UNESCO-IUCN Enhancing Our Heritage Project:
Monitoring and Managing for Success in Natural World Heritage Sites

Technical Report No. 04

Kaziranga National Park World Heritage Site

Review of Protection Strategies and Suggestion to Enhance their Effectiveness;

Development of a Comprehensive Capacity Building Plan for Frontline Staff




UNITED NATIONS FOUNDATION

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Improving Protection and Building Capacity of Staff At Kaziranga National Park

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Sponsored by

UNESCO-IUCN-WII

August 2005

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KAZIRANGA NATIONAL PARK (ASSAM)

Project Title:

Enhancing our heritage: Managing and Monitoring for Success in World Natural Heritage Sites.

Project Objectives:

1) Review of Protection Strategies and suggestion to enhance their effectiveness

2) Development of a Comprehensive Capacity Building Plan for Frontline Staff.

Methodology:

Relevant background information was sought from the park management. The park was visited from 16.3.05 till 22.3.05. The existing management plan of the park was perused for relevant information. One to one discussions were held with the Director of the park and other park officials. Field visits were made to various locations in the park to get a first hand impression of the field situation and requirements and to elicit the views of the staff posted at various camps in the park.

A one day workshop was held on 20.3.05 for different levels of field staff to elicit their views regarding the park, its protection requirements as well as their training needs through an adaptive SWOT process (List of participants and report enclosed). Pictures where appropriate were also taken. Other relevant information about the park was procured from the park Director's office.

Findings:

Project Site

Geographical Information

Latitude	26°33' N – 26°45'N
Longitude	93°9'E – 93°36'E
Area	430 sq km
Civil Districts	Golaghat and Nagaon
1st addition (Burapahar)	43.7 sq km
2nd addition (Sildubi)	6.47 sq km
3rd addition (Panbari RF)	0.69 sq km
4th addition (Kanchanjuri)	0.89 sq km
5th addition (Haldibari)	1.15 sq km
6th addition (Panpur RF and stretch of Brahmaputra river on the north)	376.50 sq km

Management Plan, 2002

Map 1 Kaziranga National Park

The administrative head quarter of KNP is at Bokakhat (Golaghat district), which is located at a distance of 238 km from Guwahati (State capital). All the existing range head quarters (Burapahar, Baguri, Kohora and Agoratoli) in the park can be reached by road from the National Highway (NH) 37, which runs south of the Park boundary. (See map 1). Karbi Anglong hills adjoin the park on the south and constitute an ecological extension of the park.

The Park is of rough oval shape, approximately 50 km long and 16 km wide at its broadest point. It lies on the south bank of the river Brahmaputra and its southern boundary follows for the most part the river Mora Diphlu that runs parallel to National Highway NH 37 (the main arterial highway in Assam). Two other rivers, Diphlu and Bhengrai flow through it and a number of small streams originating in the Karbi Anglong hills drain into these rivers and the *beels* (water bodies) in the park.

Climate:

Typical sub-tropical climate prevails in the Kaziranga National Park. The temperature in the park varies from 38°C (maximum) to 7°C (minimum). Annual average rainfall is 1,320 mm.

Habitat composition:

Habitat	Extent (%)
Water bodies or *beels*	6
Eastern wet alluvial Savannah or grasslands	66
Woodland or Tree Forests	28

Management Plan, 2002

Characteristics:

Seasonal variation

Marked seasonal variations in the habitat, the vegetation and the areas of animal concentration are observed during the winter and monsoon seasons. During winters the shallow *Beel*s and *nallahs* dry up and the growth of short grasses covers up their beds. As do the shallow banks around the perennial *Beel*s. Thus with the receding of the monsoon season the animals concentrate in such areas for grazing.

The tall coarse grasses elsewhere dry up during December and January and are then control burnt by the park staff. Following such burning some animals begin to concentrate in the burnt patches and relish the ash and the partially burnt stems of the reeds. With few winter showers fresh grass blades shoot up in the burnt patches attracting larger number of animals to these areas.

With onset of the summer season the grasses in the burnt patches grow up quickly and the tender shoots turn into coarse blades, which no longer attract the animals. The temperature also goes up and the animals prefer to remain near the water sources.

With the monsoon season setting in, the shallow *Beel*s and the nallahs start to get filled up, first by the rainwater and then by the floodwaters. The animals gradually start moving towards higher grounds, which are situated around the tree forests. With more and more areas coming under submergence from the floodwaters the migration of animals to the nearby Karbi Anglong Hills and other adjoining areas starts to take place.

Vegetation

The tree forests (see picture 1) occupy the comparatively higher grounds along the central and the eastern portion of the park. The main species in these forests are *Bombax ceiba, Albizzia procera, Albizzia odorotissima, Albizzia lucida, Careya arborea, Premna latifolia, Lagerstroemia parviflora, Dillenia pentagyna, Zizyphus jujuba* etc. The undergrowth in addition to the grasses like *Erianthus ravaneae, Saccharum spontaneum, S. procerum* and *Imperata cylindrica* consist of *Clerodendron spp., Alpinia allughas,* and *Leea* spp.

Grasslands cover almost two thirds of the Kaziranga National Park (see picture 2) consisting of both grasses and reeds. The reeds grow up to a height of 4-6 meters during the monsoon season. The main species of grasses and reeds are *Saccharum* spp*. Imperata cylindrica, Erianthus ravaneae, Arundo donax, Phragmites karka, Imperata arundinacea, Neyraudia reynaudiana, Typha elephantina* etc. Although these grasses grow side by side the various species have site preferences depending upon the moisture conditions in the soil.

The newly formed riverine areas (see picture 3) along the Brahmaputra River are mostly covered by *Saccharum spontaneum, Imperata cylindricia, Erianthus filifolius, Saccharum narenga, Neyraudia reynaudiana, and Cymbopogon pendulus* mixed with *Tamarix dioica.*

Animals

One horned Rhinoceros (*Rhinoceros unicornis*)

Rhinoceros is the most famous animal of the park. The park reputedly holds the largest single population (1500+) of one horned rhinoceros in the world.

Tiger (*Panthera tigris*)

The park has the highest density of tigers in the country.

Swamp Deer (*Cervus duvauceli*)

The park holds the largest population (500+) of the eastern swamp deer in the country.

Wild Buffalo (*Bubalus bubalis*)

The park holds around 50% of the global population (1000+) of wild buffalo.

Elephant (*Elephas maximus*)

There are around 900 elephants in the park.

Others

Other notable mammals reported from the park include hog deer (*Axis porcinus*), barking deer (*Muntiacus muntjack*), wild boar (*Sus scrofa*), sambhar (*Cervus unicolor)*, leopard (*Panthera pardus*), sloth bear (*Ursus ursinus*), pangolin (*Manis spp*) and hoolock gibbon (*Hylobates hoolock*). More than 400 bird species (terrestrial and water fowl) including a good diversity of raptors have been documented in the park.

External Influences

No forest produce is exploited from the park excepting the salvage of dead rhino horns and collection of shed antlers. In the past some amount of exploitation of the park's resources by way of fish *mahal* (customary rights), thatch *mahal* and semul *mahal* was allowed. But these have since been discontinued.

There are around 184 villages situated within the zone of influence of the park. Hence the threat of entry of people into the park for illegal fishing and poaching and of the domestic livestock for grazing is ever present.

Frequent sonic booms caused by the aircrafts of the Indian Air Force flying over the park are a potential source of external disturbance to the wild animals in the park.

National Highway NH - 37 which skirts the park along its southern boundary is an increasing source of disturbance with fast and heavy vehicular traffic moving on it almost round the clock. In recent times roadside restaurants and motels have mushroomed at various places along the NH with potential adverse impacts, from increased visitor movements, on the wildlife values of the park.

A petroleum refinery established recently (2001) at Numaligarh upstream and close to the park has potential danger present of pollution of the park's land and water bodies from the effluents/wastes from the refinery. Similarly a number of tea gardens (see picture 4) present close to the park also remain a source of disturbance and pollution of the land and water bodies in the park. The problem of *Mimosa* infestation in the park is believed to have origins in the tea gardens.

***Epidemics**:*

Any serious epidemic disease has not affected the animals of the park in recent years. During 1944 and 1947 heavy casualty of rhinoceros from anthrax and another unidentified disease was reported. In 1973 one case of rhino mortality from *Hemorrhagic septicemia* was confirmed and 9 other rhinos were suspected to have died from the same. Similarly in 1974 the death of one swamp deer and one rhino was suspected to have taken place from Anthrax.

Limiting Factors

1) Absence of high grounds within the park as places of refuge for the animals during high floods.
2) Few and limited functional corridors across the national highway between the park and the adjoining high lands of Karbi Anglong forests.
3) The period immediately following the receding of the flood waters appear to be the most difficult period for the animals as the habitat conditions then are far from normal with beels and their surrounds presenting a desolate picture with rotting grasses and only coarse reed being available as feed. The situation does not change till post monsoon showers encourage the growth of fresh grass.

Context: The protection imperatives at the park

Historical

The landscape of Kaziranga National Park is the creation of natural forces of silt deposition and erosion as has been effected by the river Brahmaputra over the centuries. This process of erosion (see picture 5) and deposition is an ongoing process, which becomes acute during the floods that occur at regular intervals during the monsoon season.

In the past, the forests of Karbi Anglong and the grasslands of Kaziranga National Park formed one single ecological unit of ideal wildlife habitat with very few human habitations. But with gradual opening up of the area on the southern side of the present day National Highway 37 mostly by the outside settlers and the tea planters, the forest cover has diminished and become fragmented resulting in the loss of continuity of the natural wild habitat between the park and the Karbi Anglong hills.

Conservation history

Year	Particulars
1908	Kaziranga declared as a Reserved Forests
1916	Area declared as a Game Sanctuary
1950	Kaziranga Wildlife Sanctuary declared
1974	Kaziranga National Park notified
1985- 1999	Six additions to Kaziranga National Park notified
1984	Kaziranga declared as a World Natural Heritage site

Extant Protection Strategies and their state of effectiveness

Needs

1) Park – people relations

Summary of problems faced by the people in the park's zone of influence that affect the management of the park (Management Plan, 2002)

- Shrinkage of area for cattle grazing.
- Abolition of traditional access to forest resources in the park.
- Annual flood, which cause tremendous hardship to people which in turn force people to collect resources from the park.
- Poor economic status which results in their indulging in illegal activities such as illegal fishing in park area and timber felling in reserve forest areas
- Poor education and awareness, which results in lack of sensitivity among the people towards wildlife as is seen during the floods. When high floods force the animals to go out of the Park, some people try to harm the already distressed animals.
- Crop raiding, human death / injury and damage to house and properties by the wild animals.

There are about 184 revenue villages and 50,000 households in the zone of influence of the park. (Management Plan, 2002). A recent field study (Srivastava, 2002) has perhaps for the first time tried to establish some kind of a baseline on human presence and its impact on the park and vice versa. The study suggests:

a) The local people support the park and its values though some of them (Karbi and Mishing tribals and outside settlers) are still to come to terms with the creation / declaration of the additional areas of the park.
c) The main pressure for resource use on the park by the people is in form of illegal fishing in beels and rivers.
d) The Karbi Anglong forests on south of the park serve as a *de facto* buffer to the park as the locals meet most of their requirements of forest products from these forests.
e) The livestock grazing pressure on the park is limited primarily to the additional areas.
f) Damage to agricultural crops by wild animals from the park (mainly Wild buffalo (*Bubalus bubalis*)) is greatly resented to by the local people.

Livestock grazing

The months of February-March and areas like Burapahar and Ghorakati are especially vulnerable to illegal grazing by livestock. Following measures have been advocated in the Management Plan for the purpose:

a) Cattle proof fencing is proposed to be raised in vulnerable areas
b) Temporary cattle watchers are to be placed in sensitive areas
c) A detailed survey of local livestock is proposed for devising grazing control mechanisms as well as for planning cattle immunization drive/s

Poaching of wild animals

Poaching of Rhinoceros for its horn had been a serious problem at Kaziranga. Between 1980 and 2005 the park lost around 567 rhinoceros to poachers.

Illegal fishing in the *beels* of the park by local people has been reported from time to time.

2) Forces of nature

Floods almost on an annual basis define the park. So much so that the park can be said to have only two seasons from the management point of view. That is flood and non-flood. The flood season begins in May and lasts till August.

Flood in Kaziranga is a boon as well as a curse.

Positives:
1) Floods bring in silt
2) Floods sanitize the habitat by removing the debris and other foreign material lying on the ground

Negatives:
1) Floods erode part of the park
2) Floods kill, maim or distress animals in the park
3) Floods dislocate the infrastructure (roads, bridges, camps, poles etc) in the park
4) Floods in its wake leave the entire park in a state of disarray and confusion.
5) Floods put the entire park management on its tenterhooks and on a very high level of alert for extended period of time.

STRATEGIES

LEGAL STATUS

The legal boundary of the park has been well enumerated by the various government notifications issued respectively in 1974 (national park – 429.93 sq km), 1997 (first addition – 4378.75 ha), 1985 (proposed second addition – 646.98 ha), 1985 (proposed third addition – 69.76 ha), 1988 (fourth addition – 89.75 ha), 1985 (proposed fifth addition – 115.36 ha) and 1999 (sixth addition – 37600 ha).

Other forest areas

The reserve forests of Kukurakata (notified 1889 – 3936 acre) and the Panbari (notified 1913 – 1894 acre) are also under the administrative control of Kaziranga National Park.

Observations

It has been observed that the park boundary on the ground along non-natural features like a river etc., needs improved demarcation through conspicuous and well maintained boundary pillars in place of the current inconspicuous ones. (See picture 6)

The Management Plan of the park also takes note of this fact and recommends the conduct of a fresh survey and demarcation.

ADMINISTRATIVE STRUCTURE

A Conservator level officer as its Director leads the park. A Divisional Forest Officer is the administrative chief executive of the park. There are two Assistant Conservator of Forests and four range forest officers heading park ranges at Ghorakati (Burapahar Range), Baguri (Baguri Range), Kohora (Central Range) and Agoratoli (Eastern Range) respectively. The park is further divided into Beats (headed by a forester) and sub beats (headed by forest guard) for administrative purposes.

Observations

It does not augur well for an efficient management of the park that a large number of sanctioned posts (127 of 592) in the park are lying vacant. More over since the area of the park has almost doubled (through additions) the staff strength would need to be further augmented. The Management Plan has made following comments in the matter:

'After the 6th addition to the park, the anti-poaching and other management activities would extend even beyond the northern bank of river Brahmaputra. The access to chapories comprising the 6th addition area is difficult and also time consuming. The existing sanctioned strength of staff under Divisional Forest Officer, Eastern Assam Wildlife Division does not even meet the management requirement of the original 430 Sq km'.

That there is a need to increase suitably the staff strength at the park cannot thus be over emphasised.

INFRASTRUCTURE AND COMMUNICATIONS

The existing infrastructure at the park is as follows:

Buildings

There are a number of buildings in the park which are used as (i) offices, (ii) residential quarters for officers and staff, (iii) anti-poaching camps and barracks and (iv) inspection bungalows and rest houses.

Building	Purpose	Number
Offices	Director / DFO	2
	Range Officer	4
	Beat / Sub beats	8
Tourism	IB/RH/Dormitory	5
Residence	DFO	1
	ACF	2
	RFO	5
	Others	80

Building	Purpose	Number
Anti poaching Camps	Permanent	67
	Semi permanent	50
	Temporary	2
	Floating camp	2

Management Plan, 2002

(ACF: Assistant Conservator of Forests; DFO: Divisional Forest Officer; IB: Inspection bungalow; RFO: Range Forest Officer; RH: Rest House;)

Observations

Following prescriptions made in the management plan are well placed

1. *All the office buildings need repairs*
2. *Almost all the staff quarters in the park are in need of repairs*
3. *Permanent and semi-permanent field camps require annual repair after the floods are over*
4. *All temporary camps need to be replaced with either permanent or semi-permanent camps*
5. *There is a need of a new floating range for looking after the management of the 6th Addition area for which all infrastructure including range office, residential quarters and a fleet of mechanised boats (since the river Brahmaputra comprises of a large part of the additional area) and vehicles will be required*

Vehicles

There are 20 vehicles (jeeps, gypsies, tractors, truck, mini truck, motor cycles) in the park out of which around 7 (jeep, motor cycles and a truck) are in an unusable condition awaiting formal condemnation and disposal.

Procurement of a new vehicle for each range including one for the proposed floating range has been recommended in the management plan. A time limit (service period) for the use of the vehicle before replacement becomes due needs to be fixed keeping in view the special use requirements of the park.

Wireless

Communication in the park is presently carried out through an extensive wireless network system. The system has been upgraded and extended under an MOU for support with a local NGO (Aaranyak), which has facilitated the arrangement with an international donor agency (David Shepherd Foundation) for a period of 10 years. (See picture 7)

Kaziranga, 15th January 2005:

The David Shepherd Wildlife Foundation of United Kingdom in association with Aaranyak, a society for biodiversity conservation in northeast India, has today delivered the third phase of wireless communication equipments to the Kaziranga National Park authorities this afternoon. The third phase of equipments consists of about 40 wireless sets and accessories. The equipments were delivered to the Kaziranga National Park by Mr. Bruce Norris and Mr. Nigel Keen, both trustees of the David Shepherd Wildlife Foundation (DSWF) in presence of park Director Mr. N.K.Vasu, The DFO Mr. Utpal Bora and Representatives of Aaranyak. Speaking at the function held Kaziranga National Park, Dr. B. K. Talukdar, Secretary General of Aaranyak mentioned about the 10 years project that the organization has undertaken with the support from the DSWF. This is a joint project of Aaranyak, DSWF and Assam Forest Department. Dr. Talukdar mentioned that Mr. N.K. Vasu, the park director, mooted the project concept and Aaranyak took the responsibility to raise the resources to sponsor this project in association with the DSWF. The Vice President and the Programme Secretary of Aaranyak was also present on the occasion.

Under this project, during first phase in April 2003, about 41 wireless handsets and 9 base stations were provided at Kohora in presence of the Forest Minister of Assam, Mr. Pradyut Bordoloi. In the second phase 44 wireless handsets and 9 more base stations were sponsored which were handed over to the Chief Conservator of Forests (Wildlife), Assam on 30th January 2004 during the Elephant Festival at Kaziranga. With today's equipments, sponsored by DSWF UK supporters Mr and Mrs Derek Francis, total 125 wireless handsets and about 27 base stations were handed over to the park authorities since launching of the this project in 2003.
Source: Aaranyak

The wireless control station at Bokakhat maintains round the clock records on the following:

1) Rhino deaths
2) Raid / encounter / enforcement operation
3) Animals killed by miscreants during floods
4) Animals killed on the road during floods
5) Flood water level
6) Animals rescued from the flood

Observations

The MOU entered by the park with a local NGO for long term support to the park's wireless communication requirements is a landmark initiative and deserves all commendation and support.

The records as maintained by the wireless control room over time are a wealth of very useful information. These now need to be compiled, collated and converted into useful and actionable outputs.

The control room building and the man power there at need urgent upgradation and supplementation through the provision of following infrastructure and manpower support:
1) A PC with all peripherals like printer, voltage stabilizer, computer furniture etc
2) A database researcher
3) Improvement in the control room ambience

CONTROL OF POACHING

Intelligence gathering

Gathering of actionable intelligence on plans and movements of potential poachers and illegal wildlife traders is an important tool for the prevention of wildlife crime and to apprehend the poachers once the crime has been committed. Following has been proposed in the management plan in the matter:

- Maintenance of regular source of intelligence by the Director, Divisional Forest officer and Range forest officers with focus on notorious localities.
- Close collaboration with Police and Custom authority.
- Assistance from NGOs, Wildlife enthusiasts and local people.
- Provision of suitable rewards to the informers.
- Special patrolling methodology to be used by the field staff so that their movement and secrecy matches that of a poacher.
- Well-educated and trained foresters will be engaged for record keeping and prosecution of forest and wildlife cases in the courts.
- Soliciting support from villages through promotion of eco-development activities in villages.
- Secret list of persons with criminal track record and those known to have been involved in poaching shall be prepared and regularly updated at the Range level.
- A fund for operating secret information cell shall be maintained at the Director's level.

ANTI POACHING CAMPS

Field camps are the mainstay of the protection activity in the park. Presently there are 121 anti poaching camps in the park as under:

Nature of Camp	Number of camps	Remarks
Permanent camps	67	Many have been constructed in recent years with assistance from UNESCO and USFWS (see picture 8)
Semi- permanent camps	50	These are presently in poor shape and need to be converted into permanent camps (see picture 9)
Temporary camps	2	These are of temporary nature
Floating (Boat) camps	2	These are used mainly during the floods

Management Plan, 2002

According to the Management Plan:

'The location of these camps is determined at present considering the vulnerability of the places for the poaching of rhinoceros. One line of camps is located along the bank of the Brahmaputra on the northern boundary while another line of such camps is located along the southern boundary of the park. Some camps are located in the central portion. The protection staff at these camps remains in constant touch with one another. Following measures shall be executed:

- Regular maintenance of all the existing camps including floating camps every year.
- Construction of few more camps in some more vulnerable locations especially in newly added areas to the Park and adjacent Reserve Forests namely Panbari and Kukurakata. The addition areas of the Park and adjacent Reserve Forests are at present experiencing increased presence of wild animals including rhinos and tigers.
- Construction of permanent / semi-permanent camps at locations of existing temporary camps wherever feasible.
- Establishment of mobile camps during flood season. As the animals move from the Park to outside such as to the forests of Karbi Anglong and adjacent Bagser R.F., this will require movement of field staff from one place to another to provide effective protection.
- Shifting of some temporary camps from the present locations to other locations, if necessary, as the erosion along the river Brahmaputra forces shifting of some camps to safer places.
- Strengthening of anti-poaching camps with equipment such as effective arms, wireless, solar light and safe drinking water facilities etc.
- During the winter temporary seasonal camps will be constructed in the *chapories* of 6th Addition areas.
- Possibility of using Mobile camps with the provision for moving for one place to another will also be considered.

The anti-poaching camps are manned with Foresters, Forest Guards, Game Watcher, and Boatman etc. In some cases camps are manned by temporary workers for want of enough number of permanent field staff. Large number of vacancies exists in the park as the present staff strength is far below the sanctioned strength. Besides the quality of staff is also a critical issue.

***Observations**:*

In all 20 anti poaching camps were visited. They ranged from camps in dilapidated condition (see picture 10) to newly constructed camps on concrete stilts. As recommended in the management plan, all old camps require upgradation/ reconstruction and new camps need to be created in additional areas and the reserve forests in the administrative control of the park.

In view of the fact that a large chunk of river Brahmaputra in the north of the park is now a part of the park (sixth addition) a good floating camp in form of a small ship is urgently needed to patrol the river at all times including the floods.

It is also urgent that a full review of the manpower requirement at the park in view of the changed field realities is conducted and fresh staff is sanctioned and recruited to meet the enhanced protection needs of the park.

A rapid response task force based at the park headquarters to respond to emergency situations in the field as has been suggested in the management plan is a sound measure.

It is suggested that the local people who had been traditionally fishing in the river in the past and endeavour to do so even now should be befriended through provision of regulated (as part of ecodevelopment) 'benign' fishing by them in the sixth addition area of the park, since fishing although prohibited in a National Park under the provisions of the WPA is not really a threat to the park.

There may be a case to review the exact legal status of the sixth addition area and to consider if a legal status short of a National Park (say a conservation reserve under the WPA) would not also meet the conservation requirement of the park. Such a measure would permit regulated benign fishing by the local people.

ROADS

Range	No. of Central road (path) (graveled)	No. of Fair weather road
Kaziranga (Kohora)	2	30
Western Range (Baguri)	2	24
Eastern Range (Agoratoli)	3	17
Burapahar	1	-

Management Plan, 2002

Kaziranga National Park has a wide network of forest roads especially in its 3 ranges as shown above. These roads are either graveled (central path) or fair weather in nature. These roads are to be repaired annually after the flood season is over to make them usable again. There are several wooden bridges and culverts on these roads. These are also to be periodically repaired and some of these are to be reconstructed. (See picture 11) In addition the park is strewn with a number of patrolling paths all over the park.

The southern boundary road along the river Mora Diphlu needs construction for facilitating a year round patrolling to check poaching of rhino and ingress into park of men and cattle.

***Observations**:*

New roads need to be laid in new additions to the park as well as in other areas of the park identified by the park authorities as priority especially in Eastern and Burapahar ranges.

WATCH TOWERS

The park is dotted with watch towers some of which act as elephant riding structures for the staff and the tourists. While the other watch towers are meant to keep a watch on animals and any unusual human movement in the park.

The existing watch towers are at the following places:

Range	Watch towers
Central (Kohora)	Kathpora, Bhaisamari, Mihibil (2nd riding point), Mihimukh, Kerasing, Goroimari
Western (Bagori)	Donga, Bahubeel, Namduar
Eastern (Agoratoli)	Sohola, Pelican Colony, Kaladuar, Tinibeel

Management Plan, 2002

Regular maintenance of these watch towers is necessary. Construction of new watch tower at Mona *Beel* has been recommended in the management plan.

Observations

The park would need more observation watch towers in new areas like first and sixth addition as well as in the Reserve Forests under the park's administration.

FIRE ARMS

Following fire arms are available in the park:

Fire Arms	Number	Remarks L-Lost S-Seized
.315 Rifle	346	ER-2L, KR-2S, WR-2S
American make Rifle (WIN CALIBER)	10	-
.423 Rifle	1	-
.470 DBBL Rifle	1	-
DBBL Gun	27	ER-1L, WR-1S
SBBL Gun	33	KR-7S
Revolver	5	-
	423	

Management Plan, 2002
KR: Kaziranga range,ER: Eastern range
WR: Western range

Observations*:*

While the rhinoceros poaching incidents in the park are currently under control the threat of poaching is ever present. The park needs good fire arms to combat the poachers often armed with sophisticated weapons.

The park would also require additional firearms for the staff to be recruited in view of the creation of another range for the protection of new areas.

The park's management plan suggests acquiring additional firearms as under:

'Besides regular up keep of these arms in order to get efficient service, the park authority has also to purchase new rifles as some old rifles/ guns have become unserviceable.'

DEPARTMENTAL ELEPHANTS

There are 47 departmental elephants in the park as under:

Range	**KAZIRANGA**	**BURAPAHAR**	**EASTERN**	**WESTERN**
Male	3	0	0	0
Female	16	0	5	5
MT	6	1	2	2
MM	4	0	0	3
Total	**29**	**1**	**7**	**10**

Management Plan, 2002

According to the management plan:

'These elephants are an integral part of the overall Park management and perform various important tasks such as

- Conducting patrolling in tall grass areas.
- Carrying ration to various camps located inside the park, majority of which cannot be accessed in the rainy season without the help of elephants.
- Elephant ride to the tourists.'

Since rhino *dandies* (traditional traversing paths) need frequent checking by the staff for signs of any effort at pit poaching, elephants come handy during such patrols. Many areas with tall grasses cannot be negotiated without an elephant even during the dry season. Moreover patrolling on an elephant helps the staff to cover more area intensively and places them in an advantageous position while looking for the poachers.

Elephants require expert health surveillance and support. They also need expert mahouts to handle them. The management plan has identified the following needs for them:

- Veterinary care
- Elephant gears
- Training of the sub-adults
- Contractual labour force on regular basis to strengthen the present inadequate elephant care.
- Training for mahouts and grass cutters
- Though ample fodder is available within the park area, still it needs to be supplemented with nutrient rich food on daily basis.

***Observations**:*

Elephants were found attached to few anti poaching camps during our field visit.

Departmental elephants must be seen as an essential part of the management strategy in the park from the point of view of protection as well as for facilitating the visitor movement in the park.

FLOODS

Annual floods and periodic high floods during the monsoon season characterize the park.

According to the management plan

> 'Kaziranga National Park is situated in the flood plains of the Brahmaputra River and the entire area has been formed by silt deposition carried by different river systems flowing through it. Each year with increase in the water level of Brahmaputra River along the northern boundary, and Dhansiri River on the eastern boundary, the water level in the various water bodies and stream also rise. In case of high flood years, the over topping of the entire bank line of Brahmaputra leaves the entire park except high grounds flooded with water. This situation results in migration of wild animals from the park to the Karbi Anglong hills and severe damages to the existing infrastructure like camps, roads, buildings etc in the park.

Critical Corridors

Following corridors have been identified and actions initiated by the park management to secure them

S.No	Name of Addition	Area (sq km)	Remarks
1	1st Addition: Burapahar	43.79	Functions as Corridor/ Habitat
2	2nd Addition: Sildubi	6.47	-do-
3	3rd Addition: Panbari	0.69	Corridor
4	4thAddition: Kanchanjuri	0.89	-do-
5	5th Addition: Haldibari	1.15	-do-

Observations

- *Some sign boards cautioning the motorists were seen on the corridors as the NH crosses them. (See picture 12).*
- *The mushrooming of new road side dhabas and motels was also more than evident.*
- *The highlands as raised by the army in Burapahar area (See picture 13) are getting slowly vegetated and hence stabilising themselves. It is hoped that in due course they would play a key role as places of safety for animals in distress during the flood situations. The park must encourage the army and similar other agencies with expertise and wherewithal to create more such highlands in the southern part of the park.*
- *The prescriptions as made by the park's management plan for tackling the high flood situation is well considered and deserve full support of various funding agencies and other stakeholders like the Civil, Police and Highway authorities as well as the local people and tea garden.*

- *A raised road along the park's southern boundary as suggested in the Management Plan should be given highest priority for action. It would on one hand ensure regular patrolling in sensitive area and on the other shall make high grounds available to the animals in distress during the floods.*
- *The animal rescue centre run by WTI is a commendable effort by an NGO.*
- *A professional agency be hired to conduct a feasibility study of the proposed over bridges on NH 37. Once such a study recommends the raising of such structures then money should not be allowed to become a constraint for action*.

WILD FIRE

Wild fires are unheard of in this park. This is because the local conditions of temperatures (the annual maximum average never exceeding 34^0 C) and moisture (monsoon arrives in the month of May) are not conducive to the occurrence of wild fires.

Fire in a controlled manner is used only to maintain the grasslands in the park.

INVASIVE SPECIES

Mimosa

The grasslands of Kaziranga National Park have been threatened by two species of Mimosa belonging to the family Mimoseae i.e. *M. rubicaulis* and *M. invisa*. Both species are straggling herb seen climbing to the top of several meters high elephant grasses. The quick growing herb not only destroys the grasses, it hampers the free movement of wild animals. Mimosin, a harmful toxin is known to affect herbivore population particularly ruminants. At present about 120 ha of prime grassland has been adversely affected and scattered growth can be seen in many areas inside the Park.

Wildlife Trust of India (WTI), a Delhi based NGO has been helping the park with operations to remove Mimosa from the grasslands in the park.

TRESPASS AND ENCROACHMENT

Grazing

According to the management plan:

- 'Grazing by domestic livestock along the southern boundary is a challenge for the park management. During February – March, when fodder becomes scarce for the livestock because of prevailing dry weather the villagers often push their livestock into the park area for grazing. Annual burning during the period also results in the growth of new shoot and the livestock relish such vegetation. Besides, competing for fodder with wildlife, such intrusion increases the risk of spread of diseases, as the livestock are not always properly immunized.

Observations

Cattle were seen inside the park at several places especially across river Mora Diphlu in Bagori range (see picture 14) and in the first addition area in Burapahar range.

While placing of cattle watchers (who are themselves not locals) can be effective as long as they are frequently supervised, rising of cattle proof fencing in a situation like Kaziranga where the terrain and ground situation makes access to the park extremely easy, it may not be the best way of dealing with the problem. A focussed survey of local livestock would certainly be useful for devising practical strategies.

A successful participatory ecodevelopment effort whereby people's dependence on maintaining large herds of cattle is addressed would only be a long term solution to the problem.

Immunization of cattle

In order to avoid spread of diseases from cattle to herbivores like Rhinoceros and Wild buffalo it is essential that a regular immunization of all cattle in adjoining villages is carried out regularly by the park management in collaboration with the local veterinary department officials.

Encroachment

While the park does not suffer from any recorded instance of encroachment on its land, some of the new additions are burdened with encroachments as under:

S. NO.	AREA	ENCROACHED AREA IN HECT.	REMARKS
1	Kaziranga National Park	NIL	
2	1st Addition area	650	7 H/H evicted during May/June-02
3	6th Addition Including Panpur R.F.	7100	162 H/H Evicted During May/June-02
4	4th Addition area	40	Encroached by Tea Garden
TOTAL		**7790**	

Observations

It is to be ensured through a proper survey and demarcation of the park that any encroachment on the park's land is precluded. Additionally the issue of existing encroachment on addition areas to the park needs to be resolved expeditiously.

Crop raiding

It has been found that the depredation of crop and property by wild herbivores and occasional instances of cattle lifting by large predators cause considerable hardship to the poor people who reside on the fringe of the park. Besides, instances of people getting killed by wild animals especially by wild buffalo, and elephants are also reported occasionally.

The number of wild animals such as the wild buffalo have increased to such an extent that even patrolling on foot has become difficult in certain areas. Similarly man-elephant conflict has reached a critical stage.

As a result, antagonism towards the park from the affected people has become a serious management problem for the park authorities.

Observations

The management plan suggests the following strategies, which are well placed.

- *The damage to the crop, domestic animals and properties should be adequately compensated.*
- *Injury or death of people due to attack by wild animals should be immediately attended and compensation/ ex-gratia provided soon after the incident.*
- *Formation of crop protection committees in problem villages and providing items like Kerosene oil, Fire crackers, Torch lights etc. to such committees.*
- *A flying squad in each range to be formed entirely to manage crop raiding wild animals for a period of about 3 months before harvesting of crop.*
- *Construct machan type structure on suitable locations to keep vigil on crop raiding wild animals.*

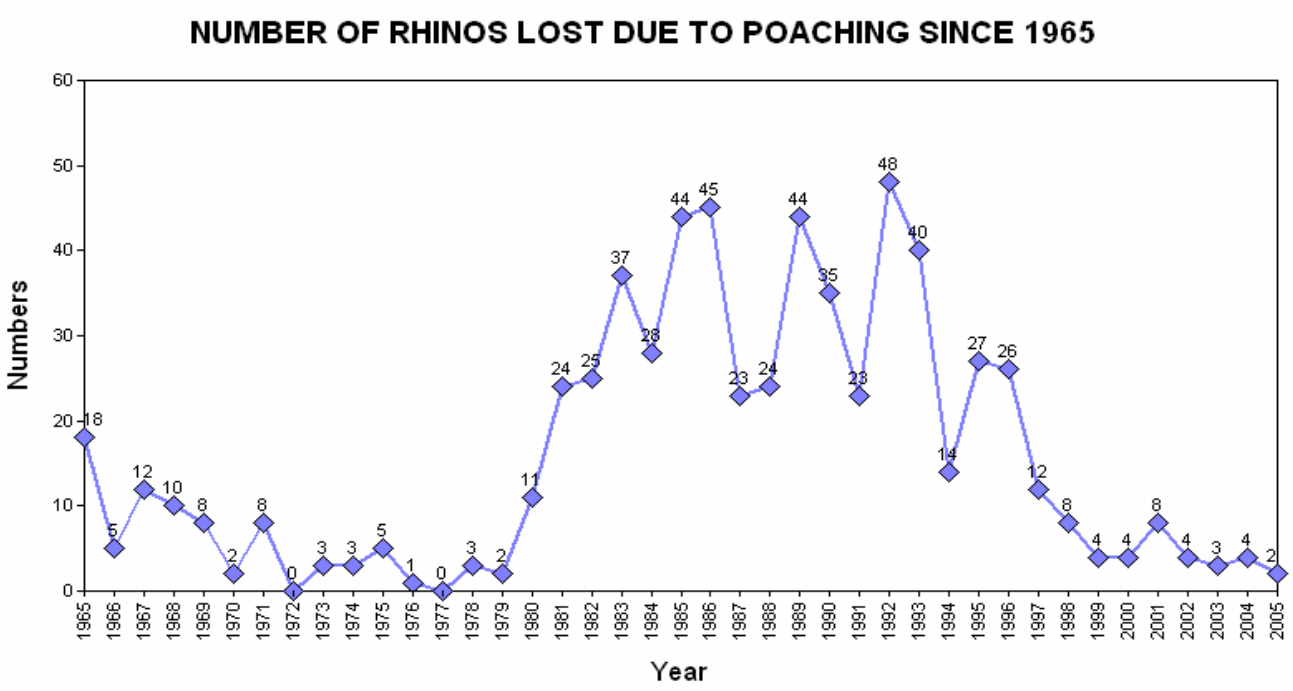
POACHING (Rhinoceros)

Following tables records the poaching figures for rhinoceros in the park since 1965:

Year	Poaching	Year	Poaching	Year	Poaching	Year	Poaching
1965	18	1978	3	1991	23	2004	4
1966	5	1979	2	1992	48	2005	2 (21.3.05)
1967	12	1980	11	1993	40		
1968	10	1981	24	1994	14		
1969	8	1982	25	1995	27		
1970	2	1983	37	1996	26		
1971	8	1984	28	1997	12		
1972	-	1985	44	1998	8		
1973	3	1986	45	1999	4		

1974	3	1987	23	2000	4		
1975	5	1988	24	2001	8		
1976	1	1989	44	2002	4		
1977	-	1990	35	2003	3		

Management Plan, 2002



Clearly the period from 1981 till 1996 was the worst period at the park for the poaching of Rhinoceros, which has since been controlled with the exception of year 2001 when 8 rhinos were poached.

Anti poaching measures

The anti-poaching activities in Kaziranga National Park could be divided into three phases as detailed below:

Pre-entry: The main activity in this phase is **proactive action** that includes intelligence gathering on the activities of poachers in the vicinity of the Park. The **intelligence providers** are usually local villagers or poachers turned informers. Effort are also made by the park authorities to involve the local people in furnishing information on the movement of poacher through implementation of **Eco-development works** as well as through **education and awareness** drive in the fringe villages of the National Park.

Post entry: This calls for **reactive action**, which denotes the activities undertaken by the staff to track down and apprehend the poachers inside the Park, once such information has been received or evidences thereof have been found by the park authorities.

Post exit: This is the **investigative and prosecutive action** after the poachers escape from the park, usually after committing an offence inside the Park. This phase mainly consists of co-ordination with other **law-enforcing agencies** like Police to keep track of the poachers and to nab them.

The anti-poaching infrastructure in newly acquired additions and reserve forests is highly inadequate and practically non-existent in many areas. Moreover, the protection activities on the north bank of the Brahmaputra cannot be effectively supervised with the administrative head quarters along the southern boundary due to difficulty of immediate access to the north bank. The only solution to the problem is the establishment of a new Range head quarter at north bank.

Assam Forest Protection Force

3 sections of Assam Forest Protection Force, which is a para military force, are posted at the park (Burapahar, Kanchanjuri and Kohora) to support the work of anti poaching at the park. A SP rank officer who is based in Guwahati leads the force.

Observations

The anti poaching measures as taken up by the park since early 2000 have been quite effective and deserve all commendation and recognition. But the park needs to remain always on guard against the poachers.

The park management has along been concentrating on the prevention of rhino poaching in the park. It is notable that although there have not been poaching incidences relating to elephants or tiger, which also share the park with the rhino, the park management should not ignore the possibility of poachers also targeting the latter species.

The urgent need of a good functional anti poaching infrastructure including staff, camps, boats, vehicles, fire arms etc in addition areas cannot be over emphasised.

At present, the Park is also maintaining 30 personnel of the Assam Forest Protection Force equipped with .303 service rifles to reinforce the protection staff of the park. But there was little evidence to indicate an integration of this force into the park's larger protection strategy.

POLLUTION

A petroleum refinery (Numaligarh Refinery Limited) has been established and commissioned in the year 2000 at Numaligarh, close to the eastern range of the park. Although it has been claimed that the newly established refinery has taken anti pollution and green measures, the likelihood of an oil spill or some other accident always remain which could result in the water in Brahmaputra and other water bodies in the park getting polluted.

Similarly since maintenance of a tea garden is an input intensive enterprise, the use of insecticides by the tea gardens can always get leached onto the park rivers and pollute the park's land and wetlands.

TOURISM

Despite the fact that the tourist season in Kaziranga is short (November – April) still around 46,300 persons visited the park in the year 2001-02.

There is a well-defined tourist zone in the park.

***Observations**:*

While regulated tourism is essential for the education of and understanding by the people of the importance of the park, it is equally essential that tourism is not allowed impacting adversely the park's management.

It is notable that the private sector participation in tourism at the park is significant. But this fact is also resulting in mushrooming of eateries and motels all along the NH 37 on the south of the park. A policy decision at the government level is urgently called for to regulate this growth to ensure that the critical corridors across the NH 37, which are utilized by the wild animals in distress during high floods, are not adversely impacted by unregulated growth in tourist facilities.

RECOMMENDATIONS:

Subject	Activity	Suggested Priority	Budget	Comments
Legal status	Survey and demarcation	I	NA	While the park's legal boundaries have been well defined by various notifications (including the 6 additions to the park) the detailed survey and demarcation along the artificial boundary needs urgent attention.
	Final declaration of the additional areas	I	NA	Pending settlement proceedings for the additional areas (second, third and fifth) need speedy conclusion for their final notification/s.
	Monitoring changes (land loss and land creation in the river islands) following erosion / deposition on the northern boundary of the park along / in the Brahmaputra river	II	INR 20 lakhs	A GIS/GPS based monitoring protocol for land loss (to erosion) and land gain (to deposition) needs to be devised.
	Ascertaining existing encroachment	II	NA	Encroachments along the park's southern and eastern boundary need attention.
Boundary pillars	Raising of boundary pillars	I	INR 10 lakhs	Properly sized and conspicuously placed boundary pillars (much more conspicuous than the existing small pillars at places) need to be raised along the non natural boundary of the park in Agaratoli, Kohora, Bagori, and Burapahar ranges. The boundary pillars of the 3 RF (Panbari, Kukurakata and Bagser) also need a revisit and consolidation.
Administrative boundaries	Internal boundaries of ranges, beats, sub beats	II	NA	Administrative efficiency requires that the internal boundaries of all territorial administrative units (Ranges, Beats, sub beats) are well laid out not only on a map but also on the ground. **May be carried out at the next revision of the current Management Plan.**

Subject	Activity	Suggested Priority	Budget	Comments
	Management of northern areas	I	NA	It is essential that a new range is created with its full complement of staff to manage the park affairs in the sixth additional area (Brahmaputra river and *chapories* etc). **Action requires decision at the highest levels within the state machinery.**
Communications and Patrolling	Wireless system	I	NA	Park's strategy of having entered into an MOU with a local NGO (Aranyak) for accessing resources from an international donor (David Shepherd Foundation) for long term (10 years) assistance in ensuring an effective wireless network in the park is a path breaking initiative.
	Wireless Control room	I	INR 5 lakhs	The park's wireless control room is maintaining detailed entries of messages received by it on various issues (flood waters levels, Rhino deaths, animals killed on road/ by miscreants during floods, animals rescued, raids/ encounters, ammunition used, etc). It is a mine of information collected over a long period of time. It would be extremely useful if this data set is professionally assessed, inventoried and analysed and its collection institutionalized through strategic upgradation of the Wireless control room facilities and the man power needs.
	Maintenance of existing roads and patrolling paths	I	NA	Park's management plan has detailed proposals for repair as well as maintenance of existing roads (Central roads- 50 km) and patrolling paths (400 km)
	Southern boundary road	I	INR 80 lakhs (@ INR 5 lakh per km)	A 16 km long raised road between Kohora and Baguri along the Mora Diphlu river would be extremely useful on several accounts including patrolling, as a barrier for incursion of cattle into the park and egress of park animals like rhinos, wild boars, wild buffalo etc. Most importantly this raised road would serve as a useful highland for the animals trying to save themselves from the floods.

Subject	Activity	Suggested Priority	Budget	Comments
	Patrolling camps	I	INR 240 lakhs (@ INR 3 lakh per camp)	These are the mainstay of the park's successful protection against illegal entry as well as poaching of key animals. The management plan has detailed proposals on upgradation of existing camps as well as the creation of 80 new camps especially in new additional areas. **Provision of toilets within the camp** is seen as an essential element in old as well as new camps. It would be useful to have an external agency work on a **model prototype of an ideal patrolling camp** for the park, keeping in view the park's special conditions and requirements.
	Floating Camp	I	Subject to finalization of the floating camp concept	Now since with the 6th addition, a part of Brahmaputra river is a part of the park, and even otherwise river patrolling during floods is an integral part of park's management activity, it would be necessary to plan for **Floating Camps** which could cater for not only the staff posted there but also animals in distress during the floods. The management plan has already suggested the requirement of such a camp in the park.
	Departmental elephants	I	INR 20 lakhs	Departmental elephants (47) play an integral role in protection as well as tourism promotion. The management plan has made detailed recommendations for their maintenance as well as for acquiring new animals for the additional areas.
	Vehicles (Heavy, multipurpose, Gypsies, motorcycles etc)	I	INR 320 lakhs	The management plan has made detailed proposals on vehicles in the park.
	Boats (Mechanised, outboard motor and country boats)	I	INR 95 lakhs	The management plan has made detailed proposals on boats in the park.

Subject	Activity	Suggested Priority	Budget	Comments
Invasive species	Mimosa spp.	I	NA	To be eradicated on priority. Management plan has provided for it.
	Water hyacinth	II	NA	Eradication could be tried as a part of participatory ecodevelopmental activity.
	Genetic purity of Wild buffalo	I	NA	It is urgent that domestic buffalos are kept out of the park to ensure that the wild buffalos do not lose their genetic distinctiveness.
Crop raiding and Loss of life	Control of crop raiding of agricultural fields by park animals (wild boar, wild buffalo, elephants, swamp deer, hog deer, rhinoceros etc)	I	INR 10 lakhs	Management Plan has provided for detailed measures for control of crop raiding by park animals. It has been suggested to create a crop protection squad consisting of park staff and local people to patrol sensitive areas during evening and night time.
	Compensation for loss of crop and loss of life	I	NA	Timely provision of compensation for loss of crop or life to the victims is the most important duty of the state.
Trespass, Poaching and Pollution	Strict vigil	I	NA	A good network of field camps and frequent patrolling by park staff has ensured that trespass into the park is under control.
	Illegal grazing by livestock	II	NA	Illegal grazing by cattle in the park is not widespread. Vulnerable areas have been identified and steps suggested in the management plan.
	Illegal fishing	II	NA	Illegal fishing in the beels and rivers of the park is a frequent happening. Regular patrolling as envisaged in the management plan is the only solution.

Subject	Activity	Suggested Priority	Budget	Comments
	Anti poaching intelligence	I	INR 5 lakh per year (secret funds)	Rhinoceros targeted poaching has been a serious problem faced by the park in the past. All efforts to keep enforcement pressure maintained on potential poachers is must. An efficient network of informers in the local areas as also in towns like Guwahati is required to keep track of poachers and illegal traders.
	Assam Forest Protection Force	I	NA	The park is maintaining a unit of Assam Forest Protection Force as a support unit for anti poaching operations. Its role and utility needs to be integrated into the park's protection strategy on a long term basis.
	Regular and constant Pollution monitoring	II	NA	Chemicals used by the tea gardens are a potential source of the pollution of the wetlands in the park. A refinery set up at Numaligarh close to the park is a potential source of pollution of the park that needs monitoring.
Mitigating flood impacts	Monitoring flood progress and severity	I	Subject to the finalization of the proposed system for monitoring	A system needs to be devised for flood monitoring in the park.
	Safety of park animals from the floods	I	INR 800 lakhs	Creation of high lands along the southern boundary of the park

Subject	Activity	Suggested Priority	Budget	Comments
	Animal Corridors on the NH 37	I	NA	The integrity of animal corridors between the park and the Karbi Anglong hills across the NH 37 is the most important safety factor for the park animals. Special signages and educational campaigns targeted at motorists are required. NGOs can play and should be encouraged to play an important role in this activity.
	Prevention of animal loss on the NH 37 during the floods.	I	INR 5 lakh per year	Special day and night patrolling of the NH 37 during the floods. Additional manpower on hire for the duration of the flood season.
	Poaching of animals inside the park during floods	I	NA	Use of boat patrols during floods.
	Erosion of land along the Brahmaputra river	II	NA	A monitoring system needs to be devised. Assistance of expert government agency is sought for the same.
	Construction of over bridges at strategic places on NH 37	II	Subject to the findings of the expert group	An external professional agency may be asked to conduct the initial feasibility study which could then be evaluated by an expert group within the government for follow up measures in the matter.
Tourism				
	Professional conduct of the visitors to the park	I	NA	Staff needs to be trained for the purpose.
	Visitor facilities	I	NA	Management plan provides for it.
	Strict enforcement of visitor do's and don'ts in the park	I	NA	Management Plan has listed do's and don'ts for the tourists in the park.
	Assessment of the visitor carrying capacity of the park	II	INR 3 lakhs	An expert agency may be asked to conduct it.

Subject	Activity	Suggested Priority	Budget	Comments
	Unregulated growth of tourism facilities along the NH 37	I	NA	It is urgent that a policy decision at government level regulates the mushrooming of motels and eateries on NH 37 as it passes along the park's southern boundary, including the critical corridors linking the park with the highlands of Karbi Anglong hills.

NA – Not Applicable (Funding is either not required or external source of funding is not solicited)
Budgetary requirement in lump sum is in many cases based on figures as given in the Management Plan, 2002.
1 lakh = 100,000
INR – Indian Rupee

CAPACITY BUILDING / ENHANCEMENT OF THE PARK STAFF

Introduction:

Capacity in terms of efficient and enabled human resource (staff) includes the following:
1) Requisite number
2) Right age
3) Right education / skills
4) Right infrastructure
5) Right motivation (staff welfare and amenities)
6) Administrative, financial and legal authority

Relevant information on the above was accessed from the records at the office of the DFO of the park. A day long adaptive SWOT (strengths, weaknesses, opportunities, threats) workshop followed by a training needs assessment exercise with around 36 staff members (list enclosed) of the park provided an insight into the staff's views and aspirations. (SWOT report enclosed). Field visits and interactions with the staff in the field also provided an opportunity to understand the capacity building needs of the staff.

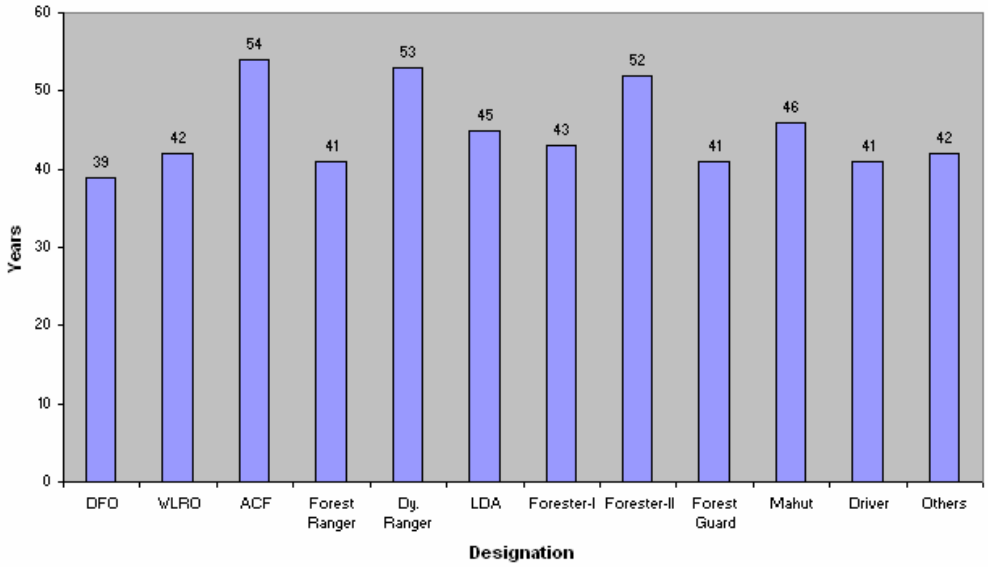
Staff

There are in all 592 sanctioned posts out of which there are 127 (20%) vacancies.

CATEGORY OF POST	SANCTIONED STRENGTH	STRENGTH AS ON 31.3.2002	VACANCY
CF	1	1	-
DCF / DFO	1	1	-
FVO	1	1	-
WLRO	1	1	-
ACF	2	2	-
Forest Ranger	7	4	3
Office Superintendent	1	-	1
Stenographer	1	-	1
Dy. Ranger/ Game Keeper	10	5	5
Forester-I	50	39	11
Fr-II/Hd Game Watcher (GW)	24	8	16
FG/GW	272	242	30
Boat Man	63	58	5
Hd. Mahut/ Mahut	35	31	4
Grass Cutter	34	16	18
Driver	25	16	9
R.Tech./ Electrician	2	2	-
Class IV	32	16	16
Head Asst.	1	1	-
UDA/ Accountant	10	6	4
LDA	17	13	4
Vety. Field Asst.	1	-	1
Handiman	1	-	1
TOTAL	**592**	**465**	**127**

DFO office, 2005

Average age of staff



Observations

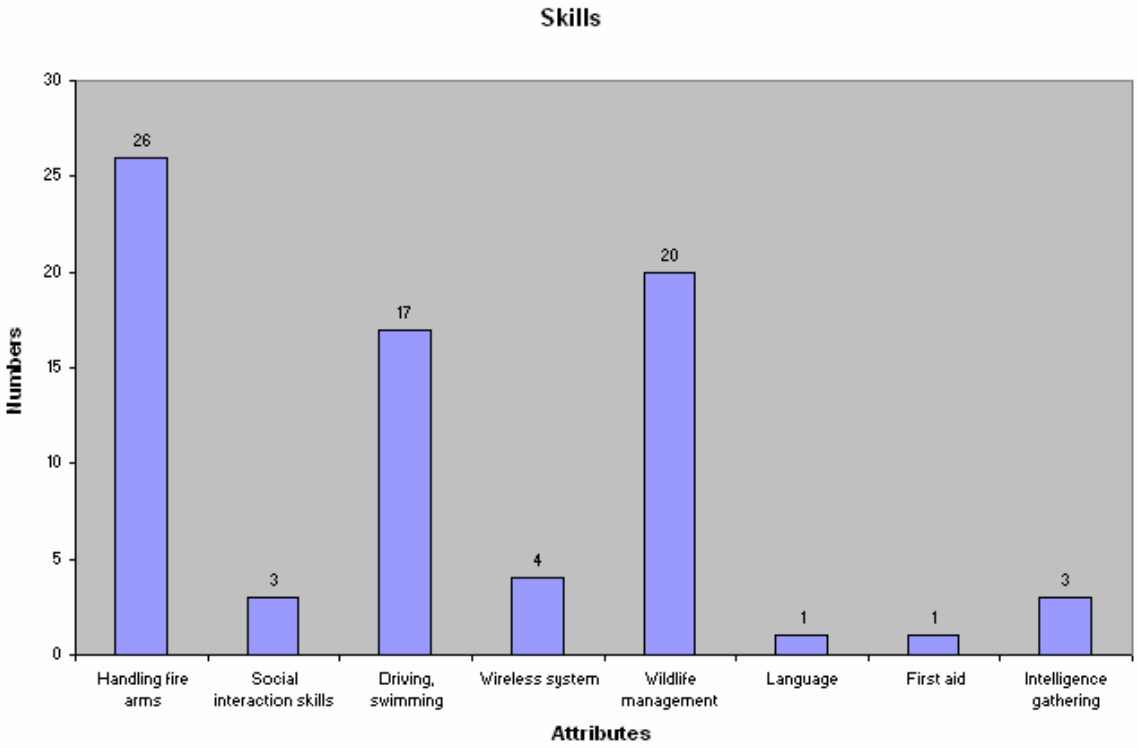
As is clear from the above that the human resource at the park needs to be augmented in numbers (by filling of vacant posts) as also fresh recruitment needs to be carried out to have younger element within the staff to meet the challenges of difficult field conditions at the park.

Additional staff for the addition areas is an urgent need of the park.

Skills

An interactive session with the park staff resulted in their identification of the skills that they wished to acquire:

Handling firearms - 26
Social interaction skills – 3
Driving, swimming – 17
Wireless system – 4
Wildlife management – 20
Language - 1
First aid – 1
Intelligence gathering – 3



Infrastructure

The support infrastructure at the park in terms of communication facilities, camping sites, patrolling (paths, boats and elephants), supply of ration to the field camps, fire arms and ammunition, kerosene supply, solar charger for the wireless set etc was seen to be satisfactory.

Repair of roads, anti poaching camps and additional infrastructure in addition areas is certainly required, but by and large the infrastructure at the park is available and functional.

This aspect of capacity building has been dealt with in detail in the earlier chapter on review of protection at the park.

Staff motivation

Amenities and staff welfare:
A focussed group discussion during the SWOT workshop (see picture 15 & 16) on the staff's expectations regarding welfare and amenities revealed the following:

- Provide more facilities (uniform, housing, school etc) to staff - 23
- Improve roads in the park – 21
- Provide modern equipments and vehicles to staff for patrolling – 14
- Improve communication facilities – 12
- Lack of modern weapons – 12
- Get more staff – 11
- Create good camps on boundary – 10
- Improve infrastructure like temporary roads, bridges etc. – 10

As regards the upholding of the staff's morale, following points were made during the group discussion and otherwise:

a) Lack of promotional avenues for the lower level staff was cited as the most demoralizing aspect of man management in the department.
b) Absence of any grievance redressal mechanism within the system also emerged as a morale dampener.
c) Lack of incentive for good workers was mentioned as a cause for frustration and demotivation amongst the staff.

CAPACITY BUILDING / ENHANCENT PLAN

Attribute	Requirement	Activity	Priority	Agency / Facilitator	Time frame	Costs
Staff strength	Optimum number	Staff 'work – time' budget assessment	I	Third party (professional agency)	1 year assignment	INR 10 lakhs
Staff age	Younger average age	Fresh recruitment at Forest Guard and Forester levels	I	Government level	-	NA
Staff vacancy	Posts to be manned	a) Vacancies to be filled. b) Additional posts to be created for managing new areas added to the park.	I	Park management / State government	-	NA
Staff skills	Wildlife and forest management	Introductory and refresher courses	I	a) WII b) State Forest training Institute or c) NGO	Once a year (on site) for 3 months spread over the year.	INR 10 lakhs per year
	Wireless operations and non technical maintenance	Skill upgradation	I	Local Police / Para military	As per the convenience of the training agency	NA
	Boat operations and maintenance training	Handling boats for patrolling and during floods	I	A training MOU with the company that supplies the boat/s (mechanized)	-	NA

Attribute	Requirement	Activity	Priority	Agency / Facilitator	Time frame	Costs
	Swimming expertise	Ability to save one's own as well as other's life / property	I	Training MOU with a local or nearest Swimming pool	As and when feasible for identified non swimmer/s amongst the staff	NA
	Wild animal restraint	On site training capsule	I	WII / Assam state Zoo	Once a year	INR 5 lakhs per year
	Maintenance and use of fire arms	Training of frontline staff in small batches	I	Local police lines / para military (Assam Forest Protection Force)	Once a quarter	NA
	Forest and wildlife laws and court craft	a) Introductory b) Advanced	I	Third party (eg ELDF, Delhi)	Six monthly (in batches of 10 participants)	INR 3 lakhs per batch (on site)
	Protection and intelligence gathering	Focussed training capsule for select staff members	I	a) Local police training institute b) Qualified NGO	Six monthly (in small batch not exceeding 5)	INR 3 lakhs per batch (on site)
	Man management, conflict resolution, social skills	Focussed training course	I	a) State forestry training institute b) Third party	In form of a compulsory refresher course, as per the capacity of the training agency	INR 3 lakhs per batch (on site)

Attribute	Requirement	Activity	Priority	Agency / Facilitator	Time frame	Costs
	Physical training	On the lines of army / police lines	I	a) Under the supervision of a retired police or army physical instructor b) Ex serviceman reemployed with the park	Every Sunday and at least a week before the national events like Independence day and Republic day	NA
	Adult literacy and foreign language skills	Utility educational course preferably within park premises	II	Third party	As per the course schedule and the employee convenience	INR 3 lakhs per batch (on site)
	First aid	Introductory including hands on experience	I	Third party (Red Cross/ local hospital)	As per the trainer's convenience	NA
	Driving / vehicle maintenance	Ability to drive a vehicle and carry out minor repairs	II	Local driving / vehicle maintenance centre	-	NA
	Experience sharing visits to other PAs	Learning from other's experiences	I	Park management	Once every 6 months	Part of the Forest and WL Mngt. course.

Attribute	Requirement	Activity	Priority	Agency / Facilitator	Time frame	Costs
Infrastructure (Other than already mentioned under Protection strategic review)	Electric power	Regular supply	I	Park management / State Electricity Board	-	NA
	Office space and material	Enabling office space and material	I	Park management	-	NA
	Wireless Control Room	Upgradation of facilities	I	Park management	-	INR 5 lakhs
	Visitor education	Development of educational material, signages etc	I	Park management / Third party (NGO or a professional consultant)	6 months	INR 3 lakhs per batch
Staff motivation	Uniform and related kit	Park to have its distinctive uniform	I	Park management	-	NA
	Staff quarters	Park staff colony at each range	I	Park management	-	INR 400 lakhs for 100 staff quarters
	Special leave provision for field staff	Rules to be framed and approved	I	Park management / State government	-	NA
	Improvement of patrol camps	Upgradation work	I	Park management	-	INR 60 lakhs (@)INR 50,000 per camp)

Attribute	Requirement	Activity	Priority	Agency / Facilitator	Time frame	Costs
	4 Transit camps for the staff	Use by park staff	II	Park management	-	INR 16 lakhs (@ INR 4 lakh per camp)
	Staff claims disposal	Speedy disposal	I	Park management	-	NA
	First Aid boxes	Provision in all camps / offices / vehicles	I	Park management	-	INR 10 lakhs
	Promotional avenues for subordinate staff	Timely promotions	I	Park management / state government	-	NA
	Staff grievance redressal mechanism	Cell to be established	I	Park management	-	NA
	Acknowledge merit and hard work	Incentives to recognize exceptional and meritorious work	I	Park management / state government	-	NA
Administrative, financial and legal authority	Enhanced decision making ability	Delegation of powers (an independent assessment to be made)	I	State government / Third party (Institutional audit expert)	6 months	INR 3 lakhs

Appendix – 1

Places visited during the field visit

Places Visited:

Park Director's office at Bokakhat
Kohora RO

Central Range - Kohora
Bokpora Camp
Borun Tika Camp
Arimora Camp
Temporary Camp

Baguri Range - Baguri
Baguri RO
Harmoti Camp
Murphuloni Camp
Gorakati Camp
Baghmari Camp
Deopani Camp
Azarkathuni Camp
Rozapukhari Camp
Donga Camp
Raomari Camp

Eastern Range - Agoratoli
Turturoni Camp
Mohpora Camp
Rajamari Camp
Ahotguri Camp
Hathi chaura Camp
Deveswari Camp

Western Range - Burapahar
Diphlu Camp

Central Wireless Control Room – Bokakhat
DFO Office - Bokakhat

Appendix – 2

Report of the SWOT Workshop

Location: Kohora, Forest Complex

Date and time: 20.3.05 (1100hrs – 1500hrs)

Number of participants: 35

Methodology**:**

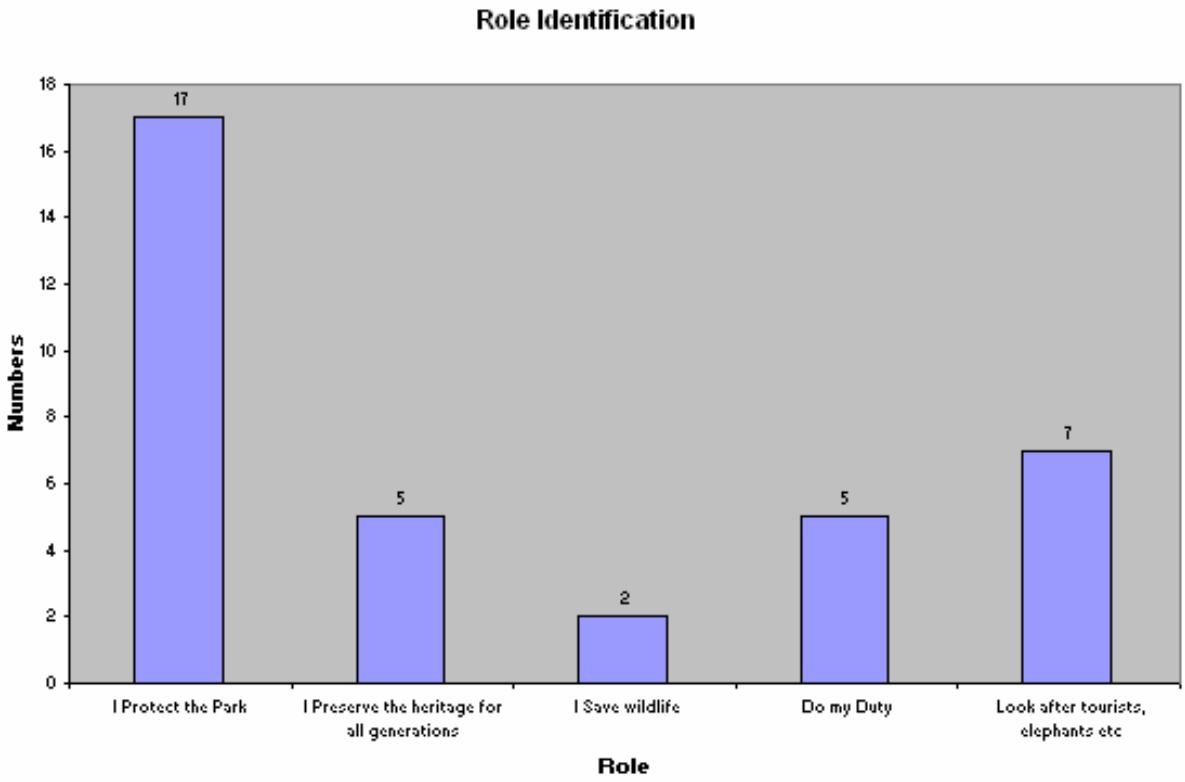
The participants were made to evaluate their park in terms of its strengths, weaknesses, opportunities and threats through a process of written responses against targeted questions and situations by a facilitator. The facilitator also had to sometimes engage the participants into a discussion to either refine a response or to elicit the relevant information.

It was heartening to note that the Director and the DFO of the park participated actively in the exercise, helping the facilitator in either explaining a question to the participants in the local vernacular (Assamese) or translating a submission from Assamese into English.
The participants were also asked to define their felt needs in terms of training requirements.

Results:

Role Identification - What do I do at Kaziranga? (1 response per participant)

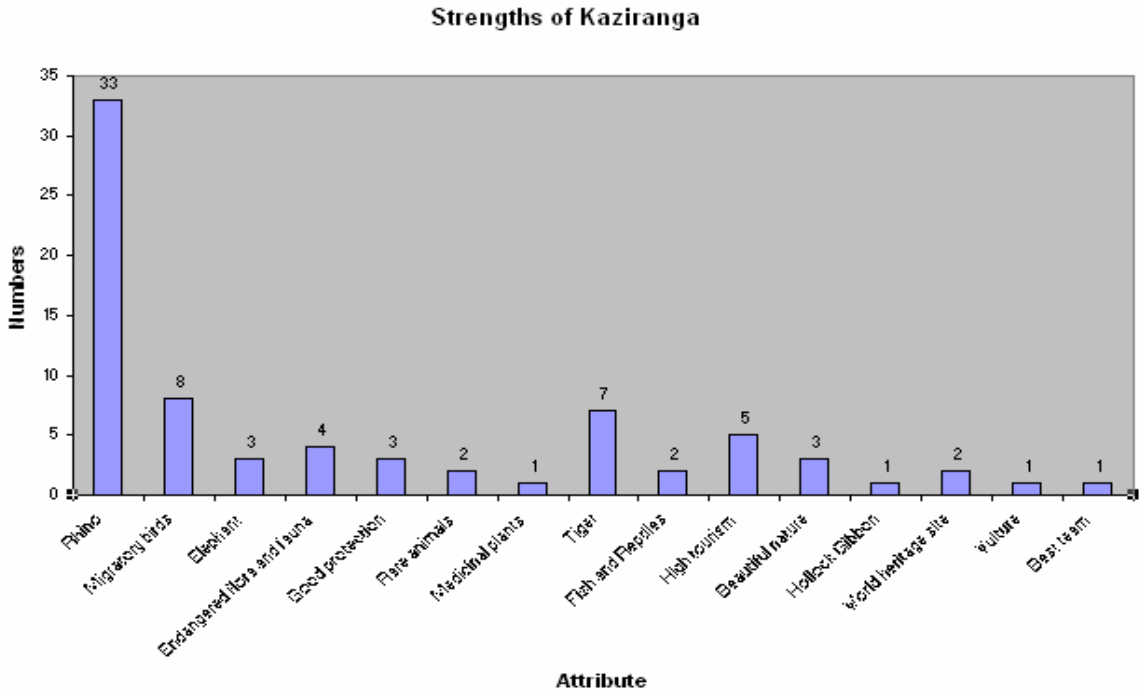
I protect the Park – 17
I preserve the heritage for all generations – 5
I save wildlife – 2
Do my Duty – 5
Look after tourists, elephants etc – 7



The response of the participants highlighting their role as the Protector of the park is on expected lines.

<u>Strengths</u> – Why am I proud of Kaziranga? (2 responses per participant)

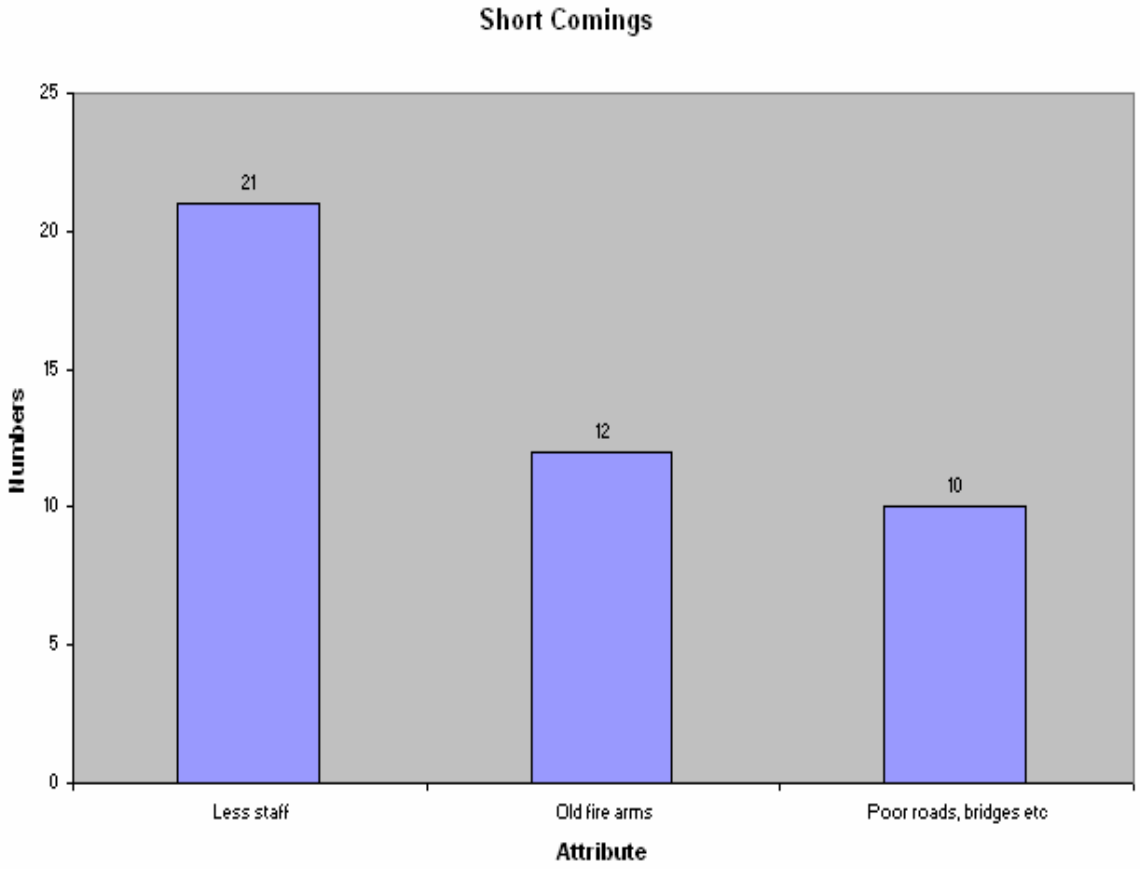
Rhino – 33
Migratory birds and other wild animals and flora – 8
Elephant – 3
Large number of endangered flora and fauna – 4
Well protected park – 3
Saving rare animals – 2
Medicinal plants in the park – 1
Tiger – 7
Fish, tortoise and forest – 2
Source of tourist attraction – 5
Beautiful nature – 3
Hoolock Gibbon – 1
World heritage site – 2
Vulture – 1
Best team – 1



The presence of rhinoceros in the park emerged as the main source of pride for the staff.

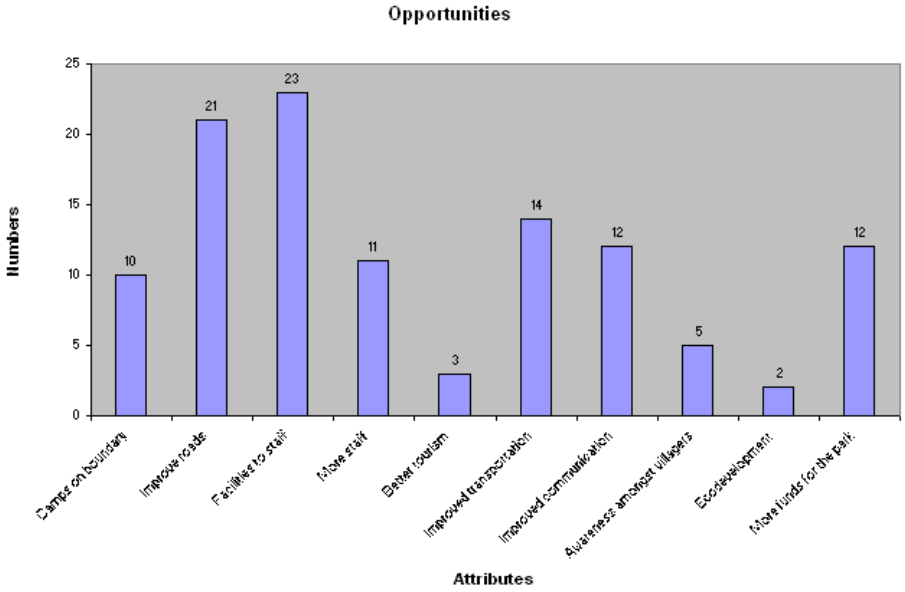
Weaknesses – What I see as the shortcomings in my park? (At most 2 responses per participant)

Shortage of Staff – 21
Lack of modern weapons – 12
Poor communication infrastructure due to temporary roads, bridges etc. – 10



<u>Opportunities</u> - If I were the Director of KNP (at most 3 responses per participant)

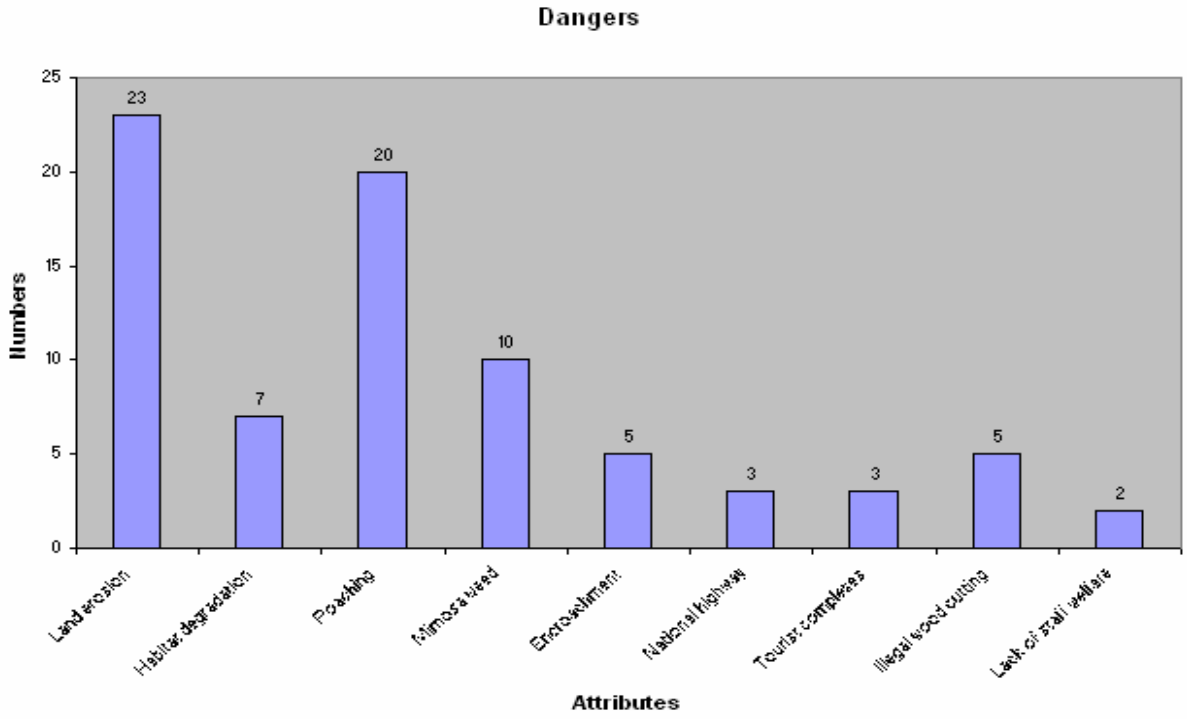
Create good camps on boundary – 10
Improve roads in the park – 21
Provide more facilities to staff - 23
Get more staff – 11
Improved Tourism - 3
Provide modern equipments and vehicles to staff for patrolling – 14
Improve communication facilities – 12
Raise awareness among villagers about the park – 5
Promote Eco-development – 2
Get more financial support for the park – 12



Improved facilities for the staff, improved roads, more number of staff, camps on the park boundary, awareness and ecodevelopment for the local people were identified as the priority actions in the park.

<u>Threats</u>- What are the dangers that my park faces? (At most 2 responses per participants)

Land erosion – 23
Habitat degradation – 7
Poaching – 20
Mimosa weed – 10
Encroachment – 5
National highway – 3
Tourist complexes near the park – 3
Illegal wood cutting – 5
Lack of staff welfare – 2



Land erosion (due to floods), poaching of rhinos, invasive species, habitat degradation, encroachment on park land, national highway and tourism have been identified as key threats that the park faces. It is notable that the staff has undervalued the threat from lack of staff welfare, which is indicative of their high level of commitment to the park's welfare.

Appendix - 3

List of Participants at SWOT workshop

S. No.	Name	Place of Posting	Range
1	Bhuban Saikia, FG	Holmora Camp	Kaziranga
2	Kukheshwar Das, Dy. Ranger	Bagori	Bagori
3	Punaram Saikia, FG	Hulal Path Camp	Kaziranga
4	Ajit Hazarika, FG	Bagori	Bagori
5	Kalia Sonowal, FG	Bagori	Bagori
6	Bhim Sonowal, FG	Bagori	Bagori
7	Abin Bori, FG	Bagori	Bagori
8	Ashim Das, Forester	Bagori	Bagori
9	Rajat Borah, FG	Bagori	Bagori
10	Ashok Bhuyan, FG	Bagori	Bagori
11	Nogen Boruah, FG	Kaziranga Range	Kaziranga Range
12	Nabin Patra, FG	Kaziranga Range	Kaziranga Range
13	Lila Ram Gogoi, FG	Agoratoli	Eastern Range
14	Dilip Baruah, Dy. Ranger	Division HQ	-
15	Nagen Patra, FG	Agoratoli	Eastern Range
16	Illegible	Agoratoli	Eastern Range
17	Sri Hem Chandra Das, FG	Agoratoli	Eastern Range
18	Md. Mamud Ali, FG	Agoratoli	Eastern Range
19	Sri Prosen Das, Forester	Agoratoli	Eastern Range
20	Sri Arabinda Debra, FG	Agoratoli	Eastern Range
21	Sri Krishna, Forester	Agoratoli	Eastern Range
22	Dharma Kanta Baruah, Dy. Ranger	Agoratoli	Eastern Range
23	Salim Ahmed, Forester	Kaziranga Range	Kaziranga Range
24	Anil , FG	Kaziranga Range	Kaziranga Range
25	Prabhat Hazarika, FG	Kaziranga Range	Kaziranga Range
26	Nogen Dutta, FG	Kaziranga Range	Kaziranga Range
27	Nabin Chandra Das, FG	Kaziranga Range	Kaziranga Range
28	Niranjan Gogoj, FG	Burapahar Range	Burapahar Range
29	Siromoni Gogoi, FG	Burapahar Range	Burapahar Range
30	Dimbeshwar Kalita, FG	Burapahar Range	Burapahar Range
31	Jiban Das, FG	Baguri Range	Baguri Range
32	Hiren Boruah, FG	Kaziranga Range	Kaziranga Range
33	Broja Kumar Saikia, FG	Kaziranga Range	Kaziranga Range
34	Ranjit Boruah Forester	Kaziranga Range	Kaziranga Range
35	Kanak Chandra Naib, FG	Kaziranga Range	Kaziranga Range

Appendix - 4

PICTURES OF KAZIRANGA NATIONAL PARK

Picture – 1: Tree Forests

Picture – 2: Grasslands

Picture – 3: Newly formed riverine areas

Picture – 4: Tea garden close to the park

Picture – 5: Erosion

Picture – 6: Boundary Pillar

Picture – 7: Wireless network project

Picture – 8: Permanent Camp constructed with assistance from UNESCO

Picture – 9: Semi Permanent Camp

Picture – 10: Camp in dilapidated condition

Picture 11: Culvert

Picture – 12: Sign Board on NH 37

Picture – 13: Highlands prepared by Army

Picture – 14: Cattle being driven away from the Park

Picture – 15: SWOT Workshop

Picture 16: SWOT Workshop

CONTENTS

Keoladeo National Park

Appendices

Kaziranga National Park

Appendices

Chitwan National Park

Appendices

Abbreviations

ACF	Assistant Conservator of Forests
APU	Anti Poaching Unit
BNHS	Bombay Natural History Society
BZ	Buffer Zone
CF	Conservator of Forests
DCF	Deputy Conservator of Forests
DFO	Divisional Forest Officer
DNPWC	Department of National Parks and Wildlife Conservation
ELDF	Enviro Legal Defence Firm
ER	Eastern Range
FVO	Forest Veterinary Officer
GIS	Geographical Information System
GPS	Global Positioning System
IB	Inspection Bungalow
ITNC	International Trust for Nature Conservation
KMTNC	King Mahendra Trust for Nature Conservation
KNP	Kaziranga National Park
KNP	Keoladeo National Park
KR	Kaziranga Range
NGO	Non-Government Organisation
NH	National Highway
PA	Protected Area
PF	Protected Forest
RCNP	Royal Chitwan National Park
RF	Range Forest Officer
RH	Rest House
RNA	Royal Nepal Army
SACON	Salim Ali Centre for Ornithology and Natural History
SWOT	Strength, Weakness, Opportunity, Threat
U/S	Under Section
VDC	Village Development Committee
WII	Wildlife Institute of India
WLRO	Wild Life Range Officer
WR	Western Range
WTI	Wildlife Trust of India
WWF	World Wide Fund for Nature - India
WWF	World Wildlife Fund – Nepal

Acknowledgement

I would like to express my sincere thanks to PR Sinha, Director Wildlife Institute of India (WII) and Dr. VB Mathur, Professor at WII, Dehradun for their confidence in my ability to do justice to the challenging task. For me it has been an extremely enriching, educating and enjoyable experience.

No assignment of this nature can be completed successfully without an active and willing support from the staff and officers at the concerned sites. Accordingly, heartfelt thanks are due to the following:

Keoladeo National Park- Arun Sen, the then Chief Wildlife Warden, Rajasthan; KCA Arun, Director, Keoladeo NP; KC Verma, Range Officer; VP Singh, Range Officer and Rajendra Kumar Gupta, Range Officer.

Kaziranga National Park - M.A. Malakar, Chief Wildlife Warden, Assam; N.K. Vasu, Director; Utpal Bora, DFO; D Boro, FRO; M Tamuly, FRO; Y Salim, FRO.

Royal Chitwan National Park - Dr. TM Maskey, Director General, DNPWC; Dr. Chandra Gurung, Country representative, WWF Nepal; Shyam Bajimaya, Ecologist, DNPWC; Diwakar Chapagain, DNPWC; Shiv Raj Bhatta, Chief Warden; Kamal Jung Kunwar, Asst. Warden; M Kafle, Asst. Warden; Ramjee Shibakoti, Asst. Warden.

It was rather fortuitous that since we were working on two different assignments under the same project logistical considerations mandated that Seema Bhat and myself travel and work in tandem at the three sites. I would like to place on record my appreciation of the help extended by Seema ji in field as well as during the SWOT workshop at the three sites.

My visit to RCNP would not have materialized but for the ready help extended by the WWF Nepal office, in particular by Bandana Lepcha and Corona Ghimire. I thank them gratefully.

At PEACE Institute, I would like to thank Sudha Mohan, Tanweer Muntakhab and Manorama Goswami for their cheerful assistance. Special thanks are also due to the husband - wife team of Captain Alok Bahuguna and Shashi who were great company and help at Keoladeo National park.

Last but not the least I would like to thank all those remarkable field staff members working at the three national parks, who shared enthusiastically their knowledge, experience and wisdom with the undersigned. Allow me to also salute their sense of resoluteness and never say die spirit in face of overbearing and extremely difficult field conditions. If this report in any way helps make their working lives better, my labours would have been well rewarded.

Manoj Kumar Misra

AT A GLANCE

KEOLADEO NATIONAL PARK

PARK	SPECIAL FEATURE	PRIORITY PROTECTION ACTION / IMPERATIVES	STAFF CAPACITY BUILDING 'FELT NEEDS'
Keoladeo NP	• Artificially created, world famous wetland • Small size (29 sq km) • Surrounded by villages • High tourist visitation • A management plan exists	a) Water supply to the wetlands b) Boundary wall c) Boundary road d) Improved *chowkis* e) Improved fire fighting f) Improved relations with local villagers g) Eradication of invasive like Prosopis, lantana and water hyacinth h) Improved visitor management i) Improved staff welfare j) Incorporate a park protection action plan as part of the management plan that looks at protection imperatives (vulnerable areas, staff capacity and welfare issues, infrastructural issues) and ways to maximize the returns in terms of enhanced protection against the resources at hand.	1. Training on bird identification, netting and ringing 2. Wildlife and Forestry training 3. Forest fire fighting training 4. Training to restrain wild animals 5. Use of fire arms 6. Forests and wildlife laws and court craft 7. Intelligence gathering 8. Computer and shorthand 9. Man management 10. Conflict resolution (including social skills) 11. First Aid 12. Language (foreign) 13. Adult literacy opportunities for the illiterate staff 14. Physical training including smart turn out

ROYAL CHITWAN NATIONAL PARK

PARK	SPECIAL FEATURE	PRIORITY PROTECTION ACTION / IMPERATIVES	STAFF CAPACITY BUILDING 'FELT NEEDS'
Royal Chitwan NP	• Sal – grasslands *terai* habitat (1000 + sq km) • Country's first and premier NP • Largest rhinoceros population in Nepal • Regular RNA personnel charged with protection duties • Major tourist destination (Concessionaires) • Innovative buffer zone management practices • Madi enclave in south bordering India • Captive elephant breeding • Wide ranging quasi judicial authority of Chief Warden • A management plan exists	a) Uncertain security environment in the country and in Chitwan region b) Alarming levels of rhino mortality c) Large number of unmanned field posts d) Setting up of wireless communications system e) Infrastructure requirements like vehicles, boats and field camps f) Madi enclaved area, which has the potential of development into a 'model' buffer zone management region of the park, is unfortunately simmering with discontent against the park. Situation needs to be tackled with imagination and farsightedness. g) Eradication of invasive like Meconia h) Improved staff welfare i) Incorporate a park protection action plan as part of the management plan that looks at protection imperatives (vulnerable areas, staff capacity and welfare issues, infrastructural issues) and ways to maximize the returns in terms of enhanced protection against the resources at hand.	1. Participatory management/community participation 2. Intelligence gathering 3. Wildlife monitoring 4. GIS training 5. Conservation education 6. Driving 7. Administration 8. EIA 9. Conflict management 10.Experience sharing with staff from other protected areas 11. Wildlife restraint 12. Camera trapping 13. Taxidermy 14. Boat handling 15. First Aid 16. Fire Arms 17. Wireless

KAZIRANGA NATIONAL PARK

PARK	SPECIAL FEATURE	PRIORITY PROTECTION ACTION / IMPERATIVES	STAFF CAPACITY BUILDING 'FELT NEEDS'
Kaziranga NP	• Grassland – woodland habitat (400+ sq km) • Largest repository of One horned rhinoceros in the world • Delicately poised on the banks of river Brahmaputra (annual floods) • Long conservation history • Recent additions to the park area • National Highway and limited corridors to highlands of Karbi Anglong • A management plan exists	a) 16 km long border road cum highland along the river Moru Diphlu b) Conversion of temporary camps into permanent camps and floating camps c) Creation of a new forest range for extended area d) Secured corridors across NH 37 to Karbi Anglong hills e) Regulation of mushrooming tourist facilities on NH 37 f) Eradication of invasive like Mimosa g) Improved staff welfare	1. Handling fire arms 2. Social interaction skills 3. Driving 4. Swimming 5. Wireless system 6. Wildlife management 7. Language 8. First aid 9. Intelligence gathering

Summary

All the three parks are unique in their own special manner. They have characteristics, which define them individually like waterfowl values in Keoladeo, extensive grasslands in Kaziranga and Sal dominated habitat in Chitwan.

All the three parks are beset with at least one problem, which defies a simple management fix. Like mortifying uncertainty of water availability for the artificial wetlands in Keoladeo, devastating annual floods in Kaziranga and debilitating civil unrest in Chitwan.

All the three parks suffer from lack of adequate infrastructural support impacting adversely their respective protection status.

All the three parks have a recently prepared Management Plan in place. At RCNP the same has been prepared by an external agency.

The staff at all the three parks was found to be well aware of the strengths and weaknesses of their respective parks and was able to identify their training and capacity building requirements.

It was interesting to note that the eradication of invasive emerged as a key protection requirement at all the three parks and following training needs were identified by the staff at all the three sites:

a) Intelligence gathering
b) Handling fire arms
c) First aid
d) Social skills