# STATUS REPORT ON CONSERVATION AND MANAGEMENT OF INDIAN RHINO POPULATION IN WEST BENGAL.

- Presented during meeting of the IUCN/SSC/ARSG at Jaldapara Wildlife Sanctuary, West Bengal, India.

Forest Directorate,
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India.

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## Distribution - Past & Present.

The terai belt in the northern part of Indian sub-continent extending from Pakistan in the West to the Indo-Burmese border held sizeable population of the Great One-horned Rhinoceros almost in continuum till early 17th century. Nepal and Bhutan, countries adjoining India in this tract, had also this species represented. The situation to-day is radically different from the one of the last century. This armoured unicorn pachyderm in India is now to be found only in some pockets of Assam and West Bengal. In addition to this species of Asian Rhino, West Bengal was lucky to have two other species of Rhinos - namely the Lesser One-horned Rhinoceros (Rhinoceros sondaicus) and the Sumatran Rhino (Dicerorhinus sumatrensis). Lesser One-horned Rhinoceros ranged over an area extending from plains of northern Bengal to the mangroves of Sunderbans. Sheabeare (1935) pointed out that this species was seen even at the beginning of this century. Asiatic two-horned rhinoceros roamed the forested tracts of northern part of West Bengal even about a century back.

West Bengal now has only two disjunct populations of the great One-horned Rhinoceros in its protected areas namely Jaldapara and Gorumara Wildlife Sanctuaries. Both these protected areas occur in bio-geographical Zone 7A (Upper Gangetic plains) as recognised by the Wildlife Institute of India. Apart from these two areas this unicorn was also reported from Bholka of Buxa Forest Division, Patlakhawa of Coochbehar Division and Chapramari of Jalpaiguri Forest Division. It is interesting to note that as many as 10 individuals of this species were reported each from Bholka and Patlakhawa even in 1955-56. Rhinos used to migrate to Bholka of Buxa Forest Division from Manas in Assam even in the sixties. Rhinos from Jaldapara used to migrate to Patlakhawa of Coochbehar District till the mid-seventies. A few individuals of Garumara used to move to Chapramari in the north and South Diana in the east even in early eighties. Recent unearthing of skeletal remains of one ponderous animal at Sonarpur in south 24-Parganas testify to the existence of a clan of the great one-horned Rhinoceros in

riverine grass-jungles close to the Sunderban mangrove swamps about 3000 years ago.

**Vegetation in Rhino-bearing tract.**

Jaldapara Wildlife Sanctuary in its present extent of 216.00 Sq.Km. holds a mosaic of vegetation when compared to a much smaller protected area of Gorumara. Vegetation in these two protected areas can broadly be classified into the following types (Champion & Seth) :

(i) Northern Dry Deciduous seral khair-sissoo association (5B/1S2)
(ii) Eastern bhabar Sal and eastern terai sal (3C/CIb & 3C/CIc)
(iii) Sub-Himalayan secondary wet-mixed forest (2B/2S3)
(iv) Eastern sub-montane semi-evergreen forest (2B/CIb)
(v) Northern Tropical Evergreen Forest (1B/C1)
(vi) Savannah Forest (3C/DS1, 3/1S1, 4D/2S2)

Interspersion of different types of savannah in the protected areas determines distribution of this unicorn. It will, therefore, be worthwhile to describe these savannahs in greater details. These savannah types, though greatly resemble each other, their genesis, development and plant associations help to distinguish one type from the other.

Moist sal savannah.

This is characterised by the presence of scattered sal along with Kumbhi (Careya arborea), Amloki (Emblica officinalis), Sidha (Lagerstroemia parviflora), Tanki (Bauhinia purpurea) etc. Grasses are represented by Sachharum spp., Arundo donax, Phragmites karka, Imperata cylindrica and Themeda arundinacea.

Low alluvial savannah woodland.

This is characterised by Bombax - Albizzia association. This type of savannah is generally met with on the riverine flats that tend to be flooded during the rainy season but dry out during the rest of the year. Simul (Bombax ceiba), Sirish (Albizzia procera), Kainjal (Bischoffia javanica), Pitali (Trewia nudiflora), Khair (Acacia catechu) occur interspersed with tall & dense grasses. Grass can be as high as 4-5 metres and are represented by Saccharum spontaneum, S. procerum, Phragmitis karka, Arundo donax, Themeda arundinacea, Imperata spp. etc.)

Eastern alluvial grassland.

Deep flooding during monsoon alternating with drying up during summer, makes the soil stiff and inhibit tree growth. Such grasslands are generally devoid of tree-growth. Such tall grasslands have species like Saccharum spontaneum, S. procerum, Erianthus arundinacea, Narenga spp., Phargmitis karka and Arundo donax.

**History of management of Rhino-bearing areas.**

The forested tract now within the limits of the present Jaldapara Wildlife Sanctuary has been under the control of the Forest Department since 1866. These areas came under systematic management through prescriptions of Dr. William Schlich in 1874-75. Mr. C.C. Hatt in his Working Plan of Buxa reserves for the period from 1905-06 to 1919-20, prescribed selection felling to be backed up by natural regeneration for these forests. However under this plan areas of the sanctuary almost remained unaffected. Mr. E.O. Sheabeare's plan included the areas in Sal Working Circle, Stable Sissoo Working Circle and the Unstable Sisso Working Circle. Whereas clear-felling was prescribed in the first two Working Circles - selection felling was carried out in the third Working Circle. Mr. C.K. Homfray while writing his Working Plan for Buxa Division for the period 1929-30 to 1948-49 laid for the first time stress on the maintenance and improvement of savannahs which provided shelter to the rich grass-land fauna of this tract. All cultural and other operations including early burning were stopped in grassy savannahs excepting removal of thatch and other minor forest produce. Grazing was totally prohibited. Removal of dry Khair and Sissoo on selection basis was prescribed in Jaldapara and Torsa blocks while the rest of the sanctuary area came under Sal Uniform Working Circle. In the fifth Working Plan (1945-46 to 1964-65) of Buxa Division a separate Game Sanctuary Working Circle was created excluding Salkumar block - which continued to be worked under the Sal Conversion Working Circle. Under this Working Plan with the exception of sporadic felling of timber trees by departmental agency, all forms of exploitation oriented operations including manufacture of cutch, were prohibited. To maintain savannahs in their natural state and to enhance grass-growth, control burning in alternate years together with removal of scattered evergreen trees invading grasslands were to be carried

out. Measures were also prescribed for eradication of Eupatorium sp., a serious pest in these forests. With the creation of Coochbehar Forest Division in 1951 the areas of the sanctuary got transferred to this Division and in the first and second Working Plan (1962-63 to 1981-82) of this Division 99.51 $Km^2$ continued to be managed under the Sanctuary Working Circle. To bring focus on the need for management of this sanctuary for preservation and improvement of the indigenous fauna including the target species of the Great One-horned Rhinoceros, the management of this area was transferred to the newly created Wildlife Division-II in 1982. The first management plan prepared for this sanctuary prescribed maintenance of salt licks, glades, wallow pools, cultivation of fodder grass in glades. This stressed the need for maintenance of fire-lines. To save grass-lands from being swamped by Mikania spp. experiments for its eredication were initiated. Grasslands tended to be replaced by treestands as a result of progression of succession. To arrest this trend, cutting back operation for trees was initiated on experimental scale. This management plan also prescribed maintenance of a sanctum sanctorum comprising of areas under Jaldapara-1 to 3 and Torsa 1 & 2.

History of management of the areas in Gorumara Wildlife Sanctuary has been much less eventful as this has been managed as an unit of Jalpaiguri Forest Division since the creation of Forest Department. It was only during the fifth Working Plan (1942-43 to 1956-57) of Jalpaiguri Forest Division that the areas under Gorumara and Chapramari Sanctuaries were separated out to form a Game Sanctuary Working Circle. This was done with a view to preserve the indigenous fauna of grass-land, the focus being the Indian Rhino and the Indian Gaur. Such areas were closed to grazing and hunting. In the Sixth Working Plan (1957-58 to 1966-67) hunting, shooting and fishing were totally prohibited. The First Management Plan (1981-82 to 1985-86) prescribed the provision of Core and Buffer area after substantial expansion of the existing sanctuary area. It provided for opening of the canopy in riverine forests to keep grasslands alive to help the herbivores. This also prescribed planting of suitable areas with indigenous grasses to expand the grass-land ecotypes of the sanctuary.

**Legal Status.**

Mr. Homfray first conceived the idea of creating a 'National Park' in the area now declared as Jaldapara Sanctuary while writing his Working Plan of Buxa Division for the period from 1929-30 to 1948-49 leaving aside "the so-called amenity forests". This was first declared as a game sanctuary in the year 1941 vide Govt. of West Bengal notification No.10549-For dt. 13th November,1941 read with amended notification no.5838-For dated 3rd April,1943. 99.51 Sq.km. was managed as a game sanctuary till 1976 - when a fresh notification no.5404-For dt.24.6.76 was issued declaring an extended area of 115.53 km² as Jaldapara Wildlife Sanctuary. The area of the sanctuary has been further extended by another 100.98 km² vide Govt. Notification No.7245-For, dt.31.8.92. The total area of the sanctuary now stands as 216.51 km². Gorumara was first declared as a sanctuary in the year 1949 vide Govt. Notification No.5181-For, dt.2.8.49. In the year 1976 - it was reconstituted as Gorumara Wildlife Sanctuary under section 18 of the Wildlife (Protection) Act,1972 vide notification no.5406-For dt.24.6.1976. A proposal has now been mooted for consitution of Gorumara National Park with an area of about 66.0 km² - having the present sanctuary as its core.

**Population - Trend and Structure.**

Jaldapara Wildlife Sanctuary as per April,1992 census had a population of 33 individuals - 20 adults, 2 sub-adults and 11 juveniles and calves. With the natural death of a sub-adult Rhino in 1992 poaching of an adult in 1993 and addition of 3 calves in 1993 - the population is 34 now. 1989 - census of Gorumara Wildlife Sanctuary showed presence of 12 individuals - 11 adults and 1 calf. With the loss of 2 individuals due to poachers' action and addition of 3 calves during the period 1989-92 - the population now is 13 there.

Fluctuation of Rhino population in both these protected areas over the last 4 decades makes an intersting study as will be apparent from the following table :

| Year | Jaldapara | Gorumara |
|---|---|---|
| 1956-57 | 65 | 8 |
| 1964 | 72 | Not recorded |
| 1965 | Not recorded | 14 |
| 1972-73 | Not recorded | 7 |

| | | |
|---|---|---|
| 1975 | 23 | Not recorded |
| 1985 | 14 | 8 |
| 1989 | 27 | 12 |
| 1992 | 33 | 13 |

It is clear from the figures that even during 1964-65, Jaldapara Wildlife Sanctuary held a viable population and the State accounted for a population of 86. There was a steady slide-down in population reaching an all-time low of 22 in the year 1985. Two disastrous spells of poaching during the period 1968-72 and 1982-85 were responsible for this decline. During the period 1986-93 there has been steady accretion to the population and in 1992 it stands at a level of 46 individuals - 33 in Jaldapara and 13 in Gorumara. During the period 1985-93, 3 to 5 births have been recorded in these protected areas. Population of Indian Rhino during different year between 1975-92 in the protected areas classified into different age-groups and sexes is shown in Annexure - I.

Dr. D.K. Ghosh in his study of Rhinos of Jaldapara Wildlife Sanctuary during 1983-91 through photographic observation identified 22 individuals and classified them in age-group and sexes as given in the table below :

| Age-class | Total No. | No. of males | No. of females | No. of productive males (15-45) | No. of productive males (15-45) |
|---|---|---|---|---|---|
| 0-5 | 5 | 1 | 4 | - | - |
| 5-10 | 3 | 2 | 1 | - | - |
| 10-15 | 1 | 1 | - | 1 | - |
| 15-20 | 1 | - | 1 | - | 1 |
| 20-25 | 1 | 1 | - | 1 | - |
| 25-30 | 1 | - | 1 | - | 1 |
| 30-35 | 4 | 3 | 1 | 3 | 1 |
| 35-40 | 2 | 1 | 1 | 1 | 1 |
| 40-45 | 1 | - | 1 | - | 1 |
| 45-50 | 1 | - | 1 | - | - |
| 50-55 | 1 | 1 | - | - | - |
| 55-60 | 1 | 1 | - | - | - |
| | 22 | 11 | 11 | 6 | 5 |

It has also been observed by him that poor representation of individuals in most reproductive potential classes has generally resulted in a very slow rate of increase in the population. This will continue to remain so for another 10-15 years till young individuals enter into the reproductive class.

**Dispersal & Migration.**

Rhinos of Jaldapara Wildlife Sanctuary used to migrate to Titi-forests 12 Km. to the north and Patlakhawa 30 Km. to the east. Migration to Patlakhawa ceased in the mid 70's - whereas to Titi ceased in early eighties. There is also a record of a rhino moving from Jaldapara Wildlife Sanctuary to Nimati 25 Km. of Buxa Division during 1981. Rhinos from Gorumara disperse regularly in the adjoining forests of Upper Tondu and Lower Tondu Ranges i.e. within a radius of 10 Km. A few individuals used to migrate to Chapramari Sanctuary 12 Km. to the north and 8 Km. to the east in South-Diana block of Diana Range even in early eighties. But such migration has not been reported after 1984. 4 Rhinos strayed from Gorumara Wildlife Sanctuary during March,1989 and one of these entered Bangladesh travelling 45 Km. down the beds of the river Teesta and Karala. Two of these Rhinos could be driven back to the Sanctuary. The third Rhino was recovered from Bangladesh after a series of border-meetings between the Forest & District Administration of Jalpaiguri, Border Security Force and Bangladesh Rifles. At the time of recovery it was in seriously injured condition. In spite of the best veterinary care provided to this female rhino in a very advanced stage of pregnancy, it succumbed to its injuries. The fourth individual - a sub-adult female strayed into Apalchand Reserve of Baikunthapur Division 24 Km. east. During 1991, this individual was recorded in Gulma of Mahananda Wildlife Sanctuary 40 Km. to the west. This animal was killed by poachers in Churaviza Block of Baikunthapur Division in June,1992.

**Habitat types.**

An attempt was made in 1989-90 - to classify the 115.50 $km^2$ of Jaldapara Wildlife Sanctuary into different habitat types. The area under each habitat type is shown in the table in next page :

| | Habitat type | Approximate area (km²) |
|---|---|---|
| (i) | Dry mixed | 44.0 |
| (ii) | Wet mixed | 4.5 |
| (iii) | Savannah | 11.5 |
| (iv) | Savannah with Sissoo | 3.0 |
| (v) | Savannah with Khair-Sissoo-Simul | 24.0 |
| (vi) | Simul-Siris | 4.0 |
| (vii) | Sissoo-Simul | 3.0 |
| (viii) | Khair-Sissoo | 6.4 |
| (ix) | Mixed Sal | 1.0 |
| (x) | Pure Sal | 2.5 |
| (xi) | Bamboo | 0.1 |
| (xii) | Plantations | 3.0 |
| + | Rivers, roads | 8.5 |
| | | 115.50 km² |

With the extension of the sanctuary, to enclose an additional area of more than 100.0 km², habitat mapping was done in 1993 and the entire area was classified into 8 broad types. Area distribution of such habitat types is shown below :

| Habitat type | Compartments included | Area in km² | Percentage of total area. |
|---|---|---|---|
| (i) Dry Mixed Forests | Titi-1,2,3,4<br>JP-3,4,5<br>Torsa-1,2,3<br>Chilapata-4b<br>Hasimara -4 | 46.17 | 21.3% |
| (ii)Wet Mixed Forests | JP-2,<br>Hasimara -4<br>Mendabari -6<br>Bania -3,4<br>Boradabri -1,2<br>Chilapata-2, 3b | 12.41 | 5.73% |
| (iii) Mixed Sal | Baradabri-1,2,6b,7b<br>Mendabari-6<br>Bania -1<br>Titi-1,2,3<br>Salkumar-1,3 | 17.61 | 8.13% |
| (iv) Savannah | Hasimara -3<br>JP-3,4,5<br>Malangi-1,2,3<br>Chilapata-1, 3b<br>Bania- 8b<br>Baradabri - 7b<br>Torsa - 2 | 30.55 | 14.11% |

| | | | |
|---|---|---|---|
| (v) Savannah with Khair-Sissoo | Hasimara-1,2,3,4<br>Dalsingpara-1,2,3,4<br>Jaigaon-1,2<br>Titi -4<br>JP-1,2,3,4,5<br>Torsa-1,2,3<br>Malangi-1,2<br>Chilapata-3b | 42.90 | 19.81% |
| (vi) Savannah with Simul-Siris | Dalsingpara-1,2,3,4<br>Jaigaon-1,2<br>Titi-1,2,3,4<br>Torsa -2 | 22.59 | 10.43% |
| (vii) Bamboo breaks | Titi-1, JP-3<br>Bania-1 | 1.23 | 0.6% |
| (viii) Plantations | Mendabari-3,4,5,6<br>Bania-1,2,3,4<br>Titi-2,3,4<br>Salkumar-2,3,4<br>Jaigaon-2<br>Hashimara-1,2<br>Dalsingpara-3 | 26.40 | 12.19% |
| + River beds roads, Forest villages | --- | 16.65 | 7.7% |

The areas under each habitat type shown are only approximate as it is very difficult to compute area accurately under each because of presence of eco-tones.

Out of a total area of 8.60 km² of the existing Gorumara Wildlife Sanctuary approximately 6.50 km² are under different types of savannah - the balance area being represented by Wet mixed forest.

**Associates of Indian Rhino.**

Tiger and leopard are the two predators that occur in association with the Indian Rhino in the protected areas. Ungulates include the Indian Gaur (Bos gaurus), Hog deer (Axis porcinus), introduced, Sambar (Cervus unicolor) and the barking deer (Muntiacus muntjac). The biggest pachyderm, the Asian Elephant (Elephas maximus) occasionally share the same habitat with the Indian Rhino. Earlier during census periods only a few individuals of this pachyderm were recorded. During recent years, it has been observed, in particular in Jaldapara Wildlife Sanctuary, that a composite herd of approximately 20 elephants use the prime habitat of the rhino for a period of 7-8 months in a year. Population trend of these associates in Jaldapara Wildlife Sanctuary as

revealed from census figures is tabulated below :

| Species | 1964 | 1975 | 1985 | 1988 | 1989 |
|---|---|---|---|---|---|
| Tiger | 2 + | 4 | 3 | 7 | 7 |
| Leopard | Not recorded | Not recorded | Not recorded | 6 | 5 |
| Indian Elephant | 2 + | 4 | 6 | 2 | 3 |
| Indian Gaur | 14 + | 26 | 44 | 37 | 52 |
| Hog deer | 141 + | 430 | 246 | 385 | 1385 |
| Cheetal | 11 | - | 13 | 71 | 114 |
| Sambar | 20 | 11 | 4 | 36 | 204 |
| Barking deer | 188 + | 45 | 34 | 64 | 165 |

**Pressures on Indian Rhino and its existing habitat.**

**Poaching.**

Nothing describes more eloquently the persecution of this animal by poachers than when Mr. E.O. Shebbeare describes this animal as being `condemned to carry a horn worth half its weight in gold'. Indeed currently there are indications that Rhino horn is being bartered for gold. Hunting pressure on this animal in the latter part of the nineteenth century was great and this is amply demonstrated by the hunting spree of the Maharajah of Coochbehar who bagged as many as 207 Rhinos between 1871 and 1907 in West Bengal and Assam. There was particularly a very bad spell of poaching during the years 1968-72 when some 28 Rhinos were poached in Jaldapara Wildlife Sanctuary. The lull in poaching pressure during 1973-81, got a break by another serious spell of poaching during 1982-85 when 14 individuals were poached. It is striking to note that this sanctuary did not lose any individual of this species during the period 1986-90 due to action of poachers. During the years 1991-93, 3 animals have fallen victims to poachers' action. In Gorumara Sanctuary similarly seven Rhinos were similarly lost in the worst spell of poaching during 1968-72. There has been 4 poaching cases during the period 1981-90. Apprehension of a person from Kalimpong with 6 rhino-horns weighing 2.7 kg. in Hongkong in 1985 and reported detention of a high dignitary at Taipei with a haul of 22 rhino-horns weighing more than 14 kg. indicates that the pressure of poaching on Indian Rhino continues unabated.

**Grazing.**

32 inhabited mouzasand 8 Tea Estates exist along the fringe of the Jaldapara Wildlife Sanctuary. 4 Forest villages are also included within the boundaries of this protected area. All these villagers keep cattle. The livestock population is about 1.25 lakh, mostly comprised of cows, bulls and buffaloes. Villages fringing Jaldapara, Torsa, Malangi, Chilapata and Hashimara forest blocks are having large cattle population and the problem of illicit grazing in these forest blocks is severe. Illicit grazing incidence generally becomes acute in the months of March and April. Domestic cattle not only compete with wild-herbivores for forage but poses hazard of communicable diseases for the latter. As far as Gorumara Wildlife Sanctuary is concerned grazing is a problem in the grass-lands on the eastern boundary and high forests on the western side.

**Collection of timber, fuelwood and minor forest produce.**

Inhabited fringe-mouzas, tea estates and forest villages have a large population of approximately 2.00 lakhs. Of the 32 mouzas having common boundaries with the sanctuary, 19 have a population of more than 2000 in each. Firewood continues to be the principal source of domestic energy in almost all the revenue villages, forest villages and tea estates. Head-loading of firewood for domestic consumption and subsistence living by sale is common. Mostly womenfolk, young and old, carry out such operation and thereby making it difficult to deal with such offenders under the provisions of the law. The pool of idle labour in tea estates during off-seasons exacerbates the problem of illicit collection of fuelwood and timber. Rafting of soft-wood during the rains, through streams passing through the sanctuary, by illicit operators to meet the demands of small-scale veneering units in the neighbourhood, is a cause of concern for the management. Occasional felling of khair trees and removal in the form of billets or chips for manufacter of katha and cutch causes damage to some khair-sissoo formations. Demand of furniture-making industries in semi-urban localities makes sissoo, both mature and immature, vulnerable to illicit operations. Collection of NWFP like thatch, simul floss etc. can cause a lot of disturbance to the prime habitat of the Indian Rhino and pose problems of security to individuals of the population.

**Invasion by Weeds.**

Shrinkage of habitat by weed invasion is a serious problem in Jaldapara Wildllife Sanctuary. Mikania spp., Leea Sp. and Eupatorium odoratum have swamped some areas of savannah. Ageratum conyzoides, Lantana camara, Clerodendron sp. pose problems in restricted areas Ferns (Cyclosanrun sp) had literally covered the ground in some degraded forest patches. To retrieve such areas to herbivores by getting rid of these weeds through mechanical removal and close-planting with indigenous grasses is a costly proposition but is considered to be very effective to add to the existing forage resources of large herbivores including the Indian Rhino. Gorumara Wildlife Sanctuary does not have any serious problem of weed infestation in its grasslands.

**Floods and stream back erosion.**

Two important rivers namely the Torsa and Malangi traverse through Jaldapara Wildlife Sanctuary. Floods during peak rains and waning rains in these rivers and their tributories have been rather common since fifties. Floods of severe nature, that deserve mention on account of damage caused to the forest crop took place during 1952, 1954, 1964,1968 and 1993. 1968 flood is considered to be a physiographic land-mark as this flood resulted in change of course of the river Torsa. Before this flood the main flow of the river Torsa was in the western arm of the sanctuary through Chartorsa. The entire flow of Char Torsa after the flood got diverted into the Siltorsa channel. The resultant heavy flood damaged forest crops in Bania, Chilapata and Baradabri Blocks. During the recent July high-flood of 1993 - large volume of water flowed through the Titi, Howri and Hollong resulting in severe stream-bank erosion in Titi and Jaldapara Blocks thus affecting forest crop badly along their courses. The river Jaldhaka & the Murti had experienced similar floods but such floods rather had beneficial effects on grass-lands of Gorumara Wildlife Sanctuary.

**Predation and Intraspecific aggression.**

During early eighties, at least 2 individuals of the species fell victim to predation by tiger. Cases of severe assault on adult males by dominant males have been recorded during 1985-92. Three such individuals had to given veterinary care after tranquillisation to ensure their survival. A calf in Gorumara

Wildlife Sanctuary bled to death because of aggression by a male preparing to mate its mother in early eighties.

**Organisation in Rhino-bearing Protected areas.**

Jaldapara Wildlife Sanctuary is now managed by Divisional Forest Officer, Wildlife Division-II and Divisional Forest Officer, Coochbehar Division. Rhino-bearing areas (115.00 $Km^2$) is under the control of Divisional Forest Officer, Wildlife Division-II. An offier in the junior scale of IFS is located at Madarihat to oversee the management of the sanctuary from close quarters.

The total area of Jaldapara Wildldife Sanctuary is now apportioned amongst 5 territorial Ranges, 17 beats and 7 camps. It addition to these, there is a Flying Squad. The staff-strength responsible for management of the sanctuary area classified into different categories is given below :

| | | |
|---|---|---|
| 1. | Divisional Forest Officer | - 2 |
| 2. | Attached Officer | - 1 |
| 3. | Forest Ranger | - 6 |
| 4. | DR/Fr. | - 19 |
| 5. | FG/WLG | - 43 |
| 6. | Watchman | - 24 |
| 7. | Orderly/CDL/D-group | - 156 |
| 8. | NVFS | - 10 |

All Ranges, Beat-offices & Camps are under cover of a RT network - the network having 16 fixed stations, 3 mobile stations and as many as 12 walkie-talkie sets. 3 zeeps, 1 mobile van and 12 elephants have been provided for patrolling by officers and staff - protecting the habitat and the Indian Rhino along with its associates. Parts of the habitat and target species Indian Rhino being vulnerable to action of organised smugglers and poachers, the protective personnel have been provided with 10 - .315 Rifles, and 40 DBBL/SBBL Guns.

The existing Gorumara Wildlife Sanctuary is managed by a Forest Ranger under the contnrol of Divisional Forest Officer, Jalpaiguri Division. There are two Beats and two Camps. Two elephants, RT network and arms give support to the protective personnel in preservation of poaching.

From the inputs provided to the protective personnel and the strength in numbers, it is easy to assess the degree of committment of the management to secure the Indian Rhino in its present habitat.

Current management objectives and strategy.

(1) Preservation and maintenance of the diversity and interspersion of habitats through site-specific manipulative management so as to secure the long term survival of Rhinoceros unicornis and its associates.

Interespersion of grass-lands in a mosaic of a variety of treelands is a prime-requisite for the welfare of the Indian Rhino and its associate browsers and grazers. Extent of grass-lands and their capacity to provide forage and shelter largely determine the carrying capacity of protected areas to hold a viable population of the great one-horned rhinoceros. Grass-lands in Jaldapara Wildlife Sanctuary are under threat from progression to treegrowth through natural succession, invasion of grass-lands by weeds and diversion of water-coverses during floods. Manipulative management practices include :

(i) Eradication of weeds followed by close-planting of indigenous fodder grasses.

(ii) Overwood removal in areas colonised by Khair, Sissoo, Malata, Tantari, Sidha followed by weed elimination and enrichment planting with grasses.

(iii) Judicious use of fire in a prescribed burning regime in restricted areas for production of nutritive fodder.

(iv) Rehabilitation of degraded forest by using site-matching indigenous miscellaneous hard-wood species.

There is also an ambitious plan for diversion of controlled discharge from the existing channel of the Sil Torsa into its old course - Char Torsa for rejuvenation of grass-lands in Jaldapara Block.

(2) Elimination of grazing by domestic cattle from prime rhino habitat in a phased manner for improvement of habitat and prevention of outbreak of cattle-borne diseases.

As brought out earlier a very large live-stock population of the fringe villages use some areas of the habitat and thus compete with wild herbivores for forage. Such grazing also affects

adversely grass-lands and tree lands through trampling of vegetation and compaction of soil. Free-ranging domestic cattle can pose problems for wild-herbivores by transmitting diseases like Anthrax, Foot and Mouth disease and Rinderpest. The strategy to achieve this object includes :

(i) Construction of boundary wall with suitable live-hedge of thorny shrubs and multi strand energised fence along vulnerable boundaries to prevent cattle tresspass into Jaldapara Wildlife Sanctuary.

(ii) Raising fodder plantations on community lands to be shared by beneficiaries for stall-feeding and also raising silvo-pastoral plantations on such lands to permit rotational grazing.

(iii) Earmarking 2 $km^2$ of Hashimara Block situated between the LRP and the Railway line as a grazing block for the practice of rotational grazing in consultation with the members of eco-development committes.

(iv) Reduction in number of low-yielding milch-cattle through castration of useless bulls and artificial insemination of cows with the active assistance of the local organisation of Veterinary Services.

(v) Dealing with cases of unauthorised grazing under provisions of the Wildlife (Protection) Act,1972 - which provides for seizure and confiscation of all such cattle.

(vi) Immunisation of all domestic cattle living within 5 Km. of the fringes of the protected area through organisation of camps involving local Veterinary organisation.

(3) Strengthening protective network and ensuring intensified vigilance to prevent poaching of Indian Rhino and its associates, and illicit felling of timber and fuelwood

There has been considerable input in this direction since early-eighties in the form of installation of RT network, increased mobility of protective personnel and re-organisation right from the level of Division to camps. To combat determined poachers and organised gangsters, protective personnel have been armed with rifles, and guns. To complete this on-going process, following steps in future years are envisaged.

(i) Placing the entire area of Jaldapara Wildlife Sanctuary under unified control of a Divisional Forest Officer and

transfer of the management of the proposed Gorumara National Park to a Wildlife Manager.

(ii) Strengthening the RT network by bringing in all stations located in the extended part of the sanctuary on same frequency.

(iii) Re-organisation of Ranges & Beats as necessary on transfer of extended area of Jaldapara Wildlife Sanctuary and Gorumara National Park to Wildlife Managers.

(iv) Establishment of an intelligence net-work for collection of information on attempts to poach valued individuals, to degrade habitat and a mechanism of suitably rewarding informers and govt. servants.

(v) Establishment of additional beats & camps at vulnerable points to prevent entry of poachers and organised smugglers.

(4) Reinforcing conservation efforts in the sanctuary by developing a rapport with people through implementation of eco-development works for economic uplift of the rural people on the fringes.

It has been increasingly felt that Wildlife Conservation without local participation is likely to fail. This is more so when we are dealing with conservation prospects of a pachyderm that carries a horn worth half its weight in gold. West Bengal is committed to involving local people in forest protection and management. Enabling Govt. orders have already been issued and FPCs - around 2500 in number have significantly contributed to the rejuvenation of degraded forests. For introduction of participatory management, in protected area network of sanctuaries and national park the concept of eco-development committes has been introduced. In the fringes of Jaldapara Wildlife Sanctuary 10 such eco-development committes have been formed and beneficiary oriented/community development works on identified items have been taken up for implementation on a small scale. An ambitious eco-development plan is under formulation and shall be posed for funding by external assistance.

(5) Judicious promotion and regulation of tourism in the sanctuary as well as provision for appropriate extension and interpretation facilities.

Jaldapara Wildlife Sanctuary holds great promise for people of the State for wildlife viewing as an elephant ride of about 1½ to 2 hours' duration enables them to see the Great One-horned Rhinoceros and its associates. Such tourism is restricted only to the buffer zone. Currently elephant rides are organised from Hollong. Availability of forage for captive elephants being a limiting factor, only limited tourists can have the facility of going on elephant back. This quite often attracts adverse criticism. A proposal has been mooted to take tourists on an Electra-van and leave them in a watch-tower at a suitable location for about an hour or more both at dusk and dawn. This will require acquisition of a van and improvement of road-surfaces.

Gorumara caters to tourism in the most restricted scale. Day visitors can wait till dusk at the observatory for viewing wild herbivores coming onto the saltlick. Recently an interpretation centre has come up at Murthy - which has accommodation for 12 persons. There is a proposal to use this facility for taking out groups of young people to Gorati watch-tower through Bholka line and leave them for the night. They will trek back to Murthy next morning. Such jungle-treks shall be guided and interpretation facility provided.

During the period 1987-88 to 1922-93, Jaldapara Wildlife Sanctuary had around 2000 day-visitors. In addition to this approximately 2400 visitors used facilities of Hollong/Baradabri and equal number of visitors put up in Jaldapara Tourist Lodge of West Bengal Tourism Development Corporation Ltd. to view wildlife in sanctuary.

(6) Provision of social facilities for park personnel for getting the best out of them on park-management related issues.

Protective personnel are have under compulsion to live in remote locations often far away from their families. Facilities for family welfare, health-care and education of children do not exist in many such locations. Such conditions often have a demoralising effect on such personnel and quite often they do not feel enthused to put in their best. It is, therefore, absolutely essential to provide for mininum social facilities to keep them contented. With this end in view, it is proposed to make provision for the following.

(i) Construction of a hostel in a central township with facilities for education upto graduate level for accommodation of sons/daughters of protective personnel.

(ii) Construction of community halls with facilities for recreation and education.

(iii) Provision of school buses for taking younger children to schools in semi-urban centres.

(7) Provision of training facilities for park personnel.

Training facilities are available with Wildlife Institute of India for park-personnel upto the rank of Forest Rangers in their Diploma and Certificate courses. Such facilities are limited. Park personnel at the grass-root level of DR/Frs.do not get trained. For the last few years - basic capsule courses for such people have been organised on management related issues. Such efforts require to be re-inforced for Rhino-bearing protected areas. For this purpose special capsule courses need to be organised for imparting training to park-personnel on the following issues :

(i) Grass-land ecology and managing such grass-lands for Indian Rhino.

(ii) Tranquillisation, Rescue and Veterinary care.

(iii) Management of captive elephants.

(iv) Animal signs, animal monitoring & census techniques.

(v) Erection and maintenance of energised fences.

(vi) Interpretation and extension.

**Research priorities.**

Taking into account the extent of grass-lands in Jaldapara Wildlife Sanctuary and current management practices - this sanctuary is capable of holding a population of 70-80 individuals - as had been the case in early sixties. The reproductive rate is small at present but with younger age-group coming into reproductive age-classes during the next 10-15 yrs, the recovery potential is likely to rise significantly. Both Jaldapara and Gorumara populations are important from the point of view that the tract in which these are located, has been largely free from civic turmoil and armed terrorism. Gorumara can hold 15-20 individuals and this population may possibly never satisfy the MVP guidelines for long-term viability. But it will be worthwhile to attempt preservation of this small population for providing important

research and educational opportunities.

Rhino-evaluation sub-committee of the Indian Board of wildlife during early eighties also observed that the rate of reproduction of these populations was below optimal and surmised that this stagnation in genepool may be result of isolation of this small population over a long period. The introduction of new blood, they suggested may result in promoting reproductive behavior of the population.

In this back-ground research priorities in Rhino-bearing areas include the follow :

(i) Reproductive biology of Indian Rhinos in Jaldapara and Gorumara Wildlife Sanctuaries through registration of individuals and monitoring of rhino population with reference to reproduction and population dynamics.

(ii) Karyotypic study to test whether inbreeding depression of these two disjunct population is responsible for slow rate of recovery.

(iii) Study on grass-land ecology-with special reference to their use by Rhino-population and its associate ungulates.

(iv) Assessment of carrying capacity of existing savannah types and quantification of the needs of habitat development keeping in view the long-term survival of a viable population in Jaldapara Wildlife Sanctuary.

Under the West Bengal Forestry Project, Wildlife and Bio-diversity component has provision for such studies by identified institutes. Such studies will commence from the financial year 1994-95.

Annexure - I

Indian Rhino population in West Bengal -

Trend during 1975-'92

| Year/Protected Area | Adult | | | Sub-adult | | | Juvenile & Calf | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | M | F | UN | M | F | UN | M | F | Un | |
| 1975 | | | | | | | | | | |
| a. Jaldapara WLS | 7 | 7 | 4 | - | - | - | - | - | 5 | 23 |
| b. Gorumara WLS | Not recorded | | | | | | | | | |
| 1978 | | | | | | | | | | |
| a. Jaldapara WLS | 5 | 7 | 4 | - | - | - | - | - | 3 | 19 |
| b. Gorumara WLS | 1 | 3 | 3 | - | - | - | - | - | 1 | 8 |
| 1980 | | | | | | | | | | |
| a. Jaldapara WLS | 5 | 7 | 6 | - | - | - | - | - | 4 | 22 |
| b. Gorumara WLS | 3 | 4 | - | - | 1 | - | 2 | - | - | 10 |
| 1985 | | | | | | | | | | |
| a. Jaldapara WLS | 3 | 6 | - | 1 | 1 | 1 | - | - | 2 | 14 |
| b. Gorumara WLS | Not recorded | | | | | | | | | |
| 1989 | | | | | | | | | | |
| a. Jaldapara WLS | 9 | 13 | 5 | - | - | - | - | - | - | 27 |
| b. Gorumara WLS | 4 | 7 | - | - | - | - | - | - | 1 | 12 |
| 1992 | | | | | | | | | | |
| a. Jaldapara WLS | 8 | 12 | - | 1 | - | 1 | - | - | 11 | 33 |
| b. Gorumara WLS | 4 | 6 | - | - | - | 1 | - | - | 2 | 13 |