

## SYNOPSIS

On a suggestion made by the Secretary of the Bombay Natural History Society, an Ecological re-survey of the Hazaribagh National Park was carried out after five years, in two visits during 1965. The first visit was from March 7 to March 11, when a halt was made at the Tourist Lodge, and an intensive sampling of the areas sampled in 1959, as also some new ~~XXXXXX~~ areas, was carried out. The second was from March 22 to March 31. On this occasion the halt was outside the National Park, and by daily visits the fringes and border areas were investigated, particularly to determine the extent of poaching and the routes used for it.

The sampling method was the same as <sup>described</sup> ~~detailed~~ in my earlier paper, vide Journal of the Bombay Natural History Society, Vol., 57, No: 2, August 1960. The results show that birds, both in numbers and species, <sup>as well as Sambar and spotted deer</sup> have increased and become bolder. ~~Among the animals, only Sambar (Rusa unicolor) and Spotted Deer (Axis axis) show increases;~~ <sup>animals</sup> The others have either diminished or remained static. Floristically, there are signs of seral retrogression, and gully erosion is on the increase.

## HAZARIBAGH NATIONAL PARK RE-VISITED

By Jamal Ara

### I. GENERAL

The factor that finally led to the Park being located here in preference to other sites, was accessibility to visitors and tourists, so as to attract them in increasing numbers. This expectation has been more than fulfilled, and between January and December, 1964, over 30,000 people visited the Park. Unfortunately the majority of those who come have no interest either in wild life or forest scenery or Nature Conservation. The normal sequence is to arrive in the Park with transistors or amplified gramophones, stay at the Tourist Lodge, make a lot of noise, leave the area in an insanitary condition, and depart. During my stay at the Tourist Lodge, a batch of students and teachers from the Ranchi College went through this routine, and not one word did I hear about animals, the impressive landscape or the flora and allied subjects. Rather a visit to the National Park is one of the things that must be done in order to qualify for the small talk of sophisticated society.

On the other hand the attitude of the Forest Department also appears to be to convert <sup>the Park</sup> ~~it~~ <sup>a</sup> into an ideal picnic spot, and all activity ~~is~~ directed towards that end by increasing amenities and accessibility. Their aim is to attract the maximum number of people, and from the trends shown up to March, it is clear that the 1965 figure for visitors will be much higher than the 1964 one.

There has been a change in the set up and numbers of staff. The Game Warden is now a Forest Ranger, but posted at Hazaribagh, <sup>and</sup> assisted by an Assistant Game Warden, who is a Deputy Ranger, and 20 Game Guards. None of the staff has received any special training; their background is just the normal Forestry training given to staff of this rank, of which wild life forms a very small part. At the same time staff amenities inside the Park are poor. There are no means of communicating with Headquarters in an emergency nor is any transport available. There are no medical facilities nor any arrangements for the education of children. The staff is consequently dissatisfied and regards posting to the Park as a form of punishment.

(ii) The legal status is as wooly as ever. In spite of the lapse of ten years it is still a Sanctuary created by executive order, and no action has been taken for enacting legislation on the lines of the Model Act circulated by the India Wild Life Board. This reinforces the plea for the creation of a separate department under the Central Government for looking after Sanctuaries and National Parks, since obviously the Forest Department have no time for it. Lack of legislation gives rise to some curious situations. Officially the use of transistors and loud-speakers is forbidden, but nobody cares <sup>bothers</sup> for it, because there is no section of the Forest Act under which action can be taken for a breach of this regulation.

(iii) The boundaries are still unfenced, and there does not appear to be any scheme for doing so.

## II. AMENITIES

Construction work on a large scale is still going on. The length of roads has been doubled from 65 to 130 kms., and in addition to the Rest House and Tourist Lodge, a small cottage to provide family accommodation was under construction at the time of my visit. There are plans to build more of them, as also another 4-roomed Tourist Lodge. On the artificial lake near the Tourist Lodge, an Island Canteen has been set up, reasonably well stocked with food-stuffs, and a great attraction to potential visitors, who are assured of the availability of food. The tariff is reasonable.

Some curious innovations have been made. Some Governor suggested that 'ready-made' animals should be available in the Park, so that even the most casual visitor who came only for an hour or so, could see something. This suggestion has been carried out. In an enclosure near the Rest House, enclosed in deer-proof fencing, is kept a solitary Spotted Deer.

In the garage are a number of large bird cages containing a few Laagus pigeons and Mynas. And if while taking tea in the Canteen, you find a Sarus Crane begging for titbits, donot assume that a wild one from the Park has become so familiar due to protection. No, a pair was purchased from a Calcutta dealer and introduced

introduced in the Park. It seems a true pair was not obtained, as one of them flew away, but the other stayed behind as it had a damaged wing, and spends its time tramping round the Canteen and Tourist Lodge.

### III. ECOLOGY

Despite protection for ten years, there has been no improvement in the flora, rather there are distinct signs of seral retrogression. At the time of my visit, the Park presented an extremely bleak appearance, as early burning operations were in full swing. Every day a number of workers would set out to carry out the burn, causing great disturbance to the animals, both by the noise and the fire throughout the day. The annual fire tracing of the view strip and the roadsides has now become so extensive as to cover the bulk of the area, and there was evidence that at some places the burn had been a very fierce one. Smouldering logs and smoking stumps several days after the burn had been carried out, proved that in those areas at any rate, the departmental operations had got out of hand. Bark scorching of thin barked trees like Gardenia sp. was seen at a number of places, and many young trees of Boswellia serrata had their lower branches completely burnt.

The objective of these burning operations is two fold: (1) to prevent fires in the hot weather; and (2) the hope that since the fire will have reduced the undergrowth, even a casual visitor motoring along the roads will be able to see wild animals through lack of cover. How far the Department has succeeded in the first, I cannot say, though they claim that there has been no fire in the National Park for the last five years. As for the second, the effect is just the opposite. Animals have been driven more and more into the deeper recesses of the forest, and are more difficult to see today than they <sup>w</sup>ere five years ago. Even then they were scared.

The results of this annual burning have been disastrous in other directions as well. The proportion of <sup>1. khn-</sup> Heteropogon contortus is increasing everywhere, and is slowly forming a dense impenetrable mat, at the expense of the other herbaceous flora.

1. sp. can grass

flora. I could find no natural regeneration anywhere of either Sal of the other main tree species.

There has been no improvement in the canopy density of the main crop, Shorea robusta, and the average is about 0.5 to 0.6. At the same time the absence of any regeneration means that as these trees die, none others will come up to replace them, and over a period of time the entire floristic composition of the forest will change, probably for the worse. The evidence provided by the very large view strip cut on both sides of the road leading from the Tourist Lodge to the National Highway, a kilometre away from the latter, is unmistakable. An area of 40-50 hectares has been clear felled, with just a few seed bearers of Sal and other species randomly distributed. The strip had been burnt a few days before I reached the Park, and presented a scene of unbelievable desolation. There were no signs of any shrubby undergrowth, whereas the H. contortus was already springing back to life. It was easy to visualise what the area would look like after it had recovered from the effects of the burn: a veritable sea of knee-high Spear Grass with the odd tree sticking out, stark and grotesque. No animal will come out in this large blank traversed by a road with fairly heavy traffic upon it.

The intensity of grazing has increased considerably within this period of five years, and takes place much more openly and boldly now. Formerly much of the grazing was on the sly; now cattle are met all over the place. The village located in the heart of the Park, within a few kilometres of the Tourist Lodge, has a fairly large number of buffaloes and enjoys prescriptive rights of grazing. Consequently, for quite some distance around that village the forest is honeycombed with tracks. Along with grazing, lopping, felling of young trees and removal of <sup>3</sup>Bauhinia vahlii bark for rope making also goes on. In the interests of the Park, this village must be acquired and the inhabitants re-settled somewhere outside.

On the periphery of the Park, are a number of villages, and cattle from all of them

3. Mahul

2 Sal

them graze in the Park itself. As such, ~~there~~ are a large number of footpaths leading in from the boundary and penetrating several kilometres inside. The density of the tracks is thickest on either side of the new road built from the main approach road to the Bahimar Gate, <sup>a road</sup> and one which is very little used by visitors so far. The total area of the forest commanded by the tracks is surprisingly large, and all along them are signs of illicit fellings and rope making. One of the worst villages is Garu, which has a mixed Santhal and Birhor population. The Santhals kill animals for selling meat and skins; the Birhor's sole means of livelihood is rope making either from Sabai grass (Ischaemum angustifolium) or the bark of Bauhinia vahlii. Both the tribes find the National Park very convenient for their activities.

Considering each of the forest sub-types differentiated <sup>in my previous paper,</sup> earlier, the following changes were noticed:-

Type A: There is distinct evidence of retrogression. Nyctanthes arbortristis is spreading, and the Flacourtia ramontchi has larger and more persistent spines, at places it looks almost like a strange variety of cactus.

Sub-type A1: There has been little change in this sub-type, probably on account of its xerophylous nature. The bamboo clumps, however, are beginning to get congested and the culms themselves are thin and willowy. In spite of total protection for nearly 10 years now, I could not find a single bamboo culm 50 mm in diameter.

Type B: This has been the worst sufferer of all the types due to the annual burning. There are no traces left of fire-tender shrubs like Indigofera pulchella and Flemingia chappar, indicating that the site quality has undergone a deterioration. One looks in vain for the dense bushes of Bauhinia vahlii seen on the first visit; fire and rope makers between them have played havoc with it. Even in this type, which looks like a climax formation, there is no natural regeneration of either Sal or of any of the Terminalias.

Type C: There has been no change in this type. The lake behind the dam near the Tourist Lodge is silting up <sup>and</sup> badly, as also getting choked with weeds, particularly

Tinal  
Galphuli

particularly <sup>Ghichu</sup> Aponogetum. This stream, the Rajederwa Nalla, is the only large one throughout the area, and any degradation in it will make the water supply position more acute.

Gully erosion everywhere was much more noticeable on this occasion than on the previous one, and the heads of some of them are advancing very fast indeed. Several gullies are already 8-10 metres wide and 2-3 metres deep. The rate of advance is anything up to 3 metres annually, as estimated from the manner in which the plant roots had become exposed. Soil conservation is not taboo in any National Park, and it is not quite clear why measures to control gully erosion have not been taken so far. As a matter of fact, I could find little purpose or direction in the management of the National Park. The entire concentration is on building more buildings and constructing more roads. Of scientific steps to improve the forest and increase the proportion of wild life, I could not find a single sign. I had a feeling that the Forest department have little interest in these matters, and are content with having established something which is attracting an increasing number of visitors every year.

#### IV. SAMPLING METHODS

The sampling method was the same as on the previous occasion, but the area was gone over more intensively. The new road from the 9th kilometre of the approach road to the Tourist Lodge leading to the Bahimar Gate and many tracks in that area had not been visited on the last occasion. Observations were carried out throughout the day and late into the night as well. The days were neither hot nor the nights cold.

#### V. DISTRIBUTION OF FAUNA BY FOREST TYPES

The maximum concentration of fauna continues to be in Ecological Type B wherever it occurs, particularly in the valley bottoms. The centre of gravity stays in the valley between the Bahimar Road and the opposite hills, on either side of a road leading past the staff quarters, and another one has developed in the valleys on either side of the new road taking off from the 9th kilometre of the main approach road. Running these two a close second is a large, deep valley near Watch Tower No: 5, which

which has a perennial stream running through it, and a journey along the bye-pass road leading to it from the Tiger Trap is a rewarding experience. At all these places, however, the main increase has been in the number of Sambar (Rusa unicolor) and Spotted Deer (Axis axis). On the other hand Nilgai (Bosephalus tragocamelus) and Bison (Bibos staurus) appear to have been driven out of the area. The Asst. Game Warden claims that he and some of his Game Guards have seen a White Tiger in the vicinity of Watch Tower No: 5, but before accepting it, I would await independent confirmation by some Naturalist. I did not see it myself. The bird fauna is no longer distributed by Ecological Sub-types, is much more scattered and mixed up, and this sub-type does not present any special features now.

The valley on either side of the road leading past the Staff Quarters to the Bahimar Road, which contains forests belonging to Sub-type B, can have its animal population increased considerably by improving the water supply and closing down burning operations. A stream runs through, but at the time of my visit was already drying up, though it was only early March. Several very convenient spots exist where a small weir can be built, which will store water throughout the hot weather, and lead to a concentration of fauna.

Type A: Does not provide the richest bird life now. The Spotted Deer (Axis axis) too are no longer concentrated in this type. On the last occasion, the bulk of the Nilgai (Bosephalus tragocamelus) were found in this sub-type, but this time neither did I see a single one nor found any hoof prints. Hares (Lepus ruficaudatus) and pigs (Sus cristatus) have been reduced in numbers. The frequent signs of digging by pigs, so common on the last visit, are much less frequent now.

Type C: The Redwattled Lapwings (Vanellus indicus) are no longer confined to the artificial lake. They have spread out as well as increased in numbers.

Two resting places of Sambar (Rusa unicolor) and Spotted Deer (Axis axis) were seen, but the places are not mentioned here, because people will go and disturb their peace. The ~~six~~ Sambar herd was about a dozen strong and the herd of Spotted Deer had about six animals.



## VI. RESULTS

A change has been made in the table. The number in the Sampling Area has not been mentioned, as that will be 20% of the number given in the table. Instead the numbers estimated on the last Survey have been given for immediate comparison.

Species	Number now in Park	Number estimated in 1960	Remarks
1. Common Langur ( <i>Simopithecus entellus</i> )	Not Seen	Not Seen	Reported by staff to be present in large numbers near the villages.
2. Tiger ( <i>Felis tigris</i> )	NIL	10	Staff claim an increase to 20.
3. Leopard ( <i>Panthera pardus</i> )	10	10	Staff agree that numbers have remained more or less constant.
4. Mongoose ( <i>Herpestes edwardsii</i> )	20	20	
5. Jackal ( <i>Canis aureus</i> )	Not Seen	Not Seen	According to staff number increasing specially around villages.
6. Fox ( <i>Vulpes bengalensis</i> )	50	Frequent	
7. Wild Dog ( <i>Cuon alpinus</i> )	40	Not Seen	Staff report that on the periphery numbers have increased.
8. Sloth Bear ( <i>Melursus ursinus</i> )	20	30	
9. Palm Squirrel ( <i>Fumambulus pennanti</i> )	30	10	
10. Common Hare ( <i>Lepus ruficaudatus</i> )	Common	Very common	Seen to have diminished in numbers.
11. Bison ( <i>Bibos gaurus</i> )	NIL	20	Was an over estimate last time. Staff claim that a single herd comes in for 3-4 months every year, following a well-defined route for both inward and outward journeys.
12. Nilgai ( <i>Bosephalus tragocamelus</i> )	NIL	15	Appear to have definitely gone away.
13. Sambar ( <i>Rusa unicolor</i> )	150	30	
12. Spotted Deer ( <i>Axis axis</i> )	250	150	
13. Muntjac ( <i>Muntiacus muntjak</i> )	20	20	

Species	Number now in Park	Number estimated in 1960	Remarks
16. Wild Boar (Sus cristatus)	Common	Common	Though still common, the numbers have definitely gone down.

The Asst. Game Warden claimed that Fourhorned Antelope were to be found in sufficient numbers in the Park, that one had been shot by an employee of a Public Sector Corporation, who had been caught and suitably punished. A visiting Naturalist, however, was of the opinion that they might be Chinkara (Gazella bennetti). The latter is more probable, because Chinkara do occur in the Hazaribagh district. Not having seen either, I have not included any of them in my list.

From the table it is obvious that except for the Sambar (Rusa unicolor) and the Spotted Deer (Axis axis), none of the other animals have increased during this interval of five years. And all of them, despite protection for ten years now, continue to be extremely shy and afraid of Man. The slightest movement makes them dive for cover. As they retreat, their cautious backward glances reveal the terror in their eyes. To see any animal in daylight is a near impossibility. I am of the firm opinion that animals in the Singhbhum Sanctuaries are far bolder than in the National Park. Visitors who have gone round other National Parks in India are rather surprised to find animals so few in numbers and so difficult to see, in spite of the area being better watered and less heavily grazed. Staff attribute this state of affairs to the presence of Wild Dogs. I differ. It is well known that Wild Dog Packs are always on the move and never stay long in any one place. Their presence can have a temporary effect only, and in any case the sufferers should have been the Ungulates who are increasing.

I feel that annual burning and the heavy construction programme, both of which involve large bodies of men tramping noisily over the forests all the time, as also a certain amount of poaching are responsible. Instead of the animals responding to protection and coming out into the open, they <sup>keep themselves very well hidden.</sup> ~~are being driven deeper and deeper into~~ the recesses of the forest. Formerly deer used to come quite close to the Staff

Staff ~~go~~ quarters, right into the open, but now they never break cover. The Tiger has been affected the most. In spite of the nights being moonlit ones in March, and water holes few, neither did I see a single Tiger, nor hear ~~hear~~ the roar of any or come across pug marks. Yet the Singbham Reserves resound with the roar of Tigers during March and April, particularly when the moon is up.

At the same time there are neither the resources nor the effort to effectively control poaching, particularly along the periphery. I never met a single Game Guard or any other member of the Staff out patrolling, though I spent long hours in the field surveying extensively. Again, most poachers use motor vehicles, the Staff have only bicycles to cope with it. ~~Obviously the contest is very unequal.~~ Mention must be made of the activities of a Shikar Agency. It guarantees tigers for Rs 10,000/- to foreign tourists, and carries out the guarantee by arranging a shoot just outside the boundary of the National Park. There are reports that on occasions Tigers have been beaten out or lured outside the Park by baits being tied up just clear of the demarcation line. This is little different from organized poaching.

In the Island Canteen there is a book in which visitors record the animals they have seen. I do not feel very happy about many of the entries. During my entire stay, I noticed that the set programme for visitors was to arrive at the Canteen by the main approach road leading in from the National Highway, partake of refreshments, and leave by the bye-pass road via Watch Tower No: 5, the departure from the Canteen being usually around 7.30 - 8 p.m. Identification of animals from the fleeting glimpses obtained with a spot-light from a fast moving vehicle at night, is a job from which even experts will shrink; yet exactly on this kind of evidence the entries in the book have been made. The most honest entry was by a Staff of the U.K. High Commissioner, who recorded that the only animal he saw was a chicken in the Canteen, which was very tasty!

**B I R D S:** Compared with the mammals, birds have definitely increased and are

are really bold. <sup>Bright</sup> Green <sup>Leaf</sup> Willow Warblers (Phylloscopus <sup>nitidus</sup> trachiloides) were so many that it appeared <sup>as if</sup> they had assembled for migration. They spent the whole day on the lawn near the Canteen, restlessly flickering their wings and tails. It was really fascinating to watch them from such close quarters - now on the lawn, the next minute atop a bush, then on to a tree and back again to the lawn. The Redbreasted Flycatchers (Muscicapa parva) were also quite plentiful, and the breasts of the males were a beautiful red. It is possible to approach quite close to all the birds, terrestrial or arboreal. Given below is a list of the birds seen on this survey. Variations in the status of individual species compared with the last survey are indicated against each. The arrangement and nomenclature are according to the Synopsis by Dillon Ripley.

1. Pond Heron: Ardeola grayii - Infrequent, mostly around the lake.
2. Cattle Egret: Bubulcus ibis - About 3-4 near village on field.
3. Night Heron: Nycticorax nycticorax - Once heard after dusk, not seen. The Heronry near Watch Tower No: 5 has disappeared.
4. Whitenecked Stork: Ciconia episcopus - Not seen this time.
5. White-eyed Buzzard Eagle: Buteo teesa - 2 near Watch Tower No: 5. Loud moving call. Shy, shunned observation.
6. White-backed Vulture: Grus bengalensis - Large flocks circling the Park.
7. Crested Serpent Eagle: Spilornis cheela - Seen quite often.
8. Redheaded Merlin: Falco chicquera - 1-2 seen often.
9. Kestrel: Falco tinnunculus - A single bird hovering on the stream captured a mole.
10. Black Partridge: Francolinus francolinus - Not seen on this visit.
11. Red Jungle Fowl: Gallus gallus - Many seen around the new road from Km 9 of main approach road to Tourist Lodge, going to the Bahimar Gate. I think they are confined to that area.
12. Peafowl: Pavo cristatus - Not seen, but once heard. Staff say very common.
13. Sarus Crane: Grus antigone - Tamed specimen.

14. Indian Moorhen: Gallinula chloropus - Large numbers on the artificial lake.
15. Redwattled Lapwing: Vanellus indicus - Quite numerous.
16. Yellow<sup>h</sup>wattled Lapwing: Vanellus malabaricus - Less than the Redwattled Lapwing.
17. Green Sandpiper: Tringa ochropus - About 4. I think they gathered en-route to breeding ground.
18. Wood - or Spotted Sandpiper: Tringa glareola - 2 seen near stream.
19. Common Sandpiper: Tringa hypoleucos - Not seen.
20. Woodcock: Scolopax rusticola - Only 1 seen. Rich marbled plumage was difficult to separate from the wood. A slight movement ~~gave~~ betrayed it. The bird left the next day.
21. Little Stint: Calidris minutus - More in number than the Sandpipers.
22. Blue Rock Pigeon: Columba livia - Not seen.
23. Rufous Turtle Dove: Streptopelia orientalis - One or two seen feeding here and ~~in~~ there.
24. Ring Dove: Streptopelia decaocto - Very common.
25. Spotted Dove: Streptopelia chinensis - Common. Number definitely increased.
26. Large Indian Parakeet: Psittacula eupatria - Not many.
27. Roseringed Parakeet: Psittacula krameri - Common. One nest with young in hollow of Madhuca latifolia tree.
28. Papiha: Cuculus varius - Heard and seen near Watch Tower No: 5.
29. Indian Cuckoo: Cuculus micropterus - Not seen, but its familiar call 'Utho-dekho' once heard in the jungle on the path leading to the village.
30. Dusky<sup>H</sup>horned Owl: Bubo coromandus - Only 2 seen on the road to the Bahimar Gate.
31. Mottled Wood Owl: Strix ecallata - Not observed.
32. Jungle Nightjar: Caprimulgus indicus - Loud 'Wak-lukroo'. Common.
33. Longtailed Nightjar: Caprimulgus macrurus - Seen as soon as evening falls. The place resounds with 'Chouk-chouk-chouk' repeated up to 40-50 times, at intervals of a second. Common.

34. Common Indian Nighjar: Caprimulgus asiaticus - 'Took-took-took-tukru'. Common.

35. Franklin's Nighjar: Caprimulgus affinis - 'Chwees-chwees.' Common

Note: As soon as dusk fell, all the Nighjars would start calling from all sides, as if in competition. They would ~~also~~ wheel and fly, almost at head height.

They were most frequent in the burnt areas.

36. Whiterumped Spinetail: Chaetura sylvatica - Not seen.

37. House Swift: Apus affinis - Large flock which used to fly over the artificial lake.

38. Palm Swift: Cypsiurus parvus - In small numbers with the House Swifts at the same place.

39. Pied Kingfisher: Ceryle leucorhoa - Only 2 birds seen near the Tourist Lodge.

40. Common Kingfisher: Alcedo atthis - No increase in numbers. only 1-2 seen occasionally near the Tourist Lodge.

41. Whitebreasted Kingfisher: Halcyon smyrnensis - More frequently seen. Number has increased.

42. Green Bee-eater: Merops orientalis - About 6, which used to gather about the stream near the Canteen. Seen capturing insects on the edge.

43. Roller: Coracias benghalensis - Has increased in numbers from the last time. 3 pairs seen.

44. Green Barbet: Megalaima zeylanica - Commonly met with wherever the Simul (Bombax malabaricum) tree was in bloom. Very fond of sipping the nectar.

45. Crimsonbreasted Barbet: Megalaima haemacephala - Common. Preparing for nesting.

46. Goldenbacked Woodpecker: Dinopium benghalense - Only <sup>2</sup> chasing each other among the highest trees near the stream on the Main Road.

47. Mahratta Woodpecker: Dendrocopos mahrattensis - Common, specially near the burnt areas.  
(yellow fronted pied woodpecker)

48. Pigmy Woodpecker: Dendrocopos nanus - Frequent.

49. Skylark: Alauda gulcula - Large flock near burnt up area, feeding with the Paddyfield Pipit (Anthus novaeseelandiae)

50. Common Swallow: Hirundo rustica - A large flock with this year's young ones, near Tourist Lodge. Used to fly all day on Rajaderwa Nalla. Suddenly departed on March 10, 1965. Place then taken by House & Palm Swifts.

51. Grey Shrike: Lanius excubitor - Frequent.
52. Rufousbacked Shrike: Lanius schach tricolor - Seen in display.
53. Golden Oriole: Oriolus oriolus - Not seen.
54. Blackheaded Oriole: Oriolus xanthornus - Quite common. Musical call.
55. Black Drongo: Dicrurus adsimilis - Have increased in numbers from last time.
56. Whitebellied Drongo: Dicrurus caeruleus - Not many this time. A few here and there especially on Simul trees in flower.
57. Greyheaded Myna: Sturnus malabaricus - A few small flocks on Simul flowers.
58. Common Myna: Acridotheres tristis - Has increased from last time. Now 2-3 pairs can be seen around the Tourist Lodge, staff quarters, and in the burnt up areas.
59. Treepie: Dendrocitta vagabunda - Frequent.
60. Jungle Crow: Corvus macrorhynchos - Common.
61. Pied Shrike: Hemipus picatus - Frequent. More near burnt up area.
62. Large Cuckoo Shrike: Coracina novaehollandiae - Only two near the village forest above stream. Very noisy, attracting attention.
63. Scarlet Minivet: Pericrocotus flammeus - One or two, mostly on Simul flowers.
64. Small Minivet: Pericrocotus cinnamomeus - Large flocks. Common.
65. Iora: Aegintha tippia - Increased from last time.
66. Goldfronted Chloropsis: Chloropsis aurifrons - Not seen.
67. Jerdon's Chloropsis or Leaf Bird: Chloropsis cochinchinensis - Quite common.
68. Redwhiskered Bulbul: Pycnonotus jocosus - Not seen.
69. Redvented Bulbul: Pycnonotus cafer - Increased very much over last time.
70. Rufousbellied Babbler: Dumetia hyperythra - Flock near Watch Tower No: 5.
71. Yelloweyed Babbler: Chrysomma sinensis - 4-6 in tall grass near Canteen.
72. Jungle Babbler: Turdoides striatus - Increased.
73. Brown Flycatcher: Muscicapa latirostris - Mouse brown above; dull white below; some whitish bars in wings and tail; a flock of 6 near stream.

74. Redbreasted Flycatcher: Muscicapa parva - Plentiful.
75. Tickell's Blue Flycatcher: Muscicapa tickelliae - Not seen this time.
76. Verditer Flycatcher: Muscicapa thalassina - Only one on foot path to village.
77. Greyheaded Flycatcher: <sup>cl</sup>Culicapa ceylonensis - Near Watch Tower No: 5 in Salai  
(Boswellia serrata) patch.
78. Whitebrowed Fantail Flycatcher: Rhipidura aureola - On village foot path. Very bold.
79. Rufousfronted Longtail Warbler: Prinia buchanani - Seen on Rajaderwa Stream in tall grass. A shrill call 'Chirup-chirup' betrays the bird. Small flock of 4-5-
80. Plain longtailed Warbler: Prinia subflava - 4-5 on Bahimar Road near a ravine covered with grass. Sharp note like 'weep-weep' uttered when one or two birds swing on grass.
81. Jungle longtailed Warbler: Prinia sylvatica - Not observed.
82. Tailor Bird: Orthotomus sutorius - Common. A half nest in a Holarrhena bush.
83. Eastern Orphean Warbler: Sylvia hortensis - Not seen this time.
84. Brightgreen Leaf Warbler: Phylloscopus nitidus - Very common and bold.
85. Large-crowned Leaf Warbler: Phylloscopus occipitalis - Not seen this time.
86. Magpie-Robin: Copsychus saularis - Not seen.
87. Black Redstart: Phoenicurus ochruros - A flock of 7-8 near burnt up area. Gathered there to depart.
88. Pied Bush Chat: Saxicola caprata - Near burnt up area.
89. Jerdon's Bush Chat: Saxicola jerdoni - Near burnt up area. Flight direct and strong, but flies only short distances.
90. Indian Robin: Saxicoloides fulicata - Very common all over. In full song.
91. Paddyfield Pipit: Anthus novaeseelandiae - Large flock near burnt up area feeding with Sky Larks (Alauda gulgula)
92. Yellowheaded Wagtail: Motacilla citreola - A few on the stream near the main road.
93. Grey Wagtail: Motacilla caspica - More than the Whitefaced Wagtail. Breast turning golden.



94. White Wagtail: Motacilla alba leucopsis - 1-2 only.  
95. Tickell's Flowerpecker: Dicaeum erythrorhynchos - Frequently seen on Simul flowers.  
96. Purple Sunbird: Nectarina asiatica - Plentiful.  
97. White-eye: Zosterops palpebrosa - Small flock of 4 near stream on Main Road.

28. Three mixed hunting parties invariably used to gather in the morning and around 3 p.m. in the afternoon, so punctually that it seemed as if the members had a watch apiece. The parties were:-

I. On Footpath to Village - Small Minivets, Ioras, Indian Robins, Jerdon's Chloropses, Large Cuckoo Shrikes, and Purple Sunbirds.

II. Near Watch Tower No: 5. Rufousbellied Babblers, Brightgreen Leaf Warblers, Whitebellied and Black Drongos, Jungle Babblers, Treepies, Jerdon's Chloropses, Northern Green Barbets, Green Bee-eaters, Marhatta Woodpeckers, Scarlet Minivets, Ioras, Blackheaded Orioles, Pigmy Woodpeckers, Sunbirds and Greyheaded Flycatchers; all on Simul tree.

III. Near Canteen - <sup>Blackheaded</sup> Golden Orioles, Redvented Bulbuls, Spotted Doves, Purple Sunbirds, Green Bee-eaters, Black Drongos, Jungle Babblers, Jerdon's Chloropses, Redbreasted Flycatchers, Crimsonbreasted Barbets, Grey and White Wagtails, Ioras, Whitebreasted and Common Kingfishers, Common Mynas, Plain longtailed Warblers, Small Minivets, Grey Shrikes, Brightgreen Leaf Warblers, Treepies and Goldenbacked Woodpeckers. But the Red and Yellow Wattled Lapwings, Pond Herons and Indian Moorhens keep to themselves.

Taking both the visits, the total number of species observed in the National Park now stands at 97, which is still short of the 108 observed in the Kodarma Sanctuary, only 55 Kms to the North. The game birds, particularly Grey Partridge, Spurfowl and Quail continue to be absent, as well as kites and Hornbills.

The Black Drongos have increased considerably within these five years, whereas the Whitebellied Drongos appear to have been reduced.

#### VII. RECOMMENDATIONS

If the Bihar Forest Department are at all serious about this area being a real National Park, in my opinion, the steps indicated below must be taken without any

any delay. If, however, the sole intention is to create a picnic spot which will attract visitors in ever increasing numbers, the animals being just something accidental, then the present laissez faire policy can continue; it is admirably serving that purpose. The measures I have in mind are:-

1. Immediate legislation to put the Park on a firm legal basis. Unless the Forest Department take the initiative and press Government strongly for it, such a Bill will never be placed before the Assembly.
2. A proper plan of management, something on the lines of a Forest Working Plan, should be drawn up, so that there is a properly defined policy in respect of the Park.
3. The entire boundary of the Park has to be fenced. This work can be spread over the next five years.
4. All burning operations to cease and construction activity to be cut down to a minimum. Selected blank areas can be given over to the cultivation of pulses for attracting deer. At least this will serve the purpose of making it a Deer Park.
5. The Watch Towers which contrast with the landscape and drive away animals, can have their outlines softened by a liberal planting of foliaceous creepers. If any more Watch Towers are contemplated, they should be of rough hewn timber, and so constructed as to merge in the background. They should not offend aesthetically.
6. Staff for the Park to have specialised training in Animal Ecology and Management. Dehradun can consider having special classes for training Officers, Forest Rangers and Deputy Rangers. Game Guards can be trained in the States themselves, provided the higher echelons have the correct background. Allied to it, for creating better interest, the Staff should be given Special Pay, and arrangements made for proper medical attention to them and their families, as well as a special provision for the education of their children.
7. A Jeep is a sine qua non for efficient patrolling and the elimination of poaching.

#### VIII. ACKNOWLEDGEMENTS

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I thank the Bombay Natural History Society for the contribution which made this re-survey possible. I also thank Mr. S. Muhammad, Conservator of Forests, Hazaribagh Circle, and Mr. D.P. Sinha, Divisional Forest Officer, for help and co-operation. Special mention must be made of the Assistant Game Warden, Mr. Razzaque, whose constant attention and a genuine desire to make my work a success, was one of the pleasantest experiences I had during my stay in the Park. Special thanks are also due to Mr. Sami Ahmad, who was my constant companion throughout the Survey, in spite of sickness.