

KAZIRANGA

Leaves from a forester's notebook

A large rhinoceros stands in a grassy field, facing right. Three white egrets are scattered around its feet. The background is a lush green field.

RANJAN KUMAR DAS

Foreword by ANWARUDDIN CHOUDHURY



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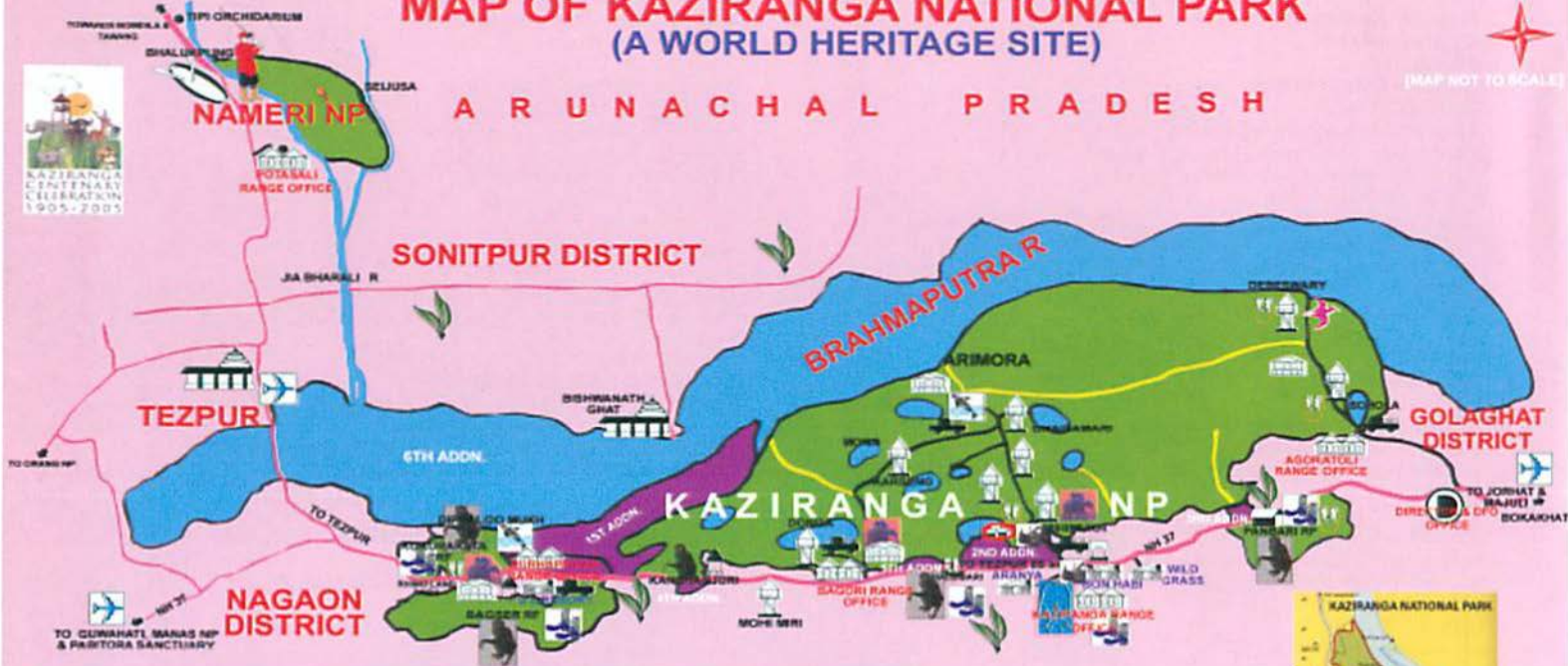
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MAP OF KAZIRANGA NATIONAL PARK (A WORLD HERITAGE SITE)

A R U N A C H A L P R A D E S H



(MAP NOT TO SCALE)



DESCRIPTION	SYMBOL	LOCATION	DESCRIPTION	SYMBOL	LOCATION
Director and GPS Office		Bokakhat	Police Camp		Bokakhat
Range Office		Agarwadi, Kuluwa, Bagdori, Burhagohar	Tracking		Purbari, Kuluwa, Hukilbar, Bagdori, Kuluwadi
Assess Tourist		Kuluwa	Elef Manring		Sohria, Police Camp, Purbari, Hukilbar, Kuluwadi, Debarbari
Resort		Kuluwa, Aranya, Bagdori, Wild grass, etc.	Fishing		Nameri NP (100 Km.)
Bank		Kuluwa	Angar		Nameri NP (100 Km.)
Government & Private Lodges		Kuluwa, Aranya, Bagdori, etc.	Forest		Tezpur, Nameri NP, etc.
Government & Private Bungalows		Kuluwa, Aranya, Bagdori, etc.	Forest (Protected)		Tezpur, Nameri NP, etc.
Government & Private Cottages		Kuluwa, Aranya, Bagdori, etc.	Forest (Reserved)		Tezpur, Nameri NP, etc.
Government & Private Huts		Kuluwa, Aranya, Bagdori, etc.	Forest (Sanctuary)		Tezpur, Nameri NP, etc.
Government & Private Shacks		Kuluwa, Aranya, Bagdori, etc.	Forest (Wildlife)		Tezpur, Nameri NP, etc.
Government & Private Dwellings		Kuluwa, Aranya, Bagdori, etc.	Forest (Wildlife)		Tezpur, Nameri NP, etc.
Government & Private Huts		Kuluwa, Aranya, Bagdori, etc.	Forest (Wildlife)		Tezpur, Nameri NP, etc.
Government & Private Shacks		Kuluwa, Aranya, Bagdori, etc.	Forest (Wildlife)		Tezpur, Nameri NP, etc.
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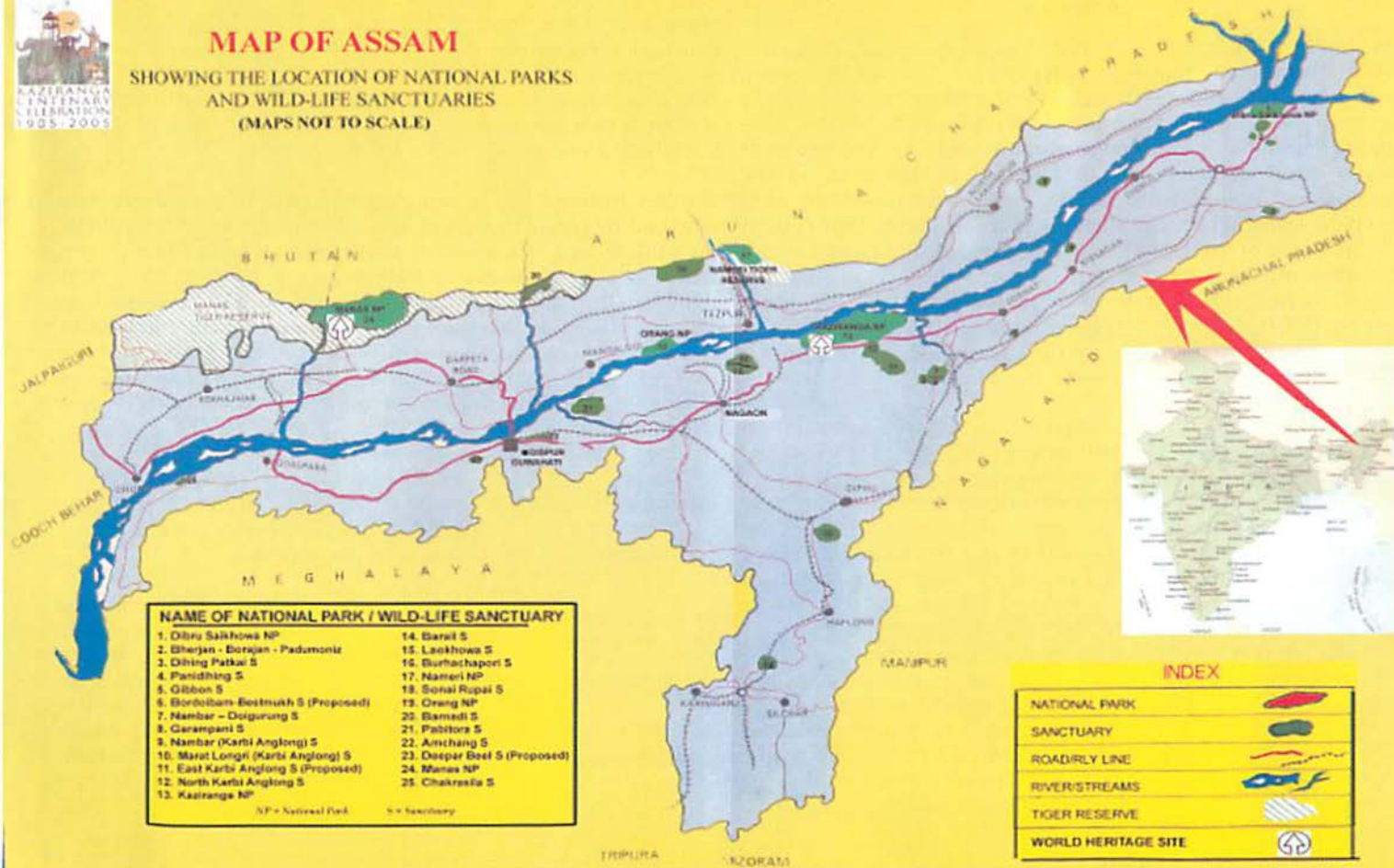


An earlier map of KNP. Presently even the mighty Brahmaputra flowing alongside has been attached to the Park area for all practical purposes.



MAP OF ASSAM

SHOWING THE LOCATION OF NATIONAL PARKS
AND WILD-LIFE SANCTUARIES
(MAPS NOT TO SCALE)



NAME OF NATIONAL PARK / WILD-LIFE SANCTUARY

- | | |
|-------------------------------------|------------------------------|
| 1. Dibru Saikhowa NP | 14. Barail S |
| 2. Bherjan - Borjan - Padumoni | 15. Lakhnow S |
| 3. Dihing Patkai S | 16. Burhachapori S |
| 4. Panidhing S | 17. Nameri NP |
| 5. Gibbon S | 18. Sonai Rupai S |
| 6. Borobam-Bestmuth S (Proposed) | 19. Orang NP |
| 7. Nambor - Dorigurung S | 20. Bamedi S |
| 8. Garapani S | 21. Pabitora S |
| 9. Nambor (Karbi Anglong) S | 22. Amchang S |
| 10. Marat Longri (Karbi Anglong) S | 23. Deepor Beel S (Proposed) |
| 11. East Karbi Anglong S (Proposed) | 24. Nameri NP |
| 12. North Karbi Anglong S | 25. Chakrasila S |
| 13. Kaziranga NP | |

NP = National Park S = Sanctuary

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NATIONAL PARK	
SANCTUARY	
ROAD/RLY LINE	
RIVER/STREAMS	
TIGER RESERVE	
WORLD HERITAGE SITE	

Foreword

The famous Kaziranga National Park of Assam is in fact, a living laboratory, unique in India, where, in a single sweep of the eye, one can see hundreds of wildlife at any time of the year. A National Park and a World Heritage Site, it is among the most well-known wildlife areas in the world. It was a hundred years ago in 1905, that this area on the floodplains of the Brahmaputra river was proposed as a reserved forest when the dwindling rhino population caught the attention of the Britishers. It is believed that Lady Curzon was instrumental in getting Kaziranga declared a Reserve Forest. Lord Curzon's role in the preservation of the Indian lion in the Gir forest in Gujarat is well known, and hence there is every reason to believe the theory although not much of document in black-and-white is available to back up.

Kaziranga is the largest unspoilt grassland area left in Northeastern India. The tall grass and reeds, also called the elephant-grass or the wet savannah grassland, grows to a height of over five metres during the rainy season. Here inhabits the Indian or greater one-horned rhinoceros *Rhinoceros unicornis*, the animal that has made Kaziranga world famous. But Kaziranga is also extremely important for various other reasons. It has the highest number of threatened birds among the 400 odd 'Important Bird Areas' in India. It also has the densest tiger population anywhere, while the largest population of the endangered wild water buffalo is found in this Park. The Eastern race of the swamp deer, if it is treated as a valid subspecies, is virtually confined to Kaziranga only with stragglers in Manas. A thousand plus population (mainly in winter) of Asian elephants makes the Park vital for the survival of these pachyderms.

Kaziranga was also a poacher's paradise, who were after the rhinos for their horn. It is only in recent years that the poaching could be checked effectively where the NGO supplement to the Governmental effort was also noteworthy. However, there was no publication of any significance in the form of a book on this magnificent wilderness till 2003-04 when a few small books hit the stands.

Ranjan Kumar Das is among a handful of Forest officials who can be termed as 'wildlifers'. He has adequate knowledge on wildlife and was keen on matters relating to wildlife even when he was in the Social Forestry wing. We had many field trips together in Dhemaji, Lakhimpur as well as in Kaziranga. Mr. Das has put together his observations while serving in Kaziranga, in a book form. These accounts would be interesting to both general readers as well as serious students of wildlife. While narrating his experiences he has tried to maintain the scientific authenticity of facts, thus making this publication a valuable document as well.

Kaziranga is going to celebrate its centenary early this year and this book is a fitting gift to the people who are concerned on this famous wilderness and its wildlife.

Anwaruddin

Choudhury, Ph.D

Deputy Commissioner, Baksa

Honorary Chief Executive, The Rhino Foundation of

nature in NE India,

Member, State Board for Wildlife, IUCN/SSC/BLI Asian

Elephant/Asian Rhino/Waterbird/Small Carnivores/

Pheasant Specialist Groups

Acknowledgements

I owe a great deal of gratitude to the following altruist people, for their generous help and selfless, philanthropic guidance during my days in Kaziranga and during preparation of the manuscript. I enjoyed a great deal in jotting down about the gallant 'Green warriors' of the equally great Rhino land. Kind persuasion and inspiring words by Mr. K.C. Patra, IFS who was the Divisional Forest Officer of Kaziranga National Park and retired as a Conservator of Forests, and Mr. V.S. Mathur, IES, Conservator of Forests, led the undersigned to make such an effort, his maiden venture, to speak about the unsung heroes, their brave acts and commitment while describing the Kaziranga rhinos and other wild animals. Encouraging comments from Mr. Pradeep Gogoi, the noted Film Director and Producer, maternal uncle of my wife, inspired me to a great extent to step forward. Support from my family and my wife, Madhu, was always with me and acted as the 'driving force' while serving in Kaziranga and even while writing this book. I did not consider myself different from the fleet of five hundred forest staff, but was rather a part of the system, guarding and monitoring the diverse ecological values. A tough stance, moral support and an apt hand were absolutely necessary to accomplish the tasks I was entrusted with. Ideas, plans, lexis and styles were borrowed from write-ups and travelogues published by Ms. Anjali Tirkey on the Internet. She is a known travel writer in leading national level newspapers and is the able spouse of the present Deputy Commissioner of Golaghat District. Ideas were also borrowed from write-ups of Mr. Nayanta Das, a Lecturer of Bokakhat College and many others. Dr. Podmeswar Gogoi who is the Head of the Botany Department of D.B. College, Golaghat was kind enough to go through the manuscript and made the necessary corrections in the flora section. Dr. Gogoi is one of the leading Botanists of the region and is presently, one of the Members of the State Wildlife Advisory Board. Mr. Arup Ballav Goswami is the Honorary Wildlife Warden of Golaghat District and was associated with the undersigned throughout. He has contributed a lot for conservation of the flora and fauna and is a well known wildlife photographer. He takes premeditated risks to produce some magical moments and makes them look as natural as possible; the extraordinary photographs of a pair of copulating rhinos, the pair of Great Pied Hornbills eating figs and the Tusker with convergent tusks speak for themselves. Mr. Prasanta Kumar Bordoloi, a born Artist, a wildlife admirer and Photographer and presently an Honorary Warden was also kind enough to spare his rare photographs of the Otter eating a fish and of the Pangolin, and also did the much needed sketch renderings

of the African and Asian rhinoceros. Md. Firoz Ahmed who is doing research on the Herpetofauna has contributed to the reptilian diversity and the fabulous photographs of the Green Tree Throated Lizard, the Black Soft Shelled Turtle, the tree and Mink Snake, the Bull Frog and an Elephant herd are owed to him. The superb and breathtakingly beautiful photographs of the Bar Headed Goose, Tulkers, Swamp deer and the Otter are by Mrs. Dr. Bhaskar of Bangalore have definitely added variety to the get up of the book and are valuable visual documentation. Bhaskar is now an internationally acclaimed Wildlife Photographer and has covered many countries including the Bio-diversity of the Amazon. It is an honour for me that a Photographer of his class has contributed to the charm of this book. I remember how Mr. Rabindra Sharma, the Research Officer of Kaziranga National Park supported me and acted as a 'catalyst' in accomplishing many difficult tasks and sharing the pain on many occasions. My days in Kaziranga would have never been so gratifying and rewarding had I not received such caring from him. I owe a great deal to him and offer my sincere thanks and gratitude. I troubled Dr. Tarun Kheria, who has served as the Forest Veterinary Officer in Kaziranga for more than six years and I obtained much valuable information from him. He writes regularly in Assamese dailies under the caption *Kaziragar Diary*, which is very popular among Assamese readers. I tender my earnest thanks for the guidance and assistance that he rendered to me. Special thanks to Mr. Nikh Vasu, the Director of the Park who was my 'mentor' during my endeavour to protect the wild animals as the DFO of the Eastern Assam Wildlife Division. Equally, the support from all other Officers and subordinate staffs was tremendous and overwhelming. Not only me but also the entire community of wildlife enthusiasts and nature lovers do admire and appreciate their services and are indebted to them. Dr. Parag Das Gupta who retired as the Head of the Dept. of English, Pandu College, Guwahati initially edited the text and I am thankful for his magnanimous support and encouragement. Dr. Anwaruddin Choudhury who is recognized, as an 'expert' in the wildlife arena was kind enough to write the 'Foreword' of this book, and went through the manuscript, marking the necessary corrections. I am indebted to him for sparing his valuable time and for his guidance. I am thankful to Mr. Krishari Kumar who readily agreed to publish the book in a record time. Thanks are due to all others who are left unknowingly but without whose support, this venture might not have been possible.

Dated 12.1.2005
Guwahati.

Ranjan Kumar Das

Introduction

It was the thirteenth of August 2003, a sunny day, when I arrived and took charge of managing the Rhino Land— Kaziranga. The Government of Assam directive was a pleasant surprise for me and I accepted it as a lifetime opportunity to transform and translate many of my ideas into reality. The challenge ahead— to protect the famed one horned rhino and rebuild my career from a cooling-off period of one and half years.

We arrived after a five-hour comfortable car journey from Guwahati, and this is perhaps the best way to reach Kaziranga from Guwahati, virtually the gateway of all of Northeast India and its treasures. For the tourist these few hours are the ideal means to acclimatize with the countryside and the people of the area. The East-West highway traversing right through Assam touches Nagaon, a centrally located town where we had our breakfast. We travelled further East enjoying the stretches of paddy fields extending unto eternity and attended by mud covered cultivators, chains of green forests, sprawling tea gardens and their bevy of working pluckers, the rows of avenue plants comprising *ajar*, *sonaru*, *nahor* and *gulmohar* trees adding a touch of diversity and vibrant colour. Thatched hutments and granaries enclosed in traditionally designed bamboo fences, charming girls, cute children, coconut and betel nut trees, doves in courtyards, shallow ponds choking with lotus and hyacinth, each frame in the window of your speeding vehicle can perhaps make a good picture postcard shot. And all this is on way to the treasure house that awaits you— Kaziranga. As a son of the soil, I am of course familiar with countryside Assam but each such drive in this land of eternal beauty always appeals to me— in one word— enchanting.

In the words of the late Dr. Robin Banerjee whose name has been woven into the very fabric of Kaziranga, "The Amazon Rainforest may be deep but it is Kaziranga that is truly lovely and complete." The months of September and even early October



A rhino standing by the beel



Elephant festival 2004



remain hot in Kaziranga with occasional showers. The days are still long and humid for the most part of September. The year 2004 experienced floods in mid-October, the wet lands getting filled with gushing waters from the rivers originating in the neighbouring Karbi Anglong Hills. The Pelicans have nests over tall *Simul* trees at Koladuar in the Eastern range of Kaziranga. The marshes are now full of fish, aquatic birds and other wet land insects. The animals are back from their temporary stay in the hills. The Park authority is busy restoring the damage of the last floods. The resort managers and jeep owners seem engrossed with planning how best to welcome the tourists this winter, which will be most special as it is the Centenary year of the Kaziranga National Park.

As I begin the rough draft for this book, the nights are slowly becoming foggy, cooler and shorter. The winter birds have begun arriving from the far-flung places of Siberia, Europe and Central Asia.

The Assamese people are basically agrarian, relieved from the task of harvesting, remain in a joyous frame of mind and in a festive atmosphere; awaiting their traditional Magh Bihu. Besides, it will soon be Christmas and the beginning of the New Year; the merry making people remain buoyant.

Kaziranga National Park, (KNP for short) spreads over an area of 860 square kilometres in the flood-prone plains of the Brahmaputra, lying in the Northeastern corner of India. The habitat is a perfect mosaic of deciduous jungles with cane groves, tall elephant grass, dotted with numerous marshes and shallow water pools locally called *beels* with swaths of lush green carpets of short grasses around them. The Diphaloo and Bhengrai are the main contributing rivers of these *beels* though the vast expanded tract is interspersed with numerous small streams.

Coming back to 2003, when I joined KNP— as I stepped into my official residence at Bokakhat, my mind already heavy after leaving wife Madhu, daughter Esha and son Vibhee, the rooms felt empty though well furnished by Dwipen, my caretaker.



A deer pictured at night



A leopard cat



A hoolock gibbon- the curious ape
and the tailless primate.

Conscious of my responsibilities, I moved to ascertain over the VHF set if everything was all right as I already knew that every moment in Kaziranga could be apprehensive and unpredictable.

Assam is also the land of merging cultures and reflects a fusion of festivals of the different communities, celebrated at different times of the year. The major festival of Assam, the *Bihu* is in three main forms, viz. *Kati Bihu* in October/November, the *Magh Bihu* in January and the *Bohag Bihu* in April. Some years by early April the monsoon breaks in and there is a long spell of rains, strong winds and glittering sunshine, and the main tourism season is already over. Of course, the rains are also a pleasurable time of the year and sometimes continue right throughout October, as they did in 2004. This is the rainiest part of the country, and not too far away in neighbouring Meghalaya, are Cherrapunji and Mawsynram two towns now vying for the top spot of being the rainiest places in the world. Of course, Cherrapunji held the record for very many years. The countryside turns lush with different shades of green, fresh leaves, flowers and shoots. Villagers retreat to their paddy fields to start another cycle.

The home of the rhino as KNP is also known as, extends over an original area of 430 sq. km., and to accommodate its growing wild life population an additional area of 429.4 sq. km has been acquired. Our celebrity animal- the rhino, a rare, surviving prehistoric one, can be easily observed grazing in the short grasses or enjoying the mud packed belly deep water in the *beels*. These marshy places with short grassy patches can never be separated from the rhinos. Elephants, buffaloes and the swamp deers are called mega herbivores and they share these habitats without any apparent confrontation and seem to tolerate each other as if they are members of the same family. As a beginner, I tracked and roamed over the vast, almost impenetrable terrain, sometimes on elephant back, spending the whole day and at times staying overnight in a jungle camp to gain more and varied experiences. Come dinner time,



A portrait of Lady Curzon, the heiress from
Chicago and wife of Lord Curzon, Viceroy of
India, painted by Franz von Lenbach in 1901.

I would be served all these delicacies from the jungles of Kaziranga- *naltenga* (*Chissus repans*) *chutney*, *dal* sour with *outenga* (*Dillenia indica*), *bet* (burnt or fried cane tender shoots), *dhekia* (Ferns) fry etc. The occasional hoot of an owl or the trumpeting of an elephant herd nearby sometimes breaks the silence of the cool long nights. On this occasion I sleep peacefully after confirming over the wireless radio that everything was OK, but keeping myself ready for any eventuality. Many a times I have been awakened by some form of emergency— which can be common for the Park authority in Kaziranga.

Binoculars or digital cameras with night vision lenses are always very handy for spotting the animals on a moonlit night. Female buffaloes, swamp deer herds resting with vigilance on open ground, rhinos grazing, the cacophony of wintering birds, the shrill reminders of fishing eagles, the occasional alarm calls of deer, and even tiger calls— all make the wilderness of the Park rather like a living abstract painting. And in this and many more ways, I experienced, enjoyed and served from my heart, the “Wild Kaziranga”.

Next morning, forgetting the fatigue of the previous day, I started a unique Kaziranga day— with visiting dignitaries, and the countless problems of looking after a large Park like Kaziranga where poachers played a major problem in the past. The day stretched late into night, and sometimes right into the next morning. Though most exhausting, it is the sacred duty of protecting the wildlife and heritage that is paramount. Often, I failed even to contact my family for days on end; yet I derived satisfaction from and for the safe days for Kaziranga’s wildlife— quite a challenge!

The rich bio-diversity is best seen around the *beels*, with herds of ungulates, both swamp deer and hog deer, many a times with rhinos, buffaloes, wild boars and elephants nearby seen grazing on short grasses, equally shared by geese who are vegetarians. Migratory ducks, teals and pelicans often go for community fishing in deep water.



Barsohola



Black stork

Since 1908, this spectacular patch of forests has been under the protected area category. This magnificent wildlife habitat is sandwiched by the river Brahmaputra in the North and by the Karbi Anglong Hills in the South. Recognized as a part of Kaziranga Reserve Forests, proposed in the year 1905, a patch of 56,544 Acre area earned the distinction of being one of the oldest protected forests of the State intended to save the one horned rhinoceros, others being Manas and Laokhowa. Unlike other Reserve Forests, the Kaziranga Reserve Forest was managed only for the protection of wild

animals and no commercial forestry was ever allowed.

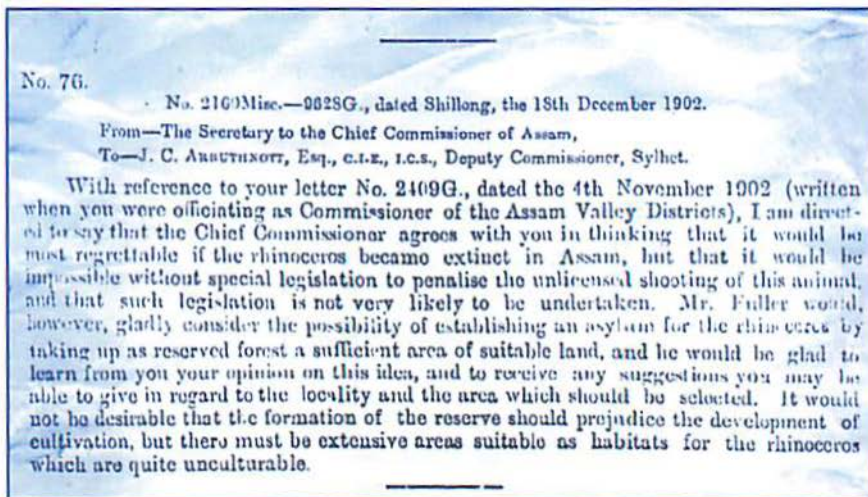
The Historical Perspective

As a mark of recognition to the farsightedness of a few conservation oriented persons, more precisely Lady Curzon, (which dates back to a full one hundred years, or more, depending on when you read this sentence) about 57,273.60 acres of area was proposed to be a reserve forest

in the year 1905 to protect the few remaining rhinos in this flood plain of the Brahmaputra river, known as Kaziranga, which became a Reserved Forest on third January 1908 with an area of 56,544 acres (228.830 square kilometres). The population of all animals was showing a rising trend and another area of 13,506 acres was added towards the North in the year



E.P. Gee



1913 to house the ever-growing population of wild animals. The area was declared as a Game Reserve in 1916 with an area of 277.654 square kilometres and finally a Sanctuary in 1950. Exclusion of a 577-hectare area took place during 1911 but additions were made during 1913 (5,403 Hectares) and 1917 (15,012 Hectares). An area of 60 hectares

was added during 1967 after declaration of the Sanctuary status in 1950. Though very strict measures were

ASSAM SECRETARIAT PROCEEDINGS.

Revenue—A.

September 1905.



Rules for the regulation of sport in reserved forests.

Proposed reservation of the Laokhowna, North Kamrup, and Kaziranga forests in Nowgong, Kamrup, and Sibsagar, respectively.

No. 75.

No. 2100G., dated Gauhati, the 9th November 1904.

From—J. C. ARBUTHNOT, Esq., C.I.E., I.C.S., Offg. Commissioner of the Assam Valley Districts,

To—The Secretary to the Chief Commissioner of Assam.

With reference to your No. 1278 Misc.—7720-25G., dated the 18th October 1902, forwarding letter No. 186, dated the 10th July 1902, from the Honorary Secretary, Zoological Garden, Calcutta, to your address, I have the honour to invite your attention to paragraph 6 of the Honorary Secretary's letter, in which the offer of Rs. 500 to Rs. 1,000 is made for an adolescent rhinoceros. The animal which was formerly common in Assam, has been exterminated except in remote localities at the foot of the Bhutan Hills in Kamrup and Goalpara and in a very narrow tract of country between the Brahmaputra and Mikir Hills in Nowgong and Golaghat where a few individuals still exist. In Kamrup and Goalpara the extinction of an interesting animal has been hastened within the last 5 years by the yearly incursions of large shooting parties from Bengal, which has led to the reckless and indiscriminate destruction of all game. It is inevitable that such parties should include novices who fire at anything that gets up in front of them. In the case of rhinoceros the slaughter of females and immature animals has brought the species to the verge of extinction. There is, I think, still time to preserve the very few that are left. I understand that the shooting of rhinoceros has been prohibited in Bengal. I would therefore suggest that the destruction of rhinoceros in Assam by shooting or by pitfalls be prohibited until further orders. I am convinced that, unless an order of the kind is issued, the complete extinction of a comparatively harmless and most interesting creature is only a question of a very short space of time. I trust therefore that the Chief Commissioner will see his way to take measures for the preservation of a species which is now verging on extinction before it is too late. An order prohibiting or limiting the destruction of rhinoceros without special permission would, I feel sure, be welcomed by all true lovers of sport and natural history. In my opinion, however, it would be necessary to absolutely prohibit the destruction of the animal in certain tracts where it is still known to exist anyhow for a period of years.

adopted by the Forest Department, Assam, there was unabated poaching of rhinos that led to changing over to new policies. Active participation of the local populace was sought and many notorious poachers surrendered. In the year 1974, the area was upgraded to the status of a National Park and a more effective control was ensured with the development of the necessary infrastructure. Such strict conservation measures paid dividends and eventually more areas (six additions totalling 430 sq.km. after 1984) were added to Kaziranga to accommodate the fast increasing population of all category of animals.

The once upon a time Reserve Forest of 1908 with perhaps a little over a dozen rhinoceros in the wild has since come a long way. UNESCO under UN Conventions declared it as one of India's five Natural World Heritage sites in 1985. Now it proudly declares itself as home of the largest population of the Great Indian One Horned Rhinoceros in the world. The efforts of conservation are pretty old, and now widely accepted as the last century's most remarkable successful conservation story. This was not an easy task considering the hindrances in a developing country like India.

Kaziranga- A World Heritage Site

Kaziranga was inscribed as a World Heritage Site on 6.12.1985 by UNESCO under UN Convention, and one of the India's five Natural World Heritage sites considering the natural criteria (ii) and (iv) which are recognized having outstanding universal values.



Dendrobium orchid

The sacred Lotus, growing in Sohola beel



IUCN Technical Evaluation

Although Kaziranga has a range of natural values and provides habitat for a number of threatened species and migratory birds, these are secondary to its major importance as the world's major stronghold of the Indian rhino. For these main reasons, it meets criteria (iv) of the convention. The Brahmaputra River's fluctuations result in spectacular examples of riverine and fluvial processes and the site thus also qualifies under criteria (ii). The National Park represents one of the last unmodified natural areas of this region of India.

World Heritage Values

Kaziranga National Park, a name known for its success in the conservation history of the one horned Indian rhinoceros, provides habitat for a number of threatened species of migratory birds. A symbol of dedication for the conservation of animals and their habitat, Kaziranga with a National Park status represents the single largest established protected area within the North East Brahmaputra Valley (9A) Biological Province (Rodgers, Panwar *et al.* 2002) to provide a long-term viable conservation of the rhinos.

Kaziranga National Park is an outstanding example representing significant ongoing ecological and biological processes in the evolution and development of ecosystems and communities of plants and animals. Kaziranga contains the most important and significant natural habitat for *in situ* conservation of biological diversity, including those containing threatened species of outstanding universal values from the point of view of science and conservation. These values and criteria made Kaziranga National Park to get inscribed on the world heritage list of "Convention concerning the protection of the world cultural and natural heritage" in the year 1985 under criteria N(ii) and N(iv) of the Natural Heritage.

Some of the significant conservation values of Kaziranga National Park are enumerated below:

- The largest undisturbed and representative area of Brahmaputra Valley flood plain grassland and forest with associated large herbivores, avifauna and wet land values (including turtles, dolphins etc.).

The World's largest population of:

- The Great Indian One Horned Rhinoceros (*Rhinoceros unicornis*), 1552 in 1999.
- Asiatic Wild Buffalo (*Bubalus bubalis*), 1431 in 2001.
- Eastern race of Swamp Deer (*Cervus duvauceli ranjitsinhii*), 468 in 2001.
- Highest ecological density of Tigers (*Panthera tigris*), 86 in 2000.
- Significant population of Asiatic Elephant (*Elephas maximus*), 1048 in 2002.
- The junction of the East Asia/Australia flyway and Indo-Asian flyway exhibits considerable diversity in avifaunal species— 500 species recorded).
- Transitional and successional example of grassland to forest and floodplain to hill evergreen forest communities.
- Considerable research, educational and recreational values.

Hands On Poachers

Settled in residence as well as in the office, I jumped headlong into anti-poaching activities. To begin with, an international gang of rhino horn smugglers was nabbed, and their vehicle confiscated. The smugglers remained behind bars for about three months, fighting against their conviction. Their attempts to facilitate the poaching of rhinos, and smuggling out their horns had got foiled and their lust for money was thus shattered. My strategy, strongly determined, was aimed at such abettors and gangs of rhino poachers. Within a few weeks, several notorious and most wanted



On a foggy morning



The antique in the mist



The arrested poachers

Bringing harmony- the Kaziranga rifle staff



poachers were nabbed and attempts made by others were grounded at the initial stages. The result was obvious. Kaziranga could score a maiden in the history of rhino protection and the year 2003 stood as a 'Zero Poaching Year'. Dharani Dhar Boro, Saidul Islam, Mukul Tamuly and Yunus Salim, all Range Officers of the Eastern Assam Wildlife Division supported immensely by B. K. Saikia and others, brought laurels to the Park, risking their lives. The team deserves yet another International Award.

Staff Of Kaziranga- Symbols Of Dedication And Commitment

Forest Guards Naser, Farooq, Bikul, Bharat, Paban, Padum, Akkel to name a few and hundreds of others are the symbols of courage, devotion, hard work, sacrifice, sincerity, politeness and are the watchful sentinels of thousands of varied animals in their wilderness with a determined tenacity to protect them. The entire bunch of five hundred staff are by nature pro-active, which is vital for the protection of animals, and a highly spirited lot. With morale increasing each day and with worldwide recognition, these cheerful soldiers greet the visitors warmly and courteously and navigate them to observe the much sought Royal Bengal Tiger, a trumpeting herd of Elephants, an inquisitive herd of Swamp Deer or a couple of elusive Bengal Floricans, safely and quietly. Tourists appreciate them, photographers sometimes tip them, and some eagerly listen to tales of their bravery and show their concern for some of their dangerous working conditions. The staff feel at home though some are hundreds of kilometres away from their families, and this matters. Six years back, the Kaziranga National Park Staff Welfare Society (KNPSWS) was established at the initiative of B.S. Bonal, then Director of the Park, with a fund of more than four lakhs of Rupees received as awards from various organizations. Instead of distributing the award money among the staff in piecemeal, the entire amount was deposited in the account of the Welfare Fund. The authority grants the required amount for welfare of staff that includes education of their children; medical treatment and they are also allowed to take a loan at very low rates of interest to address their personal problems.

Commendable support is received from International organizations like UNESCO, David Shepherd Wildlife Foundation, WWF, EIA, Care for Wild, US Fish and Wildlife Service, Shetland Foundation, Barbara Delano Foundation in collaboration with EIA, National Fish and Wildlife Foundation USA in collaboration with Ranthambhore Foundation, Windrose (Germany) through UNESCO and a personal donation from Ms. Anna Marz through IRF who showed much concern for the welfare of the rhino protectors— the frontline staff. Various National and local organizations like Aranyak, WWT, WTI, The Rhino Foundation, Kaziranga Wildlife Society and other NGOs also extend their helping hand for the cause of Kaziranga and for the rhino protectors. At present there are more than five lakhs of Rupees in the account of the KNPSWF. The authority cares for the staff and expects very high returns from them. They also live up to expectations and render their best. An example, well set, and now widely acclaimed.

Seasons change, time passes by, staff and officers get replaced on transfer and retirement, but life goes on, and must! Sometimes it is Afforestation or a Silvicultural or a Social Forestry Division where the man replacement comes from. Services, in these Divisions are meant for production of nursery seedlings, creation of large-scale plantations, and tending, and nursing, till their establishment. Protection of wild animals is a completely new avenue and particularly Kaziranga is a new platform for them. The Range Officers post them and attach them to an experienced group in an interior camp. The novices get oriented and tuned up in due course, to care about Kaziranga as well as for the wildlife as devotedly as the others in the past.

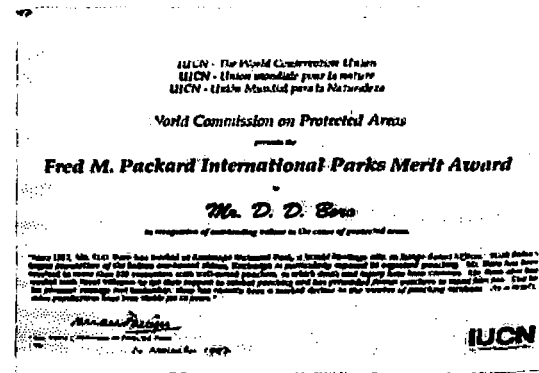
Fauna
Mammalian Diversity

I travelled to every corner of the Park. The Brahmaputra flood plain habitat, looked like embracing a part of the Karbi Anglong slopes. Except these slopes, the flood



The dedicated staff men

The Fred Packard International Parks Merit Award given to D.D. Boro





Swamp deer

Orange warmth



plain is a Terai formation and big mammals like the Elephant, Tiger, Leopard, Indian Bison (*Gaur*), Buffalo, Sambar, Barking Deer, Swamp deer, Hog Deer, and Wild Boar apart from the Rhino are encountered most frequently while the distribution of Primate species such as Hoolock Gibbon, Capped Langur, Rhesus Macaque, Assamese Macaque and Slow Loris is restricted to the Southern boundary touching Karbi Anglong Hills, Bagser and in Kukurakota Reserve Forests. The Gangetic dolphin, another mammalian species is seen in the Brahmaputra, Bhengrai and Diphhaloo rivers. The Wild Dog is not encountered in Kaziranga but the Golden Jackal is common while the Bengal Fox is also reported. The Dhole or Indian Wild Dog is found in the adjacent hilly areas of North Karbi Anglong Sanctuary. Both Sloth Bear and Black Bear are reported. Two species of Otter— the Common and Smooth Indian are seen fishing in the wet lands. Among the lesser Cats, three species of them such as Jungle Cat, Leopard Cat and Fishing Cat, the last one is the most vulnerable. Because of thick and impenetrable vegetation, it is difficult to spot wild animals easily in the woodlands, but the numerous footprints and pugmarks over the sandy riverbanks and muddy swamps remain a testimony to the richness of the area. There are 38 different species of mammals in Kaziranga. The leopards have been pushed to the Southern periphery of the Park, as there is a high concentration of tigers. More than 12,000 numbers of hog deer, and more than 7,000 of Wild Pig and other smaller mammals form a formidable prey base for the carnivores. Occasionally even rhino calves, elephant calves and buffaloes fall victim to the tigers. The forests consist of dense and tall trees with a multitude of species and due to the high humidity and much higher rainfall— lichens, mosses, liver worts, orchids and other epiphytes cover the tree trunks, including lianas, vines, herbs, shrubs and ferns that make the habitat most diverse.

The lofty mountains of the Himalayas fall far North of the Park but the gorgeous snow clad peaks are distinctly visible during winter, even from quite a distance. The breathtakingly beautiful landscape casts an indelible image on one's mind.





Sambar mother and fawn



The Significant Diversity Of Large Terrestrial Mammals At A Glance:

- KNP has the largest population of the great Indian one horned rhinoceros (1552 numbers as per 1999 census) and estimated to be around 2000 currently.
- 1431 numbers of Asiatic wild buffaloes made it the Park with their largest population in the world in 2001.
- There are about 1048 elephants as per the 2002 census.
- KNP also has the highest ecological density of Royal Bengal tigers (86 in nos. as per the 2000 census) in the region.
- 468 numbers of Swamp Deer (Eastern race), which is the only surviving population in the world.
- KNP has a high population of about 12,000 numbers of Hog deer and 7,000 number of wild boar, which is a substantial prey base for the carnivores, especially the tigers.

For efficient protection of elephants and long-term survival of the species in their habitat, the Government of Assam came up with a notification declaring an area of 3,270 square kilometres as the Kaziranga-Karbi Anglong Elephant Reserve, covering the districts of Golaghat, Karbi Anglong, Nagaon and Sonitpur. This was under the patronage of Government of India's scheme— Project Elephant with an aim to long-term conservation of the Asian Elephant in the State of Assam. Simultaneously four other Elephant Reserves viz. Chirang-Ripu (2,600 sq. km.), Sonitpur (1,420 sq. km.), Dihing-Patkai (937 sq. km.) and Dhansiri-Lungding (2,740 sq. km.) were also notified.

Kaziranga and her committed men may legitimately boast of a glorious history of conservation, recognized the world over, that has won them a number of awards, national and international, over the years. The scintillating success story owes to the sincere, devoted and loyal forest staff. Kaziranga is also an outstanding example

Wild Cats Of Kaziranga

With effective protection, Kaziranga has become an area with 86 tigers which is recognized as a most ecologically dense area. The numbers of tigers from 1972 are as follows:

Year	1972	1993	1997	2000
Number	29	72	80	86

The other wild cats are - leopard, leopard cat, fishing cat and jungle cat.

An Encounter With A Tigress

The tiger is the indicator of a healthy and vibrant forest eco-system and is the 'icon' of any wildlife lover. He is the symbol of courage, intelligence and beauty and often called as the spirit of the Indian jungle. He is the 'supreme predator' in a jungle occupying the apex of the biological pyramid. The tacit rule of nature is that by way of predation, carnivores control the animal population from becoming overgrown. In Kaziranga, 13 rhino calves were predated in the year 2003 alone by tigers, and a little more in the current year, i.e. 2004. Elephant calves; buffalo of any size and sex are common preys of the tiger in addition to all species of deer, wildboar and the smaller mammals of Kaziranga. These animals require trees, shrubs, bushes and grasses to survive which provide shelter to millions of smaller life forms and micro fauna. The vegetation is kept suppressed by the herbivores by way of grazing. An ecological balance and dependency on one another, thus, gets established. Unless the population is kept under control by natural means, there will be no place for others to survive and the balance of nature will be in jeopardy.

The 'tiger-villager conflict' around Kaziranga has become common because of a very high density of the supreme predator inside the Park. The estimated number of 86 in the year 2000 is recognized to be the highest in ecological density for any Protected Area of the country. The tiger is a territorial animal and leads more or less a solitary



Leopard



- The rare photographic sequence of a tigress attacking the Mahout -

Actual frame-by-frame sequence shown here (clockwise).



lifestyle; the female gets separated from the male as soon as the mating period is over. The mother alone rears the cubs and training for hunting and predation is imparted as soon as the cubs grow up. It was on 14th May 2004 that a tigress with her two cubs, sufficiently grown enough for weaning, prowled around Diphaloo Pathar village located at the Southern periphery of the Park, at a close distance from the divisional headquarters. The tiger family had killed two cattle heads followed by a milch cow on the same night, which had made the poor villagers and farmers absolutely restless and seek help from the KNP authority. As the area was situated very near the high tiger density area, it was not very unusual for sporadic cattle depredation. In the past, villagers generally thought this as an unavoidable hazard and took the happenings in their stride. Gradually as the tiger population has grown, the poor villagers, coupled with large-scale unemployment, consider it as a pecuniary loss not to be overlooked. The situation has changed, though not quite radically.

The authority responded quickly and after the necessary arrangements, was successful in tranquilizing the cubs on the 15th May with the Vets from the Center for Wildlife Rescue and Rehabilitation, Kaziranga. The cubs had also injured two persons in the skirmish. After two days of the tranquilizing operation and providing treatment for minor abrasions, the siblings were shifted to the Rangamotia Beat area, at a distance of more than ten kilometres and released in the wilderness. All concerned were contented with the sense of accomplishment or relief as they could save the grown up cubs— but not the mother tigress. It is only in a fable where one can get glimpses from reading about a tigress sacrificing her cubs, but cannot comprehend how dangerous she may be in reality. Barely a day had passed when the tigress, which was frantically searching for her cubs, killed a cow in the same village. The villagers reported on the morning of the 19th that they spent a sleepless night apprehending the howling tigress prowling around their village. I proceeded to the spot right away, asking the Vets to follow me. Support from the Police, Civil and Army authorities was shored up to control any law and order situation that might crop up. Steadily, hundreds of villagers even from the surroundings made a beeline to the spot and crammed full in the hope of witnessing the rare and



A jungle cat



Tiger canine



A tiger caged

The attacking tigress in full flow



exhilarating event of capturing a tigress by applying sedative drugs. We remained unruffled, studying and analyzing the situation while the tigress kept altering her hideout from one place to another. Tension built up among the villagers and some of them were so emotionally charged up that they began admonishing us in apprehension of our ineffectiveness in tackling any undesirable predicament that might arise. Instead, we concentrated on organising the operational logistics and planning; called on all the Range Officers, and a high number of staff and elephants for support. An iron cage was laid for transferring the tigress in the event of successful tranquilization. Our Chief Vet Dr. Rabin Saikia and Vets from CWRC calculated and finalized the doses to dart the target; The Police, Army and Foresters were fully gripped in controlling the edgy crowd which was growing impatient. Mr. N.K.Vasu, the Director, KNP, was equally tense and awfully engrossed, kept on guiding me relentlessly, as always, over the VHF. Four elephants were ready for the 'event'. Finally, elected teams got on the selected elephants, determined, and moved vigilantly towards the spot where the tigress, (probably more determined than us) was lurking in a standing paddy crop to make the counter attack. When we were at spitting distance, the annoyed tigress made a forward rush with a series of terrifying roars. Dimbeswar Das, a Forest personnel, and one of the best of our assortment, reacted instantly and fired a few rounds of blank shots in the air. His action clicked at the proper moment—the rush ended prematurely and the tigress lost her determination momentarily, and retreated fretfully only to be back again. My elephant, Bhadoi, blind of left eye, shook violently as she could read what was happening, while I struggled abortively to make a proper and clear video sequence of it. After few minutes of the setback, the team made another round of a 'do or die' search, this time more confident and energised, and wound up as there was no way out of the triangular affair with the anxious, angry and frightened villagers on one side and the safety of the tigress, alongwith that of the domestic cattle on the other.

The 'target' was sighted and one shot of a tranquilizing drug was fired from a distance of ten metres. D.D.Boro, a veteran Forest Ranger took the most risky initiative of darting from the back of an elephant. Dr. Bhaskar Chaudhury, the Vet from CWRC was behind him, constantly coaxing and guiding in every possible way, while Dimbeswar Das occupied the last seat. The target was quite indistinct and under

the compelling situation, was missed regrettably. The second dart gun, which was carried on a different elephant, was immediately called for. Hardly could we blink our eyes when the thoroughly exasperated, infuriated and frustrated tigress came out of her hiding place, charged at us and leapt up within seconds, targeting Satyaban Pegu, the *Mahout* of Joymala (female elephant) who threw his *ankush* in defence. The tigress almost jumped up to the head of the elephant but luckily Satyaban was holding a bamboo stick in his left hand and could divert and distract the attack after he had failed to hit the tigress with his *ankush*. The tigress was a 'left hander' and darted in the air to bite his left hand, simultaneously stabbing Satyaban's abdomen with the left paw exposing her sharp, pointed claws. The tigress floated in the air for the fraction of a second, holding the head of the elephant that compelled Joymala to bow down a little. This resulted in Boro losing his balance, as both his hands remained preoccupied with the dart gun. Taken aback, Boro fell to the ground but the elephant, trained and accustomed for such eventuality, positioned her legs in such a way that they defended Boro from the savage attack. Realizing the danger, Dimbeswar Das, circumspect, came up once again to rescue us and slid down the elephant hastily and fired repeatedly in the air, chasing the fleeing tigress. Other Forest Guards also responded instantly and a total of nine rounds were fired. Satyaban Pegu escaped as the left paw fortunately missed his abdomen as well as the vital body organs when the attention of the tigress got diverted to his left hand. Two of his fingers broke because of the bite. The back of his hand got completely de-skinned exposing the flesh underneath and a sharp split right from the forearm to the palm resulted. Bleeding profusely and outwardly horrified, he cried for help. My elephant, Bhadoi was just five feet away, not perceiving what was occurring this time and calmly allowing me to videograph one of the most dangerous but thrilling and awesome moments ever recorded from an elephant back. Her lack of vision presented me the most rewarding and exclusive opportunity of recording the scene of a 'tigress attacking' from such a close quarter. Satyaban was immediately rushed to the hospital and we called it a day but arranged for a bait to engage the nervous tigress though there was no more hope of her coming back and getting trapped.



Resting tiger



Dead leopard



The injured Mahout- Satyaban Pegu

Dimbeswar Das was the hero of the day as he saved our lives from the jaws of death. A tiger will always remain to me the symbol of courage, determination and beauty.

A team of Doctors attended Satyaban constantly at the Kushal Konwar Civil Hospital in Golaghat, the District Headquarters where he was shifted for treatment. Keen wild life lovers, eager to know about the episode and to extend any required help turned up, consoled and appreciated him for his daring act of facing a tigress and thwarting such a forceful attack. Satyaban, still deeply shocked and traumatized, narrated the fateful story but went on enquiring repeatedly whether his elephant was all right. Further he sent back one of his colleague *Mahouts* to attend the elephants instead of attending upon him pointing out that Joymala and the other elephant would remain starved if his colleague stayed behind to nurse him. Hearing this and realizing the love and affection Satyaban has for the elephants, the attendants were astounded and explained everything to me later on how a man, still under the state of deep anguish and shock could think of well being of others and that too of animals when he himself deserved the most urgent attention! His role as the elephant *mahout* was in no way less heroic and laudable than that of Dimbeswar Das. This remains an exemplary act for all the wildlife lovers of the world.

Flood brings sorrow too



Floods

Heavens open thrashing water down, recharging the marshes and the *beels*. The Brahmaputra River, which is the lifeline of Kaziranga, swells during monsoon due to incessant rain. Green grasses get submerged. Worms and snakes crawl up, insects creep up. A deer fawn somewhere frolics. Operators communicate over wireless sets. This is flood in Kaziranga, a must to maintain its habitat. Gushing water enters the *beels*. Fresh blood comes in. Elephants assemble, make conference, and move to higher reaches. High flood if retained for more than a week causes problem. Floods of severe intensity, which submerges the entire Park for prolonged periods, deprive the animals of both food and shelter. The 1988 and 1998 floods brought sorrow to the Park causing

death and destruction. Climate is strongly influenced by monsoon and hence flooding is a regular feature. The flood of 2004 could not do much harm to animals; run over cases were less than 15 on the highway.

Food for herbivores during floods becomes scarce. A do or die for them. Those who fail to cope up with the nature perish, others struggle and the fittest survive. The first wave of flood during 1998 even swept away Deven Chasa, a Forest Guard of the Park. Record says that 652 animals were drawn and several others hit by vehicle on the highway. 39 rhinos were swept away by the swirling waters. The biggest casualty was the hog deer of whom 506 were swept away.

Annual floods in Kaziranga have positive effects too. The flooding is extremely essential to maintain the unique wetland eco system by preventing the drying of the forest pools, puddles and the *beels*. The feeder rivulets originating from the Karbi Anglong Hills carry alkaline water (PH 7.5 to 7.8) and deposit them in the wetlands as residue. Fresh water dilutes the alkalinity making the wetlands more inhabitable for characteristic flora and fauna and apt for water dependant mega herbivores and migratory birds. Its nature's own way of replenishment with fresh water, which is a must as the wetlands are waterlogged and permanent in nature.

Along with the recession of water, the floodplains get enriched with nutrient and soil moisture; the unwanted vegetation, mainly water hyacinth that otherwise chokes the wetlands get flushed out of the Park, which also act as an inhibitor to the water birds. Numerous waterways, marshes, puddles, beels serve the purpose of breeding ground and nursery for amphibians, reptiles and the fishes that breed, get a chance to go out to the nearby areas, Brahmaputra river and proliferate.

During the monsoon the rivers that originate from the Karbi Anglong Hills inundate the Park by overflowing the banks. If the rising of the water level is gradual, the



A submerged camp during floods

Stranded





A rescued deer

animals get sufficient time to move to higher reaches. The submergence is not uniform throughout the Park; the earliest to be flooded are the Western and Southern part of the Park offering sufficient time for the animals to move to the highlands. Those who are near the Southern periphery, migrate to the Karbi Anglong Hills. If the Brahmaputra River swells simultaneously, water enters in the central part of the Park by overtopping the banks and the situation turns serious. Such happenings are forecasted by obtaining the data from the flood control authority whose monitoring stations are located at upper reaches of Brahmaputra River. The animals by their movements reflect that the flood is just round the corner. At times, the staffs are required to be shifted as the anti-poaching camps get submerged in high flood. Poachers cannot enter during high flood, hence rescuing of marooned animals becomes the main duty of staff.

Beels Of Kaziranga

More than two hundred-water bodies, the *beels*, big and small, form the habitat that comprises 6% of the Park area. They play a substantial hydrological and ecological role in the natural functioning of the river Brahmaputra and the few tributaries by holding back the excess water. *Bor* in Assamese means big, large or gigantic. *Borbeel* thus denotes a swampy area that encompasses a fairly large tract. Three such *Borbeels* are on record; a large chunk of them either silted or encroached by vegetation- two in the Kaziranga Range and the other in the Bagori Range. The *beels* support an appreciable assemblage of resident and migratory birds many of which are vulnerable and endangered. Rabindra Sharma sat behind me in a country boat while we sailed on the deep blue water of *Borbeel* under the Bagori Range. It was winter, cold and windy; 'a day' for the migratory ducks, cormorants and the egrets for their favourite food, the fish. The flocks moved away, having been disturbed by us. We understood, but we sailed and rowed further for a closer view. Some Storks, that walked like Army Adjutants, though few in number were concentrating on their catch, ignoring our presence. They are globally endangered now, Sharma

The assemblage





Elephants at Debeswary

Wild boar



and a junction of a tributary of Diphhaloo. Fatigue gets removed; mind freshened, mood replenished and energy recharged. I occupy a boulder and a vantage point overlooking the Brahmaputra, its vast expansion with blue-sky overcast. Karbi Hills at a distance look good and green, flood plain grassland in between. The evening sun throws a fistful of orange powder painting the clouds in its own way. The hog deers look curiously and leap; Dolphins come out of water to breathe. An Egret appears happy with a fish in its beak. A tourist destination, overwhelming in its magnitude indeed!

Debeswary

Debeswary means the abode of the Goddess; secluded, extremely peaceful, breathtakingly beautiful and literally meaningful. A river island, prominent with undulating sand dunes, and covered by a vast grass carpet appearing green, is out of bounds for general visitors, but is a paradise famous for its unique charm and unparalleled beauty designated for herds of elephants with members representing all ages and many adorned with majestic tuskers. Debeswary has a major population of swamp deer, rhino and buffalo. The entire grassland is burnt every year as a part of management tool so that new fleshy shoots may be made available to the herbivores.

I made several trips to this island on several occasions. Every time I visited, I found the island in different mood. The chances of sighting of animals are more after burning, from the mid part of February. As April is the breeding period of Bengal Florican, the control burning need to be completed before April to avoid disturbing them. Florican is a member of the Bustard family, an extremely rare bird species; the surviving population is not more than 300 in the whole world. Kaziranga has a population of 40 of them and Debeswary at least 10. Sighting even a single florican in its natural habitat, so rare in the world hence is said to provide the value of your hard earned money.

Showcasing Kaziranga As The Gateway Of Tourism In N.E. India

Carpeted with lush green primordial forests, ornamented by gushing water falls, meadows, snow covered mountain peaks; the North East Region of India comprising the States of Assam, Arunachal Pradesh, Meghalaya, Nagaland, Manipur, Mizoram and Tripura literally reknowned as "The Seven Sisters" is home to a wide variety of the denizens of the sylvan world. The region showcases, to the world, the rich variety of its floral and faunal wealth, some of them endemic and its diverse ecosystems in a variety of geographic settings and topography that are subjects of great interest to the nature lovers.

The human landscape with a wonderful heritage of primeval traditions, lifestyles, culture and crafts is also as diverse as its nature. The rich fertile land has been attracting wave after wave of migration from the pre-historic past. The Mongoloids coming from the East, and the Aryans entering from the West have melted with the aborigines offering diverse cultures and colours. Thus the great diversity of the 'Seven Sisters' is very intricately woven like a spider's web and connected by a never-ending chain of gleaming threads that should entice the tourists to discover hidden treasures of a spectacular variety and mysterious richness. The dazzling beauty has not at all been explored by nature lovers because of the inadequate publicity and the tumultuous political situation over last few decades. Coupled with poor infrastructure, internal disturbances and the obligatory 'Restricted Area Permit' to most States of the region, the tourism sector has languished over the years. With the passage of time and gradual relaxation of rules for 'Restricted Area Permits', the region has seen an improvement in inbound arrival of tourists particularly from abroad. To take full advantage of the much-improved scenario and the publicity the Kaziranga Centenary Year will generate, the planners must enlarge their tourism vision, and be more sensible and practicable than ever.

North East tourism is still conceived as 'Wildlife Tourism' and the Kaziranga National



Elephant herd at Debeswary

A Sambar pictured in the night





Buffalo closeup

Running buffaloes



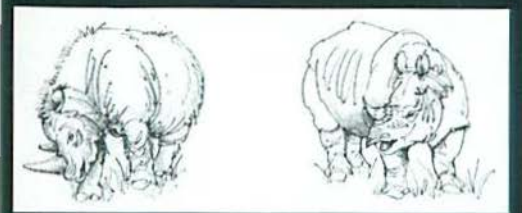
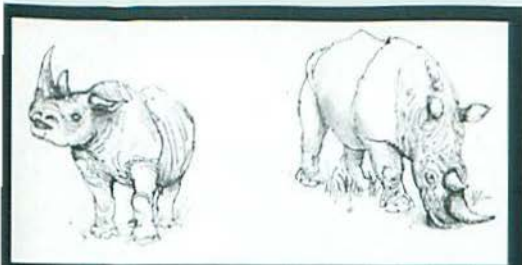
Park in Assam will continue to be projected as the Gateway to North East India, and as the top tourist destination. However, with the development of basic tourism infrastructure in the other North Eastern States and Sikkim, tourism will always remain the focal point of the region. Assam and more particularly, Kaziranga being centrally located and conveniently from all transport heads, tourists can disperse effortlessly to different destinations of the North East Region from/through here.

Kaziranga, declared a National Park in 1974, is the symbol of most remarkable achievements in the conservation and protection of wildlife. With the conservation odyssey that began in 1905 with perhaps a little over a dozen rhinoceros in the wild has come a long way since then. UNESCO under UN Convention declared it in 1985 as a World Heritage site for Protection of one of the World's Natural heritages. Now it pompously boasts of having the largest population of the great Indian one horned rhinoceros in the world with nearly 2000 number of them. Furthermore, Kaziranga is a wonderful place for Bird Watchers too, with 500 species of avifauna identified so far sheltering more than 25 globally threatened species. The serene and silent woodland- grassland combination is the paradise of the big five- Rhino, Elephant, Tiger, Buffalo and Swamp deer. The Brhamaputra, Diphaloo and Bhengrai River provide shelter to the extremely rare and endangered Gangetic Dolphin, locally known as *Hihoo*. The Otters, two species of them present themselves fishing in herds in most of the rivers and *beels*, which possibly no other Protected Area provides.

Surviving Population Of The Rhino And Present Distribution Status

All the living rhinoceroses are included in a single family called *Rhinocerotidae*. Their massive built, the thickness and solidity of their bones, their short stumpy legs each furnished with three toes are some of their familiar characteristics. The skin in all the living forms is either thinly clad with hair or naked, and in the Indian species the heavy hide in places is thrown in deep folds. For a more detailed analysis of the physical characteristics and the behavioural patterns of the Indian rhino,





Artistic rendering of African Black and White Rhinos (above) and Sumatran and Javan Rhinos (below) by Prasanta Kumar Bordoloi

Rhino closeup



one would be well advised to consult the book published simultaneously by Spectrum Publications, *Behavioural Patterns of the one horned Indian Rhinoceros: Observations in Kaziranga National Park* by Kamal Chandra Patar on the occasion of the KNP Centenary, for which I had the privilege of going through in manuscript form.

The Rhino Land Park

It was Mr. D.P. Neog, a noted Forester and former Chief Conservator of Forests, who visualized an imitated structure of a bull rhino in its royal splendour to draw the attention of every one passing by Kaziranga. His imagination was given shape in reality; visitors can see a single but grandeur bull rhino pulling a chariot by the side of the National Highway at Burhapahar, overlooking the Park. The Rhino is the 'State Symbol' of Assam and the image of the animal no doubt symbolize Kaziranga.

Nature Of The Rhino

The bull rhino is solitary by nature, roams with dignity in the habitats of Kaziranga, Orang and Pabitara in Assam. In Nepal it occupies wooded lands with ravines and low hills. Its agility, strength and arrogance have made him undaunted to move alone. Other animals do not dare to challenge him and simply gives way. The robust looking, armoured creature is respected by the elephant even. The massive body structure with solid bones and three toed or odd toed characters of the animal represents the 'Old World Animal' category. The body is enclosed in a solid bony structure with thick hide in places thrown in to deep folds, flanks tuberculed. The heavy folds look like great shields, the neck deeply folded. The male rhino may attain the height of 6 feet at the shoulder. The female rhino bears the responsibility of rearing and bringing up the offspring. The mother rhino is so stubborn that she charges at anything to protect her calf.

It is not surprising to find a juvenile remaining under the protective cover of the mother till the age of three even four years. Tigers are the natural predator of rhino calves

Surviving species of the Rhinoceros Family

Not only the Great Indian One Horned Rhinoceros is thriving in Asia but also two other smaller and different species, the Javan and the Sumatran are struggling for survival. Both these species have extremely low surviving population: Javan less than 100, the rarest among the five species of rhino, in a Protected Area in Indonesia and a few in an unprotected area in Vietnam, while the Sumatran has a population in between 250-400 in the Islands of Sumatra and Borneo. The population of Indian rhino has recovered from the brink of extinction and has grown up to more than 2000 in India and Nepal, Kaziranga in India being the major stronghold. Hats off to those pioneers whose relentless efforts, dedication and sacrifice saved the Indian rhino from possible extinction. The other two species of rhino are in Africa whose population status is better than the Asians. All the three Asian species are in the extinction threshold and are included in the "Red Data Book of IUCN". The single horned Javan rhino (*Rhinoceros sondaicus*) is a close relative of the Indian *unicornis* and belongs to the same genus *Rhinoceros* but the Sumatran rhino (*Didermocerus sumatrensis*) with two horns on its nasal bone is grouped in to a different genus. The Sumatran rhino was widely distributed in the past, quite abundant in the Siwalik Hills in the Pliocene times, inhabited a broad forest belt of Eurasia during the ice age. The Indian rhino occurred all along the Indus, Ganges and Brahmaputra river basins. The Javan and the Sumatran occurred from Eastern India covering the mainland of South East Asia, Sumatra, Java and Borneo.

The Indian rhino is a grazer, mainly eats on monocot plants like the African white rhino (*Ceratotherium simum*) while the Sumatran rhino is a browser and prefers dicot plants similar to the African black rhino (*Diceros bicornis*). The Javan rhino is known to be a mixed feeder and takes on both monocot and dicot plants.

All the five surviving species of rhino are threatened with extinction because of heavy poaching for their horns coupled with habitat destruction. The horn has a longing demand for preparation of traditional medicine in China and the rhinos are unfortunately paying for their lives that immediately call for cessation of the illegal trade of the horns and the products, reclamation and improvement of the habitat and massive awareness programmes of the general mass.

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(next page) A resting rhino caught yawning



Mother and calf- a night shot



Rhino teeth







Mother rhino and her calf

and more than fifteen such calves have been predated in Kaziranga in 2004 alone. Grown up rhino cannot be devoured by tiger unless he gets accidentally stuck in mud and is incapable of defending himself.

Wallowing in water or mud is a peculiar habit typical to rhinos and buffaloes; sufficient time is devoted to enjoying such wallows particularly in summer days, apart from grazing and sleeping. I remember, a grown up rhino calf was rescued during the flood and enclosed near Banerwar Temple in the year 1989. I was an Assistant Conservator of Forests then. When I inspected, I found the calf was quite restless and not comfortable under the blazing sun. I understood the situation and directed to pour buckets of water over its body, which resulted in miraculously cooling him down perceptibly. To satisfy him further, we offered salt wrapped in banana leaves, which he relished and devoured instantly.

Wallowing



Wallowing spots are a social area and there are records of seeing a very high number of rhinos, together upto 23 at Gahoridubi near the Borbeel camp by Dr. Tarun Kheria, the former Forest Veterinary Officer. When water bodies get shrunk during winter, clusters of animals huddle one another. This is in sharp contrast to the fact that they are solitary and defend their territory whatever small it may be. Normally five or six rhinos wallow in a stagnant water body, sometimes maybe ten or eleven depending on their concentration in a particular area and the size of the water body. Several *dandies* or animal tracks may lead to such a stagnant water body at the core of a *beel* surrounded by tall reeds of elephant grass; the tall surroundings provide the much-needed cover. Wallows are the place where rhinos tolerate the presence of other rhinos in close proximity irrespective of sex. These wallows are also the places where rhinos lie down, relax, and sleep deeply snoring but always facing the bank, the snout of one almost touching the flank of another. The arrangement is considered as a self-protective one to detect and deter any unwelcome prowler or assault by carnivores. I was close to a sleeping male rhino in an open area just after burning (*jhumming*). It was a warm morning and no doubt a siesta after a grand fiesta.

Though rhinos in the Mihimukh area are accustomed to visitors, they scuttle out of the wallow and take off on their stumpy legs at the approach of the visitors' elephants. Few wallows do not have vegetation cover, though it is a basic requirement and can be seen equally and meekly shared by buffaloes with an unrestrained sense of contentment.

Wallowing is a thermoregulatory process and more time is devoted during summer and hot hours, three to four times a day, which is lasted for one to two hours. Wallowing helps the rhinos to get rid of external parasites, which nestle among the plates of thick skin and wards off flies too. Parasites generally lay their eggs in cuts, and wounds that are inflicted during fight. Once I saw such a middle aged bull whose skin was so heavily mutilated that it exposed the flesh underneath. Alongwith my staff I kept watching him, and we saw him wallowing in the water of the Rongamotia *beel* for a number of days. The wallowing positively had a soothing and contented effect to get rid off the agony and pain, while the healing of wounds is a natural process and the rhinos definitely have a superior resistance power against infection. This particular rhino was not allowing the birds to peck at it and remained submerged. The mud wallow casts a layer of an impenetrable foundation of clay, possibly like that of a girl attending a beauty parlour. The rhino's ears, which are always exposed during such submergence, were worked upon by the naughty and playful mynas.

Wallowing is generally done in static water or in mud pools. Arup Ballav Goswami, the Honorary Wildlife Warden from Golaghat saw a rhino wallowing in the Diphaloo River. On another occasion, a rhino was enjoying a nap in a water pool down the gorge of Brahmaputra River. The staff sent a SOS that a rhino had fallen from the bank and was to be rescued urgently. Boro, the Ranger flanked by other officers and staff rushed to the spot by speed boat and tried to lasso the sleeping rhino with a rope from close quarters when, sensibly perturbed, the rhino scampered out of the pool and chased the boat in its usual mood of resentment and antagonism.



A wallowing rhino with mynas on top

Resting







Rhino in crop area



Tired rhino (above and below)



However nothing serious happened and the rescue party retreated safely to headquarters with a new experience to be etched on their minds. The home range of Indian Rhino can be expressed in between 10-20 hectares depending upon the basic requirements such as food, water bodies and cover. The rhino, for reasons of feeding, keeps on shifting to different spots within the home range. The territorial area of a male, not more than half a hectare in Kaziranga, keeps on changing with the rhino. Therefore it is not a fixed territory that can be asserted. The home range of females without calves is bigger than the males in Kaziranga.

Moreover some rhinos have been observed to regularly go out of the Park for crop depredation or for no palpable reason, rambling idly far away from their usual home range. A few rhinos of the Dhanbari area under the Eastern Range reach Melbazar, Gohpur or Majuli about 50 kilometres away, and it becomes difficult to ensure their protection. Those rhinos that migrate to Moriahola, Kuruwabahi, Rangamati area, return automatically after two-three days of stay. The number of rhinos that venture out for a long circuit is seven to eight per year in the Eastern Range. A male, aged 18-20 years with a horn of about 1.5 kilograms regularly frisks out for crop raiding and sometimes stays in the Moriahola area for 2-3 days. Crops like paddy, pulses, and vegetables like cabbage are preferred by them. A number of anti-poaching camps, therefore, were constructed recently intensifying the basic requirements for the safety of such adventurous rhinos.

Some biologists advocate that a sort of 'hook order' does persist among rhinos that reside in the same locality for a long time. The Indian rhino seems to be consecrated by a vow of peaceful co-existence; elephants, buffaloes, wild boars, swamp deer and hog deer seem to share the same grassland and water body without confrontation. One evening, I experienced a bull rhino during the course of his grazing, reach at a spitting distance of a departmental elephant that was given a bath in the small rivulet at Mihimukh. The *Mahout* and the elephant were unenthusiastic so was the rhino. After a short while a herd of buffalo and hog deer also emerged. A few days



A friendly rhino





A charging mother Rhino

later, the same bull resented the presence of an intruder, resulting in violent infighting by perhaps forgetting the sanctity of their unwritten vow. I was there, with my family, just after the fight and photographed the 'defender' from a distance as close as 15 feet (approx 4.5 metres). Mihimukh is the spot where visitors are allowed to go upto the first riding point, and it should be borne in mind that a stampede or untoward happening cannot be ruled out in course of such fighting between rhinos or during *Kheda-khedi* (mating ritual when male rhino chases the female or vice versa).

Apparently, there may be many overlapping home ranges in a given area. A number of rhinos may be seen grazing together in a small area, are often mistaken for manifesting a herd, although each is a solitary individual. Therefore, no rigid territory for a single rhino can be professed. This can be very well studied from the watchtower at Donga, under Western Range, Bagori where from the entire water body and the surroundings can be analyzed which is a happy haunting ground for at least twenty-five numbers of rhinos and host of other mammals, birds, reptiles and amphibians. As the fodder, i.e. short grass is available in profusion around the *beel*, there is no competition for food and space but what the bull protests, is the close proximity of another. Belligerent snorts are passed and if the intruder does not take heed, a confrontation results. Propinquity is not a social order among rhinos. But a pair of male and female rhino for breeding or mother and calf is a common sight. Interestingly several rhinos drop their faecal matters at the same place making it a prominent heap.

The rhino is the most adamant animal of animals and if it encounters men on foot on its *dandi*, will never ponder to recoil, but charge. A flashing rhino is a frightening sight—accompanied by a series of horrifying snorts and grunts. Picking up instant and incredible speed and without the slightest provocation, the arrogant rhino charges by lowering its head followed by the calf in most cases. Unless the sudden burst is diverted or stopped by gunshots right at its front, it reaches you, without

Male-Female association





Sleeping beauty

allowing your eyes to blink and bites at anything that it thinks belongs to the trespasser. If you are on a vehicle and turn around to avoid the charging animal, the rhino will not, and might maintain its charge at you for more than a kilometre. If a charging rhino catches up to the elephant you are riding, it inflicts deep wounds on the elephant's flank. It is also not a fact that a rhino will spare a man already grounded. Udu Marak, a Forest Guard of the Tezpur Wildlife Division narrated how the rhino was constantly trying to lift him up from the ground with his nasal parts and lips and used its forefeet to stamp upon him. This was on a river island within the Sixth Addition of Kaziranga. The most practical way to escape from a pursuing beast is to throw a piece of cloth, hanky or *gamocha* (normally carried along by staff) which will be smelled and mauled by the charging rhino giving one a sufficient opportunity to get away from the animal's line of vision and hide, or otherwise one could quickly ascend a tree nearby.

Male - Female Association

The male-female pairing for breeding is a biological instinct and is the most basic level of association to perpetuate its generation. The association is temporary, lasts only during the period of mating and is separated once copulation is over.

A young female rhino



The male attains sexual maturity at the age of 9-10 years, while it is earlier for the female, at around 8-9 years age. Both males and females come in heat, a number of times in a year. Females urinate frequently when she is in estrus, the sexual stimulant-Pheromone; a chemical drives the male wild in search of the receptive female.

No apparent season is spelled for mating. The mating ritual is a must before mating which may take place anytime during the year. A few staff of Kaziranga have seen the ritual even during pre-flood time. The mating ritual comprises of a long thunderous and thumping chase, locally called as *Kheda khedi*, generally the male

behind the female and occasionally vice versa. The chase may start in a grass land, accompanied by brays, a great deal of sound and whistles. Continuing through wood land or an open space, they may cross the road you are already on, and trample over anything on their way, and finally lead to mounting by the male which may be on the road or any level ground. The elaborate courtship or foreplay is absolutely necessary for familiarization because both the animals are strangers. Occasionally two males enter into terrible fight to win over a female. The sexually aroused male is very aggressive and if the female is non-responsive, she pays for it with heavy injuries sometimes even leading to death. Dr. T. Kheria once carried out the post mortem of such a dead body at Haldibari.

In most cases, the desiring female allows the male to mount over her. Copulation in rhinos, more precisely the period of sexual arousal and its culmination, is a strange biological phase that involves a lot of fighting, a horrifying chase and natural selection of the male. Unlike other mammals, the duo copulate for a very long period and stay in the coital position nearing two hours or more with occasional thrusts. The male is even seen dozing during mounting. Once the coital position is attained, the female becomes the guiding partner. The penis of the male rhino is peculiar. In a dead rhino it was seen to be an eight inch long muscular penis with a narrow, elongated glans, nearly 3 inches emerging out of it and ending abruptly in a circular flap like membrane.

Once, on our way to Bokpora camp, such a coital pair blocked the road, flanked by tall, unburnt elephant grasses on both the sides. We watched the mounting that continued even in our presence, uncaring of the noise of our vehicle. The male made several thrusts at regular intervals while it was the female who was controlling the forward and backward movements of the coital act. We approached as close as 60 feet (approx 18-19 metres) for better observation and kept the vehicle headlights on, as it was already dark. After 45 minutes of observation the pair



Unlike other mammals, the rhinos copulate for very long periods and stay in the coital position nearing two hours or more with occasional pelvic thrusts. The male is sometimes also seen dozing during mounting. Once the coital position is attained, the female becomes the guiding partner. The penis of the male rhino is peculiar. In a dead rhino it was seen to have been an eight inches long muscular penis with a narrow, elongated glans nearing 3 inches emerging out of it and ending abruptly in a circular flap like membrane.

Rhino penis (above and below)





The mating ritual usually comprises of a long thunderous and thumping chase leading to a successful mounting as shown here (anti-clockwise sequence).

moved sideways and were lost in the grassland. Because of darkness, we were not sure whether the mounting continued.

The gestation period for rhinos is about 16 months and one calf is delivered at a time. The inter-calving period is estimated to be less than 3 years. The suckling continues till the mother conceives again. The calf begins to nibble at grasses in about 8-9 months, while continue to suckle till milk is available. The final separation of the calf from the mother takes place usually after three years but we have observed grown up calf of about four years with the mother challenging our presence.

Food Of The Rhino

The Rhino is basically a grazer. In Dudhwa National Park, as worked on by Dr. S.P.Sinha, the food of the rhino comprises of 19 species of grass, 2 species of sedge, 15 species of Dicots, 9 species of aquatic plants and others totaling 51 food species in contrast to 55 species of grass in Kaziranga and 163 in Chitwan, Nepal. The diversity of food species in Dudhwa is extremely low. In Chitwan, the Rhino eats 183 different species of plants in different seasons as per Dr. Andrew Lauri while it is 47 in Kaziranga according to Mr. K.C.Patar who carried out research for his M.S.Thesis from Michigan University, which is being published as a book, to be simultaneously released with mine. In Nepal, food habits are quite diverse among the rhinos. Fruits, leaves of dicot plants, twigs, sedge, fern, aquatic plants, and agro crops comprise upto 30% of their food depending on the season.

A number of preferred food species have been identified in Kaziranga. *Setaria glauca* is a good fodder while floating grass such as *Hygorhyza aristata* is preferred by the rhino. *Andropogon* and *Sagittaria sagittifolia* are also eaten.



The one horned Indian rhinoceros





Rhino horns dried and labeled before deposit in the Government Treasury. The horn of rhino though so called, is not a true horn. It is a tuft of hair strongly agglutinated and is a mass of horny fibre of keratin tissues. From time immemorial, rhino horns were erroneously believed to have aphrodisiac properties- the properties of stimulating sex. Fake horns are made of plaster of Paris or horn or hoof of buffalo and can be identified on close scrutiny. The rhino horns do not possess any medicinal value or that can heighten one's libido. The belief germinated obviously because of the rhino's ability to copulate for inordinately long hours.

Horn Of The Rhino

The horn of rhino though so called, is not a true horn. It is a tuft of hair strongly agglutinated and is a mass of horny fibre of keratin tissues. The nasal bones are enlarged to serve as a support for a single horn or double horns. When two horns are present as in the case of Sumatran or African Rhinos, they are situated one behind the other in the middle line of the snout. It has no connection with the skull, although a boss of bone in the skull may serve as its foundation. The horns grow throughout life and if lost are re-produced. Unlike the African rhinos they are not the weapons of defence; without any practical value except adorning the nasal bone.

From time immemorial, rhino horns were alleged to have aphrodisiac properties for humans- the properties of stimulating sex. Furthermore, superstitions of getting miraculous relief of certain ailments by using the rhino-horn powder as medicine, almost exterminated the animal from the earth by way of mass killings. Fortunately scientists have come to their rescue and after much research and study, have proved such notions to be wrong. The rhino horns do not possess any medicinal value nor can they heighten one's libido. The belief germinated possibly because of the rhino's ability to copulate inordinately long, which as I have said, goes even up to two hours.

Charging Rhino- A Lifetime Experience

A rolling expansion of grassland with wetlands dotted here and there, further west of mainland of Kaziranga was in fact a grazing ground to about five thousand odd cattle that belonged to several hundred grazers. The area has become the latest addition to Kaziranga to house the teeming wildlife serving as a refuse pocket to wild animals while migrating to Karbi Anglong Hills across the Bagser Reserve Forests during flood. The cattle, considered to be unproductive, were disposed off at the behest of District Administration, Nagaon and the people were successfully

A genuine horn



A fake horn



rehabilitated outside the Park on the freshly allotted area. The Forty-Three square kilometre area was rightly named as the First Addition to the Kaziranga National Park. The ever-busy National Highway borders its southern periphery with several thousands vehicular traffic plying every day. The animals, domestic and wild, seemed undaunted and unconcerned to the noise pollution. After the successful evacuation process, we monitored the wild population of rhino, elephant, buffalo and wild boar again and again, photographed them repeatedly as a part of study. An accompanying Forest Guard whispered, "A truck handyman was mauled on the Highway during June'2003 much to his dismay when he fondled a rhino calf guarded by the ever watchful mother not knowing how dangerous the mother can be". The duo was thought to be the ideal model for a session of thrilling videography and they were searched by our group comprising several Guards and we found them grazing, munching and relishing short grasses comprising of *Lokucha*, *Dubori* surrounded by reeds of medium height. We reversed our vehicle, locking the gear to four-wheel mode and carefully approached the pair and could observe them for a while maintaining extreme silence. But the sound of the engine might have provoked the mother and we were charged furiously followed by the calf now about one and half year old. Though the sequence lasted for a very short period, it was recorded in digital form, frame by frame, as we marched forward and away from the charge. Yes, this is the real testimony of a mother and a calf relationship and there is no fault in saying that that the mother is extremely possessive and protective of her offspring and here we had that wonderful and thrilling piece of rare videography much to the delight of the accompanying group. Now the First addition area shelters a brigade of forty rhinos, a company of three hundred elephants, a platoon of hundred wild buffaloes and a regiment of several hundred hog deer.

Next time it was with D.K.Bhaskar of Bangalore who was declared as the "Raleigh International Wildlife Photographer of the Year" that I encountered another round of attack by a rhino. After an overnight stay at Arimora, we were heading for Mithunmari in my allotted Gypsy. After taking a ninety-degree turn and negotiating



Birds resting on tree-tops





Rhinoceros unicornis

Wallowing



a distance of about a few hundred meters, a fully-grown male rhino, from the front, charged at us. It was a violent stumbling with a resting rhino at best and in the prime of its health. Before our driver Pradip could secure the reverse gear in order to turn the vehicle and avoid the possible collision, the rhino almost reached us galloping in an aggressive mood constantly trying to bite the vehicle. Ganesh Sharma, the accompanied security guard who was standing behind in the open Gypsy, fired a blank shot in the air from his rifle with an intention to stop the charging rhino. But instead of stopping the rhino, I found the sound of the fire was intercepted by my video and shattered the digital cassette. As I was not getting a clear view and footage of the charge, I came out of the window and recorded the charging rhino from a distance of four and half feet, widening the camera lens completely. Once again I was lucky to be spared by a rhino as he thought the charge was over after he succeeded with the bite on the vehicle. As generally described, the rhino does not use its horn during an attack; it bites with its sharp teeth or tusks present in its upper and lower jaws, and bites with an upward thrust of its head. When the task of biting was over, the rhino was possibly satisfied and immediately deserted the spot. The encounter was terribly unwarranted for us; the staff later on appraised that he is a *goonda* meaning short tempered and they had such experiences with him earlier. The cut mark on the nasal bone and the eroded horn are the testimonies of a good and frantic fighter. Bhaskar, without any such experience in the past, miserably failed to click the charging rhino and had to be contended with one of my images written on a CD later on.

I still have a frenetic zeal of photographing the wild animals in their natural habitat, however dangerous or frenzied an act it may be.

Writers and the poets have often described tigers as man eaters, elephants and rhinos as dangerous; now they describe their beauty and make an appeal to explore the wilderness which is related to the survival of the human kind.



Rhino attacking- a turbulent moment



The Indian Rhino does not hit with its horn, it bites with its sharp teeth. This particular male Rhino is very arrogant, encountered frequently by the patrolling staff at Holalpat. The cut mark above the nasal bone received during a fight with other Rhinos is the testimony of his nature.



Charging rhinos



The Future Of The Indian Rhino

During the regional meeting of the IUCN/SSC Asian Rhino Specialist Group held in Kaziranga with effect from 21-27 February 1999, it was agreed upon that there should be a viable population of minimally 2,500 *Rhinoceros unicornis* in the wild in at least 10 populations of minimally 100 rhinos each, with an ultimate optimal objective of a total wild population of 5,000 individuals.

During 1993, the population of rhino in Kaziranga National Park was estimated to be slightly less than 1,200 and presently is estimated to be between 1,700 to 2,000. The experts firmly believe that Kaziranga has the capacity to carry a population of 2,500 rhinoceros considering the population growth of other animals at equal rates. The subsidiary rhino areas with small populations are Pobitora 80 (potential 150 with extension), Orang 60 (potential 150), Manas 0 (potential 300), Jaldapara, West Bengal 80 (potential 200 with Buxa), Gorumara 30 (potential 100 with extension), Dudhwa, Uttar Pradesh, India 25 (potential 150) and Bardia, Nepal 52 (potential 200). Moreover the Chitwan National Park in Nepal has a population of 500 and the Park can hold 1,050 with a buffer zone and Parsa WR (50 Rhinos). The potential rhino areas, where rhinos have become extinct are Laokhowa-Burhachapori-Kochmora complex which has the potential of holding 80-100 rhinos, Sonai Rupai 50-100, Dibru-Saikhowa 150-200 and Pani-Dehing 50. Thus the present world population of 2,500 can be doubled up with effective man induced inputs.

In Kaziranga, the rhino population of 1,164 in 1993 jumped to 1,650 in 1999 with an annual increment of 1.5%, the next census is scheduled in March 2005. The break up of male, female and sub-adults in the 1999 census was 498, 490 and 176 respectively.

The working group listed four areas for re-introduction of rhinos viz, Laokhowa-Burhachapori-Kochmara complex, Dibru-Saikhowa, Pani-Dehing and Sonai-Rupai,

and translocation would be considered by the Forest Department of Assam only if the infrastructure is made adequate for rhino protection. Since rhinos still stray into the Laokhowa-Burhachapori-Kochmara complex, this area is to be accorded first priority in translocation of rhinos.

Uttar Pradesh housed a significant rhino population during the Mughal period, from where the rhinos were exterminated through persecution over the years. An attempt to reintroduce some rhino population in Dudhwa was done in the year 1984 by bringing five rhinos from Assam, of which two died. Subsequently in 1987, four rhinos were brought from Nepal and kept in a wide enclosure in the forest habitat of Dudhwa. The population of Dudhwa started breeding and slowly registering an increase, which is now 25 in number.

The conservation of the rhino in India is the story of a relentless fight by field functionaries with the vagaries of nature, biotic interference, and the powerful poaching and illegal trade. In the year 1988, in Kaziranga alone, 129 rhinos died of natural and un-natural causes. On an average 80 to 100 rhinos used to die in Kaziranga each year from poaching and natural deaths (62 natural deaths inside and 4 poachings outside in 2003, but *nil* poachings inside the Kaziranga National Park). 100 to 120 rhinos are also born in a year. The maximum number of poachings was 48 in the year 1992, which is currently minimized to less than 5 in a year considering poaching outside the Park. Only 1 poaching on 14.8.2004 took place inside the Park. Natural deaths during 2004 have gone up to more than 80 in contrast to only 62 in 2003.

Social Behaviour In Elephant Society, The Matriarch Elephant And Sexuality

Propinquity is best exhibited in an elephant society. An intelligent, experienced and elderly lady dominates the elephant being a matriarchal society irrespective of



Dead rhino- the warning signal



Poached rhino



Elephant calf at the protective cover of mother

Mukhna at Rongamatia



the family with significant competence from impending danger and threat. Basappanavar writes in his book- *Elephant, The lady boss* —

“The matriarch keeps the male suitors at a trunk’s length, only to allow them to join the herd when their presence is felt necessary to service the females in estrus. Her long memory and experiences help in leading the family to introduce new feeding grounds of better supply of food, waterholes, springs and salt licks. Here elephant lady is the boss; this female led family remains united and truly stable. With her prowess and her devotion to her kin, the matriarch is the unquestionable authority”.

Sexual Maturity

The males attain sexual maturity at the age of 15, as do the females. The sub-adult males are forced to ramble, away from the herd, to avoid inbreeding. The matriarch does this job of selecting the most vigorous male to mate with a *saril*, the fertile cow. The males leave the family groups to make *maljuria* (an all male bachelor group) and wander around the herd like a satellite. The first delivery by a cow is recorded at 13 to 15 years of age. *Mahouts* of Kaziranga have experienced a 20-22 month gestation period, the longest period among mammals; the male foetus takes additional days. Fresh fodder with a high protein content, stimulates ovulation and the testosterone levels for fertile mating. The mammary glands in females swell visibly from 16 months. Breeding in elephant is comparatively slow.

The phase of sexual paroxysms is called *musth*- a dark, pungent smelling liquid is seen flowing down the cheeks from the temporal region during the peak month. A male in *musth* becomes restless about a month earlier to the exudation of the *musth* fluid, which lasts for 4-6 weeks; young bulls are seen with dangling genital organs. Female elephants under stressful conditions or in menopause secrete *musth*, thus many authors advocate that *musth* seems to have some sexual significance only in

males. The mating lasts for less than a minute. The length of the estrus cycle is about three weeks. The female can be monovular or polyovular.

Tuskers Of Kaziranga

Undoubtedly, the tusker is the monarch of the sylvan world; a pair of curved golden white tusks adorn only the males. In some bulls, the tusks seem to deviate from the normal course of development quite unusually and converge or diverge out. While accompanying the Chief Conservator of Forests, Wildlife, to Debeswary, I came across the divergent one initially. As time did not permit us to study the behavior etc. we postponed it till next day. We found him almost at the same spot where we left him the previous evening. He was a fully developed handsome bull at his thirties, sporting a pair of lustrous armour-like tusks, each one directed horizontally outward. They were not massive but sufficiently stood out to be glamorous. His *musth* fluid was not yet dry hence we took necessary cover to watch him over. Surprisingly he was not in a mood to challenge us, rather retreated nervously. Possibly the position of the tusks made him lose confidence as they are seemingly unfit for an outrage. As the tusks were diverging out to both directions, I named him 'Purab Paschim' which meant East-West. I came across *Purab Paschim* at Kilakili *beel* once again, fleeing away from us along the water body. This time Bhaskar was with me, the internationally acclaimed photographer, studying and recording the behaviour of the elephant in detail, a rare moment undeniably.

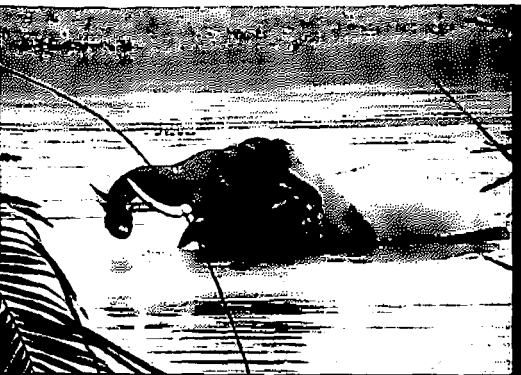
The opposite condition of this is the convergent type when both the tusks almost meet each other by converging in such a way that they trap the trunk beneath. The tusker faces great difficulty in looking for food particularly that which is at the higher reaches. Once we met such a tusker in front of the Karseng tower; we were back after inspecting a dead elephant calf whose trunk was malformed at the time of birth. As I was very close to the elephant and not moving away, the elephant



A Tusker at Ahotguri



A Tusker at Bhaisamari



The executive bath

From the shape of emerging tusks, the number etc. the male elephants are classified as Convergent, Divergent, Ganesha and so on. The trunk gets trapped and stranded below the tusks and puts the elephant in great difficulty during browsing. The diverging tusks grow outwardly and are on unusual development. A male elephant with one tusk is called Ganesha. The Ganesha may be with a right or a left tusk.



became more enthusiastic and raised his frontal body as well as the trunk by lowering his hindquarter. With great effort, the trunk came out of the trap through the narrow slit in between the tusks and he could take a *Bokhar* (to enquire by inhaling air). Then he left, in all probability failing to decide what to do, as his tusks were restricting his activity.

When patrolling on an elephant along the bank of Brahmaputra near Alubari camp, we came inadvertently, face to face with a single-tusked bull. Our appearance on an elephant was so startling that a bull of his might and virility got frightened. It was a *Ganesha* around fifty years of age, with only the left tusk, head sunken and ear lobes wrinkled and torn. We failed to confirm the reason of a single tusk as he gave way instantly and was out of sight.

In all the above conditions, I found the tuskers in a state of nervousness and lack in confidence and the winning spirit, probably because of the unusual forms of tusks, which definitely leads him to a point of no return during a conflict or charge. Age may be a limiting factor that leads even a dominating male of yester years to submit before a younger one.

Tusk less elephant bull is called *makhna*; there are instances of fight between two tuskers or a tusker and a *makhna* in Kaziranga, lasting for several hours and turning in to battlefield. Staffs who have witnessed such battles narrate that such outrages between two giants turn violent heavily injuring one another; open ground is more suitable for the tusker to carry on the fight while the *makhna* pulls him to the woodland by grasping the tusks. This is the fight for dominance and mate, not for food or space and may continue for more than six hours. Arup Ballav Goswami, the Honorary Wildlife Warden of Golaghat District remembers how two tuskers jointly trounced another tusker near Nambar-Daigurung Sanctuary under Bukial Forest Beat Office, during a scuffle in the night of Twenty Seventh October 2001. The seriously injured tusker died next day afternoon though Vets treated him in the best possible way.

Rudra, The Tusker

Male elephants, very rarely females, regularly (once a year) go through a period of peculiar paroxysms of sexual excitement, called *musth* analogous to the 'rut' in deer. Pungent smelling, reddish or brown coloured thick liquid generally exudes from the temporal glands of the males. The period of flow of the liquid lasts for 4 to 6 weeks and very high dose of 'Testosterone' is released to the blood driving the male completely *dodgy*. The genital of the elephant swells and it urinates frequently. The elephant becomes restless and exposes his penis off and on. The animal does not bath for number of days considering the fact that the bath might wash away the exudation from the temporal gland and it might fail to attract females. Such elephants on *musth* are detected from smell at a distance by the departmental *Mahouts* and are avoided. The peak of such *musth* period is attained at the age of 40 though the post-puberty *musth* is observed in males of 15 years of age. Domestic elephants too pass through such a phase of sexual indulgence and turn unpredictable, erratic and potential danger unless gratified with females to quench the sexual desire or pacified with drugs. Rudra, a young and healthy tusker was undergoing such phase regularly and mistakenly placed for patrolling duty, completely isolated, under Burhapahar Range without letting him to get relieved of the sexual urge. Dr. Kushal Kr. Sharma, from the College of Veterinary Science, Guwahati, and the noted elephant expert checked the elephant and studied the aggressive behaviour of Rudra on my request. After a through analysis of the history as narrated by the *Mahout* and recorded in the 'Elephant Book', Dr. Sharma opined that Rudra should be made to socialize with other elephants, preferably females to pacify him and accordingly no drug was prescribed. I joked, "Yes, we are going to solemnize a marriage ceremony". The tip offered by the elephant expert was followed and Rudra was transferred to a company of female elephants at Mihimukh and this clicked. Now Rudra is thoroughly transformed and does not show any arrogant behaviour and carries tourists on his back regularly. Careful observation, minute groundwork and practical solution helped saving a handsome tusker like Rudra from committing anything undesirable and unwarranted.



Convergent tusker

Divergent tusker









Pregnant cow elephant

A suckling calf born to a departmental elephant is cute but turns naughty. The first delivery by a cow is recorded at 13 to 15 years of age. Mahouts of Kaziranga have experienced 20-22 months of gestation period, the longest period among mammals; the male foetus takes longer days. Fresh fodder with a high protein content, stimulate ovulation and testosterone level for fertile mating. The mammary glands in females swell visibly from 16 months. Breeding in elephants is comparatively slow.



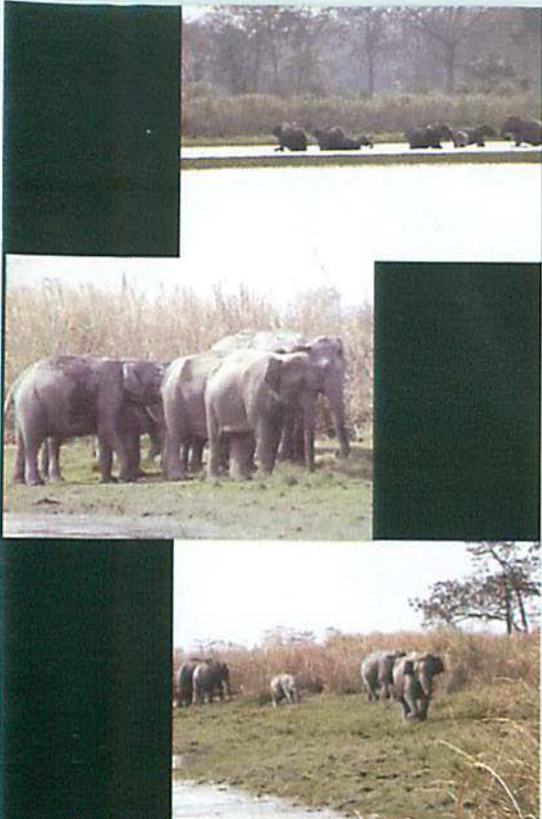
The handsome tusker





David Shepherd Herd

Watching the elephant family in different moods is an enthralling and captivating experience. Each elephant herd is a kinship group, a closely-knit society. It was around 1.30 in the afternoon, a bright sunny day in the third week of February 2004, a herd consisting of more than nineteen members, mostly cows and calves, was relishing a feast in a large water body called Kilakili *Beel* behind the Ahotguri camp. Aquatic plants like *Dol*, *Erali*, and *Vallisneria* are the elephant favourites. I was accompanying the members of the David Shepherd Wildlife Foundation of the United Kingdom who came to Kaziranga to take note of the package offered by them to assist the Park authority in day-to-day management. It was at the initiative of Aranyak— the Guwahati based NGO that the wireless network covering the entire Park could be modernized and all the required financial assistance amounting to Rupees Twenty Five Lakh was generated by the David Shepherd Wildlife Foundation at their request. Thanks to Bibhab, the most enterprising leader and other equally dedicated members of Aranyak, the wireless network in Kaziranga is so efficient to-day that any message can be transmitted to any corner instantly, and has been undoubtedly helping the staff in controlling poaching most effectively as evident from the comparison of yester years. It was my duty to accompany the honourable members to present how admirable their contribution was. The team was led to the Ahotguri camp and just after our arrival the news was transmitted that we might be lucky to have a look at a herd of elephant slightly away from the camp. To our good luck and joy, we found 10 to 12 elephants taking a dip-shower in water, their backs glistening in the sun and the mothers constantly trying to keep their young under control. A few others of the herd, were on the bank remaining out of sight in the tall grasses nearby. Gallons and gallons of water are a must for elephants for thermoregulation by way of daily intakes for drinking and their bathing. Mud water protects their skin from ailments and insect attacks, and water has a soothing and revitalizing effect on the mind and the body of some animals.



The David Shepherd herd: two adult females took the lead to desist us at Kilakili beel behind the Ahotguri camp. The Matriarch and the shy tusker remained with the herd fortifying the castle and encircling the calves. The herd just wanted us to leave and we earnestly did. Calves generally frolic around and elders are extremely concerned about their safety. The charges by the matriarch are not full-hearted, often end prematurely and are made just to threaten an unwelcome intruder.

The noise of our vehicle had an upsetting effect and the herd put an end to their fiesta and playful bathing, and the members gradually headed for the banks away from us. It was truly a sight— enhancing the beauty of the landscape by their body shape and the patches of ebony on their skins, the elephants moved under the gory sun.

A cow elephant about 50 years old with a calf at her heels stood ahead of us separated by a small water body in between. The cow exhibited excellent physical condition as most elephants in Kaziranga do. She was not the tallest and her cheeks and the head was sunken, ear lob torn as common to their elderly kin. She was definitely not the matriarch as most of the members were in water and visibly she was not commanding at any. She was growling as her calf went on playing hide and seek around her. The mother was very nervous and she wanted all the family members nearby to desist observing us. Calves are skittish and mothers are very protective of their young. One by one, the family members who were on the bank responded to her and made a fortress to defend the young one who was busy sucking her mother's breasts. The first one to join the mother was another elderly cow, taller than her, reassuring by the trunk— not to worry. Such comfort behaviour is common among elephants when they are in distress. Another cow rushed in, communicating with the others by trumpet. Finally the tallest cow and a young tusker emerged from the tall grasses simultaneously smelling in the air and had a joint, quick review of what was actually happening. The tusker was a shy one and hesitantly tried to hide himself instead of leading a charge. Two cows were selected eventually to stop our movement and they immediately headed towards us, followed by other members, a gap of only 200 feet (approximately 60-65 metres) between reach. We retreated though there was no prominent sign of aggression. There were guests with us, so we had to, but it was a rewarding and gratifying experience for me and ofcourse for our esteemed guests. The elephants earnestly wanted us to do just that, and we obliged.



Gallons of water are a must for elephants for thermoregulation by way of daily intakes for drinking and bathing; water has a soothing and revitalizing effect.





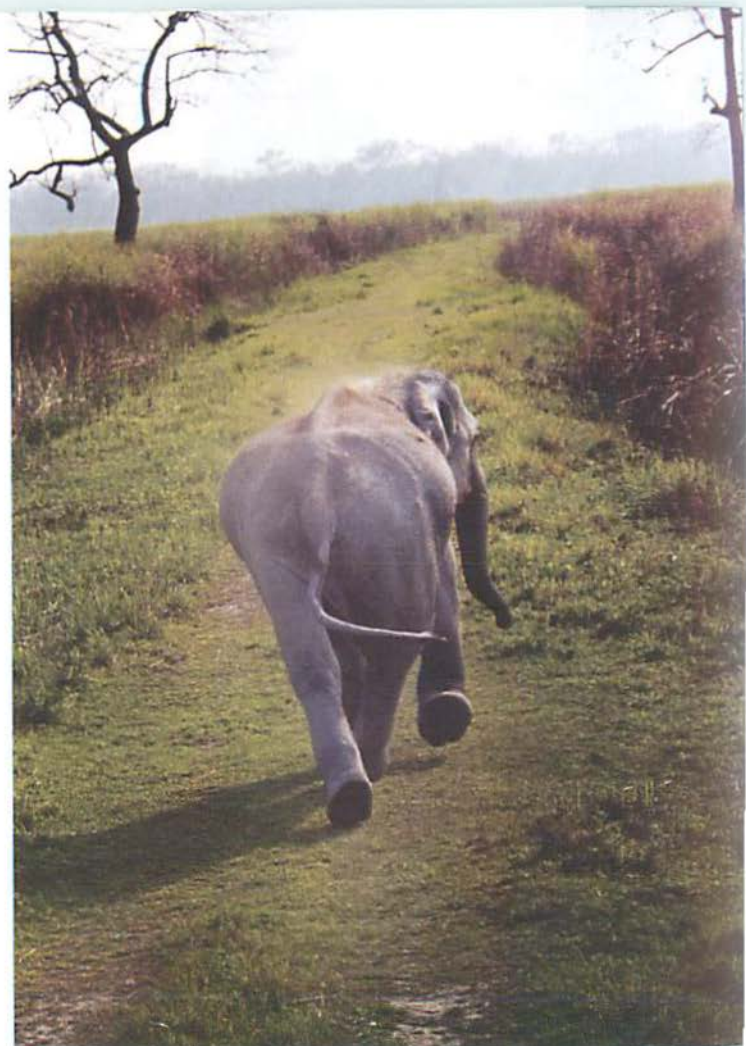
It turned out to be a well-planned and properly coordinated move that pushed us back to our camp. And I named the particular elephant family as the "David Shepherd herd".

Threat display in elephants as in most animals is common and does not necessarily lead to fight. Such display saves energy, which would have, otherwise, lost during fights among members of the family or intruders. Each elephant family is so closely and cohesively knit that every member is emotionally attached to one another. Elephant calves are extremely playful and that make the mothers to be restless and tensed in order to protect their young. Elephants are known to have a very well organized self-protective system; the cows encircling the calves making a fortified circle at the slightest alarm of danger, and allowing the matriarch to tackle the situation and lead the display threatening the intruder.

It was almost noon when we reached Debeswary Island along with the honourable members of the Central Empowered Committee, in no time the matriarch burst at us with a series of terrifying trumpets. The trunk coiled and ears stretched wide, she charged us at an incredible speed covering a distance of about 40 feet. We were on the Gypsy and the unexpected aggression took us by surprise. I shouted at the accompanying Guards not to panic and refrain from blank firing since these are considered as mock charges common in circumstances we experienced in the past. The matriarch was fairly close with her head rising high, kicking clouds of dust and grim faced, as we did not try to desist her. Then she stopped with a thud, as the charge did not get any respect from us. She recoiled, unsatisfied and went back to the herd, which by that time wound up, nineteen of them, cows and a number of calves but a docile tusker. They comforted each other and had a close circuit communication. Our team members expressed that they are uniting and contemplating a counter attack. I kept mum, as I was pretty sure that protecting

(facing page left) *Elephant tusker*
(facing page right) *Elephant running forward after being chased by a rhino*

The charging matriarch





A shy elephant

the calves were the primary duties of the cows and not a counter attack. The matriarch was still restless, constantly kicking at the earth, swinging the trunk and one of the forelegs to and fro, rocking from side to side almost crossing the other leg, throwing dust overheads with the trunk and twiddling it. From experience it was learnt that threat charges are usually not full hearted as they looked. The herd then gradually withdrew and started moving away from us.

The matriarch is associated with love and affection; she is responsible for ensuring emotional stability among the members of her family. She is the undisputed authority to coordinate and function with understanding and concord in the best interest of the family.

The *Mukhna* or the tusk less bull does not spare once the trunk is curled in his mouth. Keeping the direction of the wind in mind is the most important factor.

Swamp Deer

The swamp deer is one of the most endangered deer species and was therefore enlisted in the Schedule I category of the wild life Protection Act of India in 1972. It is also called as Barasingha as generally twelve numbers of tines are developed from its antler though fourteen or even fifteen tines are seen sometimes. They do not have true horns; they are a pair of antlers, which shed every year. In Assamese they are called Dol Harina, the name might be derived from their nature of living in *Dol* (a kind of grass in Swampy area) or for living in *Dol* (Herd). The former seems to be the more acceptable.

Formerly they were distributed up to Sindh in the West and Godavari in the South; presently restricted to the terai plains of Uttar Pradesh, Assam and Southern Nepal. They normally reside on short grassy patches near marshes and swamps. Rapid conversion of such habitat into cropland, human population explosion and poaching has reduced their number to a very low and alarming level, now facing the danger of



Elephant closeup