grass, reeds and binding materials, mainly for house construction; this is a significant benefit to the villagers, worth \$500,000 a year (Sharma & Shaw, 1993a). In 1993, 65,254 permits were issued.

Another practical benefit for the local villagers is that when a rhino is found dead - after officials have removed the horn, hooves and skin - the villagers are permitted to help themselves to blood (which is thought to regulate menstruation), urine (which is consumed to alleviate respiratory disorders) and meat (which is eaten either dried or as a stew to give extra energy). The blood and urine are particularly popular in Nepal.

Some villagers in addition benefit from work in tourist lodges and camps which employ over 650 people during the tourist season from October to May (although many jobs are also given to outsiders as the local tribal Tharus are not as well trained to deal with foreign tourists). The tourist industry has expanded greatly from 836 foreign visitors to Royal Chitwan National Park in 1974 to 55,335 in 1992 (see Table 5). There are at least 46 lodges and hotels around the Park with six more under construction, and there are seven establishments inside the Park. Over 80% of the visitors are foreigners who pay 650 rupees (\$14) to enter the Park and another 650 rupees per hour for a ride on a National Parks elephant. Foreign tourism is the second largest earner of foreign exchange in Nepal and significantly helps the local villagers in employment.



*Men of the Royal Nepal Army check vehicles traveling in Royal Chitwan National Park in order to make sure that the entrance fees have been paid and that wildlife products are not being smuggled out of the Park.*

Tourism may become an even more important benefit to the local villagers, as an Act was passed in 1993 stating that 30% to 50% of Chitwan's revenue would go to the local community, rather than the Central Treasury, for development projects and in order to create an impact zone around the Park. The impact zone would be managed by villagers and Park staff. Trees would be planted in the zone, enabling the villagers to collect legal firewood; the impact zone would also create a buffer for the rhinos and other wildlife while allowing cattle grazing, thus lowering pressure on the Park's resources and reducing the problem of the villagers' lack of firewood and fodder (U.R. Sharma, Director General, Department of National Parks and Wildlife Conservation, pers. comm.).

### **Royal Chitwan National Park's budget**

In 1993/4 the total government budget of Royal Chitwan National Park, which included maintaining an elephant breeding centre and 50 domestic elephants

*Table 5. Number of foreign tourists to Royal Chitwan National Park*

<b>Year</b>	<b>Number</b>	<b>Year</b>	<b>Number</b>
1974	836	1984	14,166
1975	2,206	1985	14,156
1976	5,021	1986	25,156
1977	5,547	1987	33,225
1978	8,325	1988	34,606
1979	6,290	1989	36,275
1980	8,116	1990	36,072
1981	8,464	1991	43,750
1982	11,570	1992	55,335*
1983	11,763		

*\* This includes not more than 10,000 Nepalese visitors a year but no exact figures are available.*

*Tourist fees (late 1993): Entry fee for foreigners 650 rupees for 2 days. Entry fee for Nepalese 10 rupees for 2 days.*

*Elephant ride per person 650 rupees per hour.*

*Source: Royal Chitwan National Park*





*At Tikauli, members of the Forest Department occasionally put rhino horns into boiling water to kill insects. in the background is a confiscated bus which was used to carry illegal supplies of wood.*

for patrolling and tourism, was 38,613,940 rupees (\$804,457) of which the army received 65%. The total budget for the Park for the same financial year, which included the government's contribution and assistance from non-government sources of at least another \$3,375, amounted to \$867 per km<sup>2</sup>, a very large sum, especially for such a poor country. The Park's revenue, mainly from tourism, but also from penalties and grass and reed cutting, was 39,600,000 rupees (\$893,905) in 1992/3 or \$959 for each km<sup>2</sup> of the Park. For the last few years, the Park's earnings have been very similar to its expenditure, which is very unusual in Asia. Royal Chitwan National Park probably produces more income per km<sup>2</sup> than any other park in Asia with a rhino population.

### **Reasons for 1992's sudden increase in rhino poaching in and around Royal Chitwan National Park**

Since 1973, most rhino deaths in the Chitwan valley have been due to natural causes (see Table 6). In 1992, however, more rhinos were killed illegally than in any other year since the late 1960s - at least 18 (see Table 7) - exceeding deaths by natural causes for that year. From August 1992 to January 1993, 14 were killed in pits, two were snared with cables, one was shot and one was speared. A minimum of four were killed in the Park in 1993 (see Table 8) and four more outside the Park. Although not biologically significant, this rise in poaching has caused concern.

Table 6. Number of rhinos killed by tigers and number that died of natural causes from 1973 to 1990 in and around Royal Chitwan National Park

Year	Inside Park		Outside Park	
	Killed by tigers	Natural deaths	Killed by tigers	Natural deaths
1973*	2	4	0	4
1974	1	7	0	4
1975	0	2	1	5
1976	0	1	1	1
1977	0	5	0	2
1978	0	7	0	4
1979	0	6	0	2
1980	0	8	1	2
1981	0	3	0	8
1982	0	7	0	6
1983	1	2	0	3
1984	0	2	0	8
1985	0	2	0	4
1986	0	2	0	4
1987	1	5	0	4
1988	1	0	0	2
1989	2	6	0	1
1990	0	3	0	5

\* Park started in January 1973.

Source. Royal Chitwan National Park, and Ministry of Forest and Soil conservation



The Forest Department at Tikauli collects dead rhino products including headskins with ears. These are put onto rooves to dry.

Table 8. Number of rhinos poached and methods used in Royal Chitwan National Park in 1993.

Area inside Park	Poaching type	No. of rhinos
Bandarjhoola island	chain noose	1
Near Temple Tiger	bullets	2
Near Materi	bullets	1
<b>Total</b>		<b>4</b>

NB These are minimum numbers; rhinos die deep in the forest and cannot be found, their bodies decompose.

Source: Royal Chitwan National Park.

Table 7: Number of rhinos poached and methods used in and around Royal Chitwan Park in 1992.

Area	Type of poaching	Number of rhinos
Inside Park near Machan Wildlife Resort	pit trap	2
Inside Park near Gaida Wildlife Camp	pit trap	4
Inside Park on Bandarjhoola island	pit trap	6
	snare	2
Inside Park near Temple Tiger	rifle/shotgun	1
Inside Park near Chitwan Jungle Lodge	pit trap	2
Outside Park near Chitwan Jungle Lodge	pit trap	1
<b>Total</b>		<b>18</b>

Source: Royal Chitwan National Park

Rhino poaching increased in 1992 for various reasons. Firstly, the prices in rupees for rhino horn rose in Nepal. Some tiger poachers thus switched to killing the more lucrative rhinos, which may also help to explain the fact that there was a decline in tiger poaching during that time (C. McDougal, tiger researcher, pers. comm.).

Secondly, with the new democratic government, it became harder to convict a poacher. The National Parks Department presently has a list of 80 identified poachers, all Nepalese, who cannot be convicted due to lack of evidence.

Thirdly, the new democracy has also led to conflicts amongst some government staff. It is now sometimes more difficult to discipline officials, and inefficiency has consequently increased. It is harder also to get rid of ineffective members of staff. A further problem has been that four different Director Generals of National Parks have been in office from 1991 to the end of 1993, which disrupts policies and continuity. In addition, government policy has been to reduce most departments' staff, and National Parks' mid-level staff were cut by 30% in the headquarters and 25% in the field in 1993.

The fourth and main reason for the increase in rhino poaching, however, was poor leadership in Royal Chitwan National Park at the time. So much depends on a good leader, and the main cause of rhino poaching decreasing or increasing unexpectedly in certain years is usually the competence or incompetence of those in charge. Before 1990, the Palace could directly order the army and other sectors of government to patrol more rigorously if leadership slackened. Now, the forest guards are fully controlled by the DFO, the Parks Department by the Park Warden, and the battalion's effectiveness depends on the commitment and strength of the Lieutenant Colonel. If these leaders are weak, ineffective or lazy, the system suffers.

The army is not obliged to patrol extensively, and this duty became even less effective than usual in the early 1990s. The army's patrol work has limitations anyway due to the regular times the men must be in camp. The presence of guard posts inside the Park is a better poaching deterrent than the limited patrolling. The worst poaching in 1992/3 was on the western side of the Park, including Bandarjhoala island where there were insufficient numbers of army posts.

Another problem is that conflict can occur between the commanding officers and the park wardens, and if the army's co-operation is lost, poaching pressure

increases. This is unacceptable when one considers that 65% of the Park's budget goes to the army for Park protection.

Furthermore, soldiers generally dislike working at Royal Chitwan National Park as they fear the rhinos; their training for rhino patrol work is inadequate and two years in the Park are not long enough to gain the needed experience. If the two-year posting is lengthened, as occurred in 1992 when the same soldiers were in the Park for two and a half years, efficiency levels drop as the men so much want to leave. The soldiers consider Royal Chitwan National Park to be a hardship post.

It is interesting to note that in the bad year of 1992 there was one area with no rhino poaching: that of Nawalparasi district (see Table 9). This was directly the result of good patrolling which in turn was due to a hard-working District Forest Officer who motivated his men (Adhikari, pers. comm.).

*Table 9. Minimum number of rhinos poached in and around Royal Chitwan National Park*

Year	Area within Park	Chitwan district	Nawalparasi district
1990	3	1	0
1991	1	1	0
1992	17	1	0
1993	4	2	2

*Source: Royal Chitwan National Park, and Ministry of Forest and Soil Conservation*

## **Recommendations for improving rhino conservation in and around Royal Chitwan National Park**

- A special Parks unit inside the Park and a special Forest unit outside the Park should be established to deal specifically with rhino protection.
- The new anti-poaching units of the Department of National Parks and Wildlife Conservation, although good at collecting information on poachers, need guns, walkie-talkies and camping equipment if their tasks are to include effective patrol work.
- The number of game scouts inside the Park should be increased from 60 to 100.
- More army posts should be set up in the western side of the Park, including the river areas and Bandarjhoala



*For 15 days a year local people are allowed to collect thatch grass, reeds and binding materials from Royal Chitwan National Park. Much fire wood, however, is smuggled out of the Park concentrated in the grass bundles.*

- island where there has recently been an increase in poaching.
- More walkie-talkies and transport should be supplied to the army posts.
- Leadership effectiveness, in all anti-poaching sectors, should be regularly checked, and incompetent leaders replaced immediately.
- The frequent changing of the Director General of Parks needs to be stopped.
- There should be a significant increase in funding for the intelligence system operated by the Park Warden and the DFOs.
- Publicity in the local newspapers is needed, stating the truth that the price of rhino horn has fallen in the Far East, in order to deter poaching.
- Conditions for the villagers need to be improved by implementing the plan for an impact zone around the Park. Villagers also need to be encouraged to plant more trees, make gas from cow dung, improve the uses of agricultural waste from rice straw and promote the use of stall feeding so the number of domestic animals illegally entering the Park would be reduced (Sharma, 1989; Sharma & Shaw, 1993b).

## **ROYAL BARDIA NATIONAL PARK**

### **The history of Royal Bardia National Park's rhinos**

Royal Bardia National Park is a large area of lowland, similar in size and habitat to Royal Chitwan National Park, in the more remote, south-west part of Nepal. In order to start a new rhino population in Nepal, rhinos were translocated there from the Chitwan area: 13 in 1986 and 25 in 1991. The first group of rhinos was

taken to the west side of the Park to the Karnali floodplain. Of these first 13 rhinos, three crossed the border into India and one was illegally killed. The second group of rhinos was released in the more remote and rugged eastern section of the Park in the Babai valley. Four of these rhinos were poached in 1992/3. From 1986 to early 1994, however, at least 17 calves were born. Of the Park's total rhino population, by early 1994 eight had been poached, four had died of natural causes, three of unknown causes and one was killed by a tiger (see Table 10). Thus Royal Bardia National Park had 39 rhinos (both adults and calves) in 1994 (R.K. Thapa, Ranger, pers. Comm.).

## Rhino poaching in and around Royal Bardia National Park

Poaching is organised by people living mostly to the north of the Park. A gang with a rifle or shotgun consists of two or three local people, but gangs of five or six are common in the remote eastern side of the Park where the poachers are less likely to be spotted. It is in this region that pits are often dug, usually near a rhino track leading to a water hole; many pits are dug at one time. The third method of poaching used in the Park is snaring. A fairly thick electric wire is tied to a tree over a rhino track, and branches are put down to block other paths, so a rhino is forced to follow the route with the snare (Ram Prit Yadav, former Warden of Royal Bardia National Park, pers. comm.).

The Park lost its first rhino to poachers by gunshot in 1988/9 in the north-west part (near Khairbhatti). Two more were illegally shot dead in 1991/2 outside the Park, one west of the Karnali river and the other to the south. In 1992/3 poachers moved to the eastern side of the Park to the newly introduced rhino population in Babai valley; two were killed in wire snares, and two poached by unknown means. In 1993, one more rhino was shot dead in the south of the Park (R.K. Thapa, pers. comm.).

Table 10. Known deaths of rhinos in Royal Bardia National Park

Year	Natural death	Poaching	Tiger predation	Unknown causes	Total
1986/7	1	0	0	0	1
1987/8	0	0	0	0	0
1988/9	0	1	0	0	1
1989/90	0	0	0	0	0
1990/1	0	0	0	0	0
1991/2	1	2	1	2*	6
1992/3	1	4	0	0	5
1993/4	1	1	0	1*	3**

Source: Royal Bardia National Park  
\*babies \*\*early January

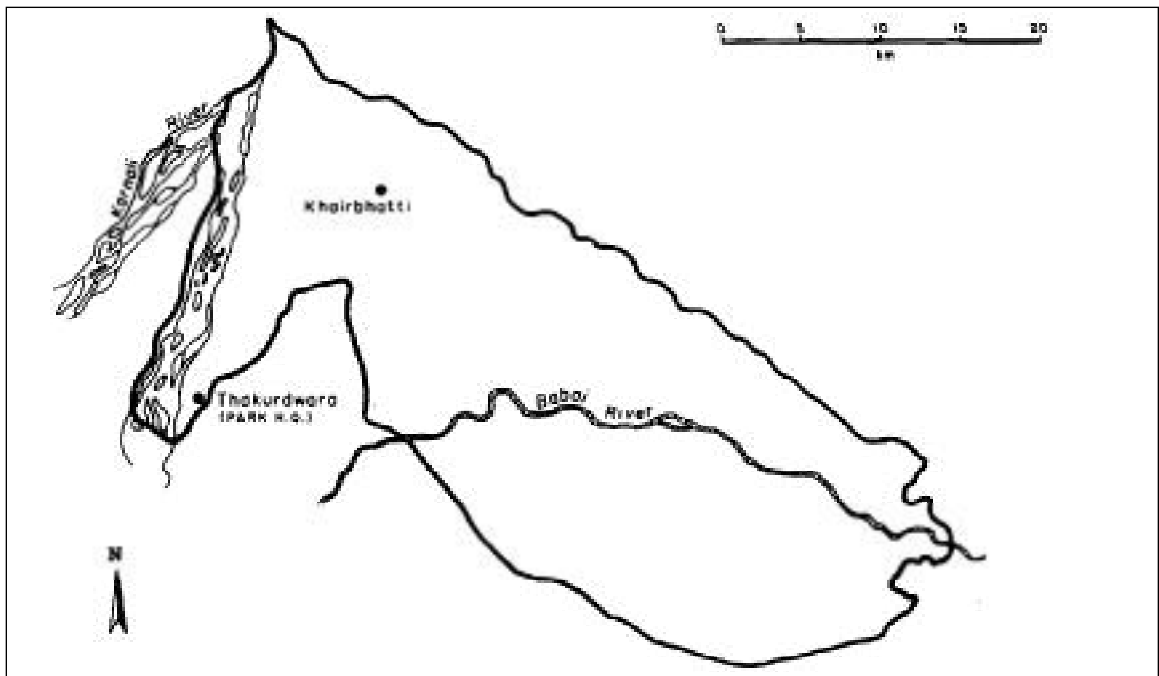


Figure 3: Map of Royal Bardia National Park.

Prices paid to poachers and middlemen for rhino horn are not known because information-gathering has been inadequate: But in November 1993 six poachers were caught south of the Park near Gulariyai. They admitted to having killed the rhino in 1993 and selling the horn to a person from Pokhara. Horns are bought probably by businessmen in Pokhara and Nepalganj who may sell them to merchants in Kathmandu who arrange their illegal export.

### Anti-poaching efforts for Royal Bardia National Park

Royal Bardia National Park has never had a Gainda Gasti or special rhino patrol unit; forest guards patrol outside the Park and the army work inside with some help from the Parks Department. There are two army companies of 250 men each, one in the west and one in the east, but only 175 men are available in each company at any one time: In 1992, unlike in Royal Chitwan National Park, the army did patrol Royal Bardia National Park effectively, due to good leadership: However, poaching worsened at that time in the Babai valley, due to lack of staff in the area: Since then, more army personnel have been posted to the valley and poaching has been reduced: Each company has a Major in charge: Patrolling occurs usually three times a day and occasionally at night. Patrol times differ so that the poachers do not know when a patrol is out. Soldiers in the Park think that it is a duty to patrol, unlike those in Royal Chitwan National Park. The Royal Bardia National Parks Department, which has 128 employees, maintains one anti-poaching unit of nine men (five Parks staff and four local men), but they have no firearms: In early 1994, this unit patrolled the western area where there were 13 rhinos. There are also 60 game scouts who patrol with nine domestic elephants, but neither do they have firearms.

### The effect of Royal Bardia National Park on the nearby villagers

Rhino damage is not so severe around the Park compared to Royal Chitwan National Park as there are far less rhinos (39 versus 450); there are also fewer people in this region; furthermore, part of the northern Park boundary is a forest reserve: Some rhinos in the east, however, do eat crops on the Park border, for which no compensation is paid: The re-introduced rhinos had acquired the habit of crop-raiding around Royal Chitwan National Park; they like rice and maize especially: Rhinos also wander out of the Park into the village areas in the west: A report submitted to

NORAD in 1993 stated "Preliminary results show that rhinos in the Karnali floodplain (in the west) are causing serious damage to agricultural crops in certain key locations and that harassment and injuries to humans are increasing" (NORAD, 1993): From 1989 to 1992 four villagers were injured, while in 1993 two people were killed by rhinos, one inside and the other outside the Park (Yadav, pers. comm.). There is still no fixed compensation for death:

In order to maintain good relations with the villagers, especially important now with the presence of rhinos, the Parks Department allows the people to receive certain benefits from the Park. There is presently little demand in this area for rhino urine, blood or meat, although the local people do use the skin for religious purposes. Villagers are allowed to cut grass and reeds for 15 days in the winter, and 45,193 permits were issued for 12 rupees each in the 1993/4 season. The Park's tourist industry is presently small, so very little employment is possible. The one tented camp (with 26 beds) inside the Park, and a lodge (with 24 beds) plus two small rest houses outside the Park employed just 54 people in late 1993. Only about 600 foreign visitors came in that year, but this was an increase from 222 in 1988 (see Table 11).

Table 11. Number of foreign tourists to Royal Bardia National Park.

Year	Number	Year	Number
1984/5	212	1989/90	556
1985/6	20	1990/1	360
1986/7	115	1991/2	670
1987/8	222	1992/3	602
1988/9	314		

Source: Royal Bardia National Park

It is hoped that a significant tourist industry will soon be established in the region as the highway to Royal Bardia National Park has now been tarmac'd the whole way from Kathmandu. In the future more money from tourism is due to go to the local people; there is new legislation, as for the Chitwan area, allowing 30% to 50% of the tourist revenue to go into local community development projects and for an impact zone around Royal Bardia National Park: Meanwhile, certain international NGOs are supporting community services, research and monitoring of the rhinos, while also helping to equip the anti-poaching personnel with camping gear and walkie-talkies.



*Rhinos are sacred animals to many Nepalese and almost all parts of the animal are used for religious or medicinal purposes. At Bhatapur near Kathmandu, two rhinos can be seen which were carved from stone several hundred years ago.*

### **Royal Bardia National Park's budget**

In 1992/3 the Park's budget was 19,524,488 rupees (\$440,733) of which the army received 72%. This budget works out at \$455 per km<sup>2</sup>. significantly less than Royal Chitwan National Park's. The earnings of Royal Bardia National Park are also far less: The majority of the income comes from the sale of trees: In 1993, the Park earned just 1,233,249 rupees (\$26,810) from all sources. The Park also has less government staff than Royal Chitwan National Park; including the full establishment of the army, the Park has a staff of 0:65 per km<sup>2</sup> compared with 1.1 for Royal Chitwan National Park.

### **Recommendations for Royal Bardia National Park**

- The budget and the number of staff for the Park should be increased, as by January 1994 eight rhinos had been poached and the net increase in rhino numbers from the 38 founder animals was only one in early 1994.
- The Park's anti-poaching unit needs to be increased in size and should be given rifles:
- The intelligence system in the area must be improved significantly, to at least the standards of that in the Chitwan area.

- More fencing around the Park is needed to keep out cattle (although this is not practical for Royal Chitwan National Park due to greater floods and human pressure).
- Relations with the villagers must be improved with local development projects.
- Communication with India should be improved so that any rhinos that cross the border can be recovered.

## CONCLUSIONS

Since the establishment of Royal Chitwan and Royal Bardia National Parks, His Majesty's Government of Nepal has provided a large annual budget to protect the growing rhino population, despite being one of the poorest countries in the world. It has also allocated a large security force, namely the army, to the parks. Royal Chitwan National Park has always had strong support, first under His Majesty's Government and now with the new democratic government; and the Nepalese have managed the rhinos almost entirely by themselves with very little foreign expertise or external funding assistance. The number of rhinos has more than quadrupled since the late 1960s, a testimony to Nepal's great conservation success, enabling a second population to be established in Royal Bardia National Park.

His Majesty's new government is also very aware of the importance of providing benefits to the local villagers around the two parks, such as by allowing tens of thousands of people to enter the parks for valuable grass and reed collection each year, and by permitting them to take certain rhino products from the dead animals. Furthermore, foreign tourism is highly encouraged in Nepal's parks and brings the local villagers much needed employment benefits.

These management strategies have been the right ones. As long as good leadership is maintained within the parks so that patrol work is carried out effectively, and as long as funding for intelligence gathering can be secured (by far the most cost-effective method of stopping poaching), Nepal's rhinos should continue to increase to the parks' carrying capacity. The rise in poaching in 1992 should remain an exceptional case, as lessons from this experience have probably already been learned. Thus, with effective management and leadership, Nepal will maintain its reputation as one of the world's greatest conservation success stories for the rhinoceros.

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